COST-CONSCIOUS MEDICAL PROFESSIONALS:

INDIVIDUAL RESPONSES TO MULTIPLE INSTITUTIONAL LOGICS IN A CHINESE REGIONAL HOSPITAL

by

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Abstract

Healthcare expenditure is expensive, and it is anticipated to see continuous growth in the future, driven by a variety of factors relating to social, political, technological and economic conditions. The generation of medical expenses is often attributed to the decisions made by healthcare professionals during their medical practice. As a result, the integration of cost consciousness into the mindset and actions of medical professionals has received significant attention, emerging as a key focal point in healthcare reforms across the globe.

Healthcare reforms have seen numerous endeavours aimed at instilling a sense of cost-consciousness among doctors, such as the incorporation of cost-control techniques into medical practice. This study focuses on the efforts made by a developing context of China in this regard, primarily addressing the question of how doctors perceive the relationship between cost control and healthcare activities by employing the institutional logics as the theoretical perspective. The study conducted 31 semi-structured interviews with medical professionals in two types of departments at a large Chinese provincial hospital: the lab department and clinical departments, and collected documentaries as a supplement to the interviews. Thematic analysis was employed to elaborate on medical professionals' perceptions toward cost control, methods developed to control costs and their reasons for controlling medical expenditures. The study shows that medical professionals displayed a context-based perception of cost control, and their reasons for cost control were derived from medical, and cultural considerations.

This study has identified two institutional logics in the case hospital, namely

commercial logic and medical logic. Medical professionals exhibited different perceptions regarding the relationship between these two logics in clinical departments and the lab department. Specifically, there was a perceived conflict between cost control and healthcare activities in clinical departments, whereas such conflict was not experienced in the laboratory department. The divergent perceptions of healthcare professionals regarding these two logics also influenced their approach towards handling the multiple logics context. When perceiving conflicting situations, medical professionals adopted three methods, namely combination, avoidance, and defiance to manage the institutional requirements from these logics. Conversely, when doctors perceived a non-conflicting situation, they utilized the acquisition approach to manage the two logics. This study additionally demonstrates that, influenced by cultural factors, the identities of medical professionals could undergo a transformation into hybrid professionals. Cultural factors also enabled doctors to strike a balance between the demands of cost control and maintaining medical quality. Through an examination of doctors' perceptions of various institutional logics in medical practice, this study suggests that the existence or absence of logic conflicts is primarily a contextual artifact, significantly influenced by the nature of medical practice. Moreover, individuals exhibit considerable agency in managing demands stemming from multiple institutional logics, developing diverse responses to these logics.

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Contents

Abbreviation List

Chinese Communist Party – CCP

Chinese Medical Association – CMA

Chinese Medical Doctor Association - CMDA

Diagnosis-related Groups – DRGs

Emerging Economies – EEs

National Medical Insurance System – NMIS

New Public Management – NPM

People's Republic of China – PRC

Standard Operating Procedures - SOP

Single Disease Payment – SDP

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Chapter 1 Introduction

The level of healthcare expenditure has been a significant concern for many nations over the last few decades. This phenomenon can be explained by the interplay of various factors, including the advancement of medical technology, the escalating costs associated with pharmaceuticals and treatments, the expansion and growing complexity of healthcare systems, the ageing demographic profile of the population, the mounting demands for healthcare services, and a reduction in government revenue (e.g., Abernethy and Stoelwinder, 1990; Coombs, 1987; Lapsley, 1994, 2007). As time has progressed, this matter has developed into one of the prominent issues for governments to address, requiring them to consider providing adequate healthcare services while simultaneously addressing the escalating trend of healthcare expenses.

Integrating medical professionals into hospital management structures, such as management accounting systems (Abernethy, 1996), has been proposed as a resolution to resolve this issue. The rationale behind this proposal is that healthcare professionals have a significant impact on hospital expenditures. Hillman et al., (1986) have stated that 80% of the total hospital expenditure is under the control of doctors, and their involvement in resource management affects the hospital's ability to sustain itself. Therefore, to improve efficiency in hospitals, doctors should be involved in the resource management process (e.g., Abernethy and Stoelwinder, 1990; Doolin, 1999). Nevertheless, doctors encounter limited incentives to enhance their operational efficiency, and they lack both the mechanisms of responsibility and comprehensive insights into the resource utilization ramifications arising from their

clinical decisions (e.g., Lapsley, 2001). Many believe that implementing more streamlined management practices, similar to those often seen in manufacturing companies, can help manage and reduce patient care expenses (Fetter and Freeman, 1986; Lehtonen, 2007). The New Public Management (NPM) was introduced within this context.

The main goal of NPM is to shift public management and administration from conventional paradigms to an 'accountingization' model (Hood, 1991, 1995). This model incorporates management concepts from the private sector into the public sector, aiming to enhance operational efficiency and effectiveness. Various accounting methodologies have been implemented within hospital contexts, leading to diverse outcomes. For example, in practice, these accounting tools are seen as ceremonial systems primarily focused on constructing and validating significance (Covaleski et al., 1993). As ceremonial systems, they enable public organisations to carry out procedures in authorized ways, providing representations of activities that are both logical and acceptable to external stakeholders, but with a restricted impact on improving efficiency and effectiveness (ibid.).

The accounting literature has extensively analysed the underlying reasons for the different outcomes of applying accounting systems, with one aspect being the responses of doctors towards the implementation of accounting techniques, especially cost control technologies. In some cases, medical professionals demonstrate a willingness to embrace accounting principles and incorporate them into their medical routines (e.g., Jacobs, 2005; Kurunmäki, 2004), but they may also oppose and even actively resist the introduction of accounting practices (e.g., Jones

and Dewing, 1997; Leotta and Ruggeri, 2017; Oppi et al., 2019). Through a series of research conducted mainly under Western context, various individual, organisational, professional, and institutional factors were identified that either heightened or diminished doctors' willingness to engage with cost information. On the one hand, the factors that prompt doctors to engage in accounting practices include getting promotions (Jacobs, 2005), competing for resources with other participants (Coombs, 1987), aiming to make medical practice more effective and efficient (Gebreiter, 2022) and the historical lack of a structured accounting profession system (Kurunmäki, 2004). On the other hand, the factors that lead to doctors' reluctance to accounting practice include the different value systems of medical and accounting practice (Jacobs, 2005), the immeasurable nature of medicine (Gebreiter, 2016), the insufficiency of accounting information systems in catering to medical requirements (Oppi et al., 2019), and the potential threat to medical autonomy caused by the accounting system (Doolin, 1999; Jones and Dewing, 1997). The responses and the factors influencing these responses can differ depending on the specific context in which accounting is employed. Therefore, it is worth analysing in different contexts on how medical practitioners perceive the relationship between medical practice and cost control activities, with specific focuses on how they navigate the demands posed by medicine and cost control within their professional activities, and why doctors perceive and navigate in their particular ways.

Given this perspective, the study chose China to carry out its investigations. As an emerging economy, China demonstrates unique economic, political, cultural, and social characteristics. Founded in 1949, the People's Republic of China (PRC) embarked on a prolonged and determined effort spanning several decades to rebuild

and recuperate from the aftermath of World War II and the Civil War. From 1949 to 1978, China implemented a centrally planned economic system and the notion of centralized planning and governance was extended to administration of the public sector as well. In 1978, the central government undertook the decision to enact the 'Reform and Opening-up' policy, with the goal of establishing a socialist economy oriented towards market dynamics. Marketization principles, such as the commercialization and decentralization of public hospital operations, as well as the introduction of the bonus system to enhance efficiency, were subsequently extended to the public sector. The healthcare reform from 1979 to 2009 was regarded as the first stage of Chinese healthcare reform, and it resulted in notable societal issues, among them being the impediments to healthcare accessibility and the elevated costs of healthcare services for the public (Renmin Zhengxie Daily, 2015). To alleviate these social issues, the central government launched the second phase of healthcare reform in 2009 and this phase has continued up to the present, with the primary goal of controlling healthcare expenditure. During this period, the National Medical Insurance System (NMIS) was introduced, subsequently giving rise to the adoption of the Single Disease Payment (SDP) system, clinical pathways and the global budget system. The SDP operated as a prospective reimbursement approach for the medical insurance, wherein the NMIS disbursed predetermined fees to public hospitals based on classified diseases. Clinical pathways established guidelines for conducting standardized medical practices. The global budget system allocated overall annual budget to public hospitals. As a result, cost control principles and techniques have been introduced into public hospitals.

The primary objective of this study is to understand the perceptions of medical

professionals in Chinese public hospitals regarding the relationship between medical practices and cost control. This further includes giving a detailed account of their reponses to cost control measures and providing an explanation for the underlying motivations behind their responses. This study selected a Chinese regional public hospital as the place for the case study, and employed the qualitative methodology to guide the data collection process. The case hospital is one of the largest 3A public hospitals[1] in a province of China. The medical functional units within the case hospital encompass both clinical departments and medical technology departments. This organisational configuration fulfils the need for a diverse set of participants. This case study relies on a combination of documentary data and 31 semi-structured interviews. Of these interviews, 14 were conducted within the laboratory department, and 17 were carried out in clinical departments. Due to the COVID-19 pandemic, data collection was conducted online. Following that, the data underwent an analysis utilizing the thematic analysis approach (Braun and Clarke, 2006) and employed the institutional logics as a theoretical perspective (Thornton et al., 2012d).

This study identifies two institutional logics, namely medical logic and commercial logic, in the case hospital. The findings reveal divergent perceptions among doctors from different departments regarding the interaction between these two logics. Within the laboratory department, doctors perceived a non-conflicting coexistence between the two logics, and they primarily drew upon elements of Chinese culture, such as frugality, to integrate the demands of cost control with medical practice. They acquired cost control ideas either through culturally-influenced habits or through

[1] **3A Public Hospitals**: Accord ng to 'Hosp ta Grad ng Management Measures , 3A pub c hosp ta s are the h ghest eve of hosp ta s n Ch na, represent ng the h ghest standards of med ca fac t es, med ca technology, and med ca serv ces.

imitation. However, in clinical departments, clinicians identified a conflicting situation between the two logics. They perceived that SDP, clinical pathways, and global budget imposed constraints on the utilization and allocation of medical resources. When perceiving such conflicting circumstances, clinicians displayed a range of responses. Clinicians might opt to selectively combine institutional requirements from both logics on a situational basis, or they may choose to make certain concessions within the medical logic to incorporate elements of the commercial logic. Alternatively, they may also avoid the necessity of conforming to cost control requirements by concealing their true pursuit for medical quality, transferring the cost control responsibilities to other constituents involved, or escaping from the possibility to comply with the commercial logic. In addition, they might choose to situationally defy commercial logic or provide rationales for rejecting cost control requirements.

According to the findings of this study, the nature of medical practice holds a pivotal role in shaping doctors' perceptions. Medicine is regarded as an art in clinical departments, which defines the unmeasurable and unquantifiable medical practice in these departments. This nature presents challenge to the integration of medical practice with accounting techniques that emphasize explicit measurement of medical activities. However, within the laboratory department, medicine is viewed through a scientific lens and is subject to quantification and measurement through well-defined processes. This nature of medical practice makes doctors in this department more inclined to embrace the concept of assessing medical procedures using numerical methodologies.

Furthermore, this study identifies other drivers behind medical professionals’

responses in different scenarios. The decision to adhere to or defy the commercial logic was also influenced by the national culture and the bonus system. In the laboratory department, the incentivizing nature of the bonus system motivated doctors to be mindful of costs, while the culture of frugality inspired doctors to develop various cost control methods. However, in clinical departments, the punitive dimension of the bonus system compelled clinicians to conform to some institutional norms and requirements, while the influence of the frugal culture had a more restricted scope, primarily affecting clinicians' cost consciousness on matters distant from the core of clinical practice.

Moreover, this study contributes to the hospital accounting literature by offering alternative viewpoints on two key subjects: the relationship between cost control and medical quality, and the emergence and development of hybrid doctors. While hospital accounting literature suggest that it is challenging to balance higher medical quality and lower medical expenditure (e.g., Cardinaels and Soderstrom, 2013; Llewellyn and Northcott, 2005), the findings from the laboratory department suggest that doctors appeared to deliver high-quality medical care at comparatively low expenses. In terms of hybrid doctors, accounting literature posits a set of personal, organisational, professional and institutional factors that have influenced medical professionals' engagement with cost information (e.g., Coombs, 1987; Gebreiter, 2022; Jacobs, 2005; Kurunmäki, 2004). The findings from the lab department highlight that national culture can indeed assume an important position in determining the degree to which doctors are willing to adopt hybrid roles and actively participate in cost control measures.

Employing an institutional logic framework to analyse doctors' perceptions on cost control within a Chinese hospital, this study demonstrates that individuals' perceptions towards multiple institutional logics are largely contextual, professional, and cultural matters. Furthermore, this study illuminates the significance of individual agency in managing situations where medical logic and commercial logic are perceived as conflicting or non-conflicting. It also provides nuanced categorizations of individual responses to these situations. Moreover, this study contributes to hospital accounting literature in terms of the discussion of cost control and medical quality, and the development of hybrid medical professionals.

The thesis has been segmented into nine chapters, arranged in the following manner. Chapter 2, the literature review, primarily discusses the introduction and development of using accounting principles in public sector management, particularly within public hospitals. It also examines how medical professionals from different regions respond to the implementation of accounting technologies. Chapter 3 provides a concise overview of the theoretical framework, namely the institutional logics. Chapter 4 offers a brief introduction to the Chinese context, including its cultural aspects and the development of medical and commercial logics. Chapter 5 delves into the methodology and research methods employed in this study. Chapter 6 presents the findings obtained from the laboratory department, while Chapter 7 concentrates on the findings within clinical departments. Chapter 8 engages in a discussion of the findings, while Chapter 9 serves as the concluding part of the thesis.

Chapter 2 Literature Review

1. Introduction

The rising healthcare expenditures have emerged as a significant and pressing concern for authorities. Public healthcare institutions, serving as the primary providers of healthcare services, have subsequently encountered criticism of perceived deficiencies in their administrative practices, which constitute one of the key factors driving the escalation of medical expenses. The NPM concept, which promotes the adoption of accountingization[2] type of organisational methods in the healthcare sector, was introduced with the aim of improving the management of healthcare institution operations. Its objective is to shift public management and administration away from conventional models and toward an 'accountingization' (Hood, 1995) model, with the ultimate goal of enhancing efficiency and effectiveness. Under this paradigm, medical professionals, notably doctors, were expected to fulfil some financial responsibilities and become gradually aware of the importance of cost control in their healthcare practices. Doctors' perception of cost control and their responses towards cost control techniques have progressively emerged as an area of interest in accounting research. In this respect, this chapter will serve as an overview of the existing literature that explores the initiation, process, and implications concerning the development of cost-conscious doctors.

[2] Hood (1995, p.93) defined accountingization as "the introduction of ever-more explicit cost categorization into areas were costs were previously aggregated, pooled or undefined".

2. The emergence of cost-conscious doctors: NPM reforms

The term NPM is introduced to describe a series of administrative efforts that have been initiated within the public sector since the late 1970s (Hood, 1991). These efforts advocate for the incorporation of private sector management practices and principles in the governance and administration of public organisations. Initially emerging in the United Kingdom and within municipal governments in the United States and later adopted by other OECD countries, the NPM then become a significant and prominent global trend in public administration over recent decades (Gruening, 2001).

The inception of the NPM was not just a convergence of concepts from the new institutional economics and business-oriented managerial practices within the public sector (Hood, 1991), but also a response to several special social conditions after World War II (Hood, 1995). On the one hand, the new institutional economics, drawing from several theoretical grounds including transactions cost theory, public choice, and principal-agent theory, had contributed to the development of administrative reform doctrines which centred on concepts of contestability, user choice, transparency, and incentive structures in the NPM (Hood, 1991). Business-type managerialism, on the other hand, advocated a set of doctrines suggesting that professional management was superior to technical expertise and was central to better organisational performance (ibid.), and served as part of the basis for the introduction of private management philosophy and practices. The NPM extended its influence even further and evolved into an enduring reform strategy due to its

compatibility with the distinct social conditions prevalent in developed countries. In the post-industrial era, advancements in technology contributed to the dissolution of the traditional demarcation between public and private sector work, leading to a general integration of roles and functions across both domains (Jessop, 1989). Furthermore, policy-making processes began to be increasingly shaped by professional party strategists instead of being solely under the purview of the bureaucracy (Hood, 1991). In developed nations, the demarcation between the private sector and the public sector gradually became less distinct, and these contextual factors created opportunities for the exchange of knowledge between the two sectors. Furthermore, the public sector of OECD countries was criticized for its rise in operational costs, the diminished efficiency, and the ineffective allocation of resources (Marcon and Panozzo, 1998; Oppi et al., 2019; Pettersen, 2001). As a result, the NPM presented itself as a potential remedy and was widely perceived as a means to tackle the various challenges confronting public administration in these nations.

As an “all-purpose garment” (Hood, 1991, p.8), the NPM claims its applicability and relevance to diverse contexts, such as education, healthcare and different levels of government, and to various nations. In practice, the NPM emphasized a primary focus on cost-cutting operation rather than expanding bureaucracy (Hood and Jackson, 1992), advocated for "self-regulation" as a preferred mechanism (ibid.), employed output targets instead of traditional process controls (Dunleavy and Hood, 1994; Hood and Jackson, 1992; Hood, 1995), implemented performance-linked pay in place of uniform fixed salaries (Hood and Jackson, 1992), and recommended contractual or quasi-market forms (Jones and Dewing, 1997). The concepts of

"efficiency" and "value-for-money" were mobilized and integrated into the public sector (Lapsley, 1994). As a result, the authority of managers was gradually fortified by these assertations, while the trust in professionals in the public sector was undermined (Dunleavy and Hood, 1994; Hood, 1995; Jones and Dewing, 1997). Apart from developed countries, these proposals also attracted substantial interest from a wide array of emerging economies, although NPM reforms in these countries displayed certain differences compared to those in developed nations (Sarker, 2006; van Helden and Uddin, 2016). The first aspect to consider is the impetus of the NPM implementation. The adoption of NPM reforms in emerging economies is often attributed to their alignment with Western trends, a process in which the NPM is set by international donor institutions as a prerequisite for providing financial assistance (Manning, 2001; Polidano and Hulme, 1999; van Helden and Uddin, 2016). The second element involves the specific conditions within these countries. The authorities in these countries also expected that the NPM reforms could address issues of poverty (Adhikari et al., 2013), unemployment (Sarker, 2006) and other socio-economic challenges prevalent in their societies.

However, the global diffusion of NPM principles has generated varying degrees of impact among countries, influenced by their distinct economic, political, and cultural contexts (Sarker, 2006; van Helden and Uddin, 2016), and this requires a more in-depth examination of the implementation of NPM in various nations. Hood (1995) also proposed that the effects of NPM reforms exhibited significant heterogeneity across different regions of the world, thereby requiring the analysis of NPM within distinct contextual frameworks to better understand its implications and outcomes. These circumstances not only affect the driving force and outcome of the NPM but

also have had a direct bearing on accounting in the public sector, including in the healthcare system (Hopper et al., 2009; van Helden and Uddin, 2016).

2.1 NPM in the Healthcare System

The governments in Europe and in many developing countries consider access to healthcare as a fundamental right of citizenship which is independent of individual income, and therefore they strive to reduce health inequalities in the healthcare sector (Mills, 1997). Nevertheless, healthcare spending has exhibited a noticeable and consistent upward trend over the years, posing challenges for governments in their efforts to address inequality in healthcare. The increase in healthcare expenditure can be attributed to multiple factors, stemming from both the surge in the demand side and the increase in the supply side of medical services (Coombs, 1987).

On one hand, there has been a significant increase in public demand for health services (Abernethy and Stoelwinder, 1990). Demographic changes, characterized by shifts in population size, age distribution, and overall health profile, place substantial pressure on healthcare systems, as the number of individuals requiring access to healthcare services rises and the demand for comprehensive healthcare coverage is also growing accordingly (Coombs, 1987; Lapsley, 1994, 2007). The government must not only improve access to medical services for individuals but also expand healthcare insurance coverage. However, endeavours to broaden healthcare coverage may simultaneously result in heightened demands for healthcare services. The absence of market-based pricing in healthcare services can lead to patients perceiving these services as either free or heavily subsidized

(Lapsley, 1994). This perception may, in turn, encourage patients to seek medical attention for minor or non-urgent health issues, thereby amplifying the overall demand for healthcare services. At the same time, as people's life expectancies increase, they often encounter age-related health issues and chronic conditions that require ongoing medical attention and specialised care (e.g., Dieleman et al., 2017). Moreover, as societies progress and become more informed, individuals increasingly expect higher standards of medical care (e.g., Ghorbani, 2021). Given this context, patients now expect healthcare services to be more patient-centred, personalized, and effective in addressing their specific health needs and concerns, and expect their healthcare providers to offer access to the most advanced and effective treatments available and embrace new and innovative healthcare solutions. The combination of these factors has led to a rise in the demand for medical services.

On the other hand, a continuous expansion of the supply side of medical services is also occurring. Advancements in medical technology have revolutionized the way healthcare is delivered (Coombs, 1987; Lapsley, 1994). As new medical technologies emerge, healthcare providers can offer a wider range of diagnostic and treatment options with cutting-edge medical equipment, diagnostic tools, and treatment modalities, addressing a broader spectrum of health conditions. It also leads to the continuous expansion of healthcare infrastructure and shapes it into the larger and more complicated medical system (e.g., Hoff, 2000; Montgomery, 1990). While the establishment of new hospitals, clinics, and specialised medical centres has expanded the accessibility of medical services, it has also resulted in an increased number of medical professionals and hospital beds, which, in turn, contributes to a rise in healthcare expenditure (Coombs, 1987). These factors operate in conjunction

to contribute to the growth of healthcare expenditure from the supply perspective. The dynamic interplay between rising demands and supplies of medical services, coupled with a reduction in government revenue (e.g., Abernethy and Stoelwinder, 1990), exerts a substantial influence on the healthcare expenditure.

In addition to the delivery of healthcare services, the medical profession itself has been considered one of the contributing factors to the surge in medical expenses. Public hospitals and medical professionals have faced criticism regarding their poor management of hospital operations and the perceived inefficiencies in healthcare provision (e.g., Kurunmäki, 1999b; Lapsley, 1997). These criticisms argue that the operation of public hospitals has been significantly influenced by a professional or clan culture, leading to the establishment of a governance structure rooted in professional self-regulation (Kurunmäki, 1999b). This structure then evolves into a longstanding tradition of hospital management, emphasizing less on bureaucratic or managerial forms of control (Kurunmäki, 1999a) . As a result, accounting information and techniques have been rarely applied (Bourn and Ezzamel, 1986). Hence, the adaptation of managerial approaches, shifting from professional self-regulation to alternative forms of control, has been suggested as a solution to enhance efficiency. Simultaneously, the trust in medical professionals, healthcare professionals' commitment to ethical standards, and their capacity to meet patient needs have been subjected to challenges (Fowles, 1993). Medical professionals are criticised for inefficient distribution of resources, over-provision of some health interventions, wasteful resource practices, as well as overstaffing (Mills, 1997), and there have been calls for increasing their financial responsibility (Kurunmäki, 1999b) and establishing clearer and more defined control mechanisms within hospitals

(Humphrey et al., 1993). Some international organisations, such as the World Bank, argue that such inefficiencies can only be overcome by radical changes in the healthcare organisations (The World Bank, 1993).

The broad NPM agenda, which advocates for actions like deregulation, contracting services to external providers, fostering internal competition, decentralizing decision-making, and separating policy formulation from service delivery functions, has been manifested within the healthcare sector as the division of healthcare purchasers and providers, internal competition among healthcare institutions, support for private sector involvement in healthcare provision, and the introduction of various health insurance schemes (Russell et al., 1999).

Some attempts, targeted at either the public hospital level or individual level, have been made to utilizing accounting techniques for the management of healthcare expenses. At hospital level, the efforts to enhance the efficiency of public hospitals have been implemented through two ways, namely privatization and corporatization. Privatization involves the transfer of formerly public healthcare organisations to private ownership, whereas corporatization involves segregating healthcare delivery away from government agencies while retaining the organisation under public ownership in a legal framework (Lindlbauer et al., 2016). The two ideas have been further implemented in practice, including imposing a cap on healthcare expenditures such as fixed lump sum on each hospital or on each medical speciality (Simonet, 2013); privatizing hospitals into healthcare centres and contracting out some or all medical service to private hospitals (Alonso et al., 2015); shifting the form of government from direct control to contractual arrangement and making adjustments

on the organisational structure (Rego et al., 2010).

Some initiatives aim at more micro-level, focusing specifically on individuals working within public hospitals. The primary goal of these initiatives is to cultivate accounting practitioners within public hospitals who possess the necessary knowledge and skills to comprehend and apply accounting information and techniques to the management and administration of healthcare institutions. The initiatives include converting bureaucrats into managers, hiring managers from the corporate side, introducing mission statements from the corporate model to medical professionals (Simonet, 2013); or transforming doctors to managers by implementing clinical leadership (Doolin, 2001). Additionally, accounting techniques have been adapted from the private sector and tailored to suit the specific requirements of medical practices. These accounting techniques include clinical budgeting (e.g., Lapsley, 2001; Preston et al., 1992), Diagnosis-related Groups (DRGs) and its derivatives (e.g., Covaleski et al., 1993; Chua, 1995; Lehtonen, 2007)(Chua, 1995; Lehtonen, 2007), care pathways (Gebreiter, 2017), and more explicit performance measurement standards (Pettersen and Nyland, 2006). These accounting technologies are designed to enhance healthcare efficiency from two different perspectives: cost effectiveness, which aims to elevate the quality of healthcare while minimizing costs or optimizing health outcomes within a predetermined budget; and operating and technical efficiency, which involves achieving the maximum possible output from a given amount of inputs or attaining a specific output with the minimal utilization of inputs (Mills, 1997).

Introduced into hospitals as a way of reducing costs and increasing efficiency, the

concept of accounting and accounting practitioners has extended beyond professionally qualified accountants and financial department (Guthrie et al., 1999). Accounting is also seen as having the potential to extend its influence to other professional domains, including the medical profession (Kurunmäki, 2004). Therefore, the upcoming section will examine how these endeavours to develop cost-conscious doctors have been implemented and the consequences and implications associated with these efforts.

3. Cost-conscious doctors: The attempts and implications

As described in the preceding section, one of the primary methods for implementing NPM principles within public hospitals is the transformation of medical professionals, particularly doctors, into individuals who consider efficiency, effectiveness, and cost-consciousness in their roles. This approach is based on the acknowledgment that a substantial portion of healthcare costs is impacted by the choices and decisions made by doctors (Hillman et al., 1986). Healthcare authorities also believe that assigning financial accountability to the level of service delivery would lead to improved hospital performance (Jones and Dewing, 1997). Therefore, different attempts have been made to develop cost-conscious doctors in public hospitals. The concepts of financial accountability, performance assessment, and efficiency evaluation, grounded in the framework of cost accounting and budgeting, have assumed progressively more significant roles in hospital accounting (Lapsley, 1994; Preston et al., 1992).

3.1 The attempts to develop cost-conscious doctors

Doctors occupy a crucial role in the daily administration and allocation of medical resources (Pollitt et al., 1988). They employ their specialised knowledge to address the complexities involved in patient care, treatment decisions, and medical resource allocation. This direct involvement in clinical decision-making, treatment planning, and patient interaction positions doctors at the core of resource management. As such, authorities hold the belief that it is crucial for doctors to assume the roles of budget holders and cost controllers (ibid.), wherein they integrate the aspects of cost management with the practice of medicine. Furthermore, costing system, as an information system, should be designed in alignment with material properties of organisational process and managerial objectives (Chapman and Kern, 2024). In organisations that provide professional services such as public hospitals, if they only rely on accountants for designing costing systems, the technical challenge of costing information (i.e., errors) may be amplified in these organisations. Therefore, the participation of doctors in cost system design enhances the alignment of cost system design and organisational processes (ibid.). Improving the effectiveness of healthcare services requires acknowledging the significance of high-quality cost data, which is dependent on active engagement of clinicians in the design of the cost system (Chapman et al., 2016). Clinicians produce cost data in the first place.

However, the well-established professional art within hospital settings creates a scenario where medical practice and professionals remains largely shielded from external interventions and oversight, including those from authorities (e.g., Barber, 1963; Engel, 1970). Since individuals are accountable when they are visible, accounting, which is regarded as creating, maintaining and enhancing the visibility of

organisational activities (Jacobs, 2000), is therefore introduced as a technology of making doctors financially responsible. First of all, accounting has the potential to shed light on actions that may not be directly witnessed in a tangible manner, particularly when considering the actions of individual entities (Miller and O'Leary, 1987). Actions can be quantified through the application of accounting, and this quantifiability not only permits a comparative analysis of these actions against established benchmarks but also promptly highlights any deviations that may arise (Jacobs, 1995). Moreover, accounting can transform abstract concepts and values into tangible representations (ibid.), and therefore serving as a foundation for control mechanisms (Hopwood, 1990). The ability to enhance the visibility of organisational activities and permeate and influence internal structure within organisations has progressively make accounting institutionalized as a device for illustrating how organisations should function to achieve organisational ends (Hopwood, 1990; Lapsley, 1994; Meyer and Rowan, 1977). Given that accounting can translate social intentions into technical frameworks, it is also acknowledged as the representation of impartial rules guiding the rational pursuit of these objectives (Lapsley, 1994). These attributes of accounting render it a viable choice for reforming the healthcare sector, reconstructing the professional boundaries within public hospitals, and redefining medical practice as well as the role of medical professionals. Budgeting systems and DRGs exemplify accounting technologies implemented within public hospitals.

3.1.1 Clinical budgeting systems

Budgets assume a vital role in the domain of managerial control within organisations. Being as comprehensive financial plans, budgets serve as the foundation for directing and assessing the performance of subordinate units and individuals within

the organisational context, with the primary objective of enhancing coordination and oversight of the various activities carried out by these components (Covaleski and Dirsmith, 1983). It was proposed in the NPM that in medical practice, doctors' resource allocation practice should be subjected to scrutiny and monitoring, and doctors should be accountable for the entire process (Jacobs, 1995). As a result, authorities have made efforts to institute budgetary measures within public hospitals, with the intention of encouraging medical professionals to effectively allocate and manage medical resources.

These attempts include delegating budgets according to the respective levels of responsibility (e.g., Rea, 1994) and engaging doctors in the formulation of budgetary frameworks (e.g., Jacobs, 1995). One of the examples that accounting literature analyses is the clinical budgetary systems established around the concept of clinical directorship, in which senior medical professionals are encouraged to take on the responsibilities of clinical directors. In New Zealand, budgetary responsibilities were associated with these senior medical professionals through a performance contract that outlined anticipated outputs, through the process of converting management accountant's operating plan into a business plan, and through participation in budget modelling and sensitivity analysis (ibid.). By encouraging senior professionals to take on budgetary responsibilities, this initiative aims to instil financial accountability among frontline medical professionals with the guidance and influence of their senior colleagues, and further enhance the visibility of medical practice and control doctors' behaviour in the allocation of medical resources (Jacobs, 1995; Lapsley, 2001).

3.1.2 DRGs

In addition to the application of clinical budgets, a system known as DRGs has been formulated to categorize hospital products. The foundation of DRGs lies in a commercial paradigm that views the delivery of patient care within hospitals as a business endeavour. This viewpoint claims that it is justifiable to identify the products of medical practice, considering its potential benefits for cost containment, strategic planning, and quality assurance (Fetter and Freeman, 1986). The identification of products is also claimed as reasonable by Fetter and Freeman because there is minimal variability observed across different physicians in the treatment process (ibid.) The limited variability offers the opportunity for standardizing medical products, as Fetter and Freeman (1986) proposed. These two viewpoints serve as the foundational basis for the development of DRGs as the operational products of medical practice. Chapman et al.(2022) also emphasised that DRGs are developed because of the need of cost information in setting healthcare price at national level, in producing report at provider level, and in benchmarking performance with other providers.

The DRGs encompass crucial elements such as the primary diagnosis, operating room procedures, comorbidities, complications, patient age, and discharge status within its multifaceted structure (Covaleski and Dirsmith, 1991). This system characterizes the outcomes of medical services by grouping patients with similar medical needs, categorizes hospital cases into 468 distinct patient classes, and establishes a pre-determined fixed price for each DRGs category (Fetter and Freeman, 1986; Preston, 1992). DRG systems leads to the development of costing guidance at provider level, where it specifies the cost object (i.e., the DRGs), cost

methods, cost categories, and reporting format, and these specification directly and/or indirectly affect the costing practice (Chapman et al., 2014).

Chapman et al., (2014) suggested that DRG systems are used primarily as a currency for provider payment. In contrast to retrospective payment mechanisms wherein hospitals received reimbursement covering their complete service provision expenses, the DRGs, as a prospective payment system, centres on lowering medical expenditure (Lehtonen, 2007). In this arrangement, hospitals are obliged to absorb any deficit should the actual costs surpass the predetermined rate. In essence, the formulation of DRGs is transforming medical services into standard, manufactured and sold “products”, and therefore creates a possibility for communication between medical knowledge and fiscal knowledge (Samuel et al., 2005). Chapman et al., (2014) proposed that DRG systems has direct impact on clinical practice through standardising medical practice, which makes financial implication of clinical decisions visible (Doolin, 1999) and establishes a platform for the evaluation and comparison of performance across both hospitals and medical practitioners (Chua, 1995). In addition to standard products, the DRGs can also be regarded as the establishment of an industry standard within the clinical realm, thereby motivating clinicians to align their behaviours in accordance with these prescribed standards (Chua and Degeling, 1993; Lowe and Doolin, 1999; Lehtonen, 2007). Under the DRGs framework, medical practitioners retain their clinical autonomy in patient care, yet they operate within a framework of quasi-market discipline that influences their medical decision-making processes. In summary, in DRGs system, accounting played an instrumental role in redefining established notions of healthcare institutions and the practices of medical professionals (Chua, 1995).

The DRG systems actually merge two data sets: clinical data from coding patients at the clinical unit level, and cost data from cost systems managed at provider level by accountants (Chapman et al., 2014). The creation of “new” accounting numbers through DRGs can be viewed as a convergence of medical, social, economic, and political discussions regarding the character, delivery, and financial aspects of healthcare (Chua, 1995; Preston et al., 1992). Constructed under different social linkages and practices, the direct application of the DRGs system to other nations will pose challenges due to variations in accounting frameworks (Coombs, 1987). An instance of this is demonstrated through the work of Chua (1995), who analysed the evolution of DRGs in Australia. The emergence of DRGs-based accounting was shaped by various factors, including shifts in state participation in healthcare delivery, economic downturns, conflicts among healthcare professionals, the impact of academic experts, advancements in computing and statistical methods, and the growing influence of economic rationality in government (ibid.). However, in the United States, where DRGs were originally conceived, the fabrication process was influenced by a combination of factors, including the politics of healthcare, the structure of institutions, the federal government's evolving role in healthcare provision, shifting public perceptions of healthcare, societal demands, and technological advancements (Preston et al., 1992). Contexts play a significant role and exert a profound influence on the development and implementation of accounting technologies, and further shape the outcomes and doctors' perceptions of applying these techniques.

3.2 The effects of accounting techniques and doctors' responses

The design of clinical budgeting systems and DRGs systems is intended to foster a heightened awareness of costs among medical practitioners. Nevertheless, in real-world scenarios, the diverse contexts can influence whether these accounting techniques, as interventions in the medical decision-making process, attain their desired objectives. The accounting literature has provided examination on the effects of these accounting techniques in various countries, and there have been some discussions regarding the compatibility of two disciplines. Some studies doubted the applicability of accounting in the hospital where professional autonomy and professional self-control have established dominant status (Samuel et al., 2005), and questioned the whether the hierarchic control system, such as the appointment of managers and the decentralization of cost and budget systems, can challenge this prevailing status quo (Bourn and Ezzamel, 1986; Jones and Dewing, 1997). Some studies have expressed concerns about whether accounting techniques are employed as they were initially designed, given that hospitals do not primarily operate on the imperative to manufacture and market products. For example, Lapsley (1994) suggested that public hospitals utilize accounting techniques to reduce internal control and coordination while simultaneously upholding their legitimacy to stakeholders, a phenomenon often termed as decoupling. Some studies have indicated that the reactions of medical professionals to accounting-oriented controls appear to be unpredictable, possibly due to the influence of contextual factors on their perceptions (Jones and Dewing, 1997). In some countries, especially in the UK, doctors unwelcome these accounting changes, and show no inclination to transition into the role of cost-conscious practitioners (e.g.,Broadbent

and Laughlin, 1998; Coombs, 1987; Laughlin et al., 1994). But in other countries, with Finland as a representative, doctors engage in learning accounting knowledge and subsequently integrate accounting principles into their medical practice (e.g., Jacobs, 2005; Kurunmäki, 2004). This unpredictability at individual level makes the compatibility of accounting and medicine more complicated.

This section, drawing from the literature on hospital accounting, intends to offer a concise overview of how medical professionals perceive the interplay between medicine and accounting across various contexts, and how they respond to this interrelationship.

3.2.1 Incompatibility of medicine and accounting

In some contexts, accounting technologies are perceived as an undesirable intrusion that encroaches upon the domain of medical professional activities by medical professionals (Broadbent and Laughlin, 1998). The accounting literature has proposed that in certain contexts, both clinical budgeting systems and DRGs systems, along with other accounting techniques, may not align well with medical practice (e.g., Jacobs, 1995; Jones and Dewing, 1997; Lapsley, 2007; Nyland and Pettersen, 2004).

The incompatibility of the clinical budgeting system has been observed by accounting literature in two aspects. Firstly, its intended purpose of cost control has not been fully realized in practice. Research conducted in Norway revealed that medical professionals tend to excessively utilize budgets, and deficits within budgets have been construed as a means to secure additional resources from stakeholders

or owners (Nyland and Pettersen, 2004) Furthermore, clinical budgets have been employed for purposes other than the management of medical expenses. Research in the United States discovered that nurses employ the clinical budgets to engage in negotiations with administrative bodies, aiming to gain recognition as professionals equal to physicians and to eliminate the hierarchical administrative framework (Covaleski and Dirsmith, 1983). While in the United Kingdom, the clinical budgets exhibited some inadequacies in its design, which subsequently affected their effectiveness in achieving cost control objectives. It seeks to manage healthcare spending by regulating patient throughput, but it struggles to establish a strong correlation between patient volumes and financial data (Jones and Dewing, 1997). In Finland basic healthcare organisations, participatory budgeting did not offer adequate support to medical professionals and instead exacerbated negative sentiments towards accounting techniques (Rautiainen et al., 2022). Overall, clinical budgets in these nations have not been fully integrated into the management control framework, and their controlling function has not been fully realized.

The second aspect of the incompatibility of clinical budgets lies in their limited impact on the medical value system, and on the behavioural patterns of medical professionals. The research conducted by Jones and Dewing (1997) in the United Kingdom revealed that clinical budgets remain constrained to central management levels, and do not significantly extend their influence to frontline medical professionals. Pettersen's (1995) research in Norway further illustrated that decoupling may occur in clinical budgets, where the actions of medical professionals are detached from the decisions articulated through clinical budgets. Similar situations were also observed in other countries such as the United States

(Covaleski and Dirsmith, 1983), the United Kingdom and Finland (Kurunmäki et al., 2003). In these contexts, clinical budgeting is perceived as an image portrayed to the external environment, signifying that physicians are adhering to prescribed directives (Covaleski and Dirsmith, 1983), while the use of budgetary information primarily revolves around the legitimation aspect of accounting (Kurunmäki et al., 2003). Accounting is employed as a tool to establish credibility by engaging with external regulatory mechanisms (Lapsley, 1994; Pettersen, 2001). Research by Jacobs (1995) conducted in New Zealand public hospitals showed that while accounting had the potential to enable external values to permeate and influence the organisation, most of the values introduced through the budgeting system faced resistance from professionals.

In addition to clinical budgets, DRGs also demonstrate incompatibility with medical practice, in that its precise role in managing resources is not straightforward (Lehtonen, 2007). This system is mainly commented as insufficient in comprehensively capturing the complexities inherent in the internal operation of hospitals (Covaleski et al., 1993). The process of standardization may overlook the individual variations in medical practice (Llewellyn and Northcott, 2005).

The perceived incompatibility between accounting and medicine leads to doctors displaying reluctance when faced with cost control responsibilities imposed upon them (e.g., Chua and Degeling, 1993; Doolin, 1999; Lowe and Doolin, 1999; Lapsley, 2001). For some doctors, financial responsibilities are perceived as an additional workload, because the increase in administrative duties does not result in a proportional reduction in their medical workload but further leads to an additional

engagement in medical practice to uphold their standing and credibility among their peers (Jacobs, 1995). Therefore they may refuse to take those responsibilities. Some doctors argue that they do not actually participate in clinical budgeting system, because they possess limited authority over budgets and lack substantial influence or control over available resources (Lapsley, 1994; Pettersen, 1995). Therefore they display reluctance to acknowledge or act upon budget-related information when carrying out their medical duties (Lapsley, 2001). In terms of the DRGs, clinicians exhibit limited interest in the information disseminated through DRGs and its derivatives, and they demonstrate resistance towards the utilization of these accounting techniques for purposes of control (Chua and Degeling, 1993; Doolin, 1999; Lowe and Doolin, 1999).

In addition to declining the use of accounting techniques, doctors may also employ strategies to express their reluctance, such as forming specialised work groups. Through the establishment of specialised work groups, institutional changes brought about by accounting practices are absorbed by a portion of individuals within the group (Broadbent and Laughlin, 1998; Jacobs, 2005; Laughlin et al., 1994). In hospitals, medical professionals in specialised groups often simultaneously fulfil dual roles, serving both as managers and providers of medical care (Llewellyn, 2001). They engage in financial and administrative affairs by integrate clinical knowledge and managerial responsibilities within them (Jacobs, 1995, 2005), and act as intermediaries bridging the divide between central decisions and practical implementations (Nyland and Pettersen, 2004). By confining accounting changes within these groups, the sub-groups play a role in preserving the existing dominance of medical professionals within hospital settings (Hoff, 2000), in contributing to

maintaining the respect that doctors enjoy from the larger external community (Jacobs, 1995; Llewellyn, 2001), in keeping the core values of the broader medical staff remain unaffected (Jacobs, 1995, 2005), and in muting the unwanted environmental disturbances (Broadbent and Laughlin, 1998; Jacobs, 1995).

The incompatibility of these accounting techniques and doctors' resistance to accounting can be explained from various perspectives. Firstly, accounting techniques introduce a conflicting set of values into the field of medicine (Jacobs, 2005). The medical value system prioritizes patient well-being over the pursuit of resource efficiency, and this ethos is instilled and passed down through professional education, further influencing the behaviour of medical professionals and distinguishing medicine from other fields (Jacobs, 2005; Jones and Dewing, 1997). Accounting techniques, such as clinical budgeting system, serve as a steering mechanism that conveys managerial values into the healthcare system, and are perceived as potentially leading to the colonisation of commercial values over medical culture (Jacobs, 1995; Lapsley, 2007). Therefore, the attempts to alter the entrenched medical value through the implementation of accounting techniques are perceived as threat by medical professionals. Secondly, doctors have traditionally hold authority over decisions regarding service provision in hospitals, and their actions are driven by the principle of appropriateness rather than the logic of effectiveness (Pettersen, 1995). Doctors have been entrusted with clinical responsibilities and hold power in the daily operations of hospitals, which legitimizes their authority to make decisions and take action before accounting information is known and accepted (Nyland and Pettersen, 2004). The introduction of accounting techniques is therefore perceived as intervention for professional autonomy

(Gebreiter, 2016). Thirdly, accounting information provides highly standardised reference for medical practice, which is perceived as conflicting with the nature of clinical medicine as an art (ibid.). For example, the clinical budgeting is criticized for applying highly standard and aggregated information rather than flexed for medical activities (Lapsley, 2001). The DRGs, although propose that it is reasonable to identify and define standardised products for medical practice (Fetter and Freeman, 1986), actually can hardly reflect the complexity of medical practice (Covaleski et al., 1993). Other cost control techniques, such as cost centres and product costing, also face criticism for oversimplifying the clinical process (Hassan, 2005). The process of standardization overlooks the individual variations in medical practice, and this oversight may result in a disconnection between accounting techniques and the practical aspects of medicine. All three factors have been employed by medical professionals to resist the implementation of accounting techniques in the name of maintaining the quality of healthcare.

The discussion thus far has provided an overview of the perceived incompatibility scenario, doctors' responses to it, and the factors contributing to its development primarily from a Western perspective. Accounting literature centered on non-Western contexts, such as Emerging Economies (EEs), has also offered explanations for the incompatible relationship between medicine and accounting. Research conducted in Vietnam revealed that hospitals were hesitant to implement certain cost-saving methods that are deemed essential in the United States hospitals, such as collaboration and outsourcing, and this reluctance may stem from the lower labour capacity in Vietnam (Pomberg et al., 2012). Studies conducted in Egypt have shown that introducing costing information into public hospitals led to resistance, and the

resistance was happening primarily to maintain the public identity of hospitals and preserve doctors' rights to earn bonuses (Hassan, 2005, 2008). Research carried out in Indonesia indicated that the use of aggregate cost information and the absence of detailed per-case/patient cost information in DRGs have not only hampered the development of a management accounting system but have also intensified the conflict between medicine and accounting (Fahlevi et al., 2022; Fahlevi, 2016).

3.2.2 Compatibility of medicine and accounting

The relationship between medicine and accounting does not follow a uniform pattern of resistance but instead varies depending on contextual factors. There is the potential for accounting to be compatible with medicine. The research conducted by Kurunmäki (2004) in Finland illustrates that doctors can be open to embracing and incorporating accounting knowledge into their medical practice. They operate within the dual realms of clinical practice and accounting, assuming responsibilities not only for resource management (Sartirana, 2019) but also for enhancing the quality of healthcare delivery (Blomgren, 2003). As a result, doctors have been shaped as hybrid medical professionals (Jacobs, 2005; Kurunmäki, 2004), who not only align with the demands set forth by accounting technologies but also identify themselves as medical practitioners who should be mindful of cost control. Mcgivern et al. (2015) further classified manager-professional hybrids into incidental hybrids and willing hybrids in their research in the United Kingdom. The first category temporarily takes on hybrid roles, using these roles to advocate for, safeguard, and uphold professionalism; while the second category is constructed through deliberate identity development, incorporating both professionalism and managerialism to establish a more credible form of hybrid professionalism within their managerial environment

(ibid.).

There are several factors that make hybridisation happen. The first factor is the relative power between medical and accounting disciplines. In Finland, accounting is not seen as an exclusive professional discipline and repository of knowledge but rather as a universally accessible tool within society (Kurunmäki, 2004). In this case, doctors may perceive it as less of a threat to their established professional status within the hospital environment, because accounting education is not a professional system with formal education and unique value system (Jacobs, 2005). Another factor contributing to the emergence of hybrid doctors is their education in accounting. Research conducted by Jacobs (2005) in Germany and Italy indicates that the acquisition of accounting knowledge, whether through general medical education or specialised training, plays a facilitating role in the process of hybridization. Education in accounting not only integrates commercial value systems into the medical value system but also equips medical professionals with the skills of how to apply accounting principles. Jacobs's (2005) study also demonstrates that the incentive schemes can facilitate the hybridization process. In Germany, when proficiency in accounting skills correlates directly with a doctor's promotion opportunities, medical personnel exhibit proactive engagement in acquiring accounting knowledge, either by learning on the job or learning by doing, because clinicians who possess accounting knowledge are more inclined to receive promotions (ibid.).

Research conducted in China reveals a distinct approach to successfully integrating cost information into medical practice, although doctors exhibit willingness to

embrace accounting changes. In a case study, Cui et al. (2019) suggested that steering media, the Municipal Health Bureau and Municipal Bureau of Finance in their case, enables the internalization of the costing system by interacting with hospitals and acquiring support from healthcare professionals. A economic scientific study conducted by Degeling et al., (2006) revealed that clinicians were less inclined to view accounting changes as a threat to their clinical autonomy. This was because they perceived medicine not as an independent profession with autonomy but rather as a tool of government policy. This perspective makes them more amenable to adopting accounting techniques mandated by the central government.

Efforts to cultivate cost-conscious doctors in public hospitals primarily revolve around the implementation of accounting technologies, including clinical budgeting and the DRGs system. These technologies seek to apply commercial principles to standardize medical procedures or intervene in the medical decision-making process, working toward the objective of controlling medical expenses at the individual level. Nonetheless, doctors may perceive the adoption of these technologies in different ways, and exhibit different responses to accounting changes, depending on the specific context in which these techniques are introduced and applied. Contextual factors, organisational factors, professional factors, and institutional factors affect doctors' perceptions of accounting practice.

4. Concluding remarks

Public hospitals do not operate like market-based organisations where efficiency solely determines success. This is because their operations are based on variable

technologies and outputs are challenging to measure (Lapsley, 1994). These characteristics have been evident in the process of cultivating cost-conscious doctors and have generated varying outcomes in different contexts (Fitzgerald and Dufour, 1997; Kirkpatrick et al., 2009). Coercive pressure (Jacobs, 2005; Llewellyn, 2001), societal values and organisational history (Fitzgerald and Dufour, 1997), and social interactions and context surrounding the professionals (Sartirana, 2019), and many other factors may affect doctors' perceptions of accounting.

The introduction of accounting in public hospitals aim to bring about organisational changes. However, organisational change is a complex process, and environmental disturbance can have an impact on this change (Broadbent et al., 1991). Therefore, an international perspective to explain the complexities of healthcare reform should be adapted to assess the suitability of the generic model of managerial reform, such as the NPM. Accounting has played an important role in moulding fundamental aspects of a managerial approach within the healthcare sector. However, it is crucial to distinguish between surface-level changes and deeper transformations to acquire a more holistic comprehension of healthcare reform (Marcon and Panozzo, 1998).

Research on the application and effects of accounting in healthcare reform has primarily concentrated on a group of Western countries that share similar cultural, political, economic, and institutional conditions, and have generated various insights regarding the public sector accounting. The research in EEs, however, have mainly reported that accounting technologies often failed to achieve the desired outcomes in these contexts (e.g., Alam, 1997; Hassan, 2005, 2008; Jones and Sefiane, 1992), and it is commonly believed that EEs do not possess the institutional mechanisms

and structural foundations needed for the successful operation of private management styles (van Helden and Uddin, 2016). Multiple perspectives are necessary to understand the factors influencing this phenomenon and to examine how private sector concepts are implemented within the contexts of EEs. Hence, these factors served as the inspiration for selecting China as the research location.

Chapter 3 Theoretical Framework

1. Introduction

Institutional approaches have served as a foundational framework for the field of organisation and management studies since the mid-19th century. This began with Selznick's (1966) empirical analysis of organisations and their institutional environments and was further extended by studies conducted by Meyer and Rowan (1977) as well as Zucker (1977), which explore the impact of culture and cognition in the analysis of institutions. According to Scott (2014), institutional approaches provide a framework to explore questions regarding organisations. This includes understanding why individuals and organisations adhere to institutional norms, how variations in cultural beliefs impact the character and functioning of organisations, and whether behaviours in organisational contexts are driven by rational interests or ingrained habits. Furthermore, institutional approaches offer researchers the ability to comprehend social structure and processes from both macro and micro perspectives (ibid).

In their seminal paper, Friedland and Alford (1991) add a substantial dimension to the institutional literature by proposing that society should be seen as an inter-institutional system. Within this system, each institution embodies distinct sets of expectations regarding social interactions, human conduct, and organisational behaviour, and thus establish a system characterized by the coexistence of multiple institutions. As actors in this system, both organisations and individuals have their conduct moulded by institutions, and they also contribute to the maintenance and alteration of institutional relationships by applying multiple logics within the system.

From this perspective, institutional logics perspective can offer valuable insights into comprehending how broader institutional systems impact the cognition and actions of social actors, as well as how these social actors react to the demands set by institutions. The micro-level empirical studies on institutional logics mainly focus on how institutional logics are applied at the micro-level (e.g., Maran and Lowe, 2022; Reay and Hinings, 2005), and how individuals respond to multiple institutional logics (e.g., Bévort and Suddaby, 2016; Reay and Hinings, 2009). This chapter starts with a brief introduction to the development of institutional logics and is followed by explaining the interaction mechanism between macro-level institutional logics and micro-level social actors. Institutional pluralism and actors' responses to multiple institutional logics will be the third part.

2. The development of institutional logics

Institutional logic was first proposed by Alford and Freidland (1985) in a book chapter named "The Power of Contradictions". They suggested that an institutional logic is "an empirically and historically variable combination of explicit norms governing behaviour, a legal rule with a sanction attached, and an implicit premise of action that permeates all social relationships" (Alford and Freidland, 1985, P. 428). This definition has identified institutional logic as norms, rules and principles that influence actions. The notion of institutional logics was also put forth in this research, conceptualizing them as representations of the established development process of their corresponding institution (ibid.). In 1991, they further developed the basic ideas of the institutional logics by clarifying the definition of the institution and the nature of institutional logics. Institutions are reconceptualized as superorganisational pattens

of human activity through which actors generate and sustain their material well-being, categorize various human activities, and imbue them with significance (Friedland and Alford, 1991). This definition explicitly highlights the comprehensive nature of institutions, addressing both their tangible and conceptual facets. Five institutions were identified in their work, namely capitalism, the state, democracy, the nuclear family, and the Christian religion (ibid.) Furthermore, in this work, institutional logic was ascribed both material and symbolic characteristics. Institutional logic, which is the central to institutions, guides the organising principles and provides social actors with their identity (Thornton and Ocasio, 2012). The practices, guidance, and symbolic elements within institutional logics are accessible to both organisational and individual actors, providing them with the means to utilize, expand upon, and manipulate these elements to their own benefit (Friedland and Alford, 1991).

Thornton and her colleague further defined institutional logics in the work as “the socially constructed, historical patterns of cultural symbols and material practices, including assumptions, values, and beliefs, by which individuals and organisations provide meaning to their daily activity, organise time and space, and reproduce their lives and experiences” (Thornton et al., 2012b). In this definition, within the context of institutional interrelationships, each distinct logic serves as a framework that influences actors' decisions in the process of making sense of their environment, the language they employ to inspire action, and their conception of self and identity (ibid.). Thornton et al., (2012d) also identified six major types of rationalized institutional logics in Western society, namely family logic, religion logic, state logic, market logic, profession logic, corporation logic, and community logic. These

institutional logics are the pathways through which their corresponding institutions affect the behaviours of social actors, by structuring some basic principles such as root metaphor, sources of legitimacy, sources of authority, sources of identity, basis of norms, basis of attention, etc (ibid.). Table 1, which is adapted from Thornton et al., (2012a), shows the organising principles of these six institutional logics. These institutional logics and principles also have also been developed by subsequent studies. For example, Rozenfeld and Scapens (2021) incorporates key values, forms of ownership, organisation form, formal control mechanism, informal control mechanism, logic of investment into the definition of institutional logics.

Thornton and Ocasio also identified three core assumptions of the institutional logics in this work: material and cultural characteristics, embedded agency, and historical contingency (Thornton and Ocasio, 2008). Material and cultural characteristics exert pressures on institutions, driving their development and transformation through the lens of institutional logics; while embedded agency proposes that in institutional structures, individual actors have the ability to have some effect on the social world (Scott, 2008) and these effects are affected by institutional requirements. In this case, the decisions they have made and outcomes of their behaviour are thus regarded as the interplay between individual agency and institutional structures. This close relationship between individual agency and institutional structure makes institutional logic suitable for micro-level analysis, such as explaining and interpreting the interests, identities, values, and assumptions of organisational and individual social actors, as these elements usually are embedded within prevailing institutional logics (Thornton and Ocasio, 2008). The notion of historical contingency underscores the enduring impact of institutions while emphasizing their varying

trajectories and significance as time progresses. As a result, this makes institutional logic a valuable framework for examining how the broader environment shapes the behaviour of both individuals and organisations. These three assumptions show the theoretical and methodological contributions that the institutional logic perspective brings to the institution analysis.

Broadly speaking, institutional logics establish the fundamental principles that underpin a specific domain and serve as the foundation for the implicit rules that direct the behaviour of individuals within that context. The actions and perspectives of social actors can be viewed as the outcome of the interplay between multiple institutional logics. At organisational level and individual level, institutional logics guide actions, and social actors also affect these logics (Lounsbury and Crumley, 2007; Thornton, 2004). To understand the enabling and constraining effects of institutional logics on social action, Thornton and her colleague also propose the model of micro-foundations of institutional logics, which will be introduced in the next section.

Table 3.1 Organising principles of the six institutional logics in Western society (Adapted from Thornton et al., 2012a, P26 & P27)

Organising principles	**Family logic**	**Community logic**	**Religion logic**	**State logic**	**Market logic**	**Profession logic**	**Corporation logic**
Root Metaphor	Family as firm	Common boundary	Temple as bank	State as redistribution mechanism	Transaction	Profession as relational network	Corporation as hierarchy
Sources of Legitimacy	Unconditional loyalty	Unity of will; Belief in trust & reciprocity	Importance of faith & sacredness in economy & society	Democratic participation	Share price	Personal expertise	Market position of firm
Sources of Authority	Patriarchal domination	Commitment to community, values & ideology	Priesthood charisma	Bureaucratic domination	Shareholder activism	Professional association	Board of directors; Top management

Organising principles	**Family logic**	**Community logic**	**Religion logic**	**State logic**	**Market logic**	**Profession logic**	**Corporation logic**
Sources of Identity	Family reputation	Emotional connection; Ego-satisfaction & reputation	Association with deities	Social & economic class	Faceless	Association with quality of craft; Personal reputation	Bureaucratic roles
Basis of Norms	Membership in household	Group membership	Membership in congregation	Citizenship in nation	Self-interest	Membership in guild & association	Employment in firm
Basis of Attention	Status in household	Personal investment in group	Relation to supernatural	Status of interest group	Status in the market	Status in profession	Status in hierarchy
Basis of Strategy	Increase family honour	Increase status & honour of	Increase religious symbolism of	Increase community good	Increase efficiency profit	Increase personal reputation	Increase size & diversification

		members & practices	natural events				of firm
Organising principles	**Family logic**	**Community logic**	**Religion logic**	**State logic**	**Market logic**	**Profession logic**	**Corporation logic**
Informal Control Mechanisms	Family politics	Visibility of actions	Worship of calling	Backroom politics	Industry analysis	Celebrity professionals	Organisation culture
Economic System	Family capitalism	Cooperative capitalism	Occidental capitalism	Welfare capitalism	Market capitalism	Personal capitalism	Managerial capitalism

3. Micro-foundation of institutional logics

Adopting an institutional logic perspective, it becomes evident that social actors play a pivotal role in comprehending the enduring nature of institutions and their evolution. These social actors are intricately woven into the fabric of social, cultural, and political structures, and their conduct is guided by cognitive frameworks and contextual identities and aspirations (Thornton et al., 2012c). By incorporating the model of human behaviour, Thornton and her colleague create a model that shows the causal links between institutional logics, practices, individuals, and interactions. This model explains macro-level propositions through macro-to-micro, micro-to-micro, and micro-to-macro mechanisms. As it is shown in Figure 1, at the macro-level, organisational practices and identities are shaped by prevailing institutional logics; at the micro-level, dominant institutional logics limit social actors' attention by focusing the attention of actors on both particular features of organisations and their environment (ibid.).

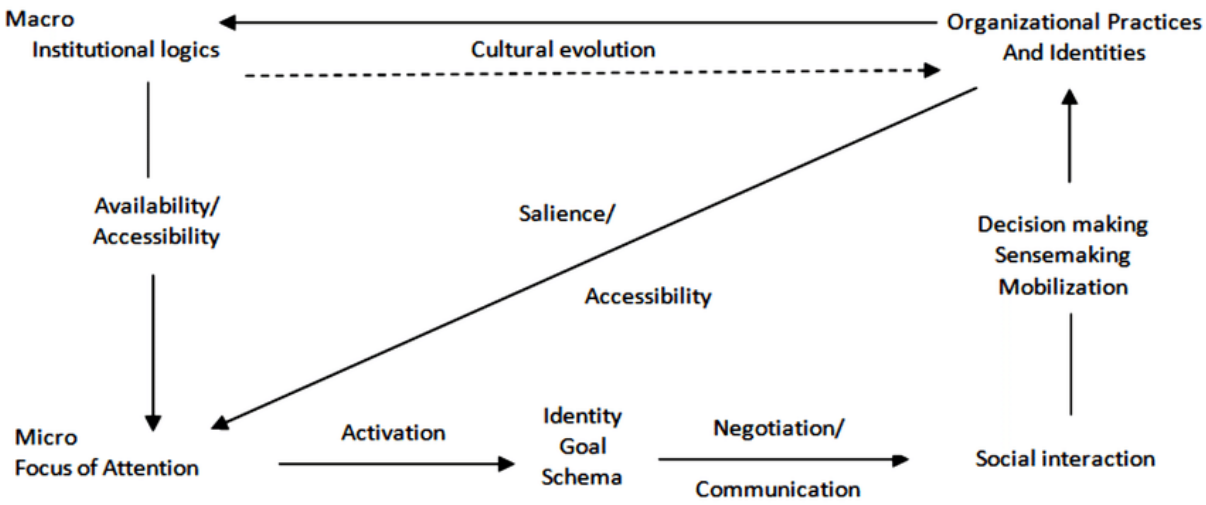

Figure 3.1 The Cross-Level Model of Institutional Logics (Adapted from Thornton et al., 2012c, P10)

Drawing from the framework of dynamic constructivism, this model posits that social actors have access to a spectrum of institutional logics, which collectively constitute the cultural knowledge that informs their actions and decisions. But whether actors can employ this knowledge is dependent on the availability, accessibility, and activation of institutional logics (Thornton et al., 2012c). Institutional logics must first be available, indicating that the knowledge and information have the potential to come into contact with actors during their cognitive processes (ibid.). The presence of institutional logics determines the options actors have when it comes to selecting the institutional logics that underpin their social actions and interactions. Accessibility concerns the information and knowledge that individuals actually bring to their awareness, and the degree to which institutional logics are accessible is influenced by cultural and situational circumstances (ibid.). Cultural embeddedness impacts the enduring accessibility of knowledge while the situational context influences the temporary accessibility (ibid.). Activation determines whether the knowledge and information that are accessible and available can indeed be employed in social interactions. The mere presence of high accessibility and availability does not inherently lead to the activation of institutional logics (Morris and Gelfand, 2004). The activation of particular identities, goals, and schemas firstly lies in the situational fit between the institutional logic and the characteristics of the situation(Thornton et al., 2012c). In addition, the activation can also be achieved by automatic or controlled attentional processes, in which automatic attentional process leads to the application of highly accessible logics, while controlled attention is caused by situational shifts and leads to departure from embedded logics and individuals' active selection of stimuli (Norman and Shallice, 1986). In conclusion, institutional logics are more likely

to be engaged when individuals apply their accessible knowledge structures to significant aspects of the institution and its context. In cases where there are no applicable elements from the readily accessible institutional logics, individuals may turn to other available institutional logics to utilize their knowledge and information.

For individuals at micro level, their cognitive resources for information processing, namely attention, cannot be allocated to all environmental stimuli and action responses (Simon, 1976). In this instance, institutional logics steer the allocation of attention by dictating which problems and issues receive prominence and which solutions are more inclined to be taken into consideration during the decision-making process (Ocasio, 1997; Thornton and Ocasio, 1999;Thornton, 2004). For example, in Thornton and Ocasio's work (1999), a shift in organisational identity of higher education publishing - from publishing as a profession (i.e., an editorial logic) to publishing as a business (i.e., a market logic) – changes the organisational focus of attention, and corporates acquisitions and executive succession have then become organisational solutions. To be more specific, Thornton and her colleague (2012a) propose in their model that the focus of attention can be shaped by both top-down attentional perspectives (i.e., institutional logics and organisational practices) and bottom-up attentional perspectives. In the top-down pathway, the focus of attention is affected by the set of social identities, goals, and schemas embedded within each institutional logic. The social identities, goals, and schemas can also be specialized by individuals' participation in situated organisations and practices, and then are served as top-down attentional perspectives. In the bottom-up pathway, the focus of attention is shaped by environmental stimuli. The more salient the stimulus is in the environment, the more likely the stimulus gets attended to. After their focus of

attention has been activated, individual actors reproduce and transform organisational and institutional structures by interacting with other social actors. This process is called social interaction in this model (Thornton et al., 2012a). These social interactions are supported by negotiations and communications among social actors. Negotiation, as proposed by Strauss (1978), exists in every social interaction and is shaped by competition and cooperation. Communications may lead to the formation of a common language, and the shared attention and cooperation among social actors may be achieved through this. Each institutional logic has its own common and distinct language. Overall, by highlighting how situated cognitive processes allow for automatic taken-for-granted behaviour and opportunities for institutional change, this model provides a variety of processes and outcomes that had not been integrated (Thornton et al., 2012a).

The content within this section has demonstrated that the impact of institutional logics is channelled through the direction of attention and social interactions at the individual level. From the micro- to macro- level, through processes like decision-making, sensemaking, and mobilization, organisational practices and identities are formed, sustained, and altered through social interactions, and these interactions disseminate, uphold, and reshape the institutional logics that underpin organisational identities and practices (Thornton et al., 2012c). Institutional logics are building blocks of sensemaking efforts, and they are also transformed through sensemaking mechanism (Weber and Glynn, 2006). The dynamic and the diversity of institutional logics enables different forms of interaction and organisational practices within organisations and fields, and complicated situation usually occurs when dominating logic is moving away by other logics, such as what happened in the health care

sector (e.g.,Scott et al., 2000). The presence of institutional pluralism complicates the sensemaking process at the individual level. The following section will provide a detailed illustration of this phenomenon.

4. Institutional pluralism

Friedland and Alford (1991) emphasized that Western society is structured by multiple logics (i.e., market logic, state logic, democracy logic, family logic, and religious logic), which constructed the foundation of institutional pluralism. Institutional pluralism underscores the varied nature of institutional contexts and the ability of organisations, groups, and individuals to adjust to such a diverse environment (Yu, 2015). In this setting, different institutional offers provide multiple sources of rationality and legitimacy (ibid.). Organisational fields (Greenwood et al., 2011), organisations (Friedland and Alford, 1991), and individual actors (McPherson and Sauder, 2013) are all under the influence of institutional pluralism.

Because each institutional logic comes with its own set of guidelines that may present diverse and at times conflicting expectations for institutional actors, institutional actors must continually deal with institutional complexity. This situation may become more complicated when prescriptions of logics are mutually incompatible. The studies analysing competing logics have shown that rivalry between logics can be managed at micro-level, through battles where actors supporting the wining logic achieve dominance and conflicting logics cease to be relevant (Hoffman, 1999; Hensmans, 2003), through covert operations where actors gradually bring their logic to dominance (Maguire et al., 2004; Reay et al., 2006)(Maguire et al., 2004; Reay et al., 2006) or to subvert the currently dominant

logic (Townley, 2002), or through collaborative relationships where actors maintain their independence but work together to achieve the desired outcome (Reay and Hinings, 2009). Some actors may also reign the tension by balancing separate demands and playing constituencies against one another (Kraatz and Block, 2008). As the result of these activities, one institutional logic may dominate the organisational field and guide social actors' behaviour (Hoffman, 1999; Hensmans, 2003). This dominant logic can be the winning side of conflicting logics (DiMaggio and Powell, 1983; Hoffman, 1999; Hensmans, 2003) or a new, hybrid version of two previous logics (Glynn and Lounsbury, 2005; Thornton et al., 2005).

The findings in competing institutional logics clearly indicate that different methods and outcomes will be generated when social actors manage competing institutional logics. Therefore, the ways of managing institutional logics should be analysed in a specific social context. Moreover, the responses of actors are shaped by their personal identities, objectives, cognitive processes, as well as the accessibility and availability of various logics to these actors (Yu, 2015).

4.1 Responses to multiple institutional logics

Within the framework of institutional pluralism, both organisational entities and individuals consistently face a multitude of institutional requirements and expectations. At times, these requirements may manifest in a conflicting manner, posing challenges for these actors to navigate. In this context, organisations often strive to navigate the complexities of institutional processes to ensure their survival. At the same time, the individuals within these organisations also confront conflicting institutional demands, and they often craft some strategies to navigate these

situations. This section aims to offer an overview of the reactions displayed by both organisations and individuals when confronted with the challenges presented by institutional complexity.

4.1.1 Organisational responses

It has been suggested that organisations are required to constantly address a variety of institutional expectations either because they need to gain legitimacy from important referent audience (Besharov and Smith, 2014), or because these logics provide a means of understanding the social world and thus facilitate them to act confidently within it (Greenwood et al., 2011). For these reasons, and also to internally deal with demands imposed by multiple institutional logics, organisations create many solutions.

According to Kraatz and Block (2008), organisations may eliminate pluralism by either eliminating or marginalizing some of their institutional identities. Alternatively, they can engage independently with various institutional constituencies. For example, they might opt to address various institutional claims in a sequential manner, tending to each one separately; they might also establish separate divisions and projects that serve as a demonstration of their commitment to the values and beliefs of particular constituencies (ibid.). In some cases, organisations can establish lasting identities and ultimately emerge as independent institutions in their own right (ibid.). These approaches assist organisations in not only surviving but also thriving amid the challenges posed by institutional pluralism.

Research has also revealed that in some cases, organisations may encounter

mutually incompatible institutional logics (Friedland & Alford, 1991). This incompatibility, resulting from institutional pluralism, may lead to fragmentation, incoherence, conflict, goal-ambiguity, and organisational instability (Heimer, 1999; Kraatz and Block, 2008). Persistent and deep-rooted tensions within the organisation itself can be generated as a result of the incompatibility (Kraatz and Block, 2008), and thus creates many challenges for organisations on how to cope with tensions raised by multiple logics. Organisations may combine requirements from competing logics (Greenwood et al., 2011). A study conducted by Battilana and Dorado (2010) shows that new types of organisation may also be created to combine multiple logics. This study indicates that to deal with the pressures from banking logic and development logic, some microfinance organisations become hybrid organisations, by initially hiring individuals who embody both logics or by recruiting individuals with limited immersion in either of these logics, and subsequently socializing these members through training programs, promotion processes, and incentive schemes. The co-existence of multiple logics has therefore sustained in these organisations. Other responses to competing logics include decoupling. This situation refers to the instances where organisations symbolically endorse practices recommended by one logic while, in practice, they implement methods advocated by another logic that better aligns with their organisational objectives (Meyer and Rowan, 1977). Pache and Santos' s (2013a) research on four work integration social enterprises shows that selective coupling may be also employed as a strategic response to completing institutional logics, which refers to the signifies the intentional execution of particular practices from a set of alternative but competing option. In selective coupling, organisations opt to incorporate unaltered demands from either logic in order to reconcile the conflicting expectations of their institutional referents. This pattern

enables these organisations to mitigate significant legitimacy challenges and to maintain their operations over the long term. At the organisational level, it is also possible for organisations to reject or refuse to comply with institutional demands. In the healthcare system in which medical professional logic has been embedded, the organisations will defy business-like logic. For example, Rautiainen et al. (2021) discovered that in the Finnish basic health care system, the application of accounting tools generated negative emotions at the individual level. These negative emotions then aggregate at the organisational level where institutional logics are incompatible and lead to professional segregation, conflict, and shattered organisational cooperation. The main reason for this is that there were too many goals and tasks characterized by three competing logics, namely medical logic, administrative logic, and political logic. These institutional logics can scatter the attention of individual actors, making it challenging to concentrate and formulate a coherent combination of logics.

Oliver's (1991) research on responses to institutional processes categorised the ways in which organisations navigate and respond to the pressures imposed by institutions. Organisations may deploy a spectrum of strategic responses, ranging from passive acquiescence to progressively heightened active resistance. These encompass a variety of approaches, notably acquiescence, compromise, avoidance, defiance, and manipulation (ibid.).

Acquiescence is manifested when organisations are willing to align with and adhere to prevailing institutional pressures and the acquiescence is achieved through habit, imitation, and compliance (Oliver, 1991). In the first case, organisations adhere to

preconscious or taken-for-granted rules or values. In cases where institutional norms have become deeply ingrained and enduring within society, organisations may operate without a full awareness of the extent to which these norms shape their actions and decisions. Simultaneously, the institutional framework has already been internalized as a tacit assumption and has acquired a history of repetition. As a consequence, Organisations often exhibit a propensity to replicate behaviours and practices that conform to the prevailing conventions within this specific institutional milieu. In the secondary standpoint, referred to as imitation, organisations commonly engage in mimicking their peer entities, such as successful organisations, in a deliberate or subconscious manner. The third method, known as compliance, involves the intentional recognition and adherence to the established values, norms, and mandates stipulated by institutions. This way of acquiescence is more active than habit and imitation. As delineated by Meyer and Rowan (1977), organisations may deploy this strategic approach to amplify their legitimacy, enhance their stability, or fortify their confidence in the execution of organisational pursuits.

In situations where organisations are confronted with contradictory institutional requirements, they may respond with endeavours to balance, pacify, or bargain with external constituents (Oliver, 1991). These tactics manifest as initial stages of resistance against institutional pressure by partially conform with the expectations of external actors. By employing balancing strategies, organisations seek to accommodate multiple institutional demands within their operations. In such instances, when conflicting institutional demands arise, organisations can safeguard their interests by reaching a viable compromise that addresses competing objectives. In the second strategy, referred to as pacifying, organisations exhibit a

modest degree of resistance while predominantly directing their efforts towards appeasing the entities from which they have resisted. However, the third strategy, known as bargaining, encompasses a more proactive manifestation of compromise. In this context, organisations engage in active negotiations to elicit specific concessions from external stakeholders in relation to their demands or anticipated outcomes. The implementation of these three compromise strategies is aimed at reconciling a multitude of institutional values, norms, and practices within the organisational context. In contrast to acquiescence, which advocates unreserved adherence to multiple institutions, compromising entails a mode of partial compliance. In such instances, organisations display a proactive stance by pursuing their own interests through a strategy of selective compliance, rather than conforming strictly to the directives of the institutions they oppose.

Oliver (1991) also identifies avoidance as an alternative means of countering institutional pressures. Avoidance is defined as “the organisational attempt to preclude the necessity of conformity” (Oliver, 1991, P154). The strategies that organisations use for avoidance include concealment, buffering, and escape (ibid.). In the first tactic, the organisation conceals its non-adherence to institutional requisites beneath the façade. Organisations may symbolically accept the institutional norms and values, so the compliance to institutional requirements are just apparent. Nevertheless, within organisational contexts, employing this specific tactic can often suffice to establish legitimacy. To mitigate the degree of external inspection, scrutiny, or evaluation, organisations may also employ the buffering tactic such as partial detaching and decoupling. This approach assists organisations in preserving their autonomy and limiting external intervention in their functioning.

Nonetheless, it may also attract scepticism from external parties, ultimately diminishing the organisation's capacity to garner social support. In extreme cases, organisations may escape the institutional pressure by alter their goals, activities, or even domain (ibid.). This response to institutional requirements, in conjunction with buffering and concealment strategies, primarily strives to bypass the situations that mandate conformist conduct.

Defiance constitutes a more vigorous response to institutional mandates, involving organisations in either ignoring, challenging, or directly opposing conflicting regulations (Oliver, 1991). These strategies are typically adopted when there is a prevailing perception within organisations that the institutional rules lack sufficient enforcement capabilities. However, disregarding institutional rules can also occur when organisations have a limited understanding of the rationale behind the institutional pressures and the potential repercussions of noncompliance. Challenging established norms and institutional rules takes place when organisations hold less prominence within widely shared external convictions, while in the context of attacking, organisations endeavour to launch aggressive actions, belittle, or vehemently criticize institutionalized values and the external entities representing those values.

The final strategic response in Oliver’s (1991) work is manipulation, which involves a deliberate effort to actively modify or exercise control over the expectations themselves, as well as the entities attempting to articulate or impose these expectations. Organisations may convince an institutional stakeholder to affiliate with the organisation and contribute to its functioning. This approach of co-optation

serves to neutralize institutional resistance and bolster the organisation's legitimacy (Oliver, 1991). In addition, organisations can also manipulate institutionalized values, beliefs, and criteria of acceptable practices, or undertake systematic efforts to establish authority and influence over external institutional stakeholders who are pressuring them.

4.1.2 Individuals' responses

On an individual level, the institutional logics perspective traditionally assumes that individuals associated with a particular group will closely adhere to the dominant logic of that group (McPherson and Sauder, 2013), because the interests, identities, values, and assumptions of individuals are deeply ingrained within the prevailing institutional logics (Thornton and Ocasio, 2008). But McPherson and Sauder (2013), by conducting an ethnographic study in the drug court, demonstrated that individual actors have the ability, willingness, and discretion to employ or even hijack multiple institutional logics, and thereby affect the outcomes and build consensus with other actors even though they represent competing institutional logics. The analysis at the individual level significantly enhances our understanding of institutional complexity, and much attention should be given to how institutional forces affect individual behaviour, and therefore more work is needed to analyse how logics are used by local actors on the ground (ibid.).

Numerous studies have been conducted to examine how individuals respond to the demands of multiple institutions. For example, Reay and Hinings (2005) found that the over time, physicians' responses to the introduction of a business-like logic in the hospital evolved, shifting from initial non-supportiveness to eventual acceptance of

the new contract. In their subsequent study, Reay and Hinings (2009) provided further insight into how individuals manage the rivalry related to competing logics within their daily work routines by forming collaborations that maintain separate identities but support the accomplishment of mutual goals. Individuals may also become hybridised under multiple institutional logics. In their case study in Norway, Berg and Pinheiro (2016) that managers working in higher education and public hospitals integrated both professional and market logics to fulfil their daily tasks and strategic objectives. Their study illustrates that individual actors can act as a catalyst to handle different institutional logics. Their case study in Norway shows that the market logic was introduced into public institutions in a hybrid way, in which managers are expected to consider the collective goals of the organisation whilst being respectful towards the needs, values, and identities of different professionals involved and thereby contribute to the co-existence of multiple logics (ibid.). Kurunmäki's (2004) study in Finland also suggested that doctors in public hospitals, who were exposed to both medical professional logic and business-like logic, become hybrid doctors who prepare budgets, calculate costs, and set prices as well as conduct medical activities.

Pache and Santos (2013b) further expound upon the ways in which individuals navigate and respond to the complexities of competing institutional demands. According to Pache and Santos (2013b), individual reactions are principally influenced by concerns surrounding social approval, status positioning, and the construction of personal identity, and they exhibit a range of five micro-level responses: ignorance, compliance, defiance, combination, and compartmentalization. In their study on conflicting institutional logics within higher

education, Gebreiter and Hidayah (2019) pinpointed various subgroups of these responses. This section will predominantly present these two theoretical perspectives.

Individuals may ignore the competing institutional requirements when he/she lacks the awareness of the logic's influence. Individuals in such circumstances neither oppose a specific institutional logic nor fully adopt the institutional logic. They simply lack consciousness regarding the presence of this institutional logic. But in some cases, individuals may possess an awareness of the institutional logic's existence and make a deliberate choice to fully conform to its designated values and practices. This is called compliance by Pache and Santos (2013b). Individuals might also display varying levels of consciousness, spanning from ingrained habitual behaviour and subconscious imitation to voluntary compliance (ibid.). And in practice, they may also exhibit different shapes as Gebreiter and Hidayah (2019) proposed, including enforced compliance, internalised compliance, compliance through exhaustion and instrumental compliance. Enforced compliance describes the circumstance where individuals conform to demands stemming from conflicting institutional requirements that have been reinforced by established official regulations. Internalized compliance refers to the phenomenon where individuals retain their commitment to a certain institutional logic while gradually conforming to prescriptions from conflicting logics. In compliance through exhaustion, individuals demonstrate a diminished enthusiasm for the institutional obligations they have adhered to, consequently leading them to conform with conflicting institutional demands. In instrumental compliance, Individuals adhere to competing institutional demands by making partial concessions in their commitment to the original institutional requirements.

It is also possible for individuals to explicitly resist the values, norms, and practices associated with a specific institutional logic, thereby engaging in an act of defiance (Pache and Santos, 2013b). Within the context of defiance, individuals possess a conscious recognition of the given institutional logic, yet their perspectives diverge from its prescriptions. As a result, they choose to either abstain from conforming to its precepts or undertake deliberate actions aimed at diminishing its prominence. Gebreiter and Hidayah (2019) suggest that individuals can manifest varying forms of resistance, encompassing categorical defiance and defiance with justification. Categorical defiance is observed in situations where individuals firmly stick to their own institutional prescriptions and refrain from attempting to interact with conflicting institutional guidelines. In instances of justified defiance, individuals dismiss competing institutional demands by providing a reason, and remain loyal to their original institutional prescriptions.

A more strategic approach adopted by individuals is compartmentalization, wherein they intentionally segregate their adherence to conflicting logics (Pache and Santos, 2013b). They might demonstrate full conformity to a particular logic and reject a conflicting one within a specific context, yet maintain adherence to the competing logics in other contexts (ibid.). In diverse circumstances, they might choose to align themselves with different logics, compartmentalizing their engagements to suit each distinct context.

Furthermore, individuals might endeavour to integrate specific values, norms, and practices from divergent logics, despite the inherent challenge of harmonizing these

conflicting demands. As Pache and Santos (2013b) proposes, individuals may selectively couple the demands for both logics, describing the deliberate implementation of chosen practices from a range of competing options. Individuals may also develop new practices and values that combine the competing logics (Rao et al., 2003). Gebreiter and Hidayah (2019) distinguished two unique forms of combination in practical application: blending and translation. Within the framework of blending, individuals engage in a trade-off between the demands of competing institutional logics, seeking to satisfy the expectations of different institutional constituents through a synthesized approach. In combination through translation, individuals translate the competing relationship between two logics into their own.

4.2 Drivers of response to multiple institutional requirements

Oliver (1991) and Pache and Santos (2013b) have offered valuable insights into the factors influencing responses to multiple institutional demands, spanning both the organisational and individual levels. As per Oliver (1991), the extent to which organisations comply with or resist institutional expectations is linked to their willingness and capacity to adhere to the prevailing institutional context. Five factors need to be considered in evaluating their willingness and capacity, including cause (i.e., legitimacy and efficiency), constituents (i.e., multiplicity and dependence), content (i.e., consistency and constraint), control (i.e., coercion and diffusion), context (i.e., uncertainty and interconnectedness) (ibid.). The presence of high or low levels in these factors will influence the strategies adopted by organisations.

Pache and Santos (2013b) also identify a series of factors that underpin individuals'

responses and suggest that the extent of adherence to conflicting logics influences this dynamic process. individuals can be categorized into three groups based on their level of engagement with the logics: novice, familiar, and identified. Within these categories, there emerge nine distinct situational groups, each yielding varied responses. In cases where individuals are unfamiliar with logic A and its competing counterpart, logic B, they may lack awareness of the requirements of both logics and exhibit a disposition of resistance towards them. Conversely, when individuals are inexperienced with logic A but possess familiarity with logic B, they possess adequate knowledge of logic B, enabling them to navigate its realm of influence. Furthermore, when individuals are novice with logic A yet strongly associated with logic B, their awareness extends beyond mere familiarity, and they are willing to witness the predominance of logic B.

In instances where individuals are familiar with logic A but inexperienced with competing logic B, their awareness of the institutional demands posed by logic B may be limited (Pache and Santos, 2013b). As a result, they are more likely to concentrate on the proposals set forth by logic A. Nonetheless, their allegiance to promoting logic A is not particularly strong, and they do not actively oppose logic B. On the other hand, when individuals possess familiarity with both logics, they possess a comprehensive understanding of the specified values, norms, and practices associated with each logic. This familiarity empowers them to adhere to both logics, thereby safeguarding their legitimacy. However, they refrain from making an absolute commitment to either logic and are less inclined to combine the two. In cases where individuals are familiar with logic A and also identify with logic B, they hold a knowledge of both logics. Their allegiance, however, leans towards logic B.

Their familiarity with logic A enables them to tactically conform to its principles as needed, while their compliance with logic B is driven by their ideological and identity-based convictions.

The third scenario involves individuals identify themselves with logic A (Pache and Santos, 2013b). In instances where individuals are identified with logic A but lack familiarity with competing logic B, their primary focus is on complying with the requirements of logic A. However, simultaneously, they may perceive the values and practices of competing logic B as potential challenges. However, if they possess a level of familiarity with logic B, they are equipped to understand its demands, yet they prioritize the prevalence of logic A. Furthermore, when individuals identify with both logics, they not only possess a comprehensive understanding of the values and practices of both logics, but they also hold a strong commitment to witnessing the prominence of both.

5. Concluding remarks

Linking the macro institution level to the micro organisational and individual levels, the institutional logic perspective can be utilized to elucidate how individuals at the micro level perceive complex contexts (i.e., institutional pluralism) and how they respond to them. The introduction of accounting to medicine makes medical area, which traditionally dominated by medical value system and conduct medical practice accordingly, complicated. It may also raise challenges for medical professionals in this area.

The discussion on institutional logics has shown that to interpret empirical data with

institutional logics perspective, it is first necessary to identify what institutional logics are embedded in the organisation. Drawing on the institutional logics framework, this study will figure out institutional logics in the case hospital by applying some of the organising principles of institutional logics. In addition, to understand how institutional logics shape individual actors' behaviours and perceptions and how actors affect the formation and development of institutional logics, it is important to include the micro-foundation in the data analysis. Therefore, the following context chapter and empirical chapters will focus on the organising principles of institutional logics and the micro-foundations of these logics in the case hospital.

In institutional pluralism, although most research has proved that it is common for organisations to deal with completing logics, competition is not the only manifestation of multiple institutional logics. Besharov and Smith (2014) have pointed out that the implications of having multiple logics depend on how these logics are manifested and put into practice within organisations, and the logic compatibility may change overtime under the influence of institutional fields, organisations, and individuals. Similar ideas were also proposed in an empirical analysis by Battilana and Dorado (2010), who propose whether institutional logics compete or not depends on how intraorganisation handles the relationship of multiple logics. Binder's (2007) empirical study also illustrates that organisational members respond to multiple institutional logics in non-uniform ways. Even within the same organisation, subunits have multiple ways of encountering institutional logics and no one logic is taken-for-granted rules for everyone in the organisation. The actions of staff are not solely shaped by overarching institutional guidelines but are instead shaped by localized systems of meaning (ibid.). Therefore, research in institutional logics should capture

the creative responses. These discoveries offer valuable insights into this study, particularly regarding how local actors interpret and put into practice institutional requirements. This aspect will be further explored in the upcoming empirical chapters.

Chapter 4 Methodology and Method

1. Introduction

Research is defined as a systematic process conducted with a specific objective in order to discover new information or gain knowledge (Saunders et al., 2019). This definition suggests that the research needs to fulfil the following two conditions: firstly, it is essential to explain the data collection methods used, demonstrate why the obtained results are meaningful, and discuss any limitations related to the interpretation of the results; and secondly, research should have multiple objectives, such as describing, explaining, analysing, and critiquing phenomena, or addressing one or more research questions (ibid). This chapter will provide a comprehensive overview of the methodology and methods utilized in this research. It will begin by discussing the philosophical foundation upon which the study is built. Subsequently, the research design will be examined, followed by a detailed account of the data collection and analysis process. The chapter will conclude with the researcher's reflections on the research process, offering insights into her experiences and insights gained throughout the study.

2. Research question and research philosophy

The research questions can be considered as the foundation of the entire research study. They can be derived from researchers' own interests, news, social media, and other sources, and then be refined and developed through existing literature and theories. Therefore, in this section, the researcher will provide a detailed description of the two research questions for this study and explain the rationale behind their

selection and design.

Research philosophy encompasses a set of fundamental beliefs and assumptions concerning how knowledge is generated and evolves (Saunders et al., 2019). The philosophical foundation is used to address questions related to the rationale and justification of the research approach. It provides a framework for understanding why the research is conducted in a particular way. So before the research starts, researchers need to be aware of any assumptions underlying their research. The research questions, along with the philosophical foundation of this study, collectively determine the subsequent research design, data collection methods, and data analysis methods.

2.1 Research Questions

According to the literature review chapter, while there has been significant discourse on the formation of cost-conscious doctors in the extant hospital accounting literature, such discussions have primarily occurred within Anglo-American nations. Moreover, these sources also indicate that even within Anglo-American nations, the approaches and outcomes of cultivating cost-conscious physicians vary across countries. For instance, the United Kingdom represents an example of unsuccessful cultivation (e.g., Jones and Dewing, 1997), whereas Finland represents a successful case (e.g., Kurunmäki, 2004). All these findings suggest that contextual factors can exert a considerable influence on the degree to which the medical profession perceive accounting knowledge and practices. As such, it is imperative to expand the scope of this research area to include a more diverse range of countries, in order to enrich the understanding of the issue. Therefore, conducting research on cost-

conscious doctors in Chinese public hospitals could offer a valuable addition to current literature on this subject.

Inspired by the current literature, the main research area of this study is cost accounting in Chinese public hospitals. The main aim of this research is to explore how doctors perceive the relationship between medical practice and cost control activity. For practical considerations, this research focus is examined through two research questions. The first research question is: ***how doctors navigate the demands posed by medical necessities and cost control within their professional activities***. This research question was developed based on the literature concerning the attitudes and behaviour of physicians towards cost accounting and their understanding of it. The literature suggests that when exposed to concepts related to cost accounting, physicians may adopt supportive (e.g., Cui et al., 2019; Kurunmäki, 2004) or opposing (e.g., Broadbent and Laughlin, 1998; Jacobs, 2005; Jones and Dewing, 1997) attitudes towards it. The attitudes and comprehension of cost information among physicians further influence their behaviour towards cost accounting. For instance, physicians may integrate cost control with medical practice (e.g., Kurunmäki, 2004), or adopt an approach that separates the two (e.g., Broadbent and Laughlin, 1998; Jacobs, 2005; Laughlin et al., 1994). The second research question of the study is: ***why doctors perceive and conduct cost control in their particular ways*.** Existing literature has scrutinized this question from various theoretical and empirical perspectives. For instance, Kurunmäki (2004) drew on Abbott's (1988) theory of professional jurisdictions to argue that Finnish doctors did not resist cost information because management accounting was defined as a practical technique rather than a professional discipline.

While Jacobs's (2005) study on British clinical managers found that the financial responsibilities were delegated by clinical directors to unit managers, which meant that more widespread doctors were distanced from developing management accounting skills. Therefore, this question aims to identify the mechanisms that shape the formation of physicians' perceptions and behaviours towards cost accounting.

2.2 Research Philosophy

The research philosophy plays a crucial role in the research process, because it has a profound impact on how the researcher comprehends the research inquiries, selects suitable research methodologies, and interprets and analyses the findings (Crotty, 1998). Therefore, this section will explain the ontological, epistemological and methodological assumptions underpinning this study.

2.2.1 Ontology: constructivism

The ontological stance in social science revolves around the nature of social entities, particularly whether they exist independently of social actors (i.e., objectivism) or are constructed by the perceptions and actions of social actors (i.e., constructivism) (Bryman, 2016). From the definition, it can be seen that constructivism places particular emphasis on two key aspects: firstly, that social reality or social phenomenon is constructed, and secondly, the individuals play crucial role in the construction process. Ontological assumptions and commitments will feed into the ways in which research questions are formulated and research is carried out (Bryman, 2016). Hence, taking into account the ontology is important prior to initiating any research. This study, upon the examination of the definition of ontology,

aligns with constructivism.

This study firstly posits that both medical and commercial considerations are socially constructed realities, whether viewed from the perspective of China's medicine history or from the perspective of the two healthcare reforms. The social realities, according to Bryman (2016), have a sustained existence and shape the behaviour of social actors by acting as a reference. The medicine as a profession provides doctors with a set of values to adhere to and a basis for formulating medical tasks. In contrast, healthcare reforms introduce a commercial value system and a basis for conducting activities from a commercial perspective. Accordingly, physicians' comprehension of medicine and cost accounting, as well as the conduct of medical activities associated with costs, are informed by these factors.

This study secondly emphasizes the active role that medical professional play in the construction of social realities mentioned above. As Bryman (2016) suggested, in constructivism, people employ social products to help them understand the world around them. Therefore, this study posits that doctors' actions and thoughts are not merely a product of being influenced by the medical profession and commercial ideas, but also a result of the choices they make. Bryman (2016) has also proposed that social phenomena are in a constant state of revision by individuals. This study therefore believes that the relationship between medicine and accounting and its meanings are constantly being accomplished by doctors involved in it. The information that physicians acquire from the two disciplines may not offer an ideal solution to every issue they encounter. As a result, medical professionals must adapt and apply their expertise to develop solutions tailored to the unique characteristics of

the new situation.

2.2.2 Logics of Inquiry: inductive research

The logics of inquiry primarily focuses on the relationship between theory and research, specifically the manner in which research endeavours to approach and engage with theory (Saunders et al., 2019). There are three approaches to the reasoning that researchers can adapt: deductive, when a conclusion is logically derived from a set of premises that are based on theory (Ketokivi and Mantere, 2010); inductive, where a gap existed between observed premises and the conclusion and a general principle is derived from observations (Saunders et al., 2019); and abductive, which combines deduction and induction (Suddaby, 2006). Since the choice between conducting research focused on theory testing or theory building significantly influences the research's design, it is necessary to consider the logic of inquiry before conducting the research (Saunders et al., 2019). This research will employ an inductive approach, where the development of theory is rooted in observations of the real world.

The primary reason for choosing inductive reasoning in this study is that this method permits a greater level of adaptability when it comes to gathering and examining data, thereby enabling a more profound insight into the research questions. The existing literature suggests that cost accounting can potentially influence the behaviour and cognition of physicians (e.g., Kurunmäki, 2004; Jacobs, 2005). However, it cannot be assumed that this influence will occur in all situations, nor can it be assumed that the mechanisms through which this influence occurs are consistent across all contexts. At the same time, there is limited research on how

doctors in China handle cost accounting information in their medical practice. Under this background, the first purpose of this study is to develop a sense of what is going on in terms of cost accounting in Chinese hospitals, so as to better understand the nature of the problem. This type of research is best suited for an inductive approach. Overall, the inductive approach will be useful when explore an underdeveloped research area, and this less-structured approach may generate more explanations regarding the same topic.

2.2.3 Epistemology: interpretivism

The epistemological dimension of any research explores whether it is appropriate and feasible to study the social world using the same principles, procedures, and ethical standards as those employed in the natural sciences (Bryman, 2016). Positivism argues for the universal applicability of natural science methods in social science research, while interpretivism suggests that studying the social world requires unique research procedures (Saunders et al., 2019). This divergence stems from the inherent disparities between the subjective aspects of social science, which is centred on individuals and their institutions, and the objective focus of the natural sciences (Bryman, 2016). Aiming to interpret doctors' perceptions of the relationship between medicine and accounting and the explanations for their perceptions, this study can be classified as interpretivism from an epistemological standpoint.

The primary stance underscored by interpretivism is that human beings create meanings, and these meanings constitute the focus of interpretive inquiry (Saunders and Townsend, 2016). Interpretivism posits that individuals possess unique backgrounds that enable them to construct diverse meanings in distinct

environmental and temporal settings, ultimately giving rise to diverse social realities (Saunders et al., 2019). In this research, it is possible that doctors from different departments, with varying professional titles, positions, and age ranges, may hold divergent conceptualizations of cost accounting. Furthermore, interpretivism contends that human actions carry significance for individuals, and individuals engage in actions based on the meanings they attribute to them (Bryman, 2016). Therefore, it is crucial to interpret the underlying meaning of individual behaviour. This is also one of the rationales for setting the research question.

Considering these aspects of interpretivism, proponents of this approach should not solely aim to describe social realities but also strive to comprehend the subjective meanings that individuals attach to them (Saunders et al., 2019). This process is instrumental in cultivating novel, more comprehensive understandings and interpretations of social environments and contexts. Accordingly, this study, situated within an interpretivist epistemological stance, entails a two-way approach: firstly, to reveal how doctors interpret their medical activities under the influence of medical and cost considerations, and to analyse these interpretations through the lens of relevant theory and literature. Through these processes, this study aims to generate some unexpected findings if possible, or at least findings that may appear surprising from a perspective external to the specific social context under investigation.

2.2.4 Methodology: qualitative research

The ontological position, the connection between theory and research, and the epistemological considerations, collectively determine that this research belongs to qualitative research. Since this research aims to explore and understand the

subjective experiences and perspectives of individuals or groups, and the meanings they assign to social or human issues, qualitative research fits the overall goal. In qualitative research, the meanings that participants attribute to their experiences and action are a central focus, and they are conveyed through words and images (Saunders et al., 2019), and it implies “an inductive style, a focus on individual meaning, and the importance of reporting the complexity of a situation” (Creswell, 2022, P27-28). Therefore, the research strategy and method design for this study are centred around revealing the meanings embedded in the doctors' words.

Qualitative research contains three strategic design principles: naturalistic inquiry, which emphasizes non-controlling and non-manipulative of the real-world situation and openness to whatever emerges; emergent design flexibility, which allows adapting inquiry as understanding deepens or situation changes; and purposeful sampling, which focuses on relatively small samples and aims to inquire into and understand a social phenomenon in depth (Patton, 2014). In this regard, the study will be designed using the purposive sampling approach, given that the study builds upon prior research and seeks to extend the existing literature. In qualitative research, research methods are typically designed to be unstructured or semi-structured, allowing for flexibility in adapting questions, procedures, and research focuses as they evolve during the research process(Saunders et al., 2019). Common qualitative research strategies include action research, case study research, ethnography, grounded theory, and narrative inquiry, and they often employ data collection methods such as observations, semi-structured interviews, and in-depth interviews to gather valuable insights (ibid.). All these characteristics show that qualitative research is distinguished by its focus on understanding the emergent

processes and patterns that underlie social phenomena, rather than relying on preconceived hypotheses or models. As such, data collection in qualitative research is often conducted in the natural settings of participants, and data analysis is typically inductive, involving the identification and interpretation of patterns and themes that emerge from the data.

In brief, this study is qualitative research that: i) will collect data in the field where doctors experience cost accounting in medical practice; ii) focuses on learning the meaning that doctors ascribe to cost accounting and medical practice; and iii) develop a complex and detailed picture of how cost accounting interacts with medical practice. This study will use the case study research strategy and non-probability sampling techniques are the main approaches. Qualitative data of this study will be collected in a semi-structured way and will be categorised by themes for analysis. The following sections will provide a detailed description of the research design, data collection, and data analysis processes employed in this study as qualitative research.

3. Case study research design

The fundamental philosophical beliefs that underlie a research project have a profound influence on its structure and implementation, including the selection of data collection process. As an interpretivist study, this research acknowledges that reality is socially constructed. Hence, in line with this understanding, the data collection process of this study should adhere to the natural flow of the collected data, ensuring that the data obtained reflect the diverse experiences and perspectives of the participants (Saunders et al., 2019). Among the different

research designs commonly used in qualitative research, this study has opted for a case study design. Despite Yin (2014) and Eisenhardt (1989) both subscribing to positivist perspectives, their discourse on case studies nonetheless provides valuable insights for this study. Drawing from the context provided, this section will predominantly expound upon the design of the case study in this research, encompassing the criteria employed for case selection and the methods chosen for conducting research.

3.1 Case selection

According to Yin (2014), a case study is “an empirical inquiry that investigates a contemporary phenomenon (i.e., the case) within its real-life context, especially when the boundaries between phenomenon and context may not be clearly evident” (P16). According to this definition, a case study is a research method that revolves around the exploration of a current phenomenon, giving special attention to the intricate dynamics between the phenomenon itself and the environment in which it occurs. Phenomenon and context are not distinguishable in this regard. This study aims to examine the how doctors perceive the influence of cost accounting on healthcare activities within the specific context – Chinese public hospitals. As such, the implementation of a case study as a research design is deemed appropriate, given its ability to facilitate a comprehensive and nuanced exploration of the phenomenon within its natural setting. This is the first reason for selecting case study method.

Yin (2014) also suggests that the selection of research methods should consider the form of research questions (i.e., “who”, “what”, “where”, “how” and “why”), and the

degree of influence a researcher can exert over behavioural occurrences. With regard to the types of research questions, the case study method is appropriate for answering "how" and "why" questions, which are classified as explanatory or exploratory questions. This is consistent with the format of the research questions posed in this study, indicating the suitability of a case study approach. In terms of the researcher's potential impact on real-life behaviour, the researcher involved in this study adopts an interpretive rather than an interventional approach, whereby she seeks to understand and analyse the phenomena as they naturally occur. As such, allowing social phenomena to occur naturally aligns with the objectives of case study method.

The process of defining a case study hinges upon two key factors: the establishment of clear research boundaries and the selection of a case to investigate (Flyvbjerg, 2011). The first factor considers what can be referred to as a ‘case’. A case can be any unit of analysis, such as one or more individuals, an organisation, an event, an activity, a process (Merriam and Tisdell, 2016). The unit of analysis for this research is an organisation, specifically a Chinese public hospital, which serves as the primary focus of investigation. This arrangement will allow the researcher to understand the interactions between the subject of the case, namely doctors, and their context, namely a Chinese public hospital, in a specific way. In this regard, this study can be classified as a single case study. According to Yin (2014), conducting a single case study allows for gaining insights into the circumstances and conditions of an everyday situation. Considering the researcher's interest in comprehending how physicians incorporate cost information into their everyday medical practices, the decision to select a common case is justified.

The case selected for this study is one of the largest 3A public hospitals in a province of China. This hospital was chosen for the following reasons. Firstly, 3A public hospitals have emerged as the cornerstone of China's public healthcare system, assuming the primary role in delivering healthcare services to the public. This predominant position has made 3A hospitals a primary target for many healthcare reform policies. These policies, centred on performance measurement, medical cost control, and clinical budgeting, predominantly exert their influence in 3A public hospitals (e.g., National Health Commission, 2023). Therefore, conducting a study within 3A public hospitals can offer clarity on the most recent healthcare reform policies, with a specific focus on those related to cost control, and how these policies affect doctors' perceptions. Furthermore, 3A public hospitals are generally perceived by the public as the symbol of healthcare excellence within their respective regions. Among 3A hospitals, some institutions serve as focal points for medical research and higher education, rendering them more appealing to patients compared to other hospitals. Typically, these hospitals exhibit greater demands for the advancement of medical technologies, which in turn impose more stringent requirements for controlling medical costs. The selected case hospital belongs to this category, serving as an affiliated hospital of a medical university. Moreover, the case hospital is a comprehensive hospital. The medical functional departments of the case hospital comprise both clinical departments[3] and medical technology departments[4], with the

[3] **Clinical departments:** C n ca departments refer to the departments n a hosp ta that d rect y nteract w th pat ents and are nvo ved n the r pract ca observat on. These departments form the core of a hosp ta and are respons b e for tasks such as pat ent adm ss on, d agnos s, and treatment.

[4] **Medical technology departments:** Med ca techno ogy departments, a so known as aux ary departments,

clinical departments further categorized into internal medicine and surgery. This organisational structure encompasses a comprehensive range of healthcare services and covers nearly all aspects of medical care. This feature aligns with the need for a diverse range of participants in this study. As doctors from different departments may have varying understandings of cost control, they may have different cost control behaviours. Finally, the researchers have access to the case hospital, which provides practical convenience for the study. In summary, this comprehensive, 3A public hospital provided necessary condition for conducting a single case study.

3.2 Research method selection

In qualitative research, evidence can be gathered from multiple sources, including documentation, archival records, interviews, and observations, among others (Saunders et al., 2019). The primary research approach for this study is centred on interviews, with documentation serving as a supplementary source of data. This arrangement was chosen based on the rationale that each data source has its own strengths and weaknesses, and a combination of multiple data sources can complement and enhance the case study, therefore developing a converging line of inquiry (Yin, 2014). This section will primarily focus on providing an explanation for the selection of documentation and interviews as the data sources, as well as their respective designs. Furthermore, this section will outline the ethical considerations associated with the research, along with a discussion on the pilot interviews.

ut ze spec a zed d agnost c and treatment techn ques and equ pment to support c n ca departments n d agnos ng and treat ng d seases. These departments do not have pat ent beds and do not adm t pat ents, but p ay a cruc a ro e as a techn ca support system w th n the hosp ta .

3.2.1 Documentation design

Documentary information can take any forms, including personal documents, official documents, mass-media outputs, and virtual documents (Bryman, 2016). When designing the documentation process, researcher are recommended to adopt an open-minded perspective when identifying useful documents (Merriam and Tisdell, 2016). Authenticity and accuracy of documents are important elements to be considered in the research process (ibid).

In accordance with these requirements, this study will draw on some public available official documents, specifically those issued by governmental authorities. The principal objective of utilizing such sources is to support and enhance findings obtained through other means (Yin, 2014). Documentation plays three primary roles in this study. Firstly, government documents can assist the researcher in gaining a fundamental understanding of the broader context. This includes a wide range of topics, including the composition of China's public healthcare system, the requirements and progress of healthcare reform, as well as the relevant requirements of cost control for public hospitals imposed by the government. Documentation can cover a long span of time and a multitude of events (ibid,), making it an ideal source for gaining insights into the background. Moreover, documentation will also provide a reference for designing and refining interview questions in this study. Considering these two advantages, this study employ documentation as one of the data collection methods.

3.2.2 Interview design

Conducting interviews is an essential approach to explore this research topic,

namely doctors' perceptions of cost control. Interviews provide the researcher with the chance to extract explanations from participants and gain valuable insights into their unique interpretations and attitudes towards cost control. Out of the many interviewing methods available, this study will employ semi-structured interviews. This approach involves a predetermined set of topics which the basis of the interview questions, yet the researcher's sequencing of questions is participant-led (Roulston and Choi, 2018). The predetermined topics in this qualitative interviewing act as a reference. In actual interview process, the researcher usually adjusts the sequence of these topics based on the flow of the conversation and the information provided by the participants. Depending on the specific context, the researcher may choose to modify or exclude certain topics in particular interviews, while also exploring new topics provided by the participants' interpretations. Therefore, semi-structured interviews provide important contextual material, making them suited for research that including exploratory elements. Furthermore, semi-structured interviews offer researchers the opportunity to probe into participants' responses in a comprehensive manner, which is crucial for understanding the meanings participants assign to various phenomena (Saunders et al., 2019).

For the scope of the interview, this study will opt for one-on-one interviews. The choice of conducting one-on-one interviews is primarily based on two considerations. Firstly, this interview may involve comments on policies, as well as their perspectives on the public hospital and departments in which they are employed. Based on the researcher's understanding of Chinese social and cultural norms, individuals tend to refrain from openly expressing their opinions on these in public settings. Other interview formats, such as group interviews, create a more public atmosphere, which

might lead to participants being less willing to share their thoughts openly. Secondly, the researcher believes that each interviewee's perspectives on the same issue may differ due to personal factors. The researcher aims to preserve this diversity by conducting one-on-one interviews. The diversity may not be achieved by conducting other forms of interview, because individuals may conform to a particular answer due to the importance placed on collective identity, potentially reducing the diversity of responses.

In interview design, having a thorough understanding of the case hospital is essential before designing the interview guide and formulating interview questions. The search for relevant information about the case hospital and its departments not only helps the researcher develop a deeper understanding of the context knowledge, but also allows the researcher to establish credibility with the participants during the interviews. By demonstrating familiarity with the case hospital's operations and management, the researcher can build trust and rapport with the participants, which can lead to more open and accurate responses from participants.

The interview guide and interview questions for pilot interview were designed by taking into consideration all the elements mentioned earlier, the two research questions, the documents, and the relevant hospital accounting literature (See Appendix A). The interview guide consists of four main sections: the introduction, background-related questions, the middle section, and the concluding remarks. In the introduction, the researcher provides a brief introduction to herself and the research topic. Additionally, the researcher also discusses matters related to data protection, confidentiality, and the interviewee's consent for the interview in the

introduction. This introduction section not only ensures that the participants understand the purpose of the interview, their rights as a participant, and the measures taken to protect their confidentiality and privacy, but also can establish credibility and build trust with the interviewees. The background-related questions primarily aim to gather information about the interviewees' positions, professional titles, work experiences, and job responsibilities. These questions provide the researcher with a fundamental understanding of the participants and their professional backgrounds. The middle section of the interview guide focuses primarily on questions related to healthcare cost control. In reference to Kvale (1996), the interview guide for this study incorporates various question forms to ensure a comprehensive exploration of the research topic. These question forms include direct questions (e.g., "Do you...?"), indirect questions (e.g., "What do your colleagues...?"), probing questions, follow-up questions, and interpreting questions. The varied forms of interview questions can assist researchers in obtaining a comprehensive understanding of participants' perspectives.

3.2.3 Ethical consideration

When designing interviews, the researcher must consider research ethics-related issues. According to Saunders et al., (2019), ethics refers to “the standards of behaviour that guide your conduct in relation to the rights of those who become the subject of your work or are affected by it” (P286). According to Diener and Crandall (1978), research should adhere to some ethical principles, including considerations of potential harm to participants and ensuring informed consent is properly obtained. In this section, the researcher will address the ethical concerns of this study based on these two principles.

Firstly, potential harm to participants in this study may include harm to participants' development and causing stress to the participants. Considering this point, it is imperative to maintain confidentiality in the interviews, ensuring the participants' identities and personal records are treated with utmost confidentiality and privacy. The audio recordings and manuscripts containing interviewee information are accessible solely to the researcher, ensuring strict confidentiality. In the findings and any reporting of this study, efforts should be made to ensure that participants cannot be identified. Therefore, in the findings section, all participants are anonymous and are coded in a way that consists of the department they belong to and the order of their interviews. Another potential factor that could cause harm to the participants was the time period during which the study was conducted. The data collection was taking place during the outbreak of COVID-19, which means that face-to-face interactions may pose a certain risk to the health of both the participants and the researcher. Based on these considerations, the researcher made some adjustments to the data collection methods. These adjustments will be described in detail in Section 4: Research process.

The second ethical consideration of this study is related to obtaining informed consent from the participants. Participants should receive comprehensive information to empower them to make informed decisions regarding their involvement in the study (Bryman, 2016). Moreover, it is crucial that participants, even if aware of their involvement in research, possess a complete understanding of the entire research process (ibid.). Therefore, an informed consent form is a prerequisite for conducting interviews. The informed consent form for this study

consists of two parts: the participant information booklet and the informed consent document (See Appendix B). In the participant information booklet, the researcher provides a brief explanation of the study, including the research topic, the main form of data collection (i.e., interviews), the expected duration of the interviews, and how the research findings will be presented. The booklet also covers relevant information regarding the protection of participant information, and emphasizes that participants have the right to terminate the interview at any time without giving a specific reason. In the informed consent form, the researcher includes a fair treatment statement and the declaration of informed consent.

This research underwent ethical review at the University of Birmingham in 2020 and was granted full ethical approval, with the ethical approve number ERN 20-1016. Pilot interviews and formal data collection were conducted afterwards.

3.2.4 Pilot interviews

Before conducting the pilot interviews, the researcher made modifications to the interview questions. The interview questions used in the pilot interviews can be found in Appendix A. Subsequently, at the selected case hospital, the researcher conducted pilot interviews with four participants: one from the internal medicine department, one from the surgery department, one from the medical technology department, and one from the administrative department. This selection aimed to provide a comprehensive overview of different healthcare domains and validate the effectiveness of the interview questions in capturing relevant information. The inclusion of the participant from the administrative department was aimed at diversifying the sources of data and gaining insights from individuals other than

doctors regarding their perspectives on doctors' cost control practice.

Due to the restrictions imposed by the COVID-19 pandemic, the researcher was unable to conduct face-to-face interviews with the selected participants. As an alternative, online telephone interviews were conducted. Prior to the interviews, the researcher communicated with the participants and inquired about their willingness to engage in video calls. Four participants agreed to this mode of communication. Before commencing the interviews, the researcher sent the informed consent forms to the participants and confirmed their understanding and acceptance of its contents. The interviews lasted between 17 and 31 minutes. During the interviews, the researcher took notes and recorded the conversations for reference and analysis purposes. After each interview, the researcher transcribed the interview and then conducted a review. The researcher also made some detailed notes in this process to ensure a comprehensive understanding of the interview content.

After the completion of the four pilot interviews, the researcher conducted a thorough analysis of the interview questions, transcripts, interview notes, and review notes. Based on the findings from the participant in the administration department, the researcher discovered a limited understanding of how doctors control costs in medical activities. Therefore, she decided to exclude the administration department from the formal interviews. Additionally, the researcher found that conducting interviews with doctors based on their departments, namely internal medicine, surgery, and medical technology, was feasible. As a result, she decided to recruit participants for the formal interviews using this classification method. Furthermore, the researcher identified instances where participants provided answers that were

not directly related to the questions asked. Upon analysis, the researcher determined that the main reasons for this issue were unclear and ambiguous interview questions, as well as a lack of logical flow between questions, which led to confusion among participants. Some interview questions initially elicited "yes" or "no" responses, which provided limited in-depth information, which offered limited depth of information, necessitating further inquiry through follow-up questions. Consequently, the researcher made adjustments to the ways of questioning and expression, and she categorized the interview questions according to major themes to improve clarity and coherence.

4. Research process

Once the case hospital was selected, the research methodology was designed and refined, and polit interviews were finished, the researcher proceeded with the formal data collection and analysis process for this study. This section will outline the procedures for collecting two types of data, namely documentation and interviews, and subsequently elaborate on the researcher's approach to analysing these data in an academically rigorous manner.

4.1 Data collection

Once the research methods were selected, the researcher needed to explain how these methods were applied to the actual research process. Data collection usually marks the beginning of the formal research process. In this section, the researcher will describe the data collection process in terms of semi-structured interviews and documentation, which are two key aspects of data collection.

4.1.1 Interviews

Once the pilot interview was completed and the interview questions were revised accordingly, the researcher proceeded with the formal data collection phase, placing significant emphasis on conducting semi-structured interviews.

The researcher selected a medical technology department and clinical departments as locations for subsequent participant selection. Department L was one of the medical technology departments. It was the largest blood testing department in the province and owned the most advanced medical equipment and technology. The department was accredited by China's National Accreditation Service for Conformity Assessment for the quality and capability of its laboratory, which indicates that it had established high standards for medical quality evaluation. Department C, the clinical departments, was the one of the main functions of the case hospital.

Once the selected departments were finalized, the researcher commenced the process of recruiting participants. Due to time constraints, it was impracticable to interview all healthcare professionals within the selected departments. Therefore, the researcher employed sampling techniques to select participants from the targeted population. The researcher took a "snowballing" approach. From a practical standpoint, the researcher had access to one representative participant from each of the two types of departments. These representatives could assist the researcher in recruiting subsequent participants, considering the significant role of guanxi (i.e., relationships or networks) in Chinese culture (Yee, 2020). The researcher employed saturation as the criterion to determine when to stop recruiting participants within

each department. Saturation refers to the point at which no new information or insights emerge from the participants in that particular department (Saunders et al., 2018). With saturation as a criterion, the researcher conducted 14 interviews in Department L, 17 interviews in Department C. These interviewees, which were assured that they would remain anonymous, represented a wide range of different positions and different professional titles. The basic information of interviews and the interviewees is provided in Appendix C.

The 31 semi-structured interviews for this study were conducted in a nine-month period from March 2021 to December 2021. In light of the COVID-19 travel restrictions and social distancing rules adopted by China at the time of data collection, all of the interviews were performed via online telephone. The interviews were conducted in Chinese, which was the native tongue of all the interviewees and of the researcher conducting the interviews. Similar to what was done during the pilot interview, the researcher provided the consent form, participant information booklet, and the list of interview themes to the participants prior to the interview. This approach was considered to enhance the credibility and validity of the research as it informed the participants about the information of interest and provided them with an opportunity to prepare for the interview (Saunders et al., 2019). At the beginning of the interview, the researcher initiated a small talk phase as an initial rapport-building strategy (Rubin and Rubin., 2012). During the interview process, all interviewees were asked a standard set of questions, which covered issues like their professional backgrounds, their views on controlling healthcare costs, their involvement (if any) with cost control, and whether they perceive a conflict between cost control and medical needs. The interview guide utilized during the formal interviews can be

found in Appendix D. All interviews were recorded with the consent of the participants. Additionally, the researcher took notes during the interview process. The duration of the interviews ranged from 31 to 68 minutes. Following the completion of each interview, the researcher promptly transcribed the interview and organized the interview notes, and performed some simple analysis and summarization on these transcripts and notes. This was because, in inductive research, data analysis took place during and after the data collection phase. This arrangement helped shape the direction of data collection by allowing researchers to refine their research questions and identify important emerging themes, patterns and relationships from the data analysis process (Saunders et al., 2019).

4.1.2 Documentation

In this study, documentation primarily served as a supplement to semi-structured interviews. Its purpose was to assist the researcher in understanding the policy background related to cost control in public hospitals and to support the researcher in designing and modifying interview questions. During the data collection process for documentation, the researcher initially focused on gathering official documents. These official documents included those issued by the State Council, the Ministry of Health, and the Ministry of Finance, and the National Healthcare Security Administration in China, and so on. The researcher searched for relevant documents using keywords such as "public hospitals," "hospital economic management reform pilot," and "healthcare system reform" on the official websites of these governing institutions. From the search results, the researcher excluded content such as news reports and narrowed down the selection to 18 documents directly related to healthcare system reform. These documents were published between 1979 and 2023, which corresponded to the timeline of two rounds of healthcare reforms in

China. The researcher continued the documentation data collection process by carefully examining the 18 identified documents to ensure their direct relevance to healthcare system reform. Subsequently, a second thorough reading was conducted, specifically focusing on extracting clauses and requirements pertaining to key topics such as “healthcare costs”, “DRGs”, “global budget control”, “performance measurement”, “bonus systems”, and “marketization”. The researcher classified these clauses in chronological order, organizing them based on their respective timeframes. At this stage, the data collection for documentation was considered complete.

4.2 Data analysis

The philosophical assumptions underlying a research project can influence the data analysis process. In interpretive research, data analysis should aim to capture the breadth of participants' experiences and perspectives, making it crucial for the researcher to be sensitive to the variability and complexity exhibited by the participants (Saunders et al., 2019). In qualitative research, data collection and data analysis are often conducted in parallel (ibid). This section primarily focuses on describing the data analysis process that occurs after the completion of data collection in this research.

During the data collection process, the researcher conducted data analysis by analysing the interview transcripts and documentation. The researcher analysed the interview data in Chinese to keep interviewees’ original expression. All interview transcripts, researchers’ notes and documentation were imported into the NVivo, a qualitative data analysis software, for subsequent analysis and coding.

The researcher adopted a thematic analysis to analyse these qualitative data. Thematic analysis searches for themes or patterns occurs across a data set and therefore offers a systematic yet flexible and accessible for data analysis (Braun and Clarke, 2006). The findings from the 31 interviews and documentation yielded abundant information that was both extensive and disparate. The information was not only embedded within the interview transcripts but also captured within the researcher's notes and official documents. To comprehensively understand and integrate the data, thematic analysis needed to be employed. This study also followed an inductive research approach, aiming to generate rich descriptive accounts of the data and, to some extent, facilitate theorization. Analysing the data in thematic form allowed researchers to focus on specific themes, providing a structured approach to presenting the data. It also facilitated the exploration of potential directions for theorization, as it highlighted key patterns, connections, and relationships within the data.

The thematic analysis of this study was not linear but rather iterative and cyclical process. It involved multiple stages that require revisiting and iterating. The researcher started the thematic analysis by familiarising herself with all data. The researcher read and re-read all data for several times to immerse herself in them. During the reading phase, the researcher continuously searched for meanings, recurring themes and patterns in the data. At this stage, the researcher observed that the data from Department L differed from Department C. Recognizing this pattern, the researcher made the decision to separate the data from Department L and Department C into different categories.

During the process of familiarizing herself with the data, the researcher started coding to systematically analyse the information. Coding entails the labelling of data units in each transcript or document with a code that represents or summarizes the meaning of the extracted information (Saunders et al., 2019). At the first coding stage of this study, a word-by-word or sentence-level coding approach, known as verbatim coding, was employed (Manning, 2017). This coding method was beneficial for the researcher in the initial stages of data analysis as it helped her gain a deep understanding of the themes present within the data. By coding at such a detailed level, the researcher minimized the risk of overlooking important information. During this stage, the codes primarily originated from the data itself. These codes were derived either from the actual terms used by the participants, namely Nvivo codes, or from researcher's understanding from the extracts (Saunders, et al., 2019). In this study, all coding processes were performed by using the software Nvivo.

After completing the initial phase of word-by-word or sentence-level coding, the researcher proceeded to search, identify and develop themes. At this point, the researcher also aimed to reduce the number of codes while retaining the most meaningful and relevant ones. A theme represents a broad category that encompasses multiple codes, reflecting a connection between them and highlighting an important idea relevant to the research question (Saunders et al., 2019). The researcher employed the semantic approach (Boyatzis, 1998) which aims to identify themes within the surface meanings of the data. Given the differences observed in the data between Department L and Department C, the researcher selected candidate themes for each data set. However, regardless of the data set, these

themes were identified as such because they captured something important in relation to the overall research question and also occurred repeatedly across different interviewees (Braun and Clarke, 2006). Moreover, based on the initial coding process and a comprehensive understanding of the data, the researcher identified institutional logics as a theoretical lens that was capable of interpreting the findings of this study. The researcher also recognized that the data aligned with the concept of institutional logics and believed that the findings could contribute to the existing body of knowledge in this area. Therefore, the theoretical framework was also one of the references for thematic analysis in searching for and redefining themes.

Within the Department L data set, the researcher identified five candidate themes, most of which included a number of sub-themes. The five themes were: classification of costs, including reagents, medical instruments, medical consumables, and other consumables; reasons for cost control, including the bonus system and frugal habits; cost control techniques, relating to reagents, medical instruments, medical consumables, and other consumables; positive attitudes towards cost control; and the impact of cost control on medical practice, namely no negative impact raised by interviewees. Having identified these candidate themes, the researcher reviewed and refined them. Redefining themes and their relationships is an important part the analytical process, as this process will provide a structured analytical framework for future analysis (Saunders et al., 2019). After referencing the theoretical framework of institutional logics and engaging in iterative processes of re-reading and reorganizing the dataset, the researcher redefined the themes as follows: commercial logic in the Department L, including doctors' perception of cost control and doctors' cost control

practice; and non-conflicting situation in the Department L, including cost control and medical quality, the bonus system, and the culture of frugality.

The subsequent thematic analysis in Department C was also similar to that of Department L. In Department C, the researcher identified five candidate themes with a number of sub-themes under each theme. The five themes were: classification of costs, including medical-related items and non-medical item; reasons for cost control, including the bonus system, the medical insurance system (i.e., DRGs, clinical pathways, global budget control), and frugal habits; attitudes towards cost control, including positive comments and negative comments; cost control practice, including practice related to medical items and non-medical items; and the impact of cost control on medical practice, namely positive and negative impact. These themes were further reviewed and redefined by the researcher. The refined themes were: commercial logic in Department C, including DRGs, clinical pathways, global budget, bonus system, and doctors' perception of cost control; non-conflicting situations, which aimed to demonstrate and explain the situation where doctors perceive a non-conflicting relationship between commercial logic and medical professional logic; and conflicting situations, which aimed to present doctors' perceptions of conflicting situations and illustrate how medical professionals manage these conflicts.

After collecting relevant documentation and conducting interviews, and performing thematic analysis on the collected data, the research entered the next stage, which involved presenting the findings. The research findings of this study will be presented in Chapter 6 and Chapter 7, divided into two parts: Department L and Department C, respectively.

5. Reflections

This section will discuss the researcher's reflections throughout the entire research process, including the research design, data collection, and data analysis. Reflection holds significant importance within research, as it enables researchers to make adjustments in various stages of the study, while also providing valuable insights and experiences that can be applied to future research endeavours. This section comprises three key components: the researcher's role in the study, the influence of COVID-19 on the research, and critical reflections on the chosen research methods.

5.1 Researcher’s role and reflexivity

Researchers are regarded as a key instrument in qualitative research because it is they who collect data, record data, and interpret data. Therefore, the researcher herself need to be aware that her knowledge level in the research field, her understanding of the study, and her past experiences may potentially influence the research design and the interpretation of data. Recognizing the influence of these factors is crucial as it allows the researcher to critically assess her own biases, preconceptions, and limitations. In general, reflexivity entails qualitative researchers engaging in continuous self-reflection throughout their research journey. The goal is to remain conscious of the cultural, political, social, linguistic, and ideological underpinnings of their own viewpoints, as well as those of the individuals they interact with during their fieldwork (Bryman, 2016).

The researcher's comment about reflexivity is related to her past experiences and

how these experiences may shape data collection and interpretation (Creswell, 2022). As a Chinese researcher, the influence of traditional Chinese culture allowed the researcher to understand certain culturally related aspects that appeared in the data. For example, participants frequently mentioned the significant role of frugality culture in healthcare cost control. This understanding aligned well with the researcher's education and the societal environment that promoted a frugal lifestyle. Consequently, during the pilot interviews, the researcher did not explicitly probe further into the topic of frugality. However, upon reflecting on the experiences from the pilot interviews, both the researcher and her supervisors recognized the importance of delving deeper into the topic of frugality. As a result, during the formal interviews, when doctors mentioned aspects related to frugality, the researcher would inquire about how such habits were formed, among other related questions. At the same time, the researcher was also aware that frugality should not become the sole focus of her study. Therefore, during the interviews, she avoided actively seeking evidence to support her own perspectives on frugality. During the data analysis, she also refrained from presenting favourable or unfavourable analysis and conclusions specifically regarding frugality culture.

5.2 COVID-19 restrictions

In the year 2021 when this study was conducted, there was a global outbreak of COVID-19, leading to travel restrictions implemented by various countries. Consequently, the researcher had to adapt and opt for remote data collection methods. Face-to-face interviews were replaced with online telephone interviews as a result.

Online telephone interviews offered several advantages as an alternative method for data collection. One notable advantage of online telephone interviews is the expedited data collection process. Compared to face-to-face interviews, online telephone interviews offered greater flexibility to participants in terms of their location and timing. In this study, a significant number of participants were interviewed at home after their work hours. Being in relatively relaxed, enclosed and familiar environment, participants may express their ideas without concerning about interruptions. The researcher conducted up to three interviews in a single day, significantly enhancing the efficiency of data collection. Moreover, telephone interviews may reduce participants' inhibition when providing statements about personal matters. In this study, sensitive topics encompassing the possible negative comments of national policies, departments, and hospitals, as well as inquiries regarding participants' past experiences. Despite their sensitive nature, the collected data revealed that many participants provided rich content in both of these areas.

However, the manner in which semi-structured interviews were conducted was likely to affect their outcomes. In the formal interviews conducted for this study, only two participants agreed to use video interviews, while all other participants were interviewed using a voice/listening-only mode of interviewing. Since online telephone interviews had limited scope in terms of personal contact, there was a lack of interaction between the researcher and participants. During the interview process, the researcher was unable to observe participants' facial expressions and body language, which could provide valuable contextual information in interviews. Another drawback of online telephone interviews was that the interview duration tends to be shorter compared to face-to-face interview (Saunders et al., 2019). The shorter

interview duration in this study could be attributed to the use of telephone interviews. Additionally, during the interviews, researchers also noticed that a few participants seemed reluctant to express their thoughts extensively, regardless of how they were encouraged. This may be attributed to the fatigue experienced by participants during online telephone interviews. Despite these limitations, the researcher was able to gather sufficient amount of information through online telephone interviews for analysis purposes.

Another negative impact of COVID-19 on this study was the limitation of data diversity. For a case study, researchers typically need to utilize multiple sources of data to provide detailed information. This is because each data collection method has its strengths and limitations, and using multiple data collection methods allows for complementary advantages. The optimal data collection approach for this study is a combination of observation and semi-structured interviews. Observation firstly helped the researcher to understand the contextual characteristics of the hospitals and departments, enabling her to ask more targeted questions. Given the COVID-19 situation, this aspect was partly compensated for through information searches on hospital websites and communication with relevant contacts. Furthermore, observation can serve to validate certain aspects of the content obtained through semi-structured interviews. During interviews, participants may provide answers they believed the researcher wanted to hear. Whether the interview results align with the observations or not, they may provide the researcher with different analytical perspectives and valuable data for analysis. However, due to the restrictions imposed by COVID-19, it was not possible to conduct on-site observations in this study.

The unforeseen factor of COVID-19 had an impact on this study. But researcher made every effort to seek alternative solutions when faced with uncontrollable circumstances, aiming to minimize the negative effects on the research. This uncontrollable factor also provides insights and lessons for future research endeavours. Given future opportunities, the researcher intends to build upon this study as a foundation for conducting data collection through on-site observation in the case hospital.

5.3 Reflections on research methods

Alongside semi-structured interviews, documentation as a data collection method was utilized in this study. As mentioned in previous sections, documentation primarily referred to official documents, which not only provided background information but also played a crucial role in informing the development of interview questions, ensuring that relevant topics were addressed during the interviews. Regarding documentation, the relevant internal hospital documents on cost control would provide further assistance in understanding the specific context and designing interview questions for the research. However, due to issues of access and data protection, the researcher was unable to obtain official hospital documents. Therefore, during the interviews, the researcher posed some probing questions when appropriate, such as ‘what requirements does the hospital have in terms of healthcare cost control’. These probing questions indirectly elicited information related to some content in official hospital documents. This approach allowed the researcher to gather insights into the cost control measures implemented by the hospital, compensating for the unavailability of official documentation.

Another important part of research methods is the sampling methods employed in the study. The sampling method utilized in this research was snowball sampling, leveraging accesses and their existing networks to recruit participants. From a practical perspective, this sampling method offered convenience as it did not require the researcher to directly contact each participant. Additionally, snowball sampling may have a higher success rate, facilitating a smoother research process. However, it is important to recognize that snowball sampling can introduce bias into the data collection process because participants tend to refer individuals who resemble themselves, potentially leading to a more homogeneous sample (Lee, 1993). To address this concern, the researcher explicitly expressed her desire to recruit a diverse range of participants to the access participants.

No single research method is without flaws. It is essential for researchers to possess a comprehensive understanding of the strengths and limitations associated with each research method and take appropriate measures to address any shortcomings. In a study, the ideal approach is to employ multiple research methods that complement each other, allowing for a comprehensive exploration of the research question. However, it is important to acknowledge that any research design may need adjustments in practice due to various real-world factors, such as access limitations, budget constraints, and time constraints. Therefore, researchers should strive to exercise their subjective agency to effectively navigate the challenges presented by these real-world circumstances.

Chapter 5 The Context of China: Chinese Culture, Medical Logic, and Commercial Logic

1. Introduction

China, officially recognized as the PRC, is marked by distinct historical periods, including Ancient China (2070 BC – 221 BC), Imperial China (221 BC -1912), and Modern China (including the Republic of China from 1912 to 1949 and the People's Republic of China from 1949 to the present). China's extensive historical timeline has bestowed it with a distinctive context, encompassing diverse facets such as social, cultural, political, and economic dimensions. This chapter serves as an introduction to the historical trajectory of China, focusing on key elements such as the frugality culture, the evolution of medical logic, and the emergence of commercial logic in the healthcare reform of the PRC.

2. The Chinese society: Confucianism, communism and frugality

Across its extensive history, China has traversed distinct eras, each imprinting its mark on the trajectory of Chinese society, encompassing factors such as social structure, cultural evolution, political milieu, philosophical stands and economic strategies. Several enduring attributes from ancient China have been transmitted into the modern era. Notably, the culture of frugality stands as one such persistent element.

The concept of frugality (俭), as defined by the Hanyu Dictionary as "being thrifty with resources and avoiding waste (节省，不浪费)" (Hanyu, n.d.), has a deep-rooted history in China (Gao, 2018). The significance of frugality was documented in the Analects, a seminal Confucianism text around 5th century BC, which promotes frugal as one of the five vital virtues of being a gentleman, and promotes frugality in national ceremonies and worship (Confucius, 2010). This text has played a central role in influencing both ancient and contemporary Chinese society. The other great Confucian philosopher, Xunzi, further defined frugality at the practical level. He proposed that wise rulers should manage economic activities by seeking ways to increase income sources and simultaneously curbing expenses (Xunzi, 2003). This perspective later evolved into the idiom "increase income and reduce expenditure" (开源节流) in subsequent generations. It was employed to characterize various forms of frugal practices in social life. Another ancient philosophy that significantly impacted Chinese ideology, Taoism, also emphasized the virtues of frugality. Laozi, the founder of Taoism, expressed in his work Tao Te Ching that he considers three things to be the most precious, with frugality being the second among them (Lao, 2016). He also put forward that if people focused on frugality, they would see their lives grow increasingly prosperous; and when leaders championed frugality, the entire country would experience greater wealth (ibid.).

Confucianism was officially embraced as the state's moral and political ideology following the establishment of centralized authority in ancient China in 202 BC. As a result, frugalist principles transitioned from the realm of ideology to the sphere of politics, and were employed to combat corruption and conspicuous consumption

among the elite and government officials (Gao, 2018). In 1840, the feudal system in China officially ended. But Confucianism remained entrenched as one of China's enduring religious traditions and was transmitted through a range of socialization rituals and customs (Yee, 2009). A similar situation applies to frugality. Following the establishment of the PRC in the 1940s, the ruling Chinese Communist Party (CCP) also adopted the concept of frugality, and it persisted in influencing the politics, culture, and economy of China.

At the political level, frugality is regarded as the tradition of the CCP. During its evolution, the CCP had to navigate challenging circumstances with limited resources, which led to the development of frugality as a central component of its political ideology (Gao, 2018). The first generation of leadership in the PRC, with Mao Zedong as its central figure, mandated that all government agencies adopt an incorruptible work ethic, impose stringent penalties for corruption, and forbid wasteful practices. This requirement was recorded in “The Common Program of The Chinese People’s Political Consultative Conference”(The National Committee of the Chinese People’s Political Consultative Conference, 1949), which served as the first constitution of the PRC. Subsequent leadership generations have consistently tied the concept of frugality to the idea of corruption-free governance, embedding frugal principles into numerous CCP ordinances, directives, regulations, and guidelines.

Furthermore, frugality played a role in facilitating the execution of national policies. To address China's economic and technological underdevelopment, the government launched a "Boost Production, Cut Waste (增产节约)" campaign in 1979 as part of its comprehensive economic reform efforts, and the reduction of waste was seen as a

method to enhance production efficiency in this campaign (Gao, 2018). In the subsequent decades, as China transitioned toward a socialist market economy, the country encountered a domestic economic crisis characterized by mounting debts, non-performing loans, and increased consumer spending (Shambaugh, 2016). In response to these challenges, a "Promote Frugality, Discourage Extravagance" (厉行节约，反对奢靡) campaign was implemented from 2013 to 2015, seeking to encourage thriftiness and discourage excessive spending among both government officials and the general public. Numerous slogans featuring catchy words and phrases have been devised to convey this ideology, such as “thrift is honourable, wastefulness is shameful, embezzlement is criminal (节约光荣，浪费可耻，贪污有罪)” (Gao, 2018). These slogans received extensive promotion through various media channels, solidifying the emphasis on frugality in Chinese society. Moreover, the frugal practices of historical figures, CCP leaders, role models, and everyday citizens were highlighted in textbooks and the media, further promoting frugality as a cultural value in communist China.

In summary, frugality is a deep-seated cultural principle in China with roots in Confucianism and Taoism. In recent decades, it has been politically emphasized and reinforced by the country's ruling communist party. This cultural imperative places significant societal expectations on individuals working in public institutions, including hospital doctors, to adhere to the principles of frugality in fulfilling their duties.

3. The development of medical logic in China

The field of medicine in China is a dynamic and multifaceted domain that embraces

both traditional Chinese medicine and contemporary Western medicine. This context plays a central role in moulding the medical development in China. The fundamental values and norms that medical professionals are expected to adhere to, as well as the practices they are authorized to conduct, have evolved under the combined influence of Chinese and Western elements. This section will delineate the evolution of the medical logic by referencing relevant literature and publicly available government documents.

3.1 Key value system of the medical logic

The value system holds considerable influence over an individual's perception of the world and has a direct impact on their actions (Jacobs, 2005). The value system of medical logic has a set of rules that combine idealism and pragmatism, serving as the moral standards embraced by doctors in their professional practice (Lee, 1943). This section will explain the key value inherent in the medical logic, include the emphasis on medical quality, patient's welfare and medical autonomy.

3.1.1 Medical quality

Medical quality has persisted as a fundamental component of the core value system within medical logic, tracing back to the Imperial China. During Zhou Dynasty (around 11th century BC – 771 BC), doctors underwent annual evaluations to assess their medical expertise, which in turn had a direct impact on their earnings (Zhang and Cheng, 2000). The linkage between these evaluations and their earnings underscored the significance placed on medical competence and quality, intertwining financial incentives with the imperative to maintain and enhance healthcare standards. In the 3rd century BC, medical professionals summarized the primary

experiences and theories in the field of medicine and compiled them into the book “Huangdi Neijing”, the earliest medical treatise in China (Veith, 2015). This book proposed that normal physiological activities in the human body rely on the coordination of Yin and Yang, and for doctors, grasping the dynamic interrelationship between Yin and Yang was crucial for effective disease treatment, with their medical objective centred on harmonizing the Yin and Yang energies within individuals' bodies (ibid.). The book “Huangdi Neijing” served as a seminal reference for subsequent generations of medical professionals, offering a comprehensive foundation for the key value of medical logic.

To ensure the quality of medical services, two principles have been formulated in the Imperial Chin. The first one was the principle of personalized or individualized medical treatment. The book "Shanghan Lun”, which was published in the 3rd century and is considered China's first medical book that effectively integrates medical theory with clinical practice, emphasizes the importance of treatment variation according to the individual pathological case, and recommended that physicians should modify their treatment approaches in accordance with the meridians[5] affected by the patient (Jia, 1979). Enhancing medical expertise stood as another aspect of ensuring the standard of medical quality. The distinguished doctor Sun Simiao advocated that medicine is a complex discipline requiring practitioners to approach it with a scholarly perspective and to become well-versed in the medical literature (Chen, 2007). In order to ensure the ongoing advancement of medical knowledge, Imperial China gradually established a medical education system.

[5] **Meridians:** In Traditional Chinese Medicine, meridians are the channels through which ‘qi’ and blood flow, connecting the internal organs, the body surface, and various parts of the body (Huang et al., 2023). They form a network that regulates the body's functions and activities.

The first medical school in Imperial China was established in the Northern and Southern Dynasties period (420 - 589), marking a step towards the establishment of standardized medical professional education and the departure from the conventional apprenticeship system (Lam et al., 2006; Li, 2022). Within this education system, there was a pronounced focus on fostering specialized doctors in one of the four designated fields: internal medicine, surgery, paediatrics, and otolaryngology – ophthalmology – dentistry (Hong, 2004). These students were also obligated to undergo qualification examinations to assess their competency and willingness for being doctors upon completion of their studies (ibid.). During the Tang Dynasty (618 – 907), a dual-level medical education system consisting of central and local institutions was implemented: at the central level, medical education fell under the purview of the Imperial Medical Bureau, which was in charge of medical training and education in terms of structured curricula and unified textbooks, defined study durations, professional examination processes, as well as a comprehensive system of rewards and penalties; while on the local level, medical education was entrusted to local medical doctors who not only spread medical knowledge but also guided students in practical medical internships (Wu and Zhang, 2020). The two-tier system of medical education and training, consisting of central and local levels, continued in subsequent dynasties and remained in place until the end of the imperial era.

After the First Opium War in 1842, Western medicine was introduced to China on a large scale through missionaries. In addition to the medical knowledge and skills of Western medicine, the educational model and ideas of Western medicine were also introduced. In 1866, the first Western medical school established by Christian

missionaries was founded, and used systematic Western medical works and textbooks for teaching, and the instructors were professional doctors who had received systematic education in Western medicine (Du, 2011). In Modern China, especially during the Republic of China era (1912-1949), medical education was gradually regulated. In 1929, the Ministry of Education and the Ministry of Health jointly formed the Medical Education Committee, which assumed the responsibility of formulating textbooks, syllabi, and curriculum subjects for medical schools, with an emphasis on both Western medicine and Traditional Chinese Medicine. After the establishment of the PRC in 1949, the central government drew upon the model of the Soviet Union to construct higher medical education system, characterised by autonomous medical education institutions under the Ministry of Health and focused exclusively on the training of healthcare workers (Hou et al., 2014). These universities offered five-year or six-year degrees, with their majors covering clinical medicine, preventive medicine, dentistry, forensic medicine, medical laboratories, nursing, and pharmacy (Xu et al., 2010). While this system has experienced transformations since 21th century, the emphasis on Western medicine education remains a priority. This system consists of a five-year undergraduate programme in clinical medicine followed by either a three-year standardized resident training or a three-year postgraduate program (The State Council, 2017). The curriculum for most common five-year programmes is primarily structured around Western medical knowledge, supplemented by some emphasis on Traditional Chinese Medicine. It places significant emphasis on basic biomedical sciences, medical technology, and clinical medicine, while also incorporating courses in humanities, social sciences, ethics, public health, psychology, communication skills, and professional ethics, and clinical training in hospitals (Hou et al., 2014). The specialized medical education

programme played a role in fostering the growth of highly specialized doctors, each equipped with their own standards for defining and interpreting medical quality.

In addition to medical education, ongoing training serves as a means to further enhance medical expertise. Nowadays, medical professionals are encouraged to engage in continuous research, innovation, and evidence-based practice to ensure their medical knowledge remains up-to-date and contributes to the enhancement of medical service quality (National Health Commission of People's Republic of China, 2021). Therefore, healthcare professionals in China are now advised to continuously receive training as part of medical work and pass professional qualification examination in order to advance their professional titles (ibid.). Medical professionals have three levels of professional titles: primary, intermediate, and advanced. The titles for each level in the clinical field are as follows: "Physician" (医师) for the entry-level position, "Attending Physician" (主治医师) for the intermediate level, "Associate Chief Physician" (副主任医师) and "Chief Physician" (主任医师) for the advanced level; for medical technology professionals, the titles for each level are as follows: "Technologist" (技师) for the primary level position, "Senior Technologist" (主管技师) for the intermediate level, "Associate Chief Technologist" (副主任技师) and "Chief Technologist" (主任技师) for the advanced level (National Health Commission of People's Republic of China, 2021). In addition to passing the required professional examinations, medical professionals are evaluated based on their adherence to ethical standards, their proficiency in medical techniques, and their contributions to scientific research (ibid.). These comprehensive evaluations aim to ensure that professionals possess the necessary skills, knowledge, and qualities to attain and maintain their professional titles. The current "Code of Medical Ethics in China" also

places significant emphasis on the practice of lifelong learning to consistently enhance professional knowledge and skills (Chinese Medical Doctor Association, 2014).

Throughout the course of Chinese history, the maintenance of medical quality has consistently been a paramount concern for both medical professionals and the sphere of medical practice. The emphasis on maintaining individualized medical treatment and enhancing medical expertise has been paramount in the pursuit of achieving high medical quality. Specialized education and comprehensive training programs play a central role in fostering medical expertise and maintaining the high standard of medical practice. As Jacobs (2005) proposed, the education and training will contribute to instilling the medical value within the mindset of medical professionals.

3.1.2 Patient's welfare

Another facet of the fundamental value system inherent in medical logic is the prioritization of patient welfare. The book "Huangdi Neijing" mentioned that if doctors engaged in deceptive self-promotion of their medical expertise to patients, it was regarded as irresponsible to their patients; and physicians were advised to exercise care in the appropriate utilization of stone needles to minimize any unnecessary suffering to patients (Tsuei, 1989). Elaborative details concerning the well-being of patients were explicitly delineated in the succeeding dynasties of Imperial China. The distinguished doctor Sun Simiao in ancient China provided the summary of medical value in terms of the duties of doctors to their patients and the public (Tsai, 2014). He proposed that doctors should have mercy on patients and strive to alleviate the

suffering of all individuals, regardless of their social status or background; and physicians were expected to empathize with the suffering of patients as if it were their own, setting aside personal discomforts like night shifts, harsh weather, hunger, fatigue, and other difficulties (Tsuei, 1989).

In Modern China, due to the increased interactions and exchanges with Western nations, the ethical principles of Western medicine have been introduced into the Chinese medical landscape. Yu Fengbin, one of the founders of the Chinese Medical Association (CMA), translated the "Code of Medical Ethics" from the American Medical Association in the early 20th century, introducing western medical ethical standards to Chinese doctors for the first time (He, 2013). Subsequently, building upon this basis, the CMA compiled and published the "Physician's Code of Conduct" in 1933. This document firstly stated that medicine, as a profession, had its own unique professional standards and ethos; doctors were encouraged to prioritize serving the population as their fundamental objective and to embody a spirit of self-sacrifice for the well-being of patients (Chinese Medical Association, 2019). After the establishment of the PRC in 1949, the government attached great importance to medical ethics and promoted medical professional values through the advocacy of celebrity professionals. Dr. Norman Bethune[6] serves as a example in this regard. He became a role model for all medical professionals because of his “devotion to healing the wounded and rescuing the dying, dedication, enthusiasm, warm-heartedness, love of the profession, constant improvement of skills, and respectful practice of medicine” (Peng, 2000, P24). After the 1980s, with the implementation of

[6] **Dr. Norman Bethune:** Norman Bethune was a Canadian physician who provided medical aid in China during the World War II and became highly regarded for his selfless dedication to serving the Chinese people.

‘Reform and Opening up’ policy, China's medical profession ethics has gradually been influenced by international organisations and institutions such as the Council for International Organisations of Medical Sciences, the World Health Organisation, and the United Nations Educational, Scientific and Cultural Organisation (Wang and Wang, 2015). In 2014, the Chinese Medical Doctor Association (CMDA) issued the "Code of Medical Ethics in China". The 40 guidelines aim to standardize the ethical conduct for physicians and require doctors to adhere to professional self-discipline within the industry. The most fundamental aspects of the code include: firstly, doctors should show utmost respect to patients; secondly, doctors should allocate medical resources based on principles of fairness and justice according to patients’ needs; lastly, doctors should undertake social responsibilities that align with the public interest in their medical practice (Chinese Medical Doctor Association, 2014).

The prioritization of patient welfare as a central element of the medical value system has been passed down from Imperial China to Modern China. This principle is evident in both medical literature and codes of professional conduct. This enduring dedication to patient-centred care, characterized by empathy and compassion, has served as a significant driving force behind medical practice.

3.1.3 Medical autonomy

In Imperial China, the establishment of a medical education system provided medical professionals with a platform to assert their autonomy in the field. They held a monopoly over education and training, enabling them to dictate the requirements for individuals aspiring to become medical professionals (Wu and Zhang, 2020). In Modern China, especially during the Republic of China era (1912-1949), the

introduction of professionalized and standardized Western medicine led to a new understanding of identity and social status among Chinese physicians. They believed that physicians were a group of intellectuals who develop professional knowledge through systematic education and training, which enable them to become the authority of their industry and have the right to interpret their professional traditions and content (Yin, 2007).

The notion of medical autonomy was further solidified through the establishment of medical professional associations. Within China, the clinician is represented by two prominent professional associations, namely the CMA and the CMDA. While both the CMA and the CMDA are non-governmental organisations, CMDA has a more pronounced focus on providing support to certificated doctors. The CMA was established in 1915 by clinicians with government of Republic of China backing. It operated under government supervision in matters concerning its formation, the organisation of conferences, and the conduct of elections (Zhu and Wei, 2009). This professional association aimed to protect the interests of the clinicians and negotiate with the government on behalf of clinicians (Yao, 2015). For example, in 1929, the Shanghai Municipal Health Bureau's proposal to impose an upper limit on medical fees was resisted by the Medical Association and was considered to be an improper act by the government to interfere with clinicians' earning (ibid.). In addition to negotiations, clinicians were actively involved in shaping medicine by participating in the policy-making process through the CMA, and some managers in this organisation also hold leading positions in the government (Zhu and Wei, 2009). Subsequent to the establishment of the PRC, the CMA shifted its focus towards overseeing non-governmental medical academic exchanges and elevating the

standard of medical scientific research through the establishment of specialized research funds (Chinese Medical Association, 2018).

CMDA was established in 2002 and its members primarily consists of practicing physicians[7], licensed assistant physicians[8], and healthcare institutions. In contrast to the CMA, the CMDA operates under a framework of industry self-discipline and possesses the ability to formulate regulations for medical practice. Its responsibilities include aiding health administrative authorities in formulating a comprehensive physician assessment system, conducting assessments and certifications of physician qualifications, as well as supervising and inspecting physicians' professional practice (National Health Commission of People's Republic of China, 2012). The association also operates within the legal framework to protect and ensure the lawful rights and interests of physicians in the course of their professional engagements such as prescription, diagnosis, and treatment, ensuring that their professional autonomy is respected (ibid). Furthermore, it works towards guaranteeing that physicians' personal dignity and physical safety remain unharmed throughout their medical practice (ibid).

The progression of medical associations underscores the degree of autonomy that doctors possess. This autonomy includes their ability to shape professional training, advocate for their rights, establish connections with government bodies, and drive advancements in the field of medicine. By integrating these strategies with the

[7] **Practicing physician:** It refers to nd v dua s who possess a phys c an's pract c ng cense, spec f ca y at the "pract c ng phys c an" eve , and are act ve y engaged n med ca and prevent ve hea thcare work.
[8] **Licensed assistant physician**: It refers to nd v dua s who possess a "Phys c an's Pract c ng L cense" w th the des gnat on of "Ass stant Phys c an" and are act ve y nvo ved n med ca and prevent ve hea thcare work. They ho d a ower eve of qua f cat on compared to "pract c ng phys c ans".

foundational value system, medical logic has prescribed the set of values, norms, and practices that healthcare practitioners are expected to adhere to: they are obligated to place patient welfare at the forefront, uphold and enhance the quality of medical care, and make determined efforts to safeguard and promote their professional autonomy.

4. The development of the commercial logic: Chinese healthcare reform

The initial endeavours to infuse commercial concepts into Chinese public hospitals commenced in the late 1970s. During this period, the central government began drawing inspiration from the principles of Chinese economic reform and attempted to implement these concepts within the realm of public hospitals (The Ministry of Health et al., 1979). Through these initiatives, the central government aimed to address the pressing concern of inadequate financial support for public hospitals (ibid.). Nevertheless, these endeavours gave rise to significant societal challenges, as the cost of medical care became increasingly unaffordable for many individuals and accessing essential healthcare services became increasingly difficult (China Youth Daily, 2005). Given this context, the central government embarked on the second stage of healthcare reform in 2009, with the goal of addressing these pressing societal concerns through the implementation of cost control measures in public hospitals, and this round of healthcare reform is still in progress (The State Council, 2009b). This section will synthesize the content of both healthcare reform stages and analyse them through the lens of institutional logic, aiming to illustrate the evolution of commercial logic in Chinese healthcare reform.

4.1 The background of Chinese healthcare reform: healthcare system and national medical insurance system

During the Imperial China (221 BC -1912), there was no established, systematic nationwide healthcare system (Jia, 1979). In the era of the Republic of China (1912 - 1949), the progress in building comprehensive healthcare system was limited due to societal turbulence resulting from frequent political upheavals during that time (Jewell, 1983). One prominent contribution during that period was the implementation of the rural healthcare model in Ding County, Hebei Province in the 1930s. This framework served as the basis for creating a healthcare network that extended from larger country-level down to smaller township and village-level healthcare facilities in rural areas of Republic of China, a structure that persisted even during the early era of the PRC (Li, 2022).

After the establishment of the PRC in 1949, the central government embarked on a mission to establish a comprehensively planned and managed healthcare system that would encompass both rural and urban areas. The first step was the establishment of a top-down healthcare administration system. The Ministry of Health was established at the central government level, while health departments were established within the provinces, and health bureaus were set up at the city and county levels (Li, 2022). The second step was the establishment of healthcare institutions: below the county level, township health centres were established, and rural clinics were opened to provide primary healthcare services; while health service

institutions were established at the county level and higher to deliver and oversee a variety of services, such as medical treatment, disease prevention and management, maternal and child healthcare, the provision of essential medicines, and traditional Chinese medicine (ibid.). The arrangement of health institutions below the county level was based on a two-tier arrangement, with county hospitals at the county level and union clinics (or 'commune clinics') at the township level (Fang, 2014). In 1968, in response to the call of the Cultural Revolution to strengthen rural medical and health services, this two-tier medical system was reorganized into a highly structured, three-tier medical system, with barefoot doctors formed the lowest level of this system. The barefoot doctors were front-line medical workers who were given basic medical training to provide basic treatment and perform public health work in their home village (Zhang and Unschuld, 2008). In the end, from 1968 to 1978, almost all rural population had access to basic health services because most of villages had a health station staffed by barefoot doctors who could provide basic treatment in their villages, and many townships had union clinics which provide referral services and supervise barefoot doctors (Gerald and Gu, 1997). However, with the implementation of rural reform and the dismantling of the people's commune system in 1979, the barefoot doctor programme and cooperative medical services gradually ceased to function in most Chinese villages (Fang, 2014).

Medical insurance scheme is also part of the development of Chinese healthcare system. Before the Chinese Economic Reform in 1978, there was no medical insurance scheme that covered the whole country, with only part of the public covered by medical insurance (Henderson et al., 1995). According to Song (2009), before 1978, urban and rural residents were covered by different health insurances:

in urban areas, employees of state-owned enterprises and collectively owned enterprises often had their healthcare expenses primarily reimbursed by their respective employers, with co-payment rates arrangement for medical insurance; while individuals employed by government, political parties, public institutions, and state agencies were covered under a public insurance program that granted them access to free medical care (ibid.). In rural area, before 1960s, the health expenses of rural residents were mainly paid by out-of-pocket, while in the early 1960s, the people's commune, the highest administrative level in rural areas, was established, aiming to collect the means of production into the commune and to distribute it uniformly (Qiu, 2019). Rural Cooperative Medical Scheme was introduced as medical insurance system for rural area. The funding of this scheme consisted of peasants' contributions, subsidy from the commune and other income of the commune (ibid.). Given these conditions, the primary sources of hospital funding stemmed from government subsidies and payments from third-party insurance companies, of which government subsidies constituted 15-35% of the total budget of public hospitals (The World Bank, 2010).

As the healthcare system evolved, it encountered a range of challenges that needed to be addressed. The first challenge emerged within medical insurance system. The medical insurance system predominantly functioned under a "fee-for-service" model, where medical expenses were covered based on the services provided by healthcare providers (Henderson et al., 1995). Consequently, this approach resulted in significant inefficiencies and misuse of medical insurance resources (ibid.). The second challenge emerged concerning the funding sources for public hospitals. In 1951, the official document "Decision on Strengthening and Developing National

Health Primary-level Organisations" put forth the idea of centralizing the collection and disbursement of funds for public hospitals, and this policy entailed that public hospitals should remit all their income to the central government, which would subsequently allocate funding back to them based on a predetermined plan (Wu and Shen, 2016). As a result, the central government retained control over budget management, with public hospitals not exercising autonomy in this regard. From 1960s to 1970s, in order to enhance accessibility to medical services for a broader population, the government reduced the prices of medical services three times, requiring public hospitals to reduce the fees for the medical services they offered to the public (Zhu et al., 2014). As a consequence, government funding for services provided by public hospitals fell substantially below the actual costs incurred. Public hospitals faced considerable pressure to achieve a balance between their income and expenses. In response to this context, the Chinese government launched the initial phase of healthcare reform in 1979, aiming to alleviate the financial burden on the central government in supporting public healthcare services (The World Bank, 2010).

After the initiation of the first healthcare reform, the government gradually reduced its financial support in public healthcare and introduced financial accountability to public hospitals for their financial outcomes. After the 1990s, government healthcare expenditures as a proportion of the GDP sharply declined, reaching only 0.64% of the GDP by 1995 (Du et al., 2009). In rural regions, the communes discontinued their financial support to healthcare facilities, leading to the collapse of the cooperative medical scheme (Gerald and Gu, 1997). The proportion of villages equipped with a cooperative medical system plummeted from 90% in the 1960s to a mere 5% by

1985 (Zhang and Unschuld, 2008). Consequently, rural residents were left without adequate medical insurance coverage, which, in turn, contributed to a significant decline in the quality of rural medical care over the ensuing two decades (Song, 2009).

The first healthcare reform also brought forth a set of challenges and issues. It was argued within the medical community that the first healthcare reform led to the erosion of the public welfare nature of medical and healthcare institutions (Cui et al., 2019), due to the heightened focus of public hospitals on generating profits for their own operation and seeking for various funding sources. Moreover, it was contended that within the context of limited national healthcare insurance coverage, this healthcare reform placed constraints on the affordability and accessibility of healthcare services (Yip et al., 2012). The Minister of Health proposed that the challenge of limited access to medical care was primarily rooted in deficiencies within the primary healthcare system, while the problem of high medical expenses was predominantly influenced by two factors: the lack of a comprehensive national healthcare security system and the increase in medical costs due to advancements in medical technology (Xinhua News Agency, 2011). Faced with such criticism, the government began to assess the shortcomings of the public healthcare service system. This led to the commencement of the second healthcare reform in 2009, which aimed to re-emphasize the social welfare nature of public hospitals and re-establish the role of the state in the medical service system (Yip et al., 2012).

4.2 The development of commercial logic in healthcare reform

In 1979, the policy of "Reform and Opening-up" was implemented in the field of Chinese economy. In April of the same year, the Ministry of Health, the Ministry of Finance, and the National Labour Bureau jointly issued a notice titled "Notice on Strengthening Pilot Projects for Hospital Economic Management", which stated that economic means should be used to manage the healthcare sector. This official document articulated that economic management involves the application of economic strategies to oversee medical activities and financial transactions of public hospitals, with the aim of enhancing healthcare objectives, disease prevention, medical education, and scientific research (The Ministry of Health et al., 1979). The first stage of healthcare reform was marked by marketization and the decentralization of public hospitals, the measurement of the performance of public hospitals as well as doctors, and the introduction of bonus system for both medical professionals and public hospitals. In 2009, the State Council issued “The Opinions on Deepening the Reform of the Medical and Healthcare System”, which marked the start of the second stage of healthcare reform. This document underscores the significance of establishing a comprehensive NMIS and reinstating public hospitals to their original mission of serving public welfare (The State Council, 2009a).This stage is characterised by restricting the financial autonomy that public hospitals acquired during the first reform by implementing cost and revenue controls and this stage of healthcare reform is ongoing. The values, norms, and practice proposed by the commercial logic have been developed in this two-stage healthcare reform. This section will discuss the development of commercial logic from its value system and its basis of strategy.

4.2.1 Key value system of the commercial logic

The commercial logic introduced by the Chinese healthcare reform possessed two key values: efficiency and effectiveness. Both of these values were prominently emphasized in the official documents outlining the objectives and strategies of the two healthcare reform initiatives. This section will explain both of them in details.

Effectiveness: performance measurement and bonus system

At the outset of the initial healthcare reform in 1979, the " Notice on Strengthening Pilot Projects for Hospital Economic Management" underscored the necessity of evaluating the performance of public hospitals using various hierarchical levels, based on the completion of tasks related to medical care, prevention, teaching, research, as well as the quality of healthcare (The Ministry of Health et al., 1979). This included assessing the completion of medical tasks (such as outpatient workload, bed occupancy rate, turnover rate, cure rate, etc.), savings in expenditure (such as quotas for dressing materials, fuel, water, electricity, office supplies consumption, as well as waste recycling and reuse of old items, etc.), and charging practices (such as average daily inpatient charges, average outpatient charges per visit, registration fees, etc.) (ibid.). This document also put forth the idea of utilizing financial incentives and penalties as a means to encourage the attainment of these objectives or to address failures to do so. Individuals who exhibited exceptional task performance could receive economic incentives from the hospital, with these bonuses being drawn from the surplus generated through revenue optimization and expenditure reduction; for individuals who consistently fell short of their assigned tasks, the hospital retained the authority to apply salary deductions as a disciplinary

action (ibid.).

Although the evaluation of public hospitals and individuals' performance was mentioned in the first stage of healthcare reform, a comprehensive and specific performance measurement system was absent during this period. The deficiency of a thorough performance evaluation framework underwent a shift during the second phase of healthcare reform, which started in 2009 and is still in progress. In 2019, the State Council issued the "The Opinions of the General Office of the State Council on Strengthening the Performance Evaluation of 3A Public Hospitals". This document explicitly outlined the importance of implementing a comprehensive performance management for 3A public hospitals and established a performance evaluation indicator system (The State Council, 2019). In the performance evaluation operational manual released alongside the document, the performance of 3A public hospitals was primarily measured based on 55 indicators across four main aspects: medical quality, which concerns the function of the hospital, medical safety, drug use, and medical service quality; operational efficiency, which focuses on the control of medical expenditure and the utilization of resources; sustainable development, which involves the establishment of academic disciplines and talent cultivation; and satisfaction, which refers to patient satisfaction and medical professional satisfaction (National Health Commission, 2023). The document also suggested that the outcomes of performance assessments played a significant role in guiding financial investments, distributing funds, and establishing performance-related salaries within public hospitals (ibid.). Within the hospital setting, these performance assessment indicators were further subdivided to evaluate departments and medical practitioners, and were directly tied to the distribution of bonuses and salaries.

Efficiency: cost control

In the first stage of healthcare reform, official documents did not explicitly address cost control, and public hospitals were not introduced to cost control techniques. Public hospitals were granted the authority to diversify their funding sources, which led to their primary focus being directed toward discovering methods to increase their income. Cost control was viewed as an indirect method to assist public hospitals in enhancing their revenue.

Commencing in 2003, the central government introduced the national healthcare insurance system, encompassing Health Insurance for Urban Employees, Health Insurance for Urban Residents, and the New Rural Cooperative Medical Scheme. The national medical insurance schemes became one of the funding sources for public hospitals. With the establishment of the national healthcare insurance system, new payment methods for medical insurance also began to be implemented. In 2012, the State Council released “The Key Operational Plans for Advancing the Reform of the Healthcare System”, outlining the directive that public hospitals should adopt the SDP system and clinical pathway approach (The State Council, 2012). The payment method for medical insurance has therefore transitioned from a fee-for-service model to a payment-by-disease approach. SDP system is a system that similar to DRGs, in which healthcare service providers receive payment prospectively according to the predetermined payment rates in terms of diseases categories or groups (ibid.). In the same year, the Ministry of Human Resources and Social Security, Ministry of Finance, and Ministry of Health jointly issued the "Opinions on Implementing Global Budget Control for Basic Medical Insurance." This

document emphasized the adoption of global budget control within the medical insurance system (The Ministry of Human Resources and Social Security et al., 2012). Under the global budget control, the predetermined global budget for public hospitals was determined by considering the service provision of medical institutions and their actual medical expenses over the previous three years (ibid.). Detailed indicators that affect the amount of budget received include: the actual healthcare insurance expenses incurred by the hospital in the previous years or a specific period, the extent of previous unreasonable healthcare insurance expenses incurred by the hospital, the size of the hospital, the population density of the service area where the hospital is located, the teaching responsibilities of the hospital, the medical facilities and equipment conditions of the hospital, market inflation, the balance of the healthcare insurance fund, and the hospital's performance in medical quality assessments, and so on (Xiong, 2015). Public hospitals were granted the authority to keep any surplus funds they generated but were also obligated to handle any financial deficits that might arise. The SDP system and the global budget system played a collaborative role as mechanisms for enforcing cost control measures during the second stage of healthcare reform.

These cost control methods, the SDP system, clinical pathway, and global budget system, disseminated cost-conscious principles to the operational level of medical activities. Take clinical pathway as an example. The implementation of clinical pathway translated treatment process into a structured framework where medical tasks were organized as daily assignments, allowing doctors to check them off upon completion (Zhang and Gao, 2002). Additionally, the cost of medical materials, medical examinations, medication, as well as the services provided by doctors and

nurses, were all assigned specific prices in both clinical pathways and the SDP system (Xinhua News Agency, 2017). Consequently, a specific cost was assigned to the medical treatment of each disease within its clinical pathway. The NMIS determined average expenses for treating specific diseases and allocated these funds to public hospitals. In certain situations, such as complications, comorbidities, severe condition, as well as unique circumstances of individual patient, public hospitals and medical practitioners had the choice to deviate from the prescribed clinical pathway, resulting in the loss of funding for treating that particular disease (Zhang and Gao, 2002). However, the allowance for deviation from the prescribed clinical pathway was tightly controlled within a limit of 15% for each disease category (Xinhua News Agency, 2017).

4.2.2 Basis of strategy: providing and restricting financial autonomy

In 1985, the Ministry of Health issued the "Report on Several Policy Issues Regarding Healthcare Reform". This document stated that public hospitals were granted the authority to not only impose charges for their medical services, including specialized care and VIP accommodations, but also to imposed elevated fees for advanced healthcare amenities and specialized treatment procedures, such as advanced diagnostic, therapeutic medical technologies and medication (The World Bank, 2010). In 1989, the State Council issued the "Opinions on Issues Related to Expanding Medical and Health Services". This document highlighted that public healthcare institutions could establish businesses or engage in other healthcare industries, and they could utilize the income generated from these businesses to support the development of medical care (The State Council, 1989). Public hospitals were also authorized to sell medications to patients with a 15% markup, thereby

creating an additional source of income through drug sales (ibid.). To provide additional incentives for public hospitals and medical professionals, the government introduced the idea of performance-related remuneration in the first healthcare reform (Blumenthal and Hsiao, 2015). Once these obligations for public hospitals were met, public hospitals gained the flexibility to determine the allocation of surplus funds resulting from increased revenue and reduced expenses, such as enhancing medical facilities and providing collective and individual rewards in the form of bonuses (ibid.). Empowered by this autonomy, public hospitals exhibited a tendency to pursue profitability through diverse means, mirroring the operational strategies commonly associated with business enterprises. Overall, in the first stage of healthcare reform, public hospitals were gradually empowered with the authority to independently oversee their financial operations and manage their income and expenditures.

Delegating autonomy to public hospitals at the first stage of healthcare reform was viewed as a strategic move by the government to decentralize hospital management and promote a more business-oriented approach within these institutions (Li et al., 2008). From 1979 to 2009, public hospitals underwent a significant transformation, moving away from the centralized management model of the planned economy system. This period marked a gradual evolution toward greater autonomy in terms of hospital administration, management approaches, and the generation of revenue. However, the extent of autonomy experienced by public hospitals was curtailed during the second phase of healthcare reform. The first method was limiting the revenue streams available to public hospitals. In 2009, the State Council of China issued a notice titled "Key Implementation Plan for the Recent Reform of the Medical

and Health System (2009-2011)". Under the section "Promoting Pilot Reforms of Public Hospitals," it was proposed that the reform should gradually transform the compensation system for public hospitals from three channels (i.e., service fees, markup on drugs, and fiscal subsidies) to two channels (i.e., service fees and fiscal subsidies) (The State Council, 2009b). Public hospitals were no longer permitted to charging patients drug fees that exceeded the wholesale price, which in turn limited the revenue streams available to these institutions (ibid.). In 2018, the government completely eradicated the practice of marking up drug prices in public hospitals, and required public hospitals to limit their revenue from drug sales to a maximum of 30% of their overall income (Xu et al., 2019). The second approach involved the regulation of cost control methods. For cost control purposes, public hospitals were obligated to align their medical practices and utilization of medical materials with the stipulated requirements of the clinical pathway, SDP, and global budget systems (The State Council, 2012). Despite the curtailed autonomy in revenue generation and cost management, public hospitals retained the authority to distribute bonuses.

The development of commercial logic within Chinese healthcare reform unfolded across two distinct stages. In the first phase, the grant of autonomy to public hospitals led to a pronounced pursuit of profitability as a central objective. Conversely, the subsequent stage saw a shift towards prioritizing cost containment, spurred by the government's intent to curtail this autonomy and its associated implications. The commercial logic instils its value system and strategic framework within public hospitals, with the goal of promoting efficiency and effectiveness in medical practices. This logic requires both public hospitals and medical professionals to take into account costs and performance, adhering to the prescribed methods to

achieve the objectives of cost control and performance measurement. The evolving perspectives on granting financial autonomy have contributed to the ambiguity and instability of some prescriptions within the logic. All these factors contribute to the complexity inherent in the commercial logic itself.

5. Concluding remarks

In China, the culture of frugality exerts a lasting influence on nearly every facet of society, existing as a significant component of Chinese culture. Its influence shapes the way Chinese individuals perceive the world and guides their conduct. Medical professionals may also be subject to the sway of this cultural norm. Furthermore, medical professionals are subject to the prescriptions of medical logic, which emerges from the historical context of China and integrate some components from Western medical paradigms. Through the evolution of the two-stage healthcare reform, commercial logic attempts to ingrain in public hospitals and medical professionals, instilling profit-oriented objectives during the first phase and later focusing on stringent cost management in the subsequent stage. On a contextual level, medical practitioners could be influenced by these three key factors in their clinical practice. The empirical chapters will provide insights into how doctors in the case hospital perceive and respond to these influences in their day-to-day professional activities.

Chapter 6 The Lab Department: The Evidence of Cost-conscious Doctors

1. Introduction

Starting from the first round of healthcare reform in 1979, the commercial logic has been gradually incorporated into Chinese public hospitals through diverse mechanisms, often involving the implementation of some accounting techniques. During the first phase of healthcare reform, the bonus system was introduced, and its impact remained significant at the time of conducting this study. This chapter aims to explore and illustrate how the commercial logic was manifested at lab department of the case hospital, how it introduced concepts of cost control into this context, and how doctors in this department perceived this logic and its interplay with medical logic. Section 2 will discuss the commercial logic in detail and Section 3 will discuss doctors' perception of the situation characterized by multiple institutional logics.

2. Commercial logic: the bonus system

With the objective of granting public hospitals operational autonomy, the first stage of healthcare reform in China, from 1979 to 2009, incorporated some commercial concepts into the administration of public healthcare institutions. One of the most impactful notions clearly defined public hospitals' accountability for self-sustaining financial management, such as covering their own expenses and generating their own revenue to offset costs. The government's role as the primary financial supporter diminished, compelling public hospitals to seek independent means of sustaining their operations and supporting their staff. Illustrating this point, a doctor

provided an example related to salaries:

> “Our hospital receives limited funding from the government [...] Out of approximately 5,000 staff members, only around 2,000 receive salaries directly from the government [...] Relying on government funding alone is not sufficient to support the existing workload […] Our salaries therefore must be covered by the hospital itself.” (L8)

The changes in financial support impelled public hospitals to reflect on a series of queries, including strategies for diversifying revenue streams, methods to reduce expenditures and approaches to rationally distribute their earnings. In the case hospital, the commercial logic was mainly manifested through the implementation of the bonus system. This system integrates the answers to the three questions mentioned earlier, with a particular emphasis on the last two.

2.1 The introduction of the bonus system

The relationship between the three elements was incorporated into a simplified equation in the lab department, namely ‘departmental bonus = departmental revenue - departmental costs’. This relationship was frequently referenced by doctors in the lab. As some doctors put it:

> “The bonus of our department is closely linked to the expenditure […] Assume our revenue remains fixed, higher costs will lead to a reduction in the bonus that the department is able to receive.” (L2)

> “It is necessary to consider the cost-to-revenue ratio. Assuming a comparison

between a cost-to-revenue ratio of 40% and a ratio of 30%, it is evident that in the case of the lower cost-to-revenue ratio, the department's distributable bonus would increase." (L4)

"The correlation between bonus and the gross profit of our department is significant. If costs escalate to a level where they offset gross profit, there would be no bonus generated […] Thus, cost control measures are important to ensure the availability of bonuses." (L5)

"In fact, this is a very simple relationship. Assuming that the workload is high but costs are not controlled. Although gross income increases, costs also increase accordingly. In this situation, net income may not necessarily increase, and therefore bonus may not necessarily increase." (L6)

"For the laboratory, under the premise of ensuring the quality of the test, the lower the cost, the higher the profit […] Furthermore, the higher the profit, the higher our bonus." (L10)

"Cost and bonus are closely related […] Ideally, if we can both make more money and also find ways to save costs, then we will get more bonus for distribution." (L13)

"Bonuses are definitely related to the department's net income. The higher the net income, the higher the bonus […] Net income is further related to costs, the lower the costs, the higher the net income. These are some basic principles in

economics." (L14)

In the case hospital, departments established a financial arrangement with the hospital, involving the transfer of a portion of their earnings to the hospital before initiating the calculation of their departmental bonuses. As a doctor explained:

> “The net income generated by our department is divided in a ratio of 7:3 with the hospital, where 70% is withheld by the hospital as adjustment funds for development, maintenance, and other expenditures. As a result, the distributable bonuses available to our department are limited to 7% to 8% of the gross income, which constitutes less than 10% of the total gross income.” (L3)

The decreased share of distributable bonuses played a role in fostering doctors' awareness of costs, as pointed out by some doctors:

> “Keeping costs under control is really important for all of us. If we manage to do that, we can all earn a bit more in bonuses, which is great for our individual income. That is why almost everyone is really supportive of trying to control costs as best we can.” (L3)

The interconnectedness between the individual bonuses they received and the total departmental bonus led doctors to acknowledge their responsibility in cost management. A Chinese proverb was employed by a doctor to elucidate this perspective:

> “It’s like, when the main river has water, and the small streams are filled; when the main source dries up, the smaller streams are left dry.” (L6)

The substantial percentage of bonuses in the monthly income of doctors further provided an impetus to exercise cost control. As a doctor explained:

> “In our monthly income, the ratio of bonus to basic salary is approximately 7:3. Moreover, the basic salary has been fixed for a prolonged period of time and has limited increments.” (L1)

Similar thoughts were shared by other doctors concerning the role of individuals in cost management:

> “Considering my individual interests, a reduction in costs would result in an increase in the potential bonus that I may receive.” (L1)

> “If our department has low costs, it is highly likely that our net profit will be increased. Therefore, the department can allocate more funds towards enhancing the individual bonuses.” (L10)

> “If costs are reduced, the department's revenue would increase, and our overall bonus would improve as well. As a result, when distributing bonuses, individual doctors are likely to receive higher bonuses.” (L12)

Controlling costs for the purpose of gaining more bonuses made doctors less resistant to the cost-control aspect of the bonus system. During interviews, many doctors used ‘a good thing’ or ‘a right thing’ to evaluate cost control activity. For example, some interviewees said:

> “I am totally in favour of reducing costs.” (L1)

> “Everyone in our department highly supports cost control.” (L3, the deputy head of the department)

> “It is necessary to control costs; it is very important; it is definitely necessary.” (L5)

> “I think cost control is a right thing and a positive thing.” (L8)

The positive assessments of cost control extended beyond the aspect of earning more bonuses. Doctors believed that their attempts to manage costs could lead to favourable outcomes for medical practice, patients, hospitals, and the broader society.

In terms of medical practices, doctors believed that the implementation of cost-control measures could enhance their understanding of standardized laboratory operations, ultimately contributing to an improvement in their medical skills. As a doctor put it:

> "We try to control costs by following standardized operating procedures. But, at the same time, it helps us improve our medical skills too [...] Furthermore, when it comes to drawing blood, to reduce waste and keep costs under control, we should always improve our venepuncture skills." (L8)

As for patients’ welfare, doctors believed it cost control benefits patients in that it could reduce their financial burden. The existing Chinese NMIS system offers only partial reimbursement for patients' medical expenses, requiring patients to cover a

portion of the costs themselves. Therefore, doctors held the belief that their efforts to manage costs could additionally assist patients in mitigating their expenses. As a doctor put it:

> “Controlling costs is something that patients can benefit from because expensive medical expenses are a serious issue that our society is currently facing.” (L11)

Another doctor provided an example to clarify this point:

> "If the costs in our department decrease, then the prices of our testing services will also decrease. In such cases, patients will definitely benefit [...] For example, the price of COVID-19 tests has been reduced from 270 yuan to 80 yuan. Therefore, patients will consider this test to be affordable, because it is just a common test price [...] Moreover, the cost of the reagents used in this test has also decreased, so our costs have also been reduced as a result." (L4)

Moreover, doctors maintained the perspective that the practice of cost control offered advantages for the advancement of the hospital, particularly within the context of the constrained financial support provided by the government to healthcare institutions. As one doctor put it:

> “Controlling costs is certainly a good thing […] It has a positive effect on the entire healthcare because, after controlling costs, limited funds and resources can be allocated to where they are more needed.” (L14)

Another doctor expressed a similar idea. She said:

> “First of all, both our department and hospitals need funds for development.

> Therefore, it is a terrible thing if we don't save costs and waste resources. So I think we must control the costs." (L5)

Finally, doctors contended that the application of cost-control measures could efficiently diminish resource usage, ultimately yielding advantages to society. As some doctors put it:

> "Controlling costs is beneficial. Because not only does our nation promote resource conservation, but it is also a global trend. By controlling costs, we can save resources for our country, which is a good thing." (L7)

> "I personally believe that controlling costs is beneficial because it can help us save resources. The overconsumption of Earth's resources by humans can also impose a significant burden on the planet. Therefore, by conserving resources and controlling costs, we can help reduce our impact on the planet and promote sustainability for future generations." (L11)

Manifested in the lab department as the bonus system, the commercial logic introduced cost control concepts to the individual doctor by creating a two-tier relationship: the first concerning the interplay between the total department bonus available for distribution and the total cost, and the second encompassing the linkage between an individual's bonus and the total department bonus. In terms of the commercial logic and its requisites for cost control, doctors within the lab did not display resistance, which in turn fostered the development of doctors who were attentive to cost implications. The following section will illustrate the degree to which doctors were committed to cost considerations.

2.2 The cost-conscious doctors: knowledge of costs and cost control practice

The concept of cost control introduced through commercial logic gradually permeated into laboratory practices, leading to the emergence of doctors who were conscious of costs. In the laboratory, doctors demonstrated their awareness of cost not only through their comprehension of its financial essence but also by blending this knowledge with their medical duties. They defined 'cost' as the reflection of two elements: the resources employed in their tasks and the corresponding prices linked to those resources. Drawing from this definition, they also formulated cost control methods in accordance with these two dimensions, respectively.

2.2.1 ‘Resources consumed’ and adjusting the quantity of resource

Doctors within the laboratory initially demonstrated a certain level of familiarity with costs, particularly in relation to the structure of departmental expenditures. They highlighted the robust correlation between laboratory practices and the composition of department costs:

> “All the resources utilized in our medical work are closely related to cost, ranging from the small expenses such as water and electricity bills and office supplies, to the larger expenditures such as reagents and medical instruments. In other words, every aspect of our work involves costs." (L1)

> “From the medical profession perspective, laboratory work involves the staff, the medical instrument, the medical material, the test methodology, and the lab

environment. So the department cost is closely related to these five aspects […] the department cost basically covers all aspects of our work.” (L4)

“The cost of the department includes the cost of the site, the cost of facilities that occurred when we purchased medical equipment, the cost of reagents, the cost of water and electricity, and the cost of personal protective equipment [...] The largest expenditure is the reagents and facilities.” (L14)

Doctors' reactions also demonstrated their comprehension of a fundamental characteristic of cost, which is that costs stem from the utilization of resources, including reagents, water and electricity, daily consumables, housing and personnel. Among these resources, doctors further categorized certain ones as fixed costs. As a doctor put it:

"The fixed costs include personnel expenditures and housing. Housing is regarded as the depreciation in the calculation." (L3)

They also attempted to define these fixed costs. As some doctors explained:

“Nowadays labour costs are considerably high and show an increasing trend. Many doctors hold advanced degrees, such as master's or doctoral degrees. We need to pay salaries commensurate with their educational qualifications, which results in relatively high costs.” (L3)

“Sometimes our department develops new and challenging laboratory tests, such as chromosome analysis, tissue typing, and leukaemia immunotyping. In such cases, we need to send personnel to more advanced hospitals to acquire

the necessary knowledge and skills. This incurs a form of training cost.” (L10)

“The costs also include the housing, which refers to the area of the building occupied by our department. The hospital will deduct a certain amount of depreciation or rent for the house, which is also considered as a resource consumed by our department." (L8)

"Our laboratory incurs the expenses for the use of the space because it is part of the hospital property […] our department has to pay a portion of the rent to the hospital." (L11)

Doctors classified other segments of departmental expenditures, including reagents, water and electricity, and daily consumables, as variable costs. This categorization was rooted in the principle that these costs were contingent upon the degree of resource consumption. Reagents were considered the most significant component of departmental expenses. As some doctors explained:

“The cost of reagents is the main component of department cost. The reagent consumption is the biggest one.” (L2)

“The biggest expense is of course the reagents. They are the main cost of our department, the largest expenditure.” (L7)

“When validating test results for accuracy, a standard curve needs to be established which requires the use of a calibration solution. This calibration

solution is particularly expensive. It costs several thousand yuan[9] for just a few millilitres.” (L10)

Doctors also provided an explanation for why reagents constituted the largest portion of expenses. They reasoned that due to the indispensable role reagents played in specimen testing, the extensive consumption of these materials directly contributed to the substantial costs incurred. As some doctors explained:

“The largest costs that I am aware of are reagents, because this type of consumables is closely related to our workload. As the workload increases, the consumption of reagents rises, resulting in an increase in costs.” (L3)

“We use many materials in laboratory work. Various reagents are required by the equipment during testing, such as quality control products and calibration products. Therefore, these are the main costs of our department." (L4)

"Because the main responsibility of our department is testing the specimens for patients, we must use reagents [...] Reagents are consumable products. Therefore, the majority of the costs in our department are generated from reagents." (L12)

Reagents also held a crucial role in both the quality control process and the upkeep of laboratory instruments, which further contributed to their extensive consumption. As some doctors put it:

[9] According to the current exchange rate, 1 Yuan is equals to 0.12 pounds. Therefore a 1,000 Yuan is equal to £117.51.

> “We must perform quality control on the instruments every day. The quality control process requires reagents […] As we use them on a daily basis, they constitute a significant portion of our consumption.” (L10)

> “Some reagents used to maintain instruments, such as saline or physiological saline, are also a large part of the consumption. Because all of our instruments require regular maintenance, there is a significant usage of specific type of reagents in maintenance.” (L10)

Furthermore, certain exceptional situations could give rise to an unexpected increase in reagent consumption, subsequently leading to an escalation in the cost of reagents. One of these circumstances was the re-examination of specimens. As a doctor put it:

> “When we conduct testing on specimens, sometimes the results are found to be inconsistent or incongruous with the clinical diagnosis, for example, the test results are abnormally high or low. This probably results from poor quality control or non-compliance with tests. In such cases, it becomes necessary to re-examine the specimens. During the process of specimen review, we need to examine whether the quality control is qualified and then conduct another round of testing on the specimens using the machine. As a result, there is an increase in the consumption of reagents.” (L8)

In addition to reagents, doctors contended that the utilization of water and electricity was also considerably substantial. As a doctor put it:

> “Given the considerable number of instruments used in our department, the

daily consumption of water and electricity is exceedingly significant, particularly with respect to the coagulation analyser and the C-reactive protein specialized protein analyser. Therefore, the associated cost of water and electricity is also notably high." (L11)

The doctors identified daily consumables, including both medical and office supplies, as another substantial area of expenditure:

"The cost also encompasses daily consumption, such as printing paper, disposable and rubber gloves, as well as daily use items such as masks and hats." (L2)

"The consumption of various consumables, such as absorbent paper for routine use, reaction cups and test tubes for experimental purposes, and personal protective equipment, including hats, medical gloves, and masks, constitute a significant cost factor in our work." (L10)

"In the process of laboratory testing, the cost calculation begins from the sampling tube of the specimen […] there are also several minor cost factors, such as the commonly used applicator sticks, distilled water, as well as protective equipment such as gloves and masks." (L5)

Doctors also highlighted that unforeseen circumstances could lead to a sudden increase in the utilization of these resources, thereby amplifying departmental costs. As one doctor put it:

"For instance, the use of barcode printing paper may generate waste due to

machine malfunctions. In such cases, inaccurate or unclear printouts necessitate reprints. Similarly, if gloves become damaged during use, we need to replace them, which adds to the cost.” (L8)

Given their understanding of fixed costs and variable costs, doctors in the lab formulated some cost control methods in alignment with the different characteristics of resources. These cost control strategies primarily focused on variable costs, specifically the costs of reagents and daily consumables, and were formulated based on two key principles: optimising resource utilization and avoiding resource wastage.

The first cost control method developed by doctors was ‘creating’ more resources. As a doctor put it:

"Some reagents used during the quality control process are very expensive. In such cases, our group chooses to create our own quality control materials and use them as substitutes for quality control products, as long as they have been validated by the instruments. The same method is applied to calibration liquids […] As a result, in our group, all frontline quality control materials are created internally rather than bought from manufacturers." (L10)

What doctors usually did to ‘create’ resources was mixing residual reagents with fresh ones. As a doctor put it:

“One way we try to keep the cost of reagents under control is by mixing together some leftover reagents we have. This way, we end up with more reagents that we can use later on.” (L12)

Some doctors provided detailed examples in terms of how they mixed reagents. As a doctor put it:

> “When it comes to cost control, we know that some reagents are very stable. Therefore, when there is a small amount of such reagents left in the bottle, we do not discard it […] For example, the reagents produced by Company X are very expensive, and each reagent kit can do 100 tests. However, after performing 100 tests, there is still a significant amount of unused reagent left in the kit. Therefore, to make the most out of the remaining reagent, we often combine two or three kits together to increase the total amount of reagent available for future use.” (L2)

> “Some cleaning solutions, such as those used for cleaning large instruments may have some leftover in the bottle after use. In such cases, we can mix the leftover solution with a new bottle of solution […] this method can help to save some costs.” (L9)

The process of "creating" reagents led to an increased number of specimens being processed, ultimately contributing to cost savings. As a doctor explained:

> “According to the instrument's settings, when the reagent level indicator shows zero, the test will not continue and we should replace the reagent with a new one. However, in practical operations, we found that there is still a significant amount of reagent left in the kit when the indicator shows zero. In fact, we can often combine the remaining reagents from every three kits to make one complete reagent kit […] this approach can save costs […] So we mix the remaining reagent with a new one […] In this way, an additional 50 or more

specimens can be tested.” (L1)

The second method created by doctors was minimizing the use of resources, especially daily consumables such as paper, face masks, and medical gloves. As a doctor explained:

> “For items like disposable gloves, paper, pens, and masks, we try to use them in a frugal way because they are included in the department's costs. We are mindful of how much we use them and try to conserve them whenever we can.” (L9)

Reusing consumables was the most common way of controlling their usage. Some medical consumables, such as medical gloves, would be disinfected and reused many times. As some doctors explained:

> “In medical practice, some items, such as disposable medical gloves, can be repeatedly utilized. For these items, we usually clean or disinfect them and then reuse them.” (L10)

> “Sometimes the gloves will be contaminated during the specimen review process, but we have the hand sanitiser to be used for disinfecting medical gloves […] and this pair of gloves will be used throughout the day without changing.” (L13)

> “For example, when it comes to gloves, we do not use a new pair for each patient. Instead, we disinfect them after each use and reuse them for the next patient. If we were to use a new pair of gloves for each patient, it would result in

a lot of waste and we would need an excessive amount of gloves per day. Therefore, we clean them with a disinfectant solution to conserve resources and minimize waste.” (L8)

“When it comes to disposable gloves, we usually wear them for a whole shift and disinfect them with a solution when not in use. Then, we take them off and reuse them when needed. While these items may not be expensive, it is still important to save them whenever we can.” (L9)

In addition to disinfection, doctors had some other ways to preserve the same pair of gloves for future use. As some doctors put it:

“Here is how I reuse medical gloves: I start my shift by putting on a pair of gloves, and when I need to take them off during the work process, I flip the used side inside and put them aside. When doing normal operations in a level 2 biosafety laboratory, sometimes I wear the same pair of gloves for the whole morning, because it is not always practical or feasible to change gloves after every single use. I just try my best to save as much as possible.” (L4)

"When we use gloves, we typically wear a plastic glove inside a rubber glove. Therefore, we can replace only plastic gloves without changing the rubber gloves, which can save a lot of money. Disposable plastic gloves are in contact with the skin and are very cheap, costing only a few cents, whereas rubber gloves are expensive. If you consider that there are over 100 doctors in our department, you can imagine how much can we save per day just on rubber gloves." (L5)

The practice of reusing also extended to other medical consumables, including face masks and pipette tips. When it came to face masks, the doctors had the right to determine how to make use of the face masks, taking into account the constraints on the total quantity available. As some doctors put it:

> “Regarding personal protective equipment such as masks, our department has established a monthly quota for each doctor. Within the quota, doctors are responsible for deciding how to allocate and utilize these protective items." (L10)

> "Given that the usage of medical consumables is decided by doctors themselves, there is an unwritten rule in our department that only one mask is allowed per day after starting work." (L13)

In this context, doctors strived to minimize the need for mask replacements whenever it was possible. As a doctor explained:

> “We try our best to extend their usage as much as possible, and only replace them when necessary. It is common for us to work for four to five hours with only one mask.” (L8)

With regard to reusing pipette tips, a doctor articulated it in the following manner:

> "When conducting experiments, I often reuse the plastic tips of pipettes. For instance, after using a tip to extract saline solution, I label it with an 'N' and set it aside. Later, when I need to extract saline solution again, I use the same labelled tip. Rather than replacing the tip after every use with saline solution, I

reuse it as much as possible." (L4)

In addition to medical consumables, doctors also engaged in reusing office supplies, such as paper. Any items suitable for note-taking were conserved and subsequently reused, such as scrap paper, with the aim of reducing the utilization of resources. As doctors put it:

> “In some instances, we use the instrument manual to write down notes when reviewing the test results, as each page is printed on only one side and the other side is blank.” (L2)

> “When I am conducting experiments, I find it necessary to print out the final results and then manually input them into the computer. To save resources, I will use the paper with one side blank, instead of using a new piece of paper for each printout. As such, I make use of both sides of a single sheet of paper." (L4)

> “Sometimes when we are printing, we make mistakes, which makes the paper unusable. We would keep the paper and use both sides of it later on when printing something that is not particularly important. For example, I might print a test report for my own reference or for showing it to a clinician. In these cases, the back of scrap papers can be fully utilized.” (L8)

The notion of reducing consumption for new resources applied not only to daily consumables but also extends to reagents. In order to minimize the volume of newly

utilized reagents, doctors first redesigned their re-examination[10] protocols. Re-examination was implemented when the initial test conducted yielded ambiguous or inadequate results, necessitating an additional round of testing that demanded more reagents. As a doctor put it:

> "There are 30 international re-examination rules for the blood test, but our group, based on our actual situation, reduced these rules to 18. In this case, we have established our own re-examination system, so the number of re-examined specimens will be reduced. If we follow the 30 rules, there will be too many specimens for re-examination, and there will be a lot of reagents used. 18 rules can not only screen out specimens with problems but also appropriately reduce the use of reagents." (L9)

By revising the rules for retesting, there was a marked decrease in the consumption of new reagents across various situations, given that some specimens required only a single round of testing following the revision. As the doctor explained:

> "For example, for patients with blood diseases, once a diagnosis has been made based on initial testing, there may not be a need for retesting during subsequent visits. Similarly, for patients receiving chemotherapy, their blood cell counts are often already low and the diagnosis of cancer is already known, so there may not be a need for further re-examination. Re-examination in these cases is an unnecessary overuse of reagents.
>
> Another example is, according to our adjusted re-examination protocol, for patients with low platelet counts, we only perform an initial test. If their counts

[10] **Re-examination:** Re-examination refers to the testing when the patient's test results are abnormal, or when there is a big difference from the previous test results.

> continue to be low within 7 days, we will not perform retesting because we have already streamlined the necessary testing and retesting procedures. We believe that the standard is valid during this stage and therefore, we do not need to perform additional retesting. This is also to save costs." (L9)

Doctors also mitigate reagent consumption by altering the scope of specimens eligible for testing. As a doctor put it:

> "In the lab work, different instruments have different testing items, and there might be some overlap among instruments. Therefore, under the premise of meeting the clinical needs for testing results, we only perform specific testing items. We do not perform all testing items as set on instruments [...] This reduces the amount of reagent used." (L5)

Doctors might opt to decrease the reagent consumption directly, in contrast to the guidance provided by the reagent instructions. As a doctor put it:

> "The reagent I used in my experiment is a product from X company. The instructions for use recommend adding a specific amount of reagent per individual sample […] But we typically use only half the recommended amount for our testing […] For example, the instructions may indicate that one kit of reagent can be used for 50 samples. However, by using only half the recommended amount of reagent, we are able to extend the usage to 70 or 80 samples per kit." (L4)

The third method at played a role in adjusting resource consumption was the reduction of resource wastage. Reducing waste was originally applied in contexts

that were related to habits in daily life. As a doctor said:

> “Cost control and our habits share similarities, like approaches to conserving water and electricity.” (L1)

Given this similarity between the two, doctors believed that curbing utility wastage could also be considered a form of cost management. As some doctors put it:

> “Controlling electricity usage includes methods such as minimizing the use of central air conditioning, if possible, and reducing the number of lights turned on, such as when people are not present in the laboratory or rest areas. These actions help control costs.” (L11)

> “To control electricity usage, such as that of computers, it is important to switch them off when leaving and also to switch off the equipment after completing tasks. This helps reduce daily consumption. Once work is finished and we leave, computers, equipment, and lights should all be switched off." (L12)

The concept of minimizing resource wastage was similarly extended to reagents, manifesting itself in nearly every phase of their utilization. An inventory management system was established in the lab. As a doctor explained its importance:

> “One of the biggest concerns in regard to reagents is wastage […] In the past, some reagents would expire due to prolonged storage in corners or other areas. The issue of reagent wastage resulting from expiration was a significant problem. With the implementation of the system, such instances can now be avoided.” (L9)

Since reagents have a finite shelf life, a key element in waste prevention was the strategic coordination of reagent procurement and utilization based on their expiry dates. Regarding the procurement of reagents, doctors considered it important to avoid over-ordering reagents. As a doctor put it:

> “To keep the costs of reagents under control, it is essential to manage them properly. If we order too much, we might end up with a surplus in the stockroom, and before we use it, some of the reagents could expire. So, it is crucial to strike a balance and maintain just the right amount of inventory without going overboard with the orders.” (L3)

Therefore, in order to maintain an appropriate level of reagent inventory, doctors first referred to the batch number when placing reagent orders, as different batch numbers corresponded to different expiration periods. As a doctor explained:

> “The first step is to select the appropriate batch number. Since the efficacy of reagents varies by batch, it is important to avoid switching batch numbers indiscriminately. In the long run, it is better to use reagents with the same batch number and longer expiration dates. For example, it is best to use long-lasting quality control products for greater stability. If we keep changing the batch numbers, you will have to repeat the quality control testing every time, which will just end up wasting more of these products.” (L6)

Another factor that doctors took into consideration when ordering reagents was the workload. As the doctor put it:

> “Additionally, when placing orders for reagents, it is important to plan based on the anticipated workload. For example, over a three-year period, the workload

tends to remain relatively stable, if there are no significant changes. Based on this workload, we can determine the quantity of reagent required for each batch number, and this ensures that the reagents can be used within their shelf-life period.” (L6)

Upon the arrival of reagents to the department, arranged their storage within the warehouse in a specific fashion, ensuring that these supplies were employed before reaching their expiration dates. As aa doctor put it:

“When reagents are put into the warehouse, we organize them in a particular way. The order of placing all reagents is: the old ones are placed outside; then the new ones are placed inside […] in this case, every time when we take reagents, we can ensure that we use old reagents first.” (L9)

Doctors also developed some methods to utilize reagents in accordance with their distinct expiration dates. These approaches followed the "first-in, first-out" principle, which was described by some doctors as follows:

“Reagents that are close to expiration should be used first because they have a limited shelf life. They must be used within their expiration date to avoid wastage.” (L6)

“Reagents also have expiration dates, so we tend to use those that have a closer expiration date first, and save those with a later expiration date for later use. This practice helps us avoid situations where we need to dispose of expired reagents, which is a waste of resources.” (L7)

At the same time, a reagent manufacturer-designed inventory monitoring system aided doctors in overseeing reagents based on their respective expiration dates. As a doctor explained:

> “Every time a reagent is ordered through this system, a QR code is generated. Upon arrival, the reagent is scanned through the QR code and stored in the inventory system. When the reagent is subsequently used, its code is scanned again to record its removal from the inventory. The purpose of this process is to prevent the use of expired reagents.” (L9)

The primary benefit provided by this system was its ability to alert doctors about the approaching expiration of reagents. As the doctor explained:

> “With this system, we have access to the expiration dates of all reagents in inventory, and the system automatically sorts reagents approaching their expiration dates to the front of the queue. Consequently, when dispensing reagents, we prioritize those with imminent expiration dates to ensure their timely use […] In addition, the system generates a red pop-up warning for reagents that are close to expiration. When receiving the warning from the system, we will locate the reagent in question in the inventory, and proceed to dispense and utilize it as required.” (L9)

While conducting specimen testing with reagents, doctors also developed methods to exhaustively employ all the reagents at their disposal. As some doctors explained:

> “The reagent has a dead volume. It refers to the unusable reagent volume set by the instrument. Because of the dead volume, one kit of reagent that was supposed to do 100 tests are now only able to do 90. We have figured out a

way to deal with this. We put a small bar under the reagent box to raise it a bit, and therefore the probe will suck the reagent a little more […] it is a way of reducing reagent waste." (L11)

"In terms of reagent usage, it is important to utilize them as thoroughly as possible, ensuring that they are used completely and to their fullest extent […] Reagent manufacturers may set a minimum amount required for a machine to operate, such as 10 litters remaining. Through experience, we have found that we can request new barcodes from the manufacturer, which can be applied to the remaining reagent containers and reused, allowing for the complete utilization of the reagents. This approach can result in significant cost savings." (L5)

Doctors also made efforts to reduce the operational risk associated with reagent wastage. As doctors put it:

"We need to reduce wastage of reagents. For instance, operational errors during an experiment can result in a failure for testing and require repetitive testing process, which leads to increased costs." (L3)

"Firstly, we need to be very careful in checking the testing reagents, such as making sure that the new batch of reagents matches the ones already in use in the instrument […] If we accidentally mix up the reagents, it can also result in wastage. Therefore, it is crucial to minimize situations where reagents are misplaced or poured incorrectly." (L2)

Within the lab, doctors demonstrated a level of cost consciousness. They possessed a degree of understanding of departmental expenditures – fixed costs and variable costs. Their comprehension extended to the characteristics of these cost categories: fixed costs remain constant irrespective of resource quantity and incur depreciation, while variable costs fluctuate based on resource consumption. They have also created some methods to manage variable costs. These encompassed the strategic increase of resource availability, deliberate reduction of resource consumption, and vigilant avoidance of resource wastage. Moreover, they integrated a range of inventory management techniques into their medical practice. Beyond resource consumption, doctors also highlighted the significance of resource prices as an important aspect of cost. The subsequent section will elaborate on this assertion in depth.

2.2.2 'Price matters' and lowering resource prices

Doctors also demonstrated their comprehension of costs through their emphasis on the pricing of consumed resources, including reagents and medical instruments. Reagents carried a high cost primarily due to their status as imported products and their premium quality, and their customization to align with specific instruments made finding substitutes a complex task. As some doctors put it:

> "In some testing projects, the test performance of imported reagents is superior to that of domestically produced reagents […] I think that's why imported reagents are expensive." (L2)

> "The majority of the instruments currently in use in our laboratory are imported, while a smaller portion is domestically produced. The use of imported

instruments requires the use of corresponding imported reagents, which are associated with high costs." (L5)

"In terms of the cost of reagents, the vast majority of instruments we currently use are imported instruments, and they are paired with corresponding imported reagents. Because of this, the prices of these reagents are relatively high, thereby leading to an increase in the cost of reagents." (L10)

The medical instruments, essential for conducting specimen testing, contributed significantly to the overall expenses owing to their substantial price tags. The cost was further driven up by the monopolistic market conditions for specific instruments. As a doctor explained:

"According to national regulations, the testing instruments used in the lab department of public hospitals must possess three certifications, making the compliant instruments quite expensive. For instance, in the case of gastric protease testing, only one domestic and one foreign manufacturer offer compliant instruments, both of which are priced at a premium." (L11)

Beyond the expenditures involved in the initial acquisition, medical equipment also entailed assorted costs related to its subsequent maintenance. As some doctors put it:

"The renewal of instruments, the replacement of specific reagents when equipment becomes obsolete, and substitution of equipment components all entail notable costs." (L6)

> “Sometimes, the instrument we use may break down or not work as well as it should during usage, and this requires repairs, which can be quite expensive […] Moreover, to prolong the lifespan of the instruments, we regularly invite professional engineers from the manufacturers to perform maintenance on the machines, either on an on-demand basis or every month. All of these maintenance activities add up to extra costs.” (L10)

The functioning of medical instruments demanded various supplementary facilities for assistance, such as computers and software, which were also identified as elements that added to the overall maintenance costs. As a doctor put it:

> “The computers used for testing and reviewing are specialized and come with expensive software systems. The testing equipment is typically equipped with a built-in testing system, but upgrading the system requires the assistance of an engineer. These testing systems, linking systems, and transmission systems are all cost expenditures, with a significant portion of expenses incurred annually. Maintenance costs for these systems run into millions annually during their years of use, not to mention the costs of updating them after a few years of use.” (L5)

Due to the high costs associated with reagents and medical instruments, doctors held the belief that the prudent selection of these products at the most favourable prices was important to manage costs. As a doctor put it:

> “One way of controlling cost is choosing cheap reagents, medical instruments and medical consumables under the same quality conditions.” (L3)

Hence, in the process of selecting reagents, doctors typically engaged in comparing

quotations from multiple suppliers to secure the most competitive price. As some doctors put it:

> “The hospital has a bidding platform for reagents we use in the experiment. We can shop around and buy the most cost-effective ones.” (L4, the deputy head of the department)

> “In terms of the cost of reagents, we have both domestically produced and imported reagents […] Imported reagents are actually more expensive than domestic ones […] while ensuring the quality of the tests, we compare several suppliers and choose the ones with good quality and low cost." (L2)

Doctors also engaged in negotiations with suppliers to obtain discounts on the products. As a doctor put it:

> “The head of the department or the group leads usually negotiate the price of reagents with the suppliers. We can get some price cuts in the end.” (L9)

Similar approaches were also employed when selecting medical instruments. As a doctor explained:

> “When choosing the medical instruments, different manufacturers and agents give different quotes to the hospital. We will choose the instrument with good performance and a lower price.” (L11)

Doctors also exhibited special consideration towards the subsequent costs stemming from the prolonged operation of these instruments when selecting new instruments. As a doctor put it:

> “Choosing the medical instrument […], the reagents it will use in the future should also have an appropriate price. We must consider the price of reagents to be used later, and the performance of the instrument. For example, the failure rate should be low [...] otherwise, there will be lots of maintenance fee generated.” (L11)

To curtail the expenses associated with subsequent maintenance, doctors attached great significance to the proper upkeep and maintenance of instruments during their routine utilization. They believed that these actions led to reduced costs in comparison to purchasing new equipment. As a doctor explained:

> “In terms of controlling instruments’ costs […] proper maintenance of instruments not only extends their service life but also incurs lower costs compared to purchasing a new instrument. Because maintenance only requires the replacement of a few components.” (L5)

A doctor explained one of their methods for maintaining instruments as follows:

> “The key is to control the working time of instruments. Working 24 hours is different from working half a day, so we rotate their usage to extend their lifespan [...] When we have a lot of specimens, I will run two identical instruments at the same time, but when there is only a small volume of specimens, I will shut down one after maintaining it and only use the other. This way, the two instruments can work and rest alternately, which helps to increase their service life." (L6)

In addition to expensive items like reagents and medical instruments, some doctors

also took the price of more economical items such as medical consumables and stationery into consideration. They usually sought out more economical alternatives for these resources. As some doctors put it:

> "We control the cost of medical consumables. For example, the urine specimen cup. It is a container used to keep the patient's specimen […] There are several products to choose from and their prices vary from 0.5 yuan[11] to 0.1 yuan. If 0.1 yuan can be paid to get things done, we will definitely not spend 0.5 yuan […] For medical consumables that do not require sterility, we will choose the cheapest ones." (L1)

> "There is another way of controlling costs. As the oil-based markers are expensive, we found an alternative – pencils – which can be marked on the ceramic and the blood collection tube. These pencils are cheaper than markers and thus save a lot of money." (L7)

2.2.3 Doctors' perceptions of the relationship between cost control and medical practice

Through their comprehension of cost concepts and their practical implementation of cost control measures, doctors did not perceive commercial logic, particularly in terms of cost control, as contradictory to their work within the laboratory. As some doctors commented:

> "I don't think cost control has any negative effect on medical quality and test results." (L1)

[11] Based on the current exchange rate, CNY/GBP=0.12:1. Therefore, 0.5 yuan equals 6 pence, and 0.1 yuan equals less than 1 penny.

> “It has no bad effect on medical work. We are still doing the work in the same way as we did before. We don’t feel that work is hard to carry out because of the cost control requirements. We do not have any concerns in this regard.” (L4)

In addition, doctors believed they could preserve the top priority status of medical quality. As some doctors commented:

> “The primary goal of doctors is to treat patients and save lives, and it’s not possible to place equal importance on treating patients and controlling costs. Doctors should aim to save costs while pursuing medical quality, but it doesn’t mean that these two goals are equivalent […] Our goal is to save costs as much as possible without violating operating procedures or compromising medical quality. Given this context, we promote cost savings in our work.” (L1)

> "When it comes to cost control, we can still prioritize medical quality and ensure the quality of our services as a supporting department. We should only control costs in a way that does not compromise on quality." (L3)

> “We need to keep medical standards as our top priority when controlling costs. This is especially true for supporting departments like us, where quality is the cornerstone and bottom line. If we compromise on quality just to save money, we are essentially reversing priorities and losing sight of what really matters.” (L9)

> “For our laboratory, the lower the cost, the greater the profit. However, cost control must always be based on ensuring the quality of our testing reports.” (L10)

> "Medical standards should always come first. Saving money does not mean we lower those standards. It just means that when we have already met those standards, we should avoid any unnecessary waste. Our primary goal when doing lab tests is to ensure the quality of medical care. If we save money but end up sacrificing quality, it would be a bigger waste and could lead to even greater losses […] It doesn’t make sense to cut corners on quality just to save money. So, when it comes to controlling costs, we need to make sure we are still meeting the necessary quality standards." (L14)

Some doctors offered examples illustrating their efforts to maintain the primacy of medical quality over cost control. When selecting reagents, their medical quality was the first thing to consider. As some doctors explained:

> "When selecting reagents, we should ensure the quality of the test results, which means that accuracy and precision are both up to standard. We first compare and select reagents that are reliable and have high accuracy, then we also consider the cost. In the end, we choose reagents that have good testing quality and low cost." (L2)

> “When we choose reagents, there are many manufacturers to choose from. We evaluate these reagents and select ones that offer good value for money. We prioritize selecting reagents that are both cost-effective and ensure that patients

receive accurate results and that quality is maintained.” (L7)

In practice, doctors did not compromise medical quality in pursuit of cost control. As some doctors put it:

> “Regarding reusing the same medical gloves […] Of course, the work I am engaged in is risk-free. I just touch ordinary specimens. But if someone is doing high-risk work, such as COVID-19 test, or some microorganisms’ tests, if reusing medical gloves is not allowed in the medical standard, we will not do that.” (L4)

> “For instance, in the process of blood collection, if the first needle insertion is unsuccessful, there may be a small amount of blood left inside the collection tube. In other situations, such as accidental puncturing of the blood vessel, failure to extract blood, or poor blood flow during collection, it is necessary to replace the collection tube and reattempt the collection. This is because these circumstances can affect the accuracy of the laboratory test results [...] In such cases, it’s required to discard the affected collection tube rather than risk compromising the accuracy of the test, even if this results in wastage.” (L8)

> “Some reagents may be less expensive, but they do not meet our quality standards and may not perform well enough to meet the requirements of our daily work. Therefore, even though we want to save money, we still have to focus on medical quality to make it happen. We cannot just go for the cheapest option if it means the patient's results will not be accurate." （L11）

Understanding the pricing aspect of departmental expenses further heightened doctors' awareness of the importance of implementing cost-control measures. Doctors also made efforts to secure lower initial purchase prices for these resources and strived to minimize the potential subsequent costs these resources might entail. In conjunction with their awareness of resource consumption and its associated cost-control strategies, these perceptions and actions demonstrate that doctors in the lab have developed some extent of cost-consciousness. These doctors also recognized a non-conflicting situation between commercial logic and medical logic within the laboratory, a phenomenon that will be elaborated upon in the subsequent section.

3. Non-conflicting situation

The commercial logic, which was manifested in the lab mainly through the bonus system, introduced some cost control concepts to the doctors within this department. Nonetheless, doctors did not perceive these cost control concepts as conflicting with their medical practice, and instead, they developed some cost control methods accordingly. This section will explore the underlying reasoning that supports the development of their perceptions.

3.1 The characteristics of the lab department

The laboratory department exhibited diverse characteristics in relation to its position within the case hospital and the inherent nature of its medical practice. The lab department, in general, depended highly on medical instruments to fulfil their medical responsibilities. As a doctor put it:

> “At present, our work tasks are mostly performed using automated instruments. The instruments themselves are responsible for processing specimens. This is

different from the past, where tasks were carried out manually and therefore doctors' technical skills mattered." (L1)

The dependence of lab work on medical instruments gives rise to another distinctive attribute of this department, commonly referred to as an 'assembly line' by doctors. Within this assembly line, lab work was standardized, and the roles and responsibilities of doctors were relatively less differentiated. As some doctors explained:

"The work in our department is like an assembly line, requiring the collaboration of many individuals to complete a specific task or to perform tests on the batch of specimens." (L3)

"Our is different from the clinical department. Unlike clinical doctors where each level is clearly divided and has specific responsibilities such as conducting different levels of surgery, treating different types of disease, or being responsible for inpatients or outpatients. No such distinctions are in our department. In practice, the work performed by each doctor is basically the same here." (L1)

In the case hospital, the laboratory department was further classified as an auxiliary unit, supporting clinical departments through the provision of test reports for diagnosis. As a doctor put it:

"The laboratory department can be regarded as a distinct department because it is an auxiliary unit. Its services are essential for the operation of the clinical department. The operation of clinical departments is inseparable from the work

of the lab department.” (L1)

Some doctors expanded upon how the laboratory's dependency on the clinical sector influenced their approach to medical practice. As a doctor put it:

> “The laboratory department is characterized by its passive role. The lab, as a medical technology unit, its workload is dependent on the comprehensive capacity of the clinical department.” (L6)

Another doctor provided a detailed example:

> “When it comes to new projects, our main consideration is the clinical needs. For example, if the clinical department requires us to conduct experiments in a particular area, they will communicate this to us. After discussing with the clinical department, we will begin preparing to launch the project they requested […] if we find a new project from conferences or training sessions, we will communicate with the clinical department […] we will collect relevant materials and present them to the clinical department. If the clinical department is interested in the project, we will proceed with its implementation.” (L4)

Another doctor further explained the lab’s economic dependence on the clinical department:

> “The laboratory department earns revenue in a passive manner, as it can only generate income when physicians prescribe laboratory tests […] without their prescriptions, the laboratory department cannot seek out patients to draw blood for testing.” (L1)

Apart from acknowledging the laboratory department's role in offering medical assistance to clinical units, doctors also acknowledged the significance of maintaining high medical quality within their department. As a doctor put it:

> “Nowadays doctors make the diagnosis mainly based on imaging reports and lab reports […] If we fail to ensure the quality of medical testing, the reports we provide to the clinical department may contain errors or be unreliable. This could have a serious impact on the process of diagnosing and treating diseases, and in the worst-case scenario, lead to misdiagnosis.” (L10)

The accuracy of test results formed the foundation of medical quality. As some doctors explained:

> “If the test report we issued is inaccurate […] it may mislead the treatment plan and may cause misdiagnosis or delay in patients’ treatment […] Therefore, I think that issuing qualified and accurate test reports to clinicians and patients is the most fundamental requirement of our work.” (L10)

> “Regarding test results […]we must meet national standards and industry standards to ensure that our laboratory is providing high-quality medical services. […] For example, project A must reach 10. If we fail to do that, it’s our fault [...] For lab work, the most important standards are accuracy and precision.” (L12)

> “The laboratory is an auxiliary department and is very important to clinical departments. We must make sure that the test results are accurate and reliable and can provide accurate evidence for the clinical diagnosis.” (L13)

The evaluation of accuracy within the laboratory was supported by a multi-level framework of medical standards. According to doctors, national standards, industry standards, and some certifications, all imposed stringent requirements on the medical quality of the department. These standards provided important reference for doctors to evaluate their medical quality. As a doctor explained:

> “The standard of medical quality is like a pyramid structure. On the top is the National Health Commission standard, and the second is ISO15189 [...] The third one is the industry standard. When some instructions are not regulated in the first two groups of standards, we must implement industry standards summarized by professionals in the field. The most fundamental standard is that declared by the manufacturer [...] Failure to meet this standard indicates that there is a methodology error.” (L11)

The first type medical standard, ISO 15189, occupied a significant role within the laboratory in terms of standardized medical practice and medical quality management. As a doctor put it:

> “The ISO 15189 certification has very specific requirements for how we build, operate, and improve our quality management system in the department, through the standard operating procedures.” (L4)

Hence, the presence of ISO 15189 made it less likely for doctors to compromise medical quality in favour of pursuing cost control. As some doctors put it:

> “We must ensure the quality of our test results, because we are a 3A hospital

and have obtained ISO15189[12] certification. Our quality control standards for testing are stricter than those of other hospitals […] Therefore, we cannot compromise on the quality of our tests in order to control costs." (L2)

"Although we do pay attention to cost, our primary concern is medical quality. This is because our department has passed the ISO 15189 laboratory certification, which has very high requirements for medical quality and testing capabilities. Therefore, we cannot simply consider cost and compromise on quality." (L4)

In accordance with the ISO 15189 standard, cost control activities involving the procurement and utilization of reagents, as well as modifications to re-examination protocols, should be predicated on this standard as a point of reference. As some doctors explained:

"The control of reagent costs is also based on the quality guidelines of ISO15189. If a reagent meets the quality goals of ISO15189, we will choose it. But if it doesn't meet the quality requirements, we will discard it no matter how much is left, and we will not use it for specimen testing." (L11)

"The adjustment of re-examination rules must be verified. Because our laboratory has passed the ISO15189 quality verification, which is supported by a document. Therefore, these re-examination rules we create must comply with

[12] **ISO 15189:** ISO 15189:2012 specifies requirements for quality and competence in medical laboratories. It can be used by medical laboratories in developing their quality management systems and assessing their own competence. It can also be used for confirming or recognizing the competence of medical laboratories by laboratory customers, regulating authorities and accreditation bodies. https://www.iso.org/standard/56115.html.

> ISO15189 standards. They will be inspected by the IOS 15189 team every year.” (L9)

The second type of standard, such as Standard Operating Procedures (SOP) at the lab level, compelled doctors to carry out medical procedures in a regulated manner, a practice they deemed advantageous for cost control purposes. As a doctor commented:

> “To control costs, the general approach is to pay attention to the standard operating procedures and strictly follow them during operations. This can help prevent some wastage from occurring […] Because the operating procedures are also formulated according to national and industry standards, there is no problem with testing if we follow these standards." (L8)

In practice, doctors also established guidelines to ensure optimal medical quality. To ensure that the mixed reagents comply with the standards required for testing purposes, reagents to be mixed must meet three prerequisites, namely: “the reagents must originate from the same batch number, the stability of the reagents must be satisfactory, and the reagents must be utilized within the stable period after initial opening, which is limited to 28 days.” (L1). The batch number was an essential reference for doctors because the same batch number represented the same quality of reagents. Therefore, only when reagents belonged to the same batch number were they eligible to be mixed. As a doctor explained:

> “Reagents can be mixed within the same batch number and the used. However, if the reagents originate from different batch numbers, they cannot be combined. This is because combining reagents from different batches could

significantly compromise quality, negatively impact the performance of the new reagents, and ultimately result in undue losses.” (L11)

The stability of the reagents should also be taken into consideration before doctors mixed them. As a doctor said:

> “For instance, in the process of mixing reagents, some reagents are known to be stable. In such cases, if there is a small amount of reagent remaining in the bottle, it won’t be discarded immediately. If it’s also from the same batch, it can be added to a new bottle of the same reagent and continued to be used […] We have acquired significant experience in the laboratory, so we can identify the stable reagents. We know that the combination of stable reagents has little to no effect on the final test results. However, for unstable reagents, we do discard any remaining reagents.” (L2)

In addition to adhering to diverse medical standards that guided standardized medical procedures, doctors also conducted experiments to verify the accuracy of their medical practices. This procedure was referred to as the 'quality control process' by the doctors. Doctors emphasized that quality control played an indispensable role throughout the entirety of the specimen testing process. As a doctor explained:

> “Quality control is important. We have a detailed operation guide for this and we conduct quality control every time before testing. With quality control, the accuracy of the results can be guaranteed.” (L12)

Through the utilization of the quality control process, some cost control methods, like

reducing reagent usage, could be validated in terms of their influence on the efficacy of reagents and medical quality. As some doctors put it:

> “Of course, after adjusting the amount of reagent, we need to carry out verification. We must ensure that the performance of the adjusted reagents is no different from before. For example, the repeatability and accuracy - they must be the same as before. Only when this condition is met can we adjust the amount used. If the performance changes after adjustment, the disadvantages will outweigh the advantages. So the adjustment usually doesn’t affect the medical quality.” (L3)

> “The reagent I used in my experiment is a product from X company. The instructions for use recommend adding a specific amount of reagent per individual sample […] But we typically use only half the recommended amount for our testing […] Before we do this operation that I am talking about, we need to make sure we have done the quality control first. We must guarantee that the quality of the test is good enough before we can proceed with what we are planning to do.” (L4)

Another approach to reducing reagent consumption, namely modification of the re-examination rules, was also determined based on experimental results. As a doctor put it:

> “When setting these rules, the senior medical staff went through many experiments repeatedly. The 18 rules are chosen after the experimental screening. What they did was keep all the problematic specimens and filter out the unproblematic ones. We need to ensure the quality of the test. If we release

problematic ones, it will be troublesome […] This is our standard of doing tests […] After these 18 rules were set, we know that there will be little possibility of releasing problematic specimens. These 18 rules basically cover all problematic specimens." (L9)

When it came to mixing residual reagents to manage expenses, the decision of whether or not to utilize the mixed reagents was solely determined by the outcomes of quality control assessments. As some doctors explained:

"Sometimes we may combine two or three reagents together [...] but how do we ensure the quality of the combination? We conduct quality control before the test starts. By monitoring this particular bottle of reagent through the quality control process, we will see if it exceeds the standard and affects the test results. The precision and accuracy of the test results must fall within an acceptable range of error." (L2)

"The mixed reagents, although they belong to the same batch number, will still need to pass the quality control. Only when they pass the quality control can we use them to test specimens. If these reagents fail the quality control test, they will also be discarded. Therefore, only the reagent with the same batch number, and pass quality control, is within our controllable range." (L11)

"For the mixed reagent, we carry out quality control. It must meet the quality requirement. For example, this testing item must reach 10 in quality control, and we will use the mixed reagent if it can reach that value." (L12)

Quality control was not limited to the process of adjusting the amount of reagents, but was also applied during the selection of cheaper reagents. As a doctor explained:

> “The reagents that are compatible with our instruments are imported and very expensive. So, we try to save costs by using domestically-produced reagents that are cheaper. But we must make sure that we maintain the quality of our testing and the accuracy of our results. Before we decide to use any cheaper reagents, we test them out to make sure they are just as reliable.” (L10)

By implementing these standards and quality control processes, doctors held the belief that cost control could be accomplished without compromising medical quality. As a doctor explained:

> "We have not learned how to control costs, but what we have learned is how to handle specimens accurately according to SOP. I believe that indirectly, this can also help control costs by avoiding waste.
>
> If we can get the quality control results right the first time, we do not have to test the patient samples again. This saves us from having to double-check the patients' results, which means we use fewer reagents and ultimately save money. So it’s really important to make sure our results are accurate and to do good quality control to keep costs down." (L12)

The standardized nature of laboratory procedures, the auxiliary role within the case hospital, the multi-tiered guidelines for medical quality evaluation, and the quality control process collectively contributed to doctors' perception that there was no conflict between the prescriptions of commercial and medical logic.

3.2 Acquisition of cost control ideas: culture of frugality

Oliver's (1991) research demonstrated that organisations operating within multiple institutional logic environments might acquire institutional requirements from those constituents, and the way they acquire included habits, imitation and compliance. The findings in the case hospital also identified some similar patterns at the individual level, namely acquisition driven by culturally-influenced habits and acquisition through imitation.

Acquisition driven by culturally-influenced habits

Oliver (1991) proposed that some acquisition may be achieved through habits, when organisations adhere to some taken-for-granted values and norms. In lab department, the habit was developed under the influence of the culture of frugality. Some senior doctors within the laboratory suggested that the cost-control methods they employed were influenced by their frugal habits, which were deeply rooted in the traditional Chinese culture of frugality. As a doctor explained:

> “In addition, controlling costs actually stems from the Chinese people's sense of thrift. We feel that unnecessary waste should be avoided. Because resources belong to everyone, and if everyone wastes them, there will not be enough resources on Earth. Therefore, we must have a sense of thrift.” (L14)

The culture of frugality in China places great emphasis on the disciplined consumption of resources, particularly in relation to the use of consumables. By emphasizing the importance of small savings and waste avoidance in achieving long-term goals, frugality reflects a broader philosophy of resource management.

Frugality has a long history in China, dating back to the time when Confucianism emerged in the 5th century BCE, and has become increasingly regarded as a foundational cultural value of the Chinese nation. It has had a profound impact on Chinese people's habits. As one doctor commented:

> "The consciousness of saving resources has gradually formed under the influence of the entire society. We not only save daily protective equipment or paper, but also are mindful about conserving water and electricity. It has become a habit for us, one that we practice not only in our personal lives, but also in the workplace too." (L14)

Frugality greatly affects doctors' behaviour and their perceptions of resources. When discussing their commitment to cost control, some doctors brought up their childhood experiences, highlighting that from an early age onwards they had learned not to waste resources:

> "When I was a child, paper was a luxury good. My exercise books were used many times. I used one side of the workbook for my homework and the other side for drafts. When this exercise book was used up, I still kept it and made drafts in the blank places on the paper." (L1)

> "I have developed this lifestyle since our childhood. So we will not waste anything regardless of its importance or price." (L2)

> "When I was a kid, I was always told to turn off the tap immediately after use and turn off the lights when no one was in the room. I've also seen my parents save water after washing the vegetables and use it to flush the toilet or mop the

floor.” (L11)

These habits were subsequently carried over to their medical practices, aiding them in developing various cost-control methods. Examples include mixing residual reagents, reducing reagent usage, practising material reusability, and preventing wastage. Due to these ingrained frugal habits, doctors tended to align with the resource management aspect advocated by the commercial logic, as suggested by Oliver (1991). In the lab, many doctors came to view frugality as a core motivator behind their efforts to control costs. Frugal behaviour was characterized by a sustained commitment to resource conservation, independent of any explicit bonus incentives. As doctors put it:

> “I think it doesn’t matter how much money we will save from that […] But we are still controlling costs. That’s just because the waste is unnecessary. It’s a pity if we throw all the stuff into the bin.” (L5)

> “Waste is definitely a bad behaviour, so we try our best to control costs at work […] It’s not about money. It’s just because waste is not morally permitted.” (L2)

According to doctors, frugal behaviour also remained consistent regardless of the perceived value of the resources being consumed. Even a seemingly insignificant item like a scrap of paper, though its effect on the department's overall costs might be minimal, would still be preserved under the influence of a frugal perspective. As doctors explained:

> “Many people may think that a single sheet of paper is not worth much money and that reusing it may be making a big deal out of nothing. However, I believe that it is important to remember that every little bit counts. The waste of paper

may seem small and insignificant on a daily basis, but over time, it can accumulate into a significant amount of consumption." (L4, the deputy head of the department)

"These resources should be saved whenever possible and not wasted. For example, even though a sheet of paper may not be expensive, the cumulative waste over time can lead to significant expenses." (L8)

Acquisition through imitation

Oliver (1991) also suggested another response in the context of acquisition, which is imitation, referring to the deliberate or unintentional replication of institutional models. Frugality was not confined to being habits solely exhibited by senior doctors. Many doctors expressed that frugality, together with some cost control methods, became a tradition within their department:

"Actually, it is our department's tradition of being frugal. Frugality as a tradition does not mean that waste will be punished and frugality will be rewarded. It is just an unwritten rule […] so everyone in our department has the concept of being frugal in their minds." (L2)

"Using mixed reagents is actually a tradition in our department, and it has been passed down for a while. It helps us save resources, so we have kept using it. Actually it is derived from the culture of frugality." (L11)

The dissemination of this type of departmental culture typically occurred through departmental meetings, where cost-saving initiatives and resource management

methods were shared and discussed among doctors. As doctors explained:

> “To avoid wasting reagents, the head of department emphasized that it is important to investigate the reasons when the specimen results are not satisfactory […] at department meetings she usually shared some opinions in relation to this. For example, when conducting quality control tests and finding that the blood glucose level is out of range, she said we should not dispose of the reagents immediately. Instead, we should check whether the reagent is placed in the correct position or if different batches of reagents are mixed […] Additionally, we should examine the reaction curve to determine if it is abnormal, or if the colorimetric cups are not clean […] From our director’s perspective, investigating the root cause of such issues can prevent the waste of reagents." (L2)

> “Our management team has a monthly quality management meeting where the head of the department always reminds us to save resources, even with things like masks and gloves. They encourage us to use them wisely so we can make the most of what we have.” (L4, the deputy head of the department)

> “Our previous director was always hammering in the importance of resource conservation in our meetings. She told us not to toss gloves after just one use, because that was such a waste. And she encouraged us to be mindful of how we used masks and hats too. Her message really stuck with us and therefore we make a habit of reusing things whenever we can.” (L9)

The frugal tradition within the lab cultivated an environment conducive to imitating

frugal behaviour. According to doctors, many junior doctors did not acquire a frugal lifestyle from their childhood experiences:

> “Because younger generations have grown up during more economically prosperous times, they may not have developed as strong a sense of resource conservation as their predecessors.” (L8)

Other doctors provided some examples on this aspect. As one doctor put it:

> “Some junior doctors, when first join our department, usually wore many layers of medical gloves at work, and threw them away after using them only once.” (L6)

> “When junior doctors lack sufficient experience, they may mistakenly operate equipment or use the wrong reagents, resulting in wastage of reagents. It‘s important to prevent such unnecessary waste from occurring.” (L10)

Nevertheless, this situation gradually improved due to the frugal work atmosphere in the laboratory setting. As a junior doctor put it:

> “Our group leader is in his 50s, and people in that age group generally have a more frugal lifestyle. So under his influence, we have also created a thrifty working atmosphere, and we try not to waste resources unnecessarily.” (L8)

Within such a work environment, junior doctors imitated the values and behaviours that were promoted in the department and subsequently learned to adopt them. As junior doctors explained:

> “I saw seniors reusing the medical gloves by sanitizing them and they always

print on both sides of the paper […] I saw most seniors doing these, and then I followed suit […] The same logic applies to mixing reagents. If we found that there were no quality control issues after mixing cleaning solutions, then I would do the same thing the next time." (L9)

"The habits of saving resources that I have developed were actually influenced by the senior members in the laboratory after I joined. The experienced members can influence the newbies, and as a result, new staff members have developed these frugal habits too. The seniors set a high bar for us, like showing us how to use gloves properly, and they have been great examples for us to follow." (L11)

"I think the development of habits has a lot to do with the atmosphere in which we work. As new members of the department, we usually learn from our senior doctors. Just like the apprenticeship in the past. So what working habits senior doctors have, we will develop those habits. In our department, senior doctors are thrifty, then we are subtly influenced by their behaviour. They showed us how to properly use gloves each day, how to disinfect them for reuse, and how to be efficient with using masks." (L13)

Moreover, senior doctors provided guidance to junior doctors regarding cost-saving methods, which further provided conditions for imitation. A doctor provided an example of labelling the pipette tips:

"This is how I do to control costs, and I also tell my students to do the same. I tell them that this is the most cost-effective way to do things. If we don't do it

this way, we would need to change the tip every time we pipette, and we might end up using 20 tips in one morning. However, after I labelled each type of tip, I only use one for drawing physiological saline. So I tell my students to do the same and explain to them that it's a more economical way of working." (L4)

Imitation assumes a crucial role in spreading frugal conduct. As a doctor put it:

> "It's a way of passing down the frugal working habits of the seniors. After young people join the department, they find that the seniors all work in this way, and they become very conscious of doing the same." (L5)

Frugality, deeply ingrained in Chinese culture over centuries and attained the persisting status as a social fact, has left an enduring impact on individuals' resource perceptions and behaviours. Among these individuals were doctors in the laboratory, particularly senior professionals. Frugality has fostered economic resource utilization habits in them, facilitating their alignment with some aspects of commercial logic's norms and practices. They considered their cost control methods to be customary and taken-for-granted practice. This corresponds with Oliver's (1991) ideas regarding the acquisition of institutional requirements through habits. On the other hand, junior doctors acquired these principles through imitation of their senior colleagues' conduct. The perceptions and actions regarding cost control were reproduced in the lab on the basis of frugality. This is in accordance with Oliver's (1991) categorization of acquisition through imitation. The dual mechanisms worked together, contributing to doctors' perception of a non-conflicting relationship between the two logics.

3.3 Bonus distribution at the individual level

The bonus system, serving as a primary manifestation of commercial logic, introduced the concept that the department's bonus was contingent on the degree of cost control achieved. Nonetheless, during the subsequent distribution of individual bonuses, the criteria for allocation were not linked to the level of engagement an individual had shown in cost control practice. In practice, the proficiency for cost control was not considered one of the criteria for individual performance assessment. A substantial portion of the department's bonus, although doctors held varying perspectives on the exact proportion, was distributed among individuals in a manner unrelated to cost control. As some doctors explained:

> “The bonus received from the hospital is subject to secondary distribution, where 80% of the total amount is distributed among all eligible individuals, while the remaining 20% is allocated based on the presence of published articles and involvement in research projects.” (L1)

> “The hospital has issued a document which says that 70% of departmental bonuses should be allocated according to the guidelines, while the remaining 30% can be distributed based on the department's own criteria. The requirement for allocating the 70% takes into account things like how long someone has worked in the hospital. The longer tenure contributes to a higher bonus ratio. The requirement also considers the professional title that doctors hold. The higher the title, the higher the bonus. The remaining 30% of the bonuses are typically allocated for special circumstances such as overtime work on holidays.” (L3)

> “Regarding the bonus distribution, as far as I recall, the department generally allocates 80% of bonuses based on professional titles, while the remaining 20% is awarded by the departments based on research project leadership and publication of articles.” (L6)

To provide further detail, professional titles, research accomplishments, and the length of service were emphasized during the interviews as the primary factors that exert a substantial influence on the distribution of their bonuses. As doctors explained:

> "In terms of bonus, what impressed me the most was that our department encouraged us to apply for research projects and write articles [...] bonus is related to three main areas: professional title, published articles, and scientific research projects [...] Because our is a comprehensive medical institution that combines medical treatment, teaching, and research.” (L1)

> “When it comes to our bonus allocation, it is mainly based on our research outputs and professional titles. We have a three-level professional title system, and the bonus of the corresponding level is given to the respective title. However, the final bonus also depends on a coefficient, which may vary depending on whether we have published papers or made other contributions that deserve extra rewards." (L11)

> “The years of experience are a really important factor when it comes to how our bonus is evaluated and distributed […] Another thing that matters is the professional title […] And if I have been involved in any research projects, that

can also count towards my bonus - it depends on whether I have any research achievements and what level they are at, because different achievements are worth different amounts in terms of bonus." (L5)

Of the three primary factors, doctors considered professional titles and research accomplishments as achievable through effort, in contrast to length of service which was an uncontrollable factor. The professional title system classified doctors into different levels according to their professional abilities. As a doctor explained:

"In professions like medicine that require specialized technical skills, our titles reflect our level of expertise. We have senior, junior, and primary titles." (L14)

Such differences were also reflected in bonus coefficients, where the level of professional titles determined the corresponding level of the bonus coefficient: the higher the rank, the greater the corresponding bonus. As a doctor explained:

"Bonuses are distributed according to the bonus coefficient, and the coefficient is further related to professional titles […] For example, our director holds the second-highest rank among senior job titles, while I hold the fourth-highest rank. According to my professional title, my bonus coefficient is 1.5." (L2)

Within the framework of bonus allocation, doctors were motivated to strive for elevated professional titles, often attainable through increased research productivity. As doctors explained:

"So far, the promotion system still focuses on research, including research projects, published articles, and some clinical practice assessment." (L7)

> “From junior to vice-senior rank, you need to publish a paper in a core journal, and you must be the first author or corresponding author. And you also need to have a research project.” (L8)

Doctors expressed approval for the allocation mechanism that linked research achievements with bonuses, as these mechanisms assisted them in enhancing their medical skills. As some doctors put it:

> “I am totally in favour of the bonus system. The bonus system encourages lifelong learning, such as reading the latest literature, summarising medical records, writing up research papers, and conducting research projects, and therefore can help in improving medical skills […] it motivates the whole department.” (L1)

> “To gain add-on points on bonus, I read more literature to acquire the latest lab-related knowledge [...] I think these indicators motivate me and allow me to know the current trend of lab work. They also inspire me to keep improving myself and widen my horizons.” (L12)

Although the bonus system can be regarded as a major impetus for cost control, it did not manifest itself explicitly at individual level of cost control. Individual-level bonus allocation was developed towards motivating professional development, with metrics such as research publications and professional titles that were less likely to directly impact cost fluctuations. The limited correlation between individual-level bonuses and cost might have led doctors to perceive a situation of non-conflict between two logics.

4. Concluding remarks

This chapter unveils the manifestation of commercial logic at the departmental level and explores its interplay with medical logic. In the first phase of healthcare reform, commercial logic was integrated into the laboratory through the bonus system, resulting in the introduction of the concept of cost control. This mechanism remained intact during the time of the interviews. As a consequence, doctors within the lab developed a certain level of cost-consciousness, as evidenced by their comprehension of fundamental elements of cost and their implementation of cost control methods. Furthermore, they did not perceive the cost control requirements proposed by commercial logic as conflicting with their medical practices, under the influence of the characteristics of lab work, the culture of frugality, and lack of direct correlation between cost control and individual bonus allocation.

Chapter 7 Clinical Departments: Conflicting Situation between Two Logics

1. Introduction

The implementation of the two-stage healthcare reform in China has introduced commercial elements into the domain of public hospitals, which have long been dominated by medical values, norms, and practices. This chapter aims to examine the dynamics within the clinical departments of the case hospital, unveil the interplay between commercial and medical logic, and demonstrate medical staff's responses to their interplay. The section 2 will exhibit the presence of commercial logic within clinical departments, while section 3 will examine the conflicting situation between the two logics and medical staff's responses to the conflicting institutional demands.

2. Commercial logic: the global budget control, the SDP system, and the bonus system

During the late 1980s, the PRC initiated its first phase of healthcare reform, with the objective of granting greater autonomy to public hospitals in their operational processes. The performance-related bonus system was put forth as a method to attain this goal. Through this incentive mechanism, public hospitals became empowered to distribute their profits among various departments and personnel. This system persists during the time of conducting this study. Subsequent to the implementation of the NMIS in 2006, the PRC initiated its second healthcare reform phase in 2009, with the central objective of addressing the societal concern

regarding the high costs of healthcare provision. The global budget and the SDP system, both underpinned by the NMIS, were implemented as methods for cost control within public hospitals. The co-existence of three systems were identified in the case hospital, each serving as manifestations of the commercial logic. This section will illustrate the conflicting relationship between these manifestations and medical logic within the clinical departments of the case hospital.

2.1 The global budget and the SDP system

In clinical departments, the global budget and the SDP system collaborated to achieve cost control objectives. The former establishes a comprehensive cap on medical insurance funds allocated to public hospitals, while the latter imposes limits on the treatment expenses for individual diseases. Under the framework of global budget control, the NMIS paid public hospitals in a prospective way, and the allotment of healthcare insurance funds to each hospital was primarily determined by its historical healthcare insurance expenditures. As a doctor put it:

> “Medical insurance payment is subject to total expenditure control. The payment standard is determined by the hospital’s average medical insurance expenditure over the past three to five years, which is then subject to upward or downward fluctuation within a certain range.” (C1)

Within the SDP system, a predetermined allocation of insurance expenditure is assigned to each specific disease. The SDP guideline for double valve replacement surgery, as offered by a surgical department, specifies that a fixed expenditure is allocated not only for the overall cost but also for medical consumables, medical examinations, and certain medical services. This aspect was also brought up by

physicians from other clinical departments during the interview. As a doctor explained:

> “The NMIS sets a limit on how much it covers for a patient's hospital stay, including all the costs incurred during the stay. For example, if someone has rheumatism and needs to be hospitalized, the medical insurance may only cover up to 10,000 yuan[13]. for the whole stay. If the cost exceeds this amount, the insurance won't pay for the extra expenses. So, doctors need to be aware of the total cost and consider it when choosing treatments during hospitalization […] This is what we call a single disease payment system. Each diagnosis corresponds to a certain amount of payment.” (C4)

Another physician provided an example where the implementation of the SDP guideline led to a tangible reduction in the actual cost of medical services. As a doctor put it:

> “Because the patients we treat in our department are all suffering from hypoxia, they need to inhale oxygen during hospitalization […] the cost of oxygen inhalation used to be 98 yuan[14] per hour, but now it is 60 yuan[2] per hour, which means almost half of the charge has been reduced." (C6)

Moreover, within the SDP system, each disease is associated with a designated clinical pathway that delineates the exact sequence of steps doctors must follow for treatment. The SDP guideline for the atrial septal defect closure shows that the duration of stay, the diagnostic and treatment methods, the medical consumables

[13] Based on current exchange rate CNY:GBP=1:0.11, 10,000 yuan equals to £1100.
[14] Based on current exchange rate CNY:GBP=1:0.11, 98 yuan equals to £10.87 while 60 yuan equals to £6.6.

and medication utilized throughout the process are all predetermined by the guideline. Clinicians from other departments also brought up this point during the interview and they provided more detailed information regarding the usage of medical resources. The requirements concerning medication prescriptions, medical examinations, and certain medical services within the clinical pathway were in alignment with the regulations set forth by the NMIS. Some medication can only be used under specific circumstances. As a doctor explained:

> “When it comes to prescribing medication, medical insurance has specific rules that we need to follow. For some medications that have unclear indications - such as those for promoting blood circulation and nutrition - as well as some oral medications, the medical insurance regulations specify the specific circumstances under which these drugs can be used.” (C2)

Clinicians are also required to provide explanations for their utilization of medical resources, and these justifications must conform to both the NMIS guidelines and their initial diagnoses. As some doctors explained:

> “Let's take antibiotics as an example. Medical insurance has different categories for antibiotics and specifies when they should be used. To be eligible for reimbursement, the use of antibiotics must meet the criteria specified by medical insurance, which is also in line with clinical guidelines […] Physicians can't just use antibiotics whenever they want, even if they think it might help from their medical experience. There has to be a good reason and evidence to support it.” (C10)

> “The medical insurance requires that medical examinations be prescribed

based on the patient's diagnosis. For example, a patient can only receive a brain MRI if they have symptoms of dizziness, or a coronary CT if they have symptoms of chest pain." (C13)

"After the second healthcare reform, the NMIS now requires that medical examinations must be related to the disease in question in order to be carried out. Previously, there were no restrictions on this relevance, but now in order to control healthcare expenses, such as medical examination costs and drug expenses, these regulations have been put in place." (C15)

Regarding certain medical services and medical consumables, the NMIS has revised its criteria for utilization. As a doctor put it:

'For seriously ill patients, they need to inhale oxygen for 24 hours. However, medical insurance now does not allow us to charge for 24 hours of oxygen inhalation, and we can only charge for a maximum of 15 hours.' (C6)

For some medical consumables that were not listed in the NMIS catalogue, doctors were constrained from using and charging them. As some doctors put it:

"The biggest problem we face now is that many consumables cannot be charged. For example, in the oxygen supply facilities, the oxygen delivery devices cannot be charged; the section of tubing that connects the infusion pump and infusion tube cannot be charged. We are currently using superficial veins for infusion, and we will use a venous indwelling needle. The indwelling needle comes with a disposable sealing tube, which costs about 2 yuan, and we are not allowed to charge for the sealing tube." (C6)

> “In our department, we always use specific materials for every surgical operation we perform. The thing is, the cost of these materials can be affected by medical insurance coverage. For instance, if we have two material options for treating a particular disease, let's call them A and B, and A is actually the better one to use, but unfortunately, only B is covered by the medical insurance directory. So, we're forced to use B instead of A. We're not allowed to purchase or use any materials that are not included in the medical insurance catalogue.” (C15)

> “I'll give the example of dressing change. Previously, we could charge patients for the cost of consumables used during the process. But now, medical insurance has set regulations for three different levels of medicine changes: large, medium, and small. They also specify which level corresponds to the size of the incision and how many supplies are required for each level. In the past, when we performed simple closed thoracic drainage, we could charge for supplies like sterile gloves and gauze. Unfortunately, we're not allowed to do that anymore." (C17)

The incorporation of the global budget and the SDP system serves as a manifestation of the cost control dimension embedded in commercial logic. The global budget establishes the comprehensive financial resources accessible to clinicians, whereas the SDP system imposes constraints on the utilization of tangible medical resources through the predefinition of treatment procedures and the establishment of prerequisites for the utilization of medical consumables, medication,

and medical examinations.

2.2 The bonus system

The bonus system was initially introduced during the first healthcare reform as an incentivization mechanism aimed at motivating public hospitals and physicians to enhance their performance. This incentive system continued to operate within the case hospital, serving as a complementary element for both cost control and a motivating element for professional development and income generation. This section will illustrate how the bonus system illuminates endeavours in cost control, supports medical development, and stimulates the income generation.

2.2.1 Introduction to the bonus system

Since its formal endorsement in the early 1980s, the bonus system has evolved into a substantial financial stream for both public hospitals and individual practitioners. The "Opinions on Issues Related to Expanding Medical and Health Services" (The State Council, 1989) has granted public hospitals the discretion to determine the allocation of their bonuses, and hospitals have been responsible for their own financial gains and losses since then. As a doctor explained the importance of the bonus system:

> “Around 30% of our operating funds are provided by the government, and the remaining 70% must be earned by the hospital independently. This essentially means that as clinicians, we need to financially support our own endeavours. Consequently, the acquisition of bonuses becomes crucial, as they directly contribute to our income.” (C8)

In the case hospital, the distribution of bonuses to departments was contingent upon the departmental performance evaluations. As a clinician explained:

> “The hospital first deducts managerial costs from our income as the initial calculation. Then the hospital starts evaluating the performance of our department. For instance, penalties are imposed for improper medication use and for not meeting the norms of clinical pathways […] The Quality Management Department assesses factors such as medication proportion, bed turnover rate, and success rate of resuscitation. Only after considering all these deductions, our department gets department bonuses for individual allocation.” (C1)

Regarding the distribution of bonuses within departments, the case hospital employed the "80% and 20%" approach, wherein departments retained the autonomy to allocate 20% of their bonuses according to their own preferences, while 80% of the bonus allocation adhered to the hospital's regulations. As a doctor explained:

> “80% of department bonuses are assigned based on the hospital's criteria, taking into account factors such as professional titles, years of service, positions held, and research contributions. All of these elements combine to determine a unique bonus coefficient for each individual. We then allocate bonuses to medical staff according to their bonus coefficient […] 20% of department bonuses are called reward bonuses. The hospital grants the department head the authority to decide how this portion of bonuses is distributed […] In our department, this share is allotted considering both the difficulty of the tasks and any additional work that has been completed.” (C9)

From the standpoint of medical staff, their paramount consideration rested on the progression of the professional title, because it not only signifies enhanced professional competence but also holds relevance to the allocation of bonuses. Medical professionals with more senior professional titles tended to receive higher overall bonuses because of their higher bonus coefficient. As some medical staff explained:

> “Basically, how we get the bonus is based on this thing called bonus coefficients. And these coefficients are closely tied to our professional titles. So when you're new to the department and still on probation, your coefficient is either 0.6 or 0.8. But once you're officially hired, your coefficient jumps up to 1. After that, different professional titles have different coefficients.” (C1)

> “In our professional title system, we have four levels for the senior title and six levels for the associate title. And each level has a different coefficient that corresponds to it. Based on this coefficient, we'll decide how to distribute the bonuses.” (C5)

> “As an example, for the professional title of Nurse Practitioner, the bonus coefficient would be 1.1025. However, if the individual is promoted to the title of Charge Nurse, the coefficient may increase to 1.155. A higher coefficient correlates with greater recognition of performance, resulting in a higher bonus on a monthly basis.” (C11)

Established by the hospital, the bonus coefficient level was determined based on

three categories: the quality of medical practice, teaching responsibilities, and research accomplishments, and the detailed criteria for evaluation vary based on the specific professional titles. As some medical staff explained in terms of medical practice:

> “As a Level 3 Professor […] for the medical work, the number of my consultations and outpatient visits are also part of the assessment criteria.” (C1)

> “The first is medical activities, such as the number of outpatients and inpatients treated each year, which are some indicators related to medical care.” (C4)

> “The assessment of workload includes the number of ward rounds, the number and difficulty of bronchoscopy procedures, as well as the number of outpatient visits. If I complete the workload corresponding to my professional title, then I'm considered qualified.” (C5)

> “Bonus is the income we earn from conducting our medical work, and it is related to the amount of work we do, the level of difficulty and intensity of our medical work, and the duration of our work." (C7)

Teaching is another aspect of individual performance evaluation. As a doctor put it:

> "The bonus system also evaluates our practice from the teaching perspective, because we are a university-affiliated hospital, so doctors must undertake some undergraduate and graduate teaching tasks every year.” (C4)

The evaluation of research outputs primarily centred on factors such as publications, research projects, and innovative research contributions. As some doctors explained:

> “For example, as a Level 3 Professor, for my research work, I must have at least one national-level grant and publications in relevant journals during the assessment period.” (C1)

> "For example, as for myself, I am an Associate Chief Physician with a bonus coefficient of 1.2, which serves as a base. In the evaluation, the full score is 10 points, and getting 6 points means getting 100% basic bonuses. The remaining 4 points are for add-on bonuses: as an Associate Chief Physician, publishing an article in a core journal each year earns one point; if an award is won during the year, another point is added; if a Natural Science Fund is applied and received in the same year, one more point can be added. All bonus points will eventually be reflected in the performance coefficient, which could become 1.35 or 1.4." (C2)

> “In terms of the research projects […] In fact, the hospital attaches much more importance to research [...] The Attending Physician is required to publish one paper in a Chinese journal every year; the Associate Chief Physician requires two Chinese journal or two SCI[15] journal papers, and the Chief Physician requires three SCI or Chinese journal papers. In addition, everyone must have research funds and projects […] Published papers will contribute to professional title promotion.” (C4)

[15] **SCI:** Science Citation Index. This index evaluates academic journals and research achievements from multiple perspectives through statistical analysis of factors such as the frequency of paper citations, and thus assesses an individual's research output performance.

> “If the scientific research output fails to meet the standard, deductions will be made from the bonus coefficient. For instance, the coefficient that should have been 1.2 may be reduced to 1.0. Conversely, national-level scientific research awards or innovative clinical techniques and services may lead to an increase in the coefficient. For instance, a coefficient of 1.2 may increase to 1.6.” (C10)

This mechanism, which establishes a connection between the bonus system and the professional activities (especially research-related activities) of medical staff, received substantial support within the medical community. As some medical staff commented:

> “[…] these evaluation factors can facilitate the development of medical skills and can further contribute to the improvement of patients’ health condition [...] This is the social responsibility that hospitals and doctors must undertake.” (C10)

> “When the bonus system is linked to our professional title promotion, it will motivate everyone to actively apply for research projects and publish papers, which will also promote and enhance our research and medical skills.” (C11)

2.2.2 The cost control aspect of the bonus system

The bonus system instils cost control concepts into clinicians' perception through two ways. Firstly, it aligns these two concepts at the departmental level using a simplified equation: 'department bonuses = department income – department costs'. This

equation offers doctors an insight into the correlation between lower costs and higher departmental bonuses. As some doctors explained:

> “Our bonus is calculated on a departmental basis. The hospital takes out some management costs from our revenue and then gives us back a percentage based on that. Based on this, we subtract our departmental costs to determine our bonus [...] Our bonuses can reflect the level of costs at any time. For example, during the Chinese New Year when logistics are on holiday, our department will purchase consumables for two to three months in advance. So even if we admit more patients this month, our bonus will be low because of the higher costs.” (C1)

> “There is a direct relationship between our costs and the bonuses we receive […] Each month, the hospital provides us with a calculation of our total revenue, which is used to determine our department's bonus. However, before that bonus is calculated, our department's costs for that month are deducted, such as the cost of fixed assets like cabinets and the cost of daily consumables.” (C2)

> “In our day-to-day work, we often have to go pick up printing paper and infusion devices on a regular basis. The cost of these things gets taken out of our department's revenue, so the more we collect, the more we spend, and that can hurt our bonus.” (C8)

> "The costs of the department need to be factored into the monthly bonus of our department [...] The purchasing costs of certain fixed equipment in the

department, such as respirators, are included in the department's bonus calculation. When a new respirator is purchased, its cost is spread out over a period of time and factored into the department's bonus during that time." (C15)

As indicated by the quotes mentioned above, this simplified calculation of department bonuses also made doctors aware of the elements that make up departmental expenditures, such as fixed costs, and the ways these costs were incurred. Medical staff were conscious that not only do the resources they use come with associated expenses, but they themselves also contributed to the overall expenses, as human resources. As a nurse put it:

> “To put it in simpler terms, I think the main costs of the department are the cost of assets, that is, the cost of all the items we use, and the cost of personnel.” (C7)

Regarding the human resource cost, medical staff perceived it as primarily comprising the salaries, bonuses and training expenses of the personnel working in the department. As a nurse explained:

> “Basically, when we talk about the cost of personnel, we're referring to the cost of their labour. For example, let's say we hire 10 doctors and 20 nurses for our department. Since the number of beds in our department is fixed, we need to have a certain ratio of nurses or doctors to patients. To make our work easier, the department may choose to hire more doctors or nurses, like 16 doctors or 30 nurses, even if the number of beds stays the same. And of course, that means the cost of labour will go up.” (C7)

Therefore, to manage the personnel costs, medical staff developed some strategies in terms of recruiting new medical personnel and maintaining staffing ratios. As some medical staff put it:

> “We're pretty much at full capacity with our team right now, and sometimes the work within our department doesn't require such a large number of people to complete it. In this case, we usually give some of our nurses to other departments so that they can help out where needed. This way, they don't participate in our department's bonus distribution. Currently, we have seconded three people from our department.” (C11)

> “To keep personnel costs under control, we try to avoid hiring new medical staff as much as possible and have our current staff handle the workload. That's why we're not planning on hiring more people. After all, each person we hire comes with a cost, and we need to be mindful of that.” (C9)

Among all resource they used, doctors further classified them into fixed expenses and consumables expenses. The category of fixed assets mainly involves buildings and medical equipment, with the cost of buildings primarily referring to the area of the building used by the department. As doctors explained:

> “The building we use for our department are considered fixed costs, which means the hospital provides us with a certain amount of space and patient rooms to take care of our patients.” (C4)

> “The cost of our department takes into account the space we occupy on this floor, which is calculated at 10 yuan per square meter. It's like a business

arrangement between the hospital, the first party, and us, the second party." (C9)

Another component of fixed assets was medical equipment. As medical staff put it:

"Our department's fixed assets also include some medical equipment, such as invasive ventilators, non-invasive ventilators, high-flow oxygen machines, and so on, all of which are included in the department's cost." (C6)

“Fixed assets include the facilities that medical staff need, like computers, and the medical equipment that patients use, such as ventilators, ECG monitors, and infusion pumps.” (C11)

The cost of these medical equipment would be further depreciated over the period of use. As some medical staff explained:

“For fixed assets like ventilators, once they're purchased, they belong to our department. This means that we'll be responsible for the costs of using these machines in the coming months. The hospital deducts a certain percentage, usually 5% or 2%, of the purchase price every month as a cost for using them.” (C6)

“When it comes to fixed assets like instruments, the hospital deducts a certain percentage each month for their usage. For instance, if our department buys instruments worth 300,000 yuan, the hospital will deduct 8% of our monthly income until a total of 10% is deducted each year. So basically, it'll take a decade to pay off the full amount.” (C7)

The way in which the hospital deducted depreciation from the departmental income made doctors highly cautious when making decisions regarding the procurement of medical instruments. When deciding whether to purchase medical equipment, the price and utilization rate were critical factors taken into account. As some medical staff explained:

> “The first thing we must make sure is that the medical equipment we purchase is safe and of good quality. Once we've got that covered, we try to save costs where we can. So when we're choosing equipment, we usually go for the cheapest option from all legally compliant and legitimately sourced products available." (C10)

> “The large-scale instruments can’t be purchased endlessly. We usually consider how high the utilization rate of the instrument is after it’s purchased. If it can only be used on a small number of patients and the utilization rate is very low [...] then, to put it simply, the money we earn is not enough to cover the costs it occurs. In this case, we won’t buy the instrument.” (C7)

To reduce the substantial expenses associated with the purchase of medical equipment, medical staff may opt to borrow equipment from other departments to meet short-term needs instead of acquiring new equipment. As a nurse put it:

> "When we have a lot of surgeries going on, especially in cases of emergency trauma or when there's a sudden increase in patients, we might need to borrow an electrocardiogram monitor from another department to avoid any delays in patients’ treatment. This way, we can be sure that we're meeting the patients'

needs without having to purchase expensive equipment that might not get used very often, especially when there aren't as many patients." (C11)

Another component involved in the cost of departmental items was the cost of consumables, which is primarily determined by the quantity consumed. Doctors indicated that consumables not only comprised medical supplies, but also encompass everyday items such as paper and pens, and utilities like water and electricity. As some doctors put it:

> “Consumables are also an important cost in our department. These include infusion sets, gastric tubes, urinary catheters, and other items that we use on a daily basis. Although these items are not expensive individually, the quantity that we use is very large, which adds up to a significant cost for the department […] Our department treats patients who have the poor physical function, which means that they often require intravenous infusion when they come in. This is why these medical consumables are in high demand. They are necessary for the daily care of our patients.” (C8)

> “There are also smaller costs that add up, such as supplies like paper, ink, and electricity, as well as items for patient care like syringes, bandages, and surgical equipment. We also have to account for the cost of disinfectant items like iodine and hydrogen peroxide, and the cost of items like dressings and adhesive tape for IV lines. The hospital keeps track of all these items and deducts the cost from our department's revenue based on what we've taken from them.” (C10)

> “The cost that I have in mind includes the cost of daily consumables. For surgery, the most common ones are gauze, iodine, cotton balls, alcohol, reusable and non-reusable wound dressings, as well as sutures and fillers. It also includes the cost of infusion sets. All of these are calculated as part of the cost. Another part of the cost is the office supplies that we use, including printing paper and printer ink cartridges.” (C15)

In terms of medical consumables, doctors exercised great caution in their usage, to the extent that they engaged in estimating their appropriate quantities to avoid any waste. As some doctors explained:

> “When we're disinfecting a patient, we estimate how much iodine cotton ball we'll need beforehand and not grab more than we need. The same goes for the iodine and disinfectant solution. We pour just the right amount, no need to overdo it. When it comes to dressing the patient's wound, we need to have a plan in place. We've got these dressings that come in one, two, and five-piece packages, and we should choose the right number of pieces based on the size of the patient's cut. For instance, if we think the patient needs three pieces of dressing, we'll choose a one-piece package and a two-piece package instead of opening a whole five-piece package. This way, we're not wasting any supplies.” (C10)

> “For example, before implanting materials into patients, we need to select the appropriate model of the valve by doing some evaluations before and during the surgery. During the operation, doctors and nurses must check many times before opening the valve packaging. Opening the packaging must be done with

absolute caution. If we don't evaluate things properly before the surgery, and then find out we can't use the valve after we've opened the package, we'll have to throw it away. That just increases the department costs." (C10)

"When we're cleaning a wound or changing a dressing, it's important to plan out the steps ahead of time so we don't waste any supplies during the process. If we mess up and end up wasting a dressing pack, we'll have to open another one, which just adds to the overall cost. So it's better to be careful and avoid any unnecessary waste." (C15)

Taking into consideration the consumption of medical supplies, doctors may seek to optimize the usage of each individual supply to its fullest extent. As some doctors put it:

"When conducting experiments, we often use a type of medical supply called a 96-well plate, which can hold specimens from up to 96 patients. But sometimes, we can't collect samples from that many patients in a single day, which means that a lot of the wells on the plate are left unused and wasted. To avoid this, we pool specimens from patients over the course of a week and use them for experiments on Fridays when we have enough specimens, like around 90. This way, we can make the most of the 96-well plate and minimize waste." (C4)

"While upholding the principles of medical asepsis and without compromising the quality of medical care, we can achieve cost savings through the reuse of syringes. For instance, when preparing intravenous fluids for a patient, we can use a single syringe to draw saline solution, and then use it for different

individuals. As long as the syringe is sterile and the medication drawn is the same, it can be used to prepare the solution in different solvents, without the need for constant replacement." (C6)

“The surgical suture can be used to stitch a wound with a single thread, or it can be divided into several traction threads and used for multiple wounds. The result of the first method is that after stitching one wound, the remaining part of the thread can’t be used, and that’s just wasteful. Therefore, to save resources whenever possible, we always use one suture on many stitches.” (C12)

In terms of daily consumables, medical staff usually reused these materials. Paper was one of the examples. As some doctors put it:

“For more formal and official documents, we take extra care to ensure they are printed properly. However, when it comes to printing out things like forms, study materials, training materials, or other reference materials, we often use the backside of previously printed sheets. We keep a container specifically for ‘usable paper’, where we place any sheets of paper that have been printed incorrectly or otherwise deemed unusable. Then, when we need to use paper for less formal purposes, we can easily grab from this basket and utilize the blank side of these sheets. It's a great way to minimize waste and save money on paper costs.” (C7)

“Sometimes, when we're printing out documents, we might encounter unexpected issues where a sheet of paper becomes unusable. However, we don't simply throw it away. Instead, we make sure to utilize the other side of the

sheet as much as possible. For instance, we might use the blank side to print out examination requests, or simply use it to jot down notes or keep records. We always aim to make the most out of each sheet of paper, minimizing waste and reducing costs in the process." (C8)

Reusing was also applied to personal protective equipment such as surgical masks. As some doctors put it:

"Our daily consumption, such as masks, is distributed on a per capita basis. Typically, one surgical mask is provided per day, with a total of 30 masks per month, given directly to the doctors in one go. However, in actual use, we tend to use the same mask for multiple days, which is a form of saving resources." (C2)

"Because disposable masks are in high demand, we don't throw them away after using them only once. We don't follow strict medical requirements. We all use the same mask repeatedly [...] Sometimes we use the same mask for two days, even three to five days when the resource is extremely scarce." (C3)

In addition to reusing, medical staff also avoided wasting resources. For example, they may carefully review and plan the content before printing. As some doctors put it:

"To reduce paper waste, we should try to use less paper whenever possible. For example, before printing medical records, we should check them carefully on the computer to avoid mistakes. Printing again because of errors wastes paper. Similarly, we should try to print all the lab reports for one patient on a

single page, instead of using one page for each report. Printing multiple reports on one page is a more efficient use of paper and helps to save costs." (C13)

"To minimize paper waste when printing medical records, we make it a point to double-check everything before printing. This helps us avoid mistakes that could result in us having to reprint the entire record, which wastes paper and ink. Over time, this has become a habit for us. We're always mindful of the amount of paper we use and try our best to minimize waste whenever possible." (C16)

Electricity and water as energy resources were also within the scope of avoiding waste. As a doctor put it:

"For things like water and electricity, we will turn off the lights, shut down computers, and turn off the water whenever we can. Water, electricity, and heating are all considered costs for the department. We have replaced the water faucets with induction-type ones, which helps to avoid wasting water resources caused by forgetting to turn off the faucet. As for computers, lights, and air conditioners, they must be turned off when there is nobody in the office. This is also a way to save costs to some extent." (C8)

The cost-controlling practice of doctors aimed at reducing waste and reusing resource was influenced by the frugal culture in China, which emphasizes the importance of conserving resources and minimizing waste. As a doctor commented:

"How did we learn about cost-saving? This is a part of our national heritage. In fact, the principle of saving is universal to all of humanity. Take water resources,

for example. People have now reached a consensus that the resources on earth, such as mountains, rivers, forests, grasslands, lakes, fields, and sands, have lost their biodiversity due to overexploitation and excessive human activities. Therefore, humans must restrain themselves and conserve resources, such as by cutting down fewer trees and reducing carbon emissions, which is the overarching direction.

In fact, our ancestors understood the concept of conservation a long time ago. For example, they would not fully till every inch of farmland, but leave some for their children to till. There is also an old saying that goes, 'Do not exhaust the lake's resources,' which means not to drain all the water from the lake to catch fish, because it will lead to an unsustainable future where there is no water or fish left for future generations to consume. So I think saving resources is the nature of the Chinese people." (C10)

The economic downturn after the founding of the PRC further contributed to the formation of frugal living habits. As one doctor explained:

"In the past, material products were not particularly abundant […] the priority was to solve the problem of keeping warm and fed, that is, poverty alleviation. When productivity and society were not as developed and products used by us were scarce, people had to be frugal. We had to learn to save paper, textbooks, and clothes. Clothes were handed down from older siblings to younger ones because there were many children in the family. Food was also scarce, so people had to be frugal with bread, noodles, and rice, and anything left over from a meal was saved for the next one. This is a tradition of thrift. This mindset of saving and being resourceful is still ingrained in the Chinese culture, even

though it may not be as necessary as before.” (C10)

The culture of frugality further influenced the behaviour of medical staff, making frugality a habitual part of their daily lives and work practices. As some medical staff commented:

> “[…] Basically, these behaviours are just part of my daily habits. I'm not really a wasteful person to begin with. So if a faucet is running, I'll go ahead and turn it off. And if there's a piece of paper that can still be used, I'll save it for later.” (C4)

> “It may not save a lot of money, but it's more about having a resource saving consciousness. Wasting paper means wasting trees, so it's become a habit for us to conserve resources. Protecting our natural resources is something we should take seriously, so we try to save as much as possible.” (C7)

The bonus system is further connected to cost control by its incentive scheme. In cases where the healthcare insurance funds designated for a given fiscal year were fully utilized prior to its culmination, the hospital assumed fiscal accountability for any healthcare expenditures that surpassed the predefined budget. This excess spending was referred to by physicians as a 'penalty' in interviews. As a doctor put it:

> “The more patients we admit, the higher the medical insurance expenditure becomes. However, the total amount of funds allocated remains fixed. As a result, we incur significant medical insurance over-expenditures every year, which lead to penalties of several hundred thousand yuan.” (C5)

In practice, these penalties were further apportioned among individual clinical departments and the physicians. Consequently, it is the doctors themselves who ultimately bear the direct consequences of these penalties. As a doctor put it:

> “Medical insurance only provides a certain amount of payment, and the hospital can’t receive more than that. So, if the actual medical expenses go over that amount, the hospital has to cover the extra expenditure. This part of the expenditure will be distributed to departments that exceed their quota. Within these department, the penalties are then distributed among the doctors.” (C10)

As the department bonus was subsequently distributed within the department, clinicians were inclined to believe that higher overall bonuses offer greater potential for increased individual bonuses. As a result, the desire to obtain greater bonuses led doctors to acknowledge the necessity of cost control. As some doctors explained:

> “We definitely want to keep our departmental costs under control because they directly affect the performance-based bonuses that will be distributed to individuals later […] In the process of turning the department’s total revenue into the bonus, deducting the department’s cost is an important step [...] revenue-generating items, such as outpatient visits and hospital beds, have become saturated in our department. And our patients are fully admitted. In this case, the only way of increasing bonus is minimising expenditure.” (C2)

> “The more expenses that are deducted, the less bonus we'll receive in the end. Actually, when they deduct costs, they're reducing our bonuses, and when we control costs, we're increasing our bonuses. So, of course, we should save wherever we can." (C16)

2.2.3 The professional development aspect of the bonus system

The incentive role of the bonus system is also underscored by its strong link to the professional development of both departments and individual clinicians. On the one hand, the case hospital actively promoted the advancement of new medical technologies within its departments. The cost control process did not incorporate the expenditure allocated for the development of medical technology. As a doctor explained:

> “The expenditure for implementing new technologies and new medical services in the department falls outside the scope of cost control and departmental budgeting. As long as it benefits the development of the department, such as our department's artificial liver and polymeric anticoagulation techniques […] the hospital doesn't impose significant restrictions on this. We can procure the necessary equipment as needed […] The hospital provides a temporary declaration channel for this aspect, and the costs incurred through this channel won't be included in calculating department's costs.” (C9)

On the other hand, the hospital assessed the implementation of advanced medical technology through the performance measurement process applied to both departments and individual clinicians. The performance indicators utilized in this process aligned with the regulations established by the State Council. These indicators assess 3A hospitals from diverse angles, encompassing metrics such as the "proportion of Level-4 surgeries among discharged patients." According to clinicians in surgical department, Level-4 surgeries, along with Level-3 surgeries, were classified as intricate operations demanding advanced medical technology and

substantial efforts from medical practitioners. These indicators were further related to the departmental and individual bonuses. As a doctor explained:

> "In the surgical department, the number and complexity of surgeries are really important. It's measured by looking at how many Level-4 and Level-3 surgeries we do. The more Level-4 surgeries we do, which are the really complicated ones, the higher the bonus we'll get." (C12)

The bonus incentive structure for Level-3 and Level-4 surgeries consists of two parts. Firstly, doctors were required to achieve a specific number of these surgeries within each annual period. As a doctor put it:

> "Our senior doctors in the department are theoretically required to perform at least 100 Level-3 and Level-4 surgeries per year. In other departments, doctors need to perform at least 120 of these surgeries per year. For the most difficult surgeries, namely Level-4 surgeries, they should account for at least 15% to 20% of these surgeries." (C10)

Secondly, for medical staff involved in Level-3 and Level-4 surgeries, the case hospital offered supplementary economic rewards as an incentive. As a doctor explained:

> "Our hospital has a bonus incentive, which is to give additional rewards to all members of the surgical team, including the lead surgeon, assistants, anaesthesiologists, and nurses, for high-difficulty surgeries such as Level-4 surgeries. For example, the surgeon will be rewarded with 300 yuan, the first treatment group will be rewarded with 200 yuan, the second treatment group will be rewarded with 100 yuan, the anaesthesiologist will be rewarded with 200

yuan, and the instrument nurse will be rewarded with 100 yuan, and so on […] These surgeries are really tough - they come with high risks, are quite lengthy, and require doctors with some seriously top-notch medical skills. " (C10)

From the perspective of medical staff, the essence of bonus incentives for high-difficulty surgeries was to promote medical progress, while economic incentives served merely as a means to that end. As a nurse put it:

> “Let me give you an example to illustrate this point. A highly complex surgery performed by the cardiovascular and thoracic surgery department may generate less revenue than 100 simpler appendectomy surgeries performed by a general surgery department. Nevertheless, the hospital will still encourage the department to perform more complex surgeries in terms of bonuses. The purpose is to encourage the development of medicine.” (C7)

In internal medicine departments, bonuses were also distributed based on the level of medical procedures. Medical staff were awarded more bonuses for participating in high-demand medical procedures. A director of an internal medicine department provided an example to illustrate this point:

> “20% of our department's overall bonus is allocated for secondary distribution within the department. For instance, in nursing, when nurses perform a high-difficulty dialysis procedure such as bedside hemofiltration, we reward them with bonus incentives. This work is very demanding, requiring at least eight hours of work for each procedure. The nurse must monitor the patient's vital signs and treatment process for the entire eight-hour period, focusing solely on that one patient. Therefore, we reward each completed procedure with 300

yuan […] Our incentive mechanism encourages everyone to undertake hard work that yields productive results, such as work that reflects medical value and high-level technical skills." (C9)

The incorporation of professional advancement within the bonus system received significant support from clinicians. As some doctors commented:

> “I feel like this is a great way to acknowledge the medical skills of doctors, and it motivates me to keep improving my own expertise, taking on more challenging surgeries and honing my skills to become even better.” (C13)

> “Allocating bonuses based on medical activities is a fair method. A greater workload leads to a higher level of bonuses. No matter how well the cost is controlled, bonuses will not be generated without conducting surgery. Therefore, it becomes necessary for us to increase the volume of surgeries and the number of advanced surgeries in order to increase bonuses.” (C14)

2.2.4 The income-generated aspect of the bonus system

Another aspect of the bonus system, which focuses on evaluating the performance of departments as well as clinicians through performance measurement indicators, serves as a guide for doctors to enhance income generation. The performance indicator that doctors were most attentive to was the bed turnover rate. During the interview, medical professionals highlighted its significant role in boosting the volume of admitted patients. Their perception is rooted in the notion that an increased patient number directly corresponds to greater revenue, subsequently enhancing the potential to secure more bonuses. As some doctors explained:

“The statistics in China show that patients are more likely to generate income in the first four days of hospitalization […] This is because the patients have not been fully diagnosed in the first four days, so they are constantly taking medical examinations – medical examinations bring us money. This is why we need to speed up the bed turnover. The average turnover rate of large hospitals in China is seven days. It means that within this range, the admitted patients can maximize the income for the hospital […] So the hospital encourages us to increase the turnover rate. This is a very important way for us to earn the bonus.” (C6)

“The hospital has set the bed turnover rate for each clinical department, and it’s around 13 for us. If the actual rate falls below this value, our bonuses go down. However, if the bed turnover rate increases, our bonus improves […] In the past, nurses used to be quite resistant to admitting more patients and they often complained about being busy due to the increased workload. But now, they are urging us to admit patients because they've realized that the more patients there are and the higher the bed turnover rate becomes, the more overall bonuses our department will receive.” (C13)

“I feel that our hospital also encourages us to admit more patients. Because only by admitting more patients and effectively managing the turnover of department beds, such as optimizing bed utilization and turnover rates, can we increase our bonuses […] With more patients, our workload increases, and consequently, our bonuses may increase.” (C17)

Doctors also suggested that failing to meet the predetermined bed turnover rate could result in being labelled as "unqualified" during the performance evaluation process, potentially causing a detrimental impact on their bonus coefficient. As a doctor explained:

> “From the perspective of hospitals, the bed turnover rate is a significant performance measurement indicator […] The standard is established according to the patient turnover conditions of the preceding year. If we don’t meet the standard, our bonus coefficient will be deducted because we didn’t pass the performance measurement.” (C15)

On the other hand, physicians who surpass the standard will receive supplementary bonuses. As a doctor explained:

> “The bed turnover rate is included in the performance assessment system. After doctors achieve the prescribed turnover rate, any cases that they exceed will also be rewarded with additional bonuses. This may be helpful to motivate doctors to enhance their ability to admit patients and utilize bed capacity.” (C10)

In summary, the bonus system, which has been present in the case hospital since the initial phase of healthcare reform, incorporates cost control, medical professional advancement, and performance evaluation components within its structure. Functioning as an incentive scheme, the bonus system embodies both positive and negative attributes, manifesting them through financial components.

2.3 Summary

The two stages of healthcare reform have introduced diverse expressions of

commercial logic into the case hospital. While the global budget and the SDP system were explicitly implemented for the purpose of cost control, the bonus system exhibited a more intricate nature, encompassing elements of cost control, medical development, and income generation within its framework. The interrelation of these three elements imbues commercial logic with a somewhat complicated character, thereby rendering complex institutional requirements.

3. Conflicting situations between two logics

In the context of the case hospital, commercial logic manifested through the implementation of the global budget, the SDP system, and the bonus system. Clinicians perceived a conflict between the cost control principles embedded within commercial logic, specifically within the global budget and SDP, and their own medical values, norms, and practices. The requirements outlined in both accounting techniques introduced new approaches to the allocation and utilization of medical resources, which diverged from the established practices of clinicians. This will focus on depicting conflicting scenarios and exploring clinicians' strategies in response to these contradictory requirements.

3.1 Conflicting situations: the SDP, global budget and medical requirements

According to medical professionals, certain provisions within the medical insurance scheme, particularly those concerning the regulation of healthcare expenses, were likely to result in discordance between cost containment measures and the maintenance of medical standards. From the perspective of medical professionals,

one of the foremost principles in healthcare was individualized treatment. As a doctor commented:

> “The individualized nature of diseases is a well-established fact in medicine, and as such, personalized treatment is considered to be a critical principle in healthcare […] Even for the same disease, different individuals may exhibit varying symptoms, while the same person experiencing recurring symptoms may not necessarily be suffering from the same illness. We are thus required to conduct meticulous diagnostic procedures to identify the specific condition, reflecting our level of expertise.” (C6)

The approaches used by medical insurance to control healthcare costs, such as SDP and global budget control, were formulated to advocate for standardized medical practices. However, physicians perceive these approaches as conflicting with the principle of personalized treatment. As some doctors explained:

> “After these medical insurance requirements were put into effect, I feel like we doctors are working with a lot of constraints. We always have to keep in mind that medical insurance is monitoring us and evaluating our work, so we have to make sure every prescription and treatment we give complies with the regulations. Some of these rules may not align with the latest medical advancements or even conflict with the latest diagnostic and treatment requirements, which can make our work pretty inconvenient.” (C15)

> "Some guidelines require patients to undergo examinations on the first day of admission, have surgery on the second day, have a follow-up examination on the third day, and be discharged on the fourth day. However, it is impossible for

every patient to follow this pathway since each patient is unique." (C16)

> “After all, a patient's symptoms can differ significantly due to individual differences. This is not like a machine where doctors can simply follow standardized protocols and guidelines set forth by the medical insurance scheme. Each patient is unique and requires personalized care, and this cannot be achieved through cost control measures alone. If there are individual differences, then cost becomes insufficient to solve the problem.” (C17)

The manifestation of these situations was more pronounced in unconventional therapies. As a doctor explained:

> “In order to control costs, some of the guidelines set forth by medical insurance can be quite inflexible and mechanical […] When it comes to common illnesses, we can usually diagnose and treat patients within the guidelines set by medical insurance. However, in cases of complicated or rare diseases, such as when a patient with congenital heart disease suddenly develops pulmonary hypertension, we need to go beyond what is covered by medical insurance to provide the necessary treatment.” (C12)

As a result, the principles of personalized treatment and the restrictive requirements of medical insurance gave rise to numerous conflicting situations in medical practice. As some doctors commented:

> “The medical insurance scheme introduces certain restrictive measures, and we are required to follow cost control guidelines. But this can have unintended consequences for patients, such as limiting their treatment options or affecting

medical procedures.” (C2)

“The limitations imposed by medical insurance on treatment options are often too restrictive, which can lead to issues.” (C6)

The conflicts identified by medical professionals have primarily impacted patients in three ways: restricted medication usage, restricted treatment options, and restricted overall medical expenditure. This section will examine instances where cost containment requirements conflict with medical standards from these two perspectives.

3.1.1 Restricted medication list

As stated in Section 2, medical insurance imposed a variety of requirements on physicians regarding their medication practices. The most significant requirement was that physicians must select medications within the scope of the medical insurance list. From the perspective of doctors, such requirements could conflict with their treatment needs. A doctor illustrated this point with an example of newly developed medication:

"Every year, new drugs for treating rheumatism are introduced, and some of these new drugs have particularly good treatment effects. We can also learn about some new treatment methods through various sources. We are aware that these new drugs and treatment methods are definitely better than the ones we have, but because they have not been included in the medical insurance list, they may not be used in the treatment process for patients." (C4)

Another limitation of medical insurance on physicians' medication practices was that doctors must prescribe drugs according to the indications listed in the drug instructions. However, doctors proposed that in numerous clinical scenarios, off-label use of drugs was imperative. As a result, in these situations, there was a conflict between physicians' medical needs and the requirements imposed by medical insurance. As some doctors explained:

> “In terms of medication, for joint pain, you may need to use painkillers. Painkillers may cause irritation to the patient’s stomach, so I also need to use drug X to protect the stomach mucosa. However, this creates a conflict. Based on clinical experience, in such circumstances, we can use drug X. But X’s instructions do not specify its use for preventing painkillers' irritation to the stomach. It only states that it can be used in cases such as reflux esophagitis and gastric ulcer. Therefore, if I use this drug, medical insurance will consider it a violation of drug use regulations.” (C3)

> “Our department often treats patients with rare diseases. There is no applicable medicine for rare diseases, so we have to use medicines beyond the drug indications. In this situation, even if the medication is listed in the medical insurance category, we cannot use this medication if its indication is not listed in the directory.” (C4)

> “Some drugs related to the digestive system, such as liver-protecting drugs and gastric acid inhibitors, are often subject to strict control by medical insurance. We can understand the needs for cost control, but it is a bit dogmatic to completely prohibit us from using them. Whenever we try to prescribe such

drugs in the system, an alarm is triggered, warning us that it is considered irrational use.” (C6)

Furthermore, medical insurance divided the drugs listed in its directory into three categories: Type A, Type B, and Type C. Type A drugs were subject to full reimbursement, while Type B drugs were eligible for partial reimbursement. Type C drugs, on the other hand, were not eligible for reimbursement. Medical insurance mandated doctors to prescribe drugs from the first category for these three types of medications. This particular requirement had the potential to create conflicts or tensions. As a doctor put it:

“The thing is, medical insurance divides drugs into these three categories, but most of the drugs we use in our department are Type B. So, every time we prescribe or use these drugs, it's like we're breaking the rules. It's really frustrating because this really puts a big damper on what we can do in terms of medical work.” (C5)

These conflict situations became more pronounced due to the presence of punitive measures in medical insurance. As some doctors commented:

“Medical insurance often tries to keep costs under control by excluding certain items or procedures from coverage. If the medical insurance doesn't cover it, and the patient doesn't pay for it, then the doctor would have to pay for it out of their own pocket. It's a complicated issue that can cause conflict in medical practice.” (C10)

“Sometimes, if drugs are used without appropriate indications or used for off-

label indications, doctors may face penalties from medical insurance. In such cases, the penalties can be tripled […] It can be really tough sometimes to navigate between medical insurance and actual healthcare.” (C14)

From the perspective of medical professionals, the medication restrictions mentioned above could have negative impacts on the therapeutic outcomes for patients. As some doctors explained:

“When it comes to Type A and Type B drugs, it’s unlikely that medication instructions would explicitly state that Type A drugs are superior to Type B drugs. But based on what we've seen in clinical practice, we believe that the more expensive drugs usually work better than the cheaper ones. It's like the saying goes, ‘you get what you pay for.’ However, these drugs are often limited by medical insurance coverage, so they can't always be used. In fact, the medication a patient receives plays a critical role in determining their treatment outcome.” (C8)

“Right now, we are prescribing medication based on what medical insurance allows, rather than what's best for the patient's condition. This is a problem because every patient is different, and these restrictions can lead to situations where we don't have the right medication when it's needed, which can definitely impact the patient's treatment and recovery.” (C13)

Because the medical insurance imposed restrictions on medication lists and drug classification, doctors had limited options for drug selection and drug use during medical treatment. The mismatch between the regulations of medical insurance and

the needs of treatment created the first conflict situation.

3.1.2 Restricted diagnosis and treatment options

In addition to restrictions on medication, medical insurance also imposed limitations on medical examinations and services. These limitations were primarily implemented in two ways: firstly, medical insurance did not reimburse for advanced medical services and equipment, and secondly, medical insurance required that medical examinations used by doctors must be consistent with their diagnosis. These restrictions resulted in conflicts between medical activities and the requirements of medical insurance.

In terms of the first limitation, medical staff pointed out that the high-quality medical consumables that had been used were no longer available. They expressed concerns that using alternatives covered by the medical insurance may have a negative impact on the quality of healthcare. As some medical staff explained:

> “According to the regulations of medical insurance, many things cannot be charged for, such as the catheter needles used for infusion. In accordance with the previous infusion operation, we would use a catheter needle to place a deep vein catheter in the patient, which could reduce subcutaneous oozing by avoiding repeated puncturing of blood vessels, reduce damage to blood vessels, and facilitate drug absorption. However, now that we can't charge for it, we can only give patients injections every day. After a few days, the patient's veins are all bruised, to the extent that there are no intact veins to be found on the entire back of the hand. This will definitely have a negative impact on treatment.” (C2)

> “Medical consumables such as catheters are often costly, and medical insurance may not cover their use. However, in some cases, they may be necessary for patient care. This creates a conflict between cost control and the medical needs of patients.” (C7)

The limitations also prevent doctors from using treatment plans that may be more suitable for patients, which can have negative impacts on the patients.

> “For example, in treating heart valve disease, the traditional way is open-heart surgery. But now we have minimally invasive surgery. It's still not cheap, and the cheapest one costs almost 200,000 RMB, which definitely can't be reimbursed by medical insurance. Some patients, however, can't undergo traditional surgery because of their underlying diseases or poor heart function. From a doctor's perspective, minimally invasive surgery is better, but because it's not covered by insurance, some patients have to opt for the more risky open-heart surgery. For these patients, their future recovery and medical safety are negatively affected.” (C17)

In terms of the second limitation, doctors argued that such regulations fail to consider the complexity of the diagnostic and treatment process, and could be detrimental to their ability to diagnose diseases accurately. As some doctors put it:

> “If a patient comes to me with joint pain, and I use a thyroid ultrasound or a high-resolution CT scan of their lungs, the healthcare insurance would consider it a violation of their rules because the medical tests don't seem related to the initial diagnosis. But the thing is, I'm using these tests because joint pain can be

a symptom of certain conditions. For example, rheumatoid arthritis can cause joint pain, and it is a systemic disease, so we need to use these tests to confirm it. Or systemic lupus erythematosus, which starts with joint pain, requires us to use these tests to screen and evaluate whether it is the disease. Therefore, all the tests I use are necessary for proper diagnosis and treatment. But the medical insurance doesn’t allow it now.” (C3)

“As internal medicine doctors, our most important professional skill is the differential diagnosis. So, we use certain medical examination items to help us make a diagnosis. For example, if a patient has a shadow on their lung, I might choose to do a sputum culture with antibiotics, or I might check for tumours, rheumatic diseases, allergies, or even use all of these methods. Different patients require different examinations and methods. But, unfortunately, medical insurance doesn't allow for this flexibility. They might not approve some of the tests I use, and they might not agree that they're relevant to the diagnosis of a lung shadow.” (C6)

“For example, when a patient is admitted, I might write "pneumonia" as the initial diagnosis because I suspect that the person might have an infection. But behind the infection, I might also suspect that there's a tumour, tuberculosis, other granulomatous diseases, and so on. However, when admitting the patient, I can't write all of these potential diagnoses - it would be ridiculous to list ten different diagnoses for one patient. So, I write the most accurate diagnosis, and then in the ward, I start the process of differential diagnosis, step by step, using medical examinations to check for potential causes. This is

the purpose and function of hospitalization. However, medical insurance doesn't allow the use of these subsequent medical examinations, reasoning that these tests do not match the diagnosis that was made when the patient was admitted." (C6)

Due to cost-control considerations, medical insurance imposed restrictions on the use of some diagnostic methods, as well as high-end treatment options. These restrictions were inconsistent with the diagnostic and treatment traditions of medical professionals and may have negative effects on the treatment outcomes and diagnostic processes of patients. As a result, the second type of conflict arose.

3.1.3 Restricted overall medical expenditure

Another source of conflict between medical insurance and healthcare activities stemmed from the SDP system's control over the overall treatment costs and medication expenditure. The control of the total treatment cost was criticized by doctors for primarily considering routine treatment of patients, while neglecting the special treatment situations. As some doctors put it:

"The single-disease payment system that we have now doesn't really work for new procedures and technologies. For example, when it comes to minimally invasive surgery, the prices set by the single-disease payment system are just too low. If we use the drugs and supplies recommended by medical guidelines and chosen from the medical insurance directory, the cost will almost always exceed what the single-disease payment system offers for minimally invasive surgery. This creates a pretty big problem." (C14)

"For example, for haemorrhoid surgery, medical insurance requires that the maximum amount spent on this disease is 6,000 yuan, and any amount spent beyond that will not be reimbursed by the insurance. In most cases, 6,000 yuan is sufficient to treat this disease, but in special cases, patients may have complications. If the patient gets infected and cannot be discharged temporarily, then the 6,000 yuan will not be enough to cover the treatment. There are still many uncertainties with the patient's condition. Before admission, it may just be a simple case of haemorrhoids, but it does not mean that the patient will not have other problems after surgery." (C16)

"After all, the medical insurance is set to cover the majority of cases, usually around 90% of cases. For example, in the single disease payment, a specific total fee can only be spent on a certain type of disease. However, there are some special situations in clinical practice where the cost may not be sufficient. For instance, if patients undergo heart surgery and their blood test results remain high post-operation, or if they have a lung infection or bronchitis on chest X-ray, the use of antibiotics may be prolonged and the patient may need to stay in the ICU for a longer period of time, in which case the cost covered by medical insurance may not be enough." (C17)

In terms of medication expenditure, medical insurance primarily restricted by employing the drug proportion, which referred to the proportion of drug expenditure to total expenditure. This requirement, as perceived by doctors, may not fully consider the unique situational challenges encountered by certain departments, such as an abrupt surge in the number of critically ill patients. As a doctor explained:

> “Our department is restricted to a drug cost ratio of no more than 45%, meaning that for a patient with a total medical cost of 10,000 yuan, the cost of medication cannot exceed 4,500 yuan. However, our department often receives a large number of critically ill patients, which leads to increased medication usage. They may need high-priced medications or require more medication than usual, which drives up costs […] As a result, it is inevitable that our drug cost ratio will exceed the limit. Therefore, this restriction is deemed somewhat unreasonable." (C6)

With regard to drug proportion, the medical insurance schemes also implemented punitive measures. As a doctor explained:

> “Different departments have different requirements for the proportion of drugs. The drug proportion requirement for our department is 45% [...] if we go over the limit, our department gets hit with a fine. It doesn't happen too often since we keep a close eye on the drug costs, but we have been fined a few times.” (C5)

The control exerted by medical insurance over the total medical expenditure and drug expenses led to a third conflict situation. By regulating these two categories of expenses, medical insurance aimed to standardize medical practices, but this objective was at odds with the differentiation of medical activities. Punitive measures targeting drug proportion also exacerbated the incompatible relationship between the two.

3.1.4 Summary

Medical staff's perceptions of conflict between commercial logic and medical logic primarily manifest in three dimensions: limitations on the medication list, constraints on diagnostic and treatment plans, and curbs on overall medical expenditure. Through the introduction of accounting techniques, namely the SDP system and the global budget, these limitations were regarded by medical staff as constraining their rights in using medical resources, and they perceived commercial logic as a potential threat to their medical practice. The next section will illustrate how they responded to conflicting institutional requirements.

3.2 Responses to conflicting situations

The theory of institutional logics offers profound insights into the methods in which both organisational and individual actors address conflicting institutional requirements. Through an organisational lens, Oliver (1991) examined the conflicting situation and introduced four distinct strategic responses: compromise, avoidance, defiance, and manipulation. Pache and Santos (2013b) directed their focus towards individual practices and condensed their findings into five response strategies: ignorance, compliance, defiance, compartmentalization, and combination. Gebreiter and Hidayah (2019) expanded upon these responses by offering additional sub-categories: enforced compliance, internalised compliance, compliance through exhaustion, instrumental compliance, categorical defiance, defiance with justification, and blending and translation under the combination category. Despite this study's individual-level scope, Oliver's (1991) discoveries concerning organisational responses could also be applicable in analysing individual responses. This section will draw on these studies to categorize medical staff’s responses as well as

developed some nuanced sub-categories in data analysis.

3.2.1 Combination

According to Oliver (1991), when confronted with conflicting demand from various institutional constituents, organisations might adapt institutional prescriptions with minor modifications, aiming to strike a viable equilibrium between the contradictory expectations. Pache and Santos propose that individual also attempt to integrate some of values, norms, and practices prescribed by the competing logics (Pache and Santos, 2013b). The way of partially satisfying the demands from different institutional logics was also observed among clinicians. Multiple institutional requirements were therefore combined in either a situational way or a compromised way.

Situational combination

The situational combination is a strategy that was observed in clinical departments. It refers to the instances where clinicians assumed the responsibility of cost control within the boundaries permitted by medical considerations. Considering the global budget, doctors made some adjustments to the way they admit and discharge patients. When admitting patients, doctors considered ratio of severe cases to common cases. This combination only occurred when the budget was about to be used up, yet it contributed to controlling costs within a specified scope. As a doctor explained:

> “If the NMIS budget is about to be used up and we have already admitted too many seriously ill patients, we need to admit more common patients to balance the ratio. The cost of medical insurance for a critically ill patient is three times

that of a common patient, so continuing to treat seriously ill patients is not conducive to controlling the use of medical insurance. So, after admitting common patients, the average medical insurance cost will drop." (C10)

In the context of patient discharges, clinicians also employed an early-discharge approach as a means of cost control. Patients might be recommended by clinicians for discharge when their major symptoms were relieved. As some doctors put it:

"Because the SDP has fixed the costs for a particular disease, for patients with this disease, we need to control the expenses within this range […] When patients' symptoms improve slightly, we can advise them to leave the hospital instead of waiting until they are completely cured […] Patients can be discharged as long as the treatment of the patient's primary diagnosis at the time of admission has been finished. For some related complications, they can go to the outpatient clinic for review or go to other departments after discharge." (C14)

"According to the requirements of SDP, the patient's surgical expenses are fixed, like 6,000 yuan. The cost of preoperative examinations and routine tests has already been determined by the SDP. In most cases, after paying these fixed costs, we have already reached the expenditure limit. In this case, the longer the hospitalization time, the higher the medical expenses. Therefore, we try to save as much as possible. We shorten patients' hospital stays sometimes. For example, if a patient is supposed to stay in the hospital for five days, we will discharge them after three days when there has been some improvement in their condition." (C16)

Combination through compromise

According to Oliver (1991), organisations may resort to compromise when faced with conflicting institutional demands, but they strategically find ways to accommodate multiple institutional requirements. In response to the cost-control requirements of the SDP, medical staff might opt for more economical alternative products, bypassing the use of more advanced drugs or medical consumables. Although this led to a compromise on optimal medical treatment plans, medical staff ensured the fulfilment of fundamental patient treatment requirements while adhering to the SDP mandates. As some medical staff put it:

> “In our department, we used to use disposable catheters, adhesive films, regulators, light-shielded infusion sets, and disposable skin scrapers used for preparing the skin. But now, according to the medical insurance regulations, we can't charge for these items. Therefore, we have to choose the cheapest alternative products to save costs and reduce losses […] Take the light-shielded infusion set as an example. It costs around 30 yuan and has functions such as light-shielding, regulating, leak-proofing, and air-leak prevention. However, due to the requirements of medical insurance, we can no longer use it and can only use the most basic infusion sets that cost around 3 yuan.” (C2)

> “As medical staff, we should consider costs […] for example, infusion connectors have different prices […] One is 58 yuan, and the other is 23 yuan. Although the first one is easier for us to use, it hasn’t been included in the NMIS reimbursement list. Therefore, considering costs, we won’t use it.” (C11)

In some instances, the compromise made for cost control had detrimental implications for patient well-being and may potentially impede the pace of recovery. As some doctors explained:

> “There are some patients whose veins are not in good condition, for example, the elderly or patients who have been using hormones for a long time. Therefore, we use disposable trocars to minimize damage to their veins […] The trocar can lower the subcutaneous exudation, reduce damage to the patient’s veins, and increase the absorption rate of the medicine […] But now, considering its high costs, we seldom use the trocar.” (C2)

> “To control costs, we tend to choose oral medication over intravenous injection for treatment, as the latter is time-consuming and more costly. Although intravenous injection may be a better option in some cases, we have to consider cost and opt for a cheaper alternative. We have to settle for something less desirable as a first choice.” (C3)

> “According to the NMIS, I can only use some common medicines [...] However, for critically ill patients, newly developed medicines are so effective that some patients' symptoms can be significantly relieved within five or six days. But I have to choose the common ones. These medicines may not work as quickly as more advanced options, but they can still meet the treatment needs.” (C14)

In other cases, such compromises brought about inconveniences in doctors' medical practices. As a doctor put it:

> “We have three options for changing dressings for patients: small-scale is 10

yuan, medium-scale is 20 yuan, large-scale is 30 yuan [...] there is a transparency membrane which is very easy for me to use and to clean the wound, but it's very expensive, with a piece costing more than 10 yuan. And for each dressing change, I need to use at least one piece. In that case, the cost of using this membrane can't be covered by charging patients for every dressing change. So considering this, I don't use it anymore and simply use medical tape to stick the gauze." (C4)

3.2.2 Avoidance

As outlined by Oliver (1991), avoidance occurs when organisations attempt to preclude the necessity of conforming to institutional pressures and concealment, buffering, and escape are tactics under this category. This was also identified at individual level in clinical departments. The data also reveals several sub-categories of avoidance, namely avoidance through concealment, avoidance through transfer, and avoidance through escape.

Avoidance through concealment

Concealment is a strategy that organisations employ under the conditions of competing institutional logics. Organisations mask their non-adherence to institutional requirements by projecting a facade of compliance (Oliver, 1991). Clinicians within the case hospital employed this strategy when attempting to administer restricted medications and medical examinations to patients who did not exhibit symptoms as stipulated by the NMIS. They adjusted the diagnosis of these patients to correspond with the NMIS criteria, thereby justifying their utilization of restricted medical resources. As some doctors explained:

“Sometimes we have to modify a patient's diagnosis in order to get the treatment covered by insurance. For example, medicine A is approved for treating rheumatoid arthritis. But the patient who has a rare disease doesn’t have symptoms of rheumatoid arthritis. According to the NMIS requirements, this medicine can’t be used in this case. But according to medical practice and experience, medicine A is very effective in treating this rare disease. However, If we list the rare disease as the diagnosis, the insurance will not reimburse it. In this case, we have to change the diagnosis to rheumatoid arthritis so that the treatment can be covered by insurance. Although changing the diagnosis is not entirely compliant with regulations, it doesn't compromise the patient's treatment.” (C4)

“For example, a 30-year-old patient has a patent ductus arteriosus. Usually, a CT evaluation is better for patent ductus arteriosus, but CT can only be used to evaluate chest pain. In this case, if I want to use CT for evaluation, I need to be flexible. I need to record in the medical records that the patient has chest pain or coronary heart disease. I also need to mention that to prevent misdiagnosis, I use the coronary CT. I must justify the use of this medical examination. By making this change, I will not be judged as violating medical insurance regulations.” (C13)

Avoidance through transfer

Avoidance through transfer is a pattern that was observed in the case hospital. In some cases, doctor avoided being involved in commercial logic by transferring part of their decision-making rights to patients and their families. When clinicians required

restricted medical resources, they would inform patients about the option of self-funding for these resources and leave the final decision to the patients and their families. Clinicians employed avoidance tactics by shifting the burden of cost control responsibilities to patients and transferring their decision-making role to resource allocators. Some doctors gave examples related to medication to illustrate this viewpoint:

> “For example, the patient is critically ill and I must use human immunoglobulin. Considering the medical cost, my first thought is not to use this medicine, but I also need them for treatment. In this situation, I would suggest the patient buy this medicine outside the hospital […] Human immunoglobulin is restricted by the NMIS because it is too expensive. This medicine costs 5000 yuan a day, and if it is used continuously for five days, it will cost about over 20,000 yuan. This will definitely have a negative impact on the medicine proportion of the department. So if we take this into consideration, we will advise patients to buy this outside the hospital.” (C2)

> “In some situations, we cannot use drugs as we want. Therefore, we may find some self-paid medicines and ask the patient to sign the consent form. Because if patients pay for these medicines, we will not be punished for using these medicines by the NMIS […] For example, among three categories of drugs in the NMIS, Type A has the highest reimbursement rate, Type C is fully self-funded, and Type B is partially reimbursed. The drugs we use most are Type B drugs, but sometimes the system will flag the use of Class B drugs them as a violation. In such cases, we prescribe Type C drugs instead and ask the patient to pay out of pocket.” (C5)

> “The cost for different types of surgeries is fixed now. After we complete the standard procedures, we start getting close to the limit covered for that specific disease. At that point, to save costs, I usually suggest to patients that they might want to buy the necessary medications on their own.” (C16)

Medical staff also extended the same strategy to non-reimbursable medical consumables. As some doctors put it:

> ”According to the regulations of medical insurance, there are many consumables that we cannot charge for now. For example, some of our patients need skin preparation, and skin preparation requires disposable hangers, which will definitely cost money. But now medical insurance does not cover these costs. So if we need to use these, we will ask the patients to buy them themselves.” (C2)

> “Conflicts arise when a patient must use a medical consumable that is not covered by the NMIS. We usually ask patients for their opinions and tell them like this: ‘you must use this medical consumable […] ordinary infusion sets cost 1 yuan, while special infusion set costs more than 10 RMB yuan and is not covered by medical insurance. You can choose to use it, but the medical insurance will not reimburse you.’ Then patients will pay the fee by themselves.” (C7)

> “If the patient must use a better medical product, but the medical insurance does not reimburse it, we must make it clear to the patient in advance. If a

certain product is not applicable and we have to use another product that is not reimbursed by medical insurance, we also need to make it clear to the patient. If we did not tell the patient's family in advance and use the product for medical treatment, they may be dissatisfied with this." (C10)

"For example, in our department, we often use a device called intra-aortic balloon pump as a cardiac assist device during surgery. If a patient's condition requires it, we will send a doctor to inform the family and ask for their consent to use this device. Since this device is not covered by medical insurance, we must inform the patient and their family that it is a self-funded option before using it." (C13)

Avoidance through escape

Another tactic that Oliver (1991) proposed in avoidance is escape. According to Oliver (1991), an organisation could opt to exit the realm where institutional pressure is exerted, or alternatively, make substantial alterations to its goals and practices in order to completely evade conformity. This occurred at the individual level. Some clinicians declined to admit patients, particularly those in critical condition, when the department's allocated budget was approaching depletion. Deviating from the norm that dictates treating patients irrespective of their individual attributes, clinicians resisted the cost control responsibility imposed on them by abstaining from entering conflict situations. Many clinicians provided examples in this regard:

"Since there is a payment limit for a single disease, we have to consider whether or not we should admit critically ill patients. The more critically ill patients we admit, the higher the likelihood of exceeding the payment limit,

which increases the probability of doctors being penalized. For example, if we admitted 70 critically ill patients out of a total of 400 patients this month, we might not receive any bonus for our efforts. We worked hard and paid a high cost, but our bonus would be very low. Therefore, we do not consider admitting critically ill patients." (C1)

"One year, the NMIS notified our hospital in October that the medical insurance limit for the year had been reached. This meant that for the remaining two months, medical expenses for patients would not be reimbursed by medical insurance. It means, if a patient incurred a medical bill of 10,000 yuan, the patient would only pay 50%, and the remaining 50%, which should be covered by the medical insurance, are now covered by the hospital and doctors. Therefore, we tried to avoid admitting medical insurance patients in the last two months of the year as much as possible. We would suggest that patients with minor illnesses seek treatment at community hospitals, and we generally did not admit critically ill patients." (C4)

"The amount paid by medical insurance to hospitals is typically fixed, for example, the medical insurance allocated 20 million yuan to the hospital this year. If this amount is exhausted in the first half of the year, the hospital will inform all departments to control their costs. To control departmental costs, the total medical insurance limit must be considered. Consequently, when such notifications are issued, we may consider refusing critically ill patients for admission. Although the total number of patients cannot be controlled, we know that the medical insurance limit for severely ill patients is often insufficient to

cover their expenses. A severely ill patient can incur tens of thousands of yuan in medical expenses, which can easily surpass the total medical insurance limit. And it is highly likely that we would end up bearing half of these expenses. Therefore, we usually refer severely ill patients to other hospitals for treatment." (C6)

3.2.3 Defiance

In Pache and Santos's work (2013b), defiance occurs when individual explicitly rejected the norms, values, and practices prescribed by a given logic in competing institutional contexts. Individuals possess an awareness of the prescriptions set forth by the given logic, yet they choose to disagree with them. Gebreiter and Hidayah (2019) further categorised defiance into categorical defiance and defiance through justification, and the latter one was also recognised in this study.

Situational defiance

Situational defiance is a strategy that was observed during the interviews in the case hospital. It encompasses situations where clinicians solely adhered to medical logic and made no endeavours to exercise cost control. It is situational because the defiance occurred in medical emergency situations. As a doctor commented:

> "In some urgent cases, such as situations where a patient's life is in danger, we definitely won't consider cost control requirements. In such scenarios, we will choose to prioritize patient care even if it means exceeding the limit set by the SDP, because our priority is to rescue the patient." (C13)

This scenario was even more pronounced in surgical departments. As some doctors

explained:

> “Especially when performing heart surgery, if something unexpected happens, we certainly need to act fast and use what we need as quickly as possible. As doctors, saving lives is always paramount. If a patient's life is in danger, the consequences could be really bad. Therefore, when faced with such situations, we can't worry about costs and must use whatever supplies are necessary. This is a matter of saving lives. (C12)

> “When a patient is in trouble or if it's an urgent situation, we don't have time to worry about the cost of supplies - saving lives is our top priority. Especially when we do minimally invasive surgeries, we have to be extra prepared to prevent any potential complications, like bleeding from the femoral artery after surgery. Normally, we only need to use one or two packs of supplies for a regular surgery, but to be prepared for emergency situations, we may need to open four or five packs or even more at one time, because we may not have time to open another pack if something goes wrong. Sometimes we may end up wasting some supplies, but again, saving lives is the most important thing. Our principle in these situations is that no matter how much the cost exceeds the limit, we must ultimately ensure that the patient is cured.” (C17)

Defiance with justification

In Gebreiter and Hidayah’s work (2019), defiance with justification emerges when individuals reject conflicting institutional demands and concurrently offer rationales for their choices. Within this study, when clinicians prescribed restricted medications or medical examinations, potentially contradictory to the NMIS regulations, they were

afforded opportunities to provide justifications for their conduct to the NMIS. As some doctors explained:

> “The medical insurance has set up an electronic monitoring system to keep track of the diagnoses we provide to patients, and to check whether the prescribed medications and medical examinations match up with those diagnoses. If there are any inconsistencies, the insurance will give us a heads-up and provide us with two chances to appeal. This gives us the opportunity to explain the reasons behind our medical decisions.” (C6)

> “The medical insurance has an electronic appeals system now. If they notice any issues with the medication or medical examinations we provide, they'll let us know. Then we can find some medical guidelines or consensuses to back up our choices. If the insurance agrees with our reasoning, then we won't face any penalties.” (C10)

However, given the complex and time-intensive appeal process, doctors were hesitant about whether to opt for this approach or not. As some doctors explained:

> “Appeals have both successful and unsuccessful outcomes. Generally, if there is inappropriate medication use, the medical insurance will first impose a penalty and then allow us to file an appeal. After the appeal, if the medical insurance determines that our argument is reasonable, they will reimburse us afterwards. However, many times the reimbursement ends without any resolution.” (C10)

> “As physicians, we already have a lot on our plate, from treating patients to

managing their care. Having to explain our medication choices to the medical insurance just adds to our workload and takes up precious time. If the insurance finds an issue with our prescription, we have to go through the hassle of submitting additional documentation, taking pictures of the medical records, and providing reference materials for the medication. It's quite draining and there's still no guarantee that the appeal will be successful. Generally speaking, we don't like to file appeals unless there's a compelling reason to do so.” (C14)

3.2.4 Summary

When confronted with conflicting institutional values, norms, and practices from commercial and medical logic, medical staff manage them by combining both logics, avoiding the impact of commercial logic, and defying commercial logic. This study further identified some variation within these broader categories of responses and developed seven sub-categories, namely situational combination, combination through compromise, avoidance through concealment, avoidance through transfer, avoidance through escape, situational defiance and defiance with justification.

The enforcement of the three accounting techniques of commercial logic was executed in a coercive manner, minimizing the possibility for comprehensive rejection by medical staff of its associated institutional requirements. The understanding of how commercial logic functioned empowered medical staff to strategically address and manage these institutional demands. Therefore, although the responses fall into the categories of combination, avoidance, and defiance, the sub-categories reflect individuals’ ability to navigate the conflicting situation.

4. Concluding remarks

Within clinical departments, the commercial logic was manifested through the implementation of the global budget, the SDP system, and the bonus system. While these accounting approaches aimed to instil cost control concepts among medical staff, they were often perceived by them as conflicting with the prescriptions of medical logic. The implementation of the global budget and the SDP system introduced new ways for managing medical resources with a strong emphasis on cost control. However, these methods contradicted the longstanding autonomy that medical logic had historically conferred to clinicians in the allocation of resources. Medical staff's familiarity with the operation of commercial logic enabled them to craft strategic responses when confronted with the enforced requirements of cost control. This level of understanding allowed them to navigate the complex interplay of conflicting institutional demands.

Chapter 8 Discussion

1. Introduction

The primary objective of this study is to understand physicians' perceptions concerning the relationship between medical practice and the management of healthcare costs, with a particular focus on doctors' perceptions of multiple institutional requirements from medical practice and cost control. By employing a combination of semi-structured interviews and document analysis, along with a thematic data analysis rooted in the framework of institutional logics, this research firstly identified two institutional logics in the case hospital, namely commercial logic and medical logic, and then found that doctors' perceptions of the relationship between two logics are contingent upon contextual factors. Doctors belonging to clinical departments and those involved with the lab department exhibit divergent perspectives on relationships between two logics. While doctors from clinical departments perceive conflicting interactions, their colleagues from the lab department perceive non-conflicting associations. The way doctors perceive the interaction between these two logics also plays a crucial role in shaping their responses to institutional pluralism. On the one hand, doctors in the clinical departments display more strategic responses to cost control requirements, including combination, avoidance, and defiance. On the other hand, doctors from the lab department are more inclined to embrace cost control requirements and integrate them into their medical practices. In this chapter, these findings will be comprehensively interpreted, with an in-depth analysis of the factors contributing to the varying perceptions and responses exhibited by doctors. Furthermore, this study places its findings within the broader context of the ongoing discussions in hospital

accounting literature regarding the relationship between cost control and medical quality, as well as the emergence of hybrid medical professionals. The findings indicate that both discourses are influenced by contextual factors, with cultural elements playing a prominent role in this particular case study. This chapter will provide a more comprehensive explanation of this point.

2. Medical professionals' perceptions of the institutional pluralism

The discourse surrounding the relationship between medical logic and commercial logic gained prominence following the emergence of the NPM. The commercial logic, which emphasizes efficiency and effectiveness (e.g., Hood, 1991, 1995), introduced distinct values, norms, and practices in contrast to those traditionally established within public hospitals through the medical logic (e.g., Broadbent and Laughlin, 1998; Jacobs, 2005). When confronted with multiple institutional demands, individuals perceive institutional pluralism in different ways and demonstrate diverse responses.

The commercial logic has been implemented in Chinese public hospitals through two phases of healthcare reform. During the first round of healthcare reform from 1979 to 2009, public hospitals underwent marketization, and became responsible for managing any profits and losses incurred in their operations. The second healthcare reform, commencing in 2009 and continuing up to the present time, subsequent to the creation of the NMIS, implemented several accounting technologies, including the SDP system, clinical pathways, and global budgets, to delineate and clarify the cost control obligations of public hospitals. These accounting technologies were

designed to impact medical decision-making by integrating commercial principles into the process. At the time of conducting this study, Chinese public hospitals and medical professionals were faced with the dual responsibility of fulfilling the requirements for both healthcare delivery and financial accountability.

The research findings have indicated that the commercial logic, which prioritized cost control at the time of this study, manifested itself differently within clinical departments compared to the laboratory department. In clinical departments, this expression of commercial logic took on various forms, including the SDP system, clinical pathways, the bonus system, and the global control system. Meanwhile, in the laboratory department, it was predominantly manifested through the bonus system, and established an indirect connection with cost control. This unique mode of manifestation also influences the perceptions of medical professionals regarding institutional pluralism. It leads to conflicting perceptions within clinical departments and non-conflicting within the laboratory. This section aims to provide a comprehensive explanation of the underlying reasons influencing doctors' perceptions in such a manner.

2.1.1 Conflicting situation

In clinical departments, the commercial logic primarily manifested itself through the SDP system, clinical pathways, the bonus system and the global budget. These systems were based on the principles of the NMIS and were designed to optimize efficiency in medical practice. By establishing explicit guidelines for the usage of

medical consumables and medications, the NMIS aimed to equip clinicians with the ability to achieve their intended medical treatments with minimal input, including time, financial resources, and other medical resources. Nonetheless, these aims come into conflict with medical logic, primarily due to disparities in their fundamental value systems.

Medical quality represents an essential element within the core value system of medical logic, providing doctors with the basis to devise medical strategies and conduct their medical activities. In the clinical departments of the case hospital, clinicians proposed that medical quality was emphasised through patients' welfare. In their commitment to safeguarding patients' welfare, clinicians at the case hospital adhered to the fundamental principle of individualised treatment in their medical practice and treatment planning. The concept of individualised treatment highlights the importance of tailoring medical care to suit the specific needs and characteristics of each patient. As a result, it demands flexible methods of carrying out medical practice. As Gebreiter proposed in his work, medicine possesses variable and immeasurable nature (Gebreiter, 2016). This nature makes medicine an 'art'. Other accounting literature, such as Preston (1992), also emphasised that methods of examination and treatment should demonstrate considerable variations, not only among diverse disease categories but also within patient populations presenting the same medical condition.

However, in the second phase of healthcare reform, the SDP system and clinical pathways standardised medical practices with the aim of achieving cost control. In the SDP system, the standardisation included various methods such as categorizing

drugs based on prices and establishing medication lists accordingly. Clinical pathways standardised the treatment process for each disease type by specifying the length of the patient's hospital stay, the specific medical procedures and activities to be performed daily during the hospitalization, as well as the types and quantities of medications, medical supplies, and medical tests required. Clinicians perceived a conflict between standardisation and individualisation when they encountered rare diseases for which there were no specific drugs listed in the clinical pathway or when they faced complications and unexpected situations that fell outside the scope of the SDP system. In these cases, clinicians may find it necessary to draw upon their medical expertise and depart from the established standards. However, taking such actions may potentially result in financial penalties imposed by the bonus system. Consequently, achieving standardization of patients and treatment proves to be a challenging pursuit within the medical field (Gebreiter, 2016). Individualisation requires flexible ways of conducting medical practice.

Apart from the necessity for flexible approaches to medical care, individualized medical treatment also called for clinicians to exercise autonomy over both medical and financial assets. According to Gebreiter (2016), clinical freedom is a means to uphold doctors' professional and moral integrity, especially in situations where it is virtually impossible to assess or control the quality of medical care. This freedom is seen as essential for gaining and retaining the trust of their patients. According to clinicians in the case hospital, the diagnosis and treatment should be carried out with minimal interference from non-medical professionals, and they offered numerous examples highlighting the significance of their freedom in selecting and allocating medical resources: they insisted that discretion regarding medical resources must be

guaranteed at the diagnosis stage, where they required diverse diagnostic techniques to uncover the underlying causes or aetiologies behind similar symptoms; they also demanded autonomy in medical resources throughout the treatment process, because they needed to customize treatment plans to accommodate the unique variations in patients' conditions; and they also suggested that the full realization of clinicians' expertise and experience was also contingent upon their freedom in allocating healthcare resources. However, the SDP system and clinical pathways curtail clinicians' autonomy in this regard, by confining doctors to prescribing only low-cost medications listed in the drug formulary and mandating that clinicians must adhere to medication guidelines and medical examination indications rather than relying on their clinical experience when utilizing medical resources. The global budget system, designed to inform clinicians about the available budget when admitting patients, constrained clinicians' financial autonomy by setting a pre-defined upper limit on the financial resources they could employ. With the introduction of restrictions on certain resources, clinicians' freedom to choose the most appropriate medical treatment plans for patient care were curtailed. This further strengthened doctors' belief that limitations on medical resources would be detrimental to patients' well-being, consequently posing a threat to the quality of medical care and the fundamental value system of medical practice.

The introduction of these external standards for selecting and allocating medical resources, along with the standardized approaches to medical practice medical practice, was perceived by clinicians as conflicting with the principle of individualised treatment and the key values of medical practice. From the institutional logic perspective, both commercial logic and medical logic embodied divergent

prescriptions. The nature ingrained in commercial logic required external mechanisms for resource allocation. In contrast, medical logic advocated for resource allocation to be governed by medical professionals themselves, because they had been held expertise and knowledge in decision-making. The intervention in the medical decision-making process also increased the likelihood of the gradual erosion of clinical autonomy. Furthermore, the commercial logic aimed to establish a standardized medical practice, a goal that was challenging to attain within the framework of medical logic, even though standardized medical practice was commented as both facilitating enhanced manageability and cost-effectiveness in operations of public hospitals (Llewellyn and Northcott, 2005)and assist the government in exercising its power through sanctions and benchmarking (Baldwin, 2011).

2.1.2Non-conflicting situation

In the laboratory setting, the influence of commercial logic was evident through the implementation of the bonus system. In contrast to clinical departments, the impact of the SDP system, clinical pathways, and global budget was less pronounced within the laboratory department. Cost control methods were not explicitly enforced through these accounting technologies. In addition, the approach to cost control in the laboratory setting was indirect, achieved through the incentive system of department bonuses in which lower department costs translated to higher overall bonuses for the lab doctors. Individual doctors' cost control behaviour did not affect the individual bonus distribution of the department. As a result, the desire to maximize bonuses indirectly motivated cost-conscious behaviour within the department. The absence of formal and systematic cost control guidelines meant that laboratory doctors were not

subject to direct and stringent cost control measures, such as the SDP system, clinical pathways and the global budget.

The characteristics of laboratory practice gave it a unique interpretation of medical quality and medical practice, different from those found in clinical departments. Defining medical quality as a crucial component of the medical value system, laboratory doctors primarily emphasized the accuracy, reliability, consistency, and timeliness of test results, among which the accuracy of test results were given utmost priority by doctors. This definition of medical quality brought forth a distinguishing feature for the department, namely quantifiable medical practice. The quantification of medical quality was present in nearly every facet of laboratory work, spanning from the quality control process, through the testing procedures, and concluding with the evaluation process. The numerical representation of medical quality allowed for its comparison and evaluation and formed the basis for the lab decision-making process, in which doctors assessed patients' test results with a stronger emphasis on objective data and relied less on their personal medical expertise and the principle of individualized treatment. The quantifiable nature of medical quality also made it verifiable. A typical example of this was evident in the quality control process, where doctors used it to verify the influence of cost control measures on test results.

Another significant aspect of the laboratory was its standardized medical practice, often referred to by doctors as an 'assembly-line' process. Patients, the allocation of medical resources, and the testing process had all undergone standardization. Compared to doctors in the clinical departments, doctors in the lab established

indirect contact with patients during consultations and treatments. Hence, attributes typically employed to distinguish patients, including symptoms, medical history, and the disease's origin, assume a diminished role within the testing process. The unique attributes of individual patients tended to receive reduced attention, with patients becoming subject to standardization. In contrast to clinicians who allocate medical resources based on their medical expertise and the specific needs of individual patients, laboratory doctors allocated resources according to objective criteria such as the instructions of medical instruments, national and industrial standards (e.g., ISO 15189). These guidelines offered precise quantities of medical resources required for the testing process. Thus, within the laboratory context, resource allocation was primarily influenced by externally defined criteria and adhered to standardized procedures. The testing procedure was standardized and consisted of a sequence of defined stages. The testing process initiated with quality control measures, which involved thorough checks to guarantee the reliability of reagents and medical equipment. It then progressed to specimen testing and concluded with the examination of test results. These stages constituted an established process outlined in national and industry standards.

In summary, due to the nature of standardization, doctors in the laboratory were less likely to perceive “standardized” resource allocation as conflicting with prescriptions inherent in commercial logic; while the quantifiable nature of medical quality in the lab instilled confidence in doctors, enabling them to maintain and guarantee the standards of medical care while still taking cost control into consideration. The quantifiable nature of medical quality and the standardized medical practices in the laboratory made its approach to medical practice primarily driven by medical

considerations but also compatible with commercial logic.

2.1.3 Summary: medicine as an art and medicine as a science

The findings in the case hospital have illustrated doctors' perceptions of institutional pluralism can exhibit variations in diverse contexts. The resource allocation methods possessed by doctors and their potential impact on medical quality played a significant role in shaping doctors' perceptions within the context of institutional pluralism. The underlying reasons for doctors' concerns regarding resource allocation could be attributed to the distinct nature of medicine practiced in their respective domains, with clinical departments emphasizing medicine as an art and the laboratory focusing on medicine as a science.

In the clinical departments, medical practice was characterized by individualization and thereby could hardly be standardised. Clinicians were the frontline professionals who directly interacted with and communicated with patients. Under this context, medical practice in clinical settings was often oriented around the needs and well-being of the patients, with the final decisions and actions being determined by the clinicians themselves. Individualized medical practice further required clinicians to possess the autonomy to allocate medical resources based on the unique needs of each patient. In line with this, clinicians argued that patient well-being and medical quality were guaranteed when the necessary resources for their patients were appropriately provided, and they perceived external resource allocation requirements proposed by commercial logic as conflicting with their own positions and principles. Extensive accounting literature has reported that doctors refuse accounting

technologies because they are a threat to the autonomy of medical professionals (e.g., Doolin, 1999; Jones and Dewing, 1997), and may conflict with the core values of medical logic (e.g., Jacobs, 2005). The nature of medicine as an art further contributes to the difficulty of applying accounting technologies to measure medical practice (Gebreiter, 2016). The findings of this study were consistent with the literature.

However, in the laboratory department, medical practice exhibited a more standardized and quantified nature. It was standardized through well-defined procedures for conducting tests, precise guidelines on the quantities of medical resources employed, and established protocols for evaluating the results of their medical practices. The standardized nature of the medical practice gave rise to a systematic and standardized process of allocating medical resources. Lab doctors tended to adhere to the established ways of resource allocation that had been regulated, and the standardized ways of resource allocation became ingrained and taken for granted by the doctors. In addition, the medical quality in the laboratory setting was represented and assessed through numerical values. The presence of numerical values in the lab setting facilitated the comparison and evaluation of various aspects of medical practice, and further made verifying medical quality and medical practice possible. The standardized and quantified characteristics of medical practice in the laboratory gave it a more scientific rather than artistic nature.

The nature of medicine had such a substantial influence on doctors' perceptions that the culture of frugality, despite sharing similar principles with cost control in terms of resource reduction and having a profound impact on the Chinese, generated

different levels of potential to enhance cost consciousness among doctors. In clinical departments, some cost control initiatives inspired by frugality largely remained confined to activities that had little direct relevance to the core of medical practice. The presence of frugality did not universally embed the concept of cost consciousness into every aspect of clinical practice. However, in the lab, frugal habits, such as avoiding waste and resource reduction were extensively integrated into the testing process, with doctors perceiving little adverse impact on medical quality. Frugality was actively encouraged within the laboratory and became a tradition adopted by all doctors. Having embraced frugality, doctors in the laboratory developed a heightened awareness of cost considerations, leading them to perceive institutional pluralism as a non-conflicting scenario. This finding offers alternative perspectives for understanding the underlying reasons behind doctors' acceptance of accounting technologies. Accounting literature has identified various personal, organisational, professional, and institutional factors that have influenced medical professionals' engagement with cost-related information. These factors include the opportunity for career progression (Jacobs, 2005), competition for resources in hospital environments (Coombs, 1987), the desire to improve the efficacy and efficiency of clinical healthcare (Gebreiter, 2022), and the lack of a formalized accounting profession (Kurunmäki, 2004). This study has further revealed that national culture can also play a crucial role in determining the degree to which doctors are involved in cost control efforts.

Building upon existing literature, this study suggests that when examining the relationship between medicine and accounting, it is essential to consider both the inherent nature of medical practice and the influence of national culture. These

factors significantly shape doctors' perceptions regarding the interplay of various institutional logics. Moreover, they exert a substantial influence on how doctors react to the introduction of cost control concepts driven by accounting technologies. The following section will offer a comprehensive explanation of doctors' responses to multiple institutional requirements.

3. Individuals' responses to multiple institutional logics and drivers of responses

In settings where multiple institutional logics coexist, different logics impose distinct prescriptions on individuals responsible for enacting these logics, and individuals are expected to adhere to these specific requirements (Thornton et al., 2012c). These institutional logics regulate what behaviours are considered legitimate and outline the acceptable objectives and methods to achieve them (Pache and Santos, 2013a). Individuals operating within a context of multiple and potentially conflicting institutional logics need to consider how to respond, navigate and reconcile these diverse requirements (Oliver, 1991).

Numerous studies have extensively explored how individuals respond when confronted with situations involving multiple institutional logics. This study will mainly draw insights from the works of Oliver (1991), with Pache and Santos (2013 a,b) and Gebreiter and Hidayah (2019) as supplementary, to explain how doctors navigate their responses in the face of both conflicting and non-conflicting situations, while also exploring the underlying factors that influence their actions. While Oliver (1991)

primarily examines how organisations respond to multiple institutional logics, its exploration of the acceptance of various institutional requirements offers valuable insights for analysing individuals' responses to multiple institutional logics.

3.1.1 Responses in conflicting situations

When individuals encounter multiple and conflicting situations, they often generate a variety of responses as they grapple with the complexities and challenges presented by the divergent demands and expectations. Hospital accounting literature has identified that medical professionals, particularly those in the UK, often exhibit resistance when confronted with conflicting situations (e.g., Kurunmäki, 1999; Oppi et al., 2019). Doctors often demonstrate a reluctance to incorporate commercial ideas into their medical practice and may even successfully resist such concepts (e.g., Lapsley, 2001). The resistance is occasionally demonstrated through an alternative approach, wherein medical professionals opt to isolate commercial ideas and assign financial responsibilities to a distinct group of doctors or administrators, thus effectively segregating the financial aspects from the core of medical professionals' practice (e.g., Broadbent and Laughlin, 1998; Jacobs, 2005). However, in the case hospital, clinicians exhibited more strategic responses, namely combination (Oliver, 1991), avoidance (Oliver, 1991) and defiance (Gebreiter and Hidayah, 2019; Pache and Santos, 2013b), when they perceived a conflicting situation. Some nuanced sub-categories of these responses have also been observed in the case hospital, including situational combination, combination through compromise (Oliver, 1991), avoidance through concealment (ibid.), avoidance through transfer, avoidance through escape (ibid.), situational defiance, and defiance

with justification (Gebreiter and Hidayah, 2019).

When clinicians recognize conflicting institutional requirements arising from various institutional logics, they might choose to incorporate aspects of both commercial and medical logics with minor adjustments (Oliver, 1991; Pache and Santos, 2013b). This strategy aims to achieve a sustainable equilibrium amid the contradictory expectations posed by these institutional paradigms. Situational combination and combination through compromise (Oliver, 1991) were two strategies they employed. In situational combination where clinicians aimed to incorporate cost control requirements with medical decision-making when the budget was nearing its limits, clinicians chose to tweak the criteria for admitting and discharging patients. In combination through compromise strategy, clinicians reached a middle ground where they made concessions on certain aspects of ideal medical procedures and outcomes, like quick recovery and efficiency, in order to secure basic treatment effects while also fulfilling the demands of cost control. Within the combination strategy, clinicians made slight modifications to the principles of medical logic to accommodate the demands of cost control. They partially adhered to prescriptions from both logics, primarily because of the financial penalties inherent in the commercial logic.

Clinicians may also opt to avoid engaging in areas proposed by commercial logic through specific strategies. Oliver (1991) refers to this approach as a means of precluding the necessity to conform to institutional pressures. Some strategies under avoidance were employed with the main aim of fulfilling the medical needs: clinicians might conceal their pursuit of the most optimal medical treatment by adjusting their

diagnoses, a tactic that could aid them in passing the evaluation criteria of the NMIS system; alternatively, clinicians might shift the responsibility for cost control to patients and their families, thereby increasing their chances of utilizing medical resources that were not permitted by the NMIS without entering the NMIS system. There was also a strategy employed to prevent risks associated with commercial logic from happening. For example, clinicians might also opt to reject the admission of certain critically ill patients to avoid the risk of exceeding budget limits, although this strategy deviated from their medical value system. Overall, compared to combination, avoidance exhibited non-adherence to institutional requirements.

Another response observed among clinicians when confronted with conflicting institutional requirements was defiance. In such instances, clinicians understood the norms, values, and practices of commercial logic but made a deliberate and explicit choice to reject and defy them, as defined by Oliver (1991) and Pache and Santos (2013b). Defiance occasionally emerged in specific situations, such as medical emergencies, when doctors fully embraced medical logic to ensure that patients received the necessary resources without compromise. Sometimes doctors resisted cost control demands by providing explanations to the NMIS for their inability to comply with them. This non-compliance with commercial logic demonstrated doctors' resistance to the demands of cost control.

According to Pache and Santos (2013b), the extent to which individuals adhere to each institutional logic will significantly influence their responses to competing logics. individuals may display varying degrees of adherence to different institutional logics, exhibiting identified, familiar, and novice with the logic. In case hospital, clinicians are

identified with medical logic. This indicates that they possess extensive knowledge of the values, norms, and practices endorsed by this logic and derive their self-identities from aligning with these principles. Clinicians strongly identify with the medical profession's norms, values, and practices, making them their primary guiding framework in decision-making and patient care. Clinicians' identification with medical logic is deeply rooted in their medical education and training (Jacobs, 2005). Through medical education programs, clinicians acquire specialized knowledge, skills, and training on how to conduct medical activities professionally, and the core values, principles, and ethical standard have been instilled through education (Cooke et al., 2006). At the same time, clinicians may exhibit different degrees of adherence to commercial logic, which represents the financial and cost control requirements imposed by the NMIS. When clinicians are novices with commercial logic and have limited familiarity with its principles and requirements, they may exhibit a higher propensity for defiance towards the prescribed guidelines. At the same time, clinicians' autonomy in selecting and allocating resources based on their medical needs is deeply ingrained in their medical practice. The strong adherence to medical logic leads clinicians to view the prescriptions of commercial logic, particularly its emphasis on efficiency and cost control, with scepticism and competition. In addition to their strong adherence to medical profession logic, clinicians also possess sufficient knowledge about how commercial logic operates within the healthcare system. As a result, they are capable of strategically responding to cost control requirements and demonstrating some compliance with commercial logic when necessary.

Pache and Santos (2013b) highlight the significance of contextual factors in shaping

the strength of institutional logics' influence and the extent to which individuals may resist or embrace these influences. They emphasize the concept of hybridity of the context as an important factor. This study identifies another contextual factor, traditional culture, in mediating commercial logics' impact. Traditional culture encompasses deeply rooted values, beliefs, and practices that have been passed down through generations. The culture of frugality in China, which emphasizes prudent and resource-efficient practices, shares some similarities with the concept of cost control in managing healthcare resources. This cultural aspect provides clinicians with insights and inspirations to explore cost control methods in their medical practice. Clinicians may unconsciously apply frugal habits to their medical decision-making processes. They may strive to make efficient use of medical resources without compromising patient care or medical quality. In the case hospital where multiple logics coexist, the culture of frugality may serve as a potential bridge between medical profession logic and commercial logic.

3.1.2 Responses in non-conflicting situations

In the lab department, doctors did not perceive a conflicting situation between two logics. There is a degree of alignment between the values, norms, and practices promoted by these two logics within the context of the lab's operations. This study draws upon Oliver (1991)'s analysis of organisations' responses to multiple institutional logics, particularly the concept of acquiescence, to analyse the emergence of non-conflicting situations at the individual level. Some nuanced sub-categories of acquiescence have also been observed in the lab department, namely acquisition by culturally-influenced habits (Oliver, 1991) and acquisition through imitation (ibid.)

Acquiescence, as proposed by Oliver (1991), refers to a form of acceptance or compliance with the prescriptions and demands of multiple institutional logics. In non-conflicting situations, doctors are more inclined to accept the principles advocated by commercial logic and are also able to promote and incorporate both medical logic and commercial logic into their medical practice. They can uphold the values of medical profession logic, emphasizing patient's welfare and medical quality, while embrace and develop cost control methods. One alternative they achieve this is acquiescence through habits. Doctors have found resonance in the frugal habits developed during their childhood, leading to their adherence to cost control concepts advocated by the commercial logic regarding the control of the amount of medical resources. The culture of frugality has been deeply ingrained as a social fact in Chinese society, exerting a significant influence on shaping people's behaviour. The concept of frugality embodies the virtue of economizing resources and avoiding wastefulness, and has been passed down through generations and is deeply embedded in various aspects of daily life. Doctors in the lab have recounted their childhood experiences of avoiding waste as a means to illustrate the profound impact of frugal culture. One of the examples they cite is the practice of reusing exercise books. The culture of frugality has also become deeply ingrained as a departmental culture within the lab. It creates a shared set of values, norms, and practices that guide the conduct of doctors within the lab. Senior doctors with frugal working habits share their methods of resource-saving and draw on their experiences to demonstrate the tangible benefits of adopting a frugal approach. In this context, doctors not only adhere to frugal practices individually but also motivate and inspire their colleagues to do the same. The collective commitment to frugality

creates a supportive environment, where doctors share knowledge and strategies for optimizing resource utilization, as well as encourage each other to remain cautious in avoiding waste.

Another form of acquiescence exhibited by doctors in the lab department is through imitation, as they observe and emulate the resource-saving practices of their colleagues. As described by Oliver (1991), acquiescence through imitation involves individuals intentionally or unintentionally imitating institutional models. Imitation is predominantly employed by junior doctors within the lab department. Junior doctors propose that by observing and imitating the cost-control practices of their experienced colleagues, they can learn to manage costs without compromising medical quality. They have acquired knowledge on how to mix reagents, reuse medical consumables when appropriate, and assess whether cost control measures might compromise the accuracy and reliability of medical tests. Through the process of imitation, junior doctors undergo a socialization process within the lab department. As junior doctors assume their preliminary position in the department, they undergo a process of gradual adoption of the norms, values, and culture that prevail within the organisation. Resource-saving practices derived from frugal working habits, combined with the emphasis on ensuring medical quality while controlling costs, become deeply integrated into the medical practice of junior doctors.

The role of culture in institutional change has also been emphasized in other public sector literature. In their filed study Newcastle City Council, Ahrens and Ferry (2018) found that cultural memory provides institutional entrepreneurs significant resource for embedded agency, and therefore are not separate from objective and rules that

may lead to institutional changes. In the case hospital, the impetus for cost control did not emerge abruptly but rather embodied a strategic manifestation of enduring adherence to frugal habits.

Overall, the non-conflicting situation is developed and maintained at individual level through habits and imitation. Doctors' cultural background and position affect their ways of responding to this situation. The acknowledgment and acceptance of commercial logic within the lab department are deeply influenced by the shared cultural background. The culture of frugality, which is deeply ingrained in Chinese society, serves as a foundation for the department's approach to prudent resource utilization and cost-conscious medical practices. As junior doctors join the department, they are exposed to and influenced by the existing cultural norms and values that prioritize resource-saving habits. Within the department, knowledge sharing and imitation play crucial roles in fostering this culture of cost-consciousness, and in solidifying the department's commitment to cost-consciousness in medical practices.

4. Cost control v.s. medical quality

Cost data holds significant importance in improving the efficiency of medical services as it contributes to major resource allocation efforts. At healthcare system level, cost data from DRG systems is used to inform tariff setting, comparison across healthcare providers, and efficiency and performance assessment; while at the local level, cost data is used to support clinical and managerial decision-making process (Chapman et al., 2016). Clinicians thus interact with costing information, either actively or

passively, through management accounting practices, with cost control being one such practice.

There has been an ongoing discussion in the accounting literature regarding the challenge of simultaneously achieving cost control and maintaining high medical quality in healthcare settings. Scholars in accounting propose that the relationship between cost control and medical quality is incompatible and even contradictory with each other. Bourn and Ezzamel (1986) propose that the accountingization process aligned less with the decentralised decision-making process in hospitals, while Cardinaels and Soderstrom, (2013) from a more economic-based perspective, proposes that evaluating medical performance from the perspective of costs control was limited scope and they questioned how medical professionals could 'balance' the demands of increasing quality and decreasing costs. Jacobs (2005) proposed that cost control is contradictory to medical values system that promotes medical quality as priority and has great influences on medical staff's behaviour. Llewellyn and Northcott (2005) also proposes that there has always been an equation between high quality and high costs in professional service provider.

The findings in clinical departments were more aligned with earlier findings. Clinicians emphasized that they perceive conflicting requirements from cost control and medical activities, and they proposed that cost control affected their medical autonomy established in medicine. The decrease in medical autonomy further led to potential detrimental effect to medical quality. The contradictory relationship between the two made doctors aware of the cost-control requirements but felt antagonistic to cost control practice in most cases. The findings of lab department, however, were

contradictory to these earlier findings. Doctors in this department were more inclined to become cost conscious doctors. They not only possessed a basic understanding of definition of costs as the combination of both resource consumed and the price attached to resources, but also were able to incorporate cost control practice into their medical activities. Delivering high-quality medical practice remained the upmost goal of lab work given its auxiliary position, but the efforts to control costs were not restricted for achieving this goal. As a result, they were seemingly able to provide high quality medical care at relatively low costs. These findings suggested the inevitable ‘trade-off’ between medical quality and cost control in economic theory could have a solution in medical practice, and without perceived sacrifice in the medical value system. As a result of these reflections, this study argued that the perceived antagonism between medicine and cost control may be as much a cultural and institutional artefact as it represents a fundamental incompatibility between those two concepts.

5. The development of hybrid professionals

Hybrids are defined as novel entities resulting from the combination of two or more elements that are typically distinct, and they often manifest as actors, entities, objects, practices, processes, or bodies of expertise (Miller et al., 2008). The multiple elements, such as goals, control elements, or institutional logics (Rautiainen et al., 2022), are often regarded as contradictory (Pache and Santos, 2013b), but are required to combine in some situations, such as under institutional pressures. Hybridisation can manifest itself in different forms, such as hybrid roles (e.g., Kurunmäki, 2004; Ahrens et al., 2018), hybrid institutional logics (Ferry and

Eckersley, 2020), hybridised institutional values (Ahrens and Ferry, 2022) and hybrid organising and value creation machenisms (Ferry et al., 2023).

In public sector accounting, the impact of accounting on the operation of the public sector has been understood by examining how accounting intersects with various other forms of expertise (Ahrens et al., 2018). Some scholars have emphasized hybridisation might be one way of dealing with the complex situation. In public organisations, hybridisation of professionals may occur when there is pressure to change their management styles or to deal with shrinking resources (Ahrens et al., 2018; Rautiainen et al., 2022). A number of studies have found that, under certain circumstances, doctors transform into hybrids who account for economic alongside medical considerations in their practice. These studies have pointed to a range of personal, organisational, and professional factors that have underpinned medical engagement with cost information. Research conducted by Jacobs (2005) has indicated that doctors in Germany exhibit a strong incentive to acquire accounting knowledge since those with such expertise have a higher likelihood of advancement and promotion. The research conducted by Coombs (1987) in Sweden revealed a gradual rise in doctors' interest in accounting, which stemmed from the recognition that accounting information could be utilized to compete for resources within hospitals. Gebreiter's study (2022) conducted in the United Kingdom, moreover suggested that from the perspective of medical professionals, doctors themselves expressed a willingness to enhance the standardization and visibility of medical practice through the incorporation of accounting discipline. Kurunmäki's study (2004), which posits that the interaction between accounting and medicine may not primarily revolve around professional systems, contends that the absence of a

structured accounting profession could be a factor influencing doctors' receptiveness to accounting practices. Ahrens et al., (2018)'s research in Newcastle City Council has pointed out that hybridisation of expertise or rules is a restructuration of the interconnected arrangements that govern local authorities and the services desired by stakeholders. Ferry and Eckersley (2020) proposed that organisations with cooperative working cultures may develop hybrids because advocates for each logics were willing to compromise, even if they have conflicting objectives. The findings from the laboratory department highlight that national culture can also play a highly significant role in shaping the degree to which doctors are willing to adopt hybrid roles and engage with cost control measures. In China, a deep-seated societal focus on thriftiness, which has been advocated for centuries by Confucianism and Taoism, and more recently by the CCP, appears to have instilled in the doctors we interviewed a robust, culturally ingrained awareness of cost consciousness. Consequently, they functioned as hybrids who prioritized cost control alongside more conventional considerations such as the quality of care in their medical practice.

However, hybridisation may also not occur even under the pressures for change and address multiple goals (Reay and Hinings, 2009; Fischer and Ferlie, 2013). Many studies have also proposed professional factors as explanations, such as doctors' willingness to defend professional self-governance (Kurunmäki, 1999b) and professional value system (Jacobs, 2005), the intuitive and experience-based nature of medicine as professional practice (Gebreiter, 2016), and the inadequacy of accounting information system to support medical needs (Oppi et al., 2019). The findings from clinical departments were consistent with these findings. The nature of

medicine was defined as an art in clinical department, where individualisation principle for medical practice was perceived by clinicians as conflicting with standardisation principle proposed by cost control techniques. Even though the culture of frugality plays a role in some parts of medical practice, which made doctors believe that they controlled medical expenditures, it stayed at the periphery of medical practice. Therefore, based on these reflections, this study proposes that the development of hybrid professionals is largely a context-based process.

This context-based process can be explained by institutional logics. According to Skelcher and Smith (2015), hybridization is a process wherein plural institutional logics and actors identities are in play within an organization, resulting in various organizational outcomes. The contradictory logics confers conflicting identity and meaning to actors, and therefore provide space for actors to elaborate or manipulate these cultural and material elements. Transformation of identities, in this study hybrid professionals, may happen as a result of this. Skelcher and Smith (2015) also emphasized that some intermediating factors offer countervailing force to the imposition of new norms in the transformation. This study has proved that national culture and performance-related pay can be part of the countervailing force. However, much greater attention should be paid to intermediating factors in the analysis of hybrids.

Accounting practices have also undergone hybridization, characterized by the incorporation of principles from other disciplines (Grossi et al., 2020). The findings of this study also revealed a hybridized way of using accounting information, with a control and coercive method of applying costing information (i.e., SDP systems) in

clinical departments and a volunteered application of cost control concept in the lab. The bonus system, which was used for measuring doctors' performance and was related to cost control activities of departments, also incorporated medical disciplines into the design of performance indicators. The hybridization of accounting itself is also worth to be analysed in future studies.

As Ferry et al., (2023) suggested in their work, institutional logics can work differently in the same hybrid organising arrangement. The conflicting situation between different logics at field level may take different forms at organisational level. This study also demonstrates a similar situation, wherein a more nuanced level of analysis at the department level revealed that commercial logic and medical logic operated differently. In laboratory settings, medical logic regards standardization as a crucial element in assessing medical quality, aligning with the standardized medical practice principle proposed by commercial logic. However, within clinical departments, doctors prioritize various aspects of medical practice, such as individualized healthcare, when making medical decisions. Hence, while no conflicting views between commercial logic and medical logic were observed in the lab, their relationship in clinical departments assumed a different dynamic.

6. Concluding remarks

In the case hospital, doctors' perceptions of the relationship between medical logic, which they have been closely attached to, and commercial logic, which is introduced by the central government, exhibit considerable variation. The variation can be attributed to the different nature of the two types of departments in the case hospital. Clinicians in the case hospital perceive a conflict between medical profession logic

and commercial logic due to the inherent nature of clinical medicine, which cannot be fully standardized. They emphasize the importance of individualized medical care, where decisions regarding resource allocation are based on the specific needs of each patient. Therefore, they develop various sometimes strategic response to address different institutional prescriptions. Doctors in the lab department perceive the relationship between medical profession logic and commercial logic as non-conflicting. This perception arises from the standardized and quantified nature of their medical practice. In the lab, medical activities are well-defined, and procedures have been externally verified for accuracy and reliability. This non-conflicting situation is achieved and regenerated at individual level through habits and imitation.

The existing literature has analysed the relationship between cost control and medical quality, and most studies have proposed that these two goals are incompatible. This study, by analysing the situation in lab department, indicates that a balance between these two objectives can be reached when doctors can take advantage of favourable elements within the context, such as national culture. Concerning the development of hybrid professionals, this study contributes to the current literature by suggesting that cultural elements can act as a driving force behind the emergence of hybrid doctors. Overall, this study suggests that a pragmatic approach towards hospital cost management, which prioritises high quality clinical care but seeks to deliver it in the most economic manner, could be more widely achieved, and the hybridisation of doctors, which seeks to strike a balance between medical care and cost control, could be cultivated in the right circumstances.

Chapter 9 Conclusion

1. Findings and discussions

Through a case study conducted in a Chinese public hospital, this research endeavours to gain insights and provide explanations for how medical staff perceive and interpret cost control. The main research question of this study is how doctors perceive the introduction of cost control into medical practice. To investigate this research question further, the empirical stage divided it into two sub-questions: how doctors perceive the requirements proposed by medicine and accounting and why doctors perceive and conduct cost control in their particular ways.

Through the application of institutional logics in the data analysis process, this study revealed the existence of two predominant institutional logics within the case hospital: commercial logic and medical logic. The research findings have indicated that medical professionals from distinct departments tend to exhibit varying perceptions regarding the incorporation of commercial logic into medical practice. Within clinical departments, clinicians held the perception that the norms, values, and practices associated with commercial logic were in conflict with those of medical logic. This perception made them respond to multiple institutional requirements in a strategic manner. Drawing on Oliver (1991), Pache and Santos (2013b) and Gebreiter and Hidayah (2019), this study observed that clinicians tended to employ a range of strategies, including combination (Oliver, 1991), avoidance (Oliver, 1991), and defiance (Pache and Santos, 2013b), to address conflicting institutional demands, namely conducting medical practice while controlling costs. To be more specific, they may choose to combine these demands situationally, or may

compromise some demands to accommodate both logics (Oliver, 1991); they may also avoiding strict adherence to commercial logic through concealment (ibid.), transfer, and escape (ibid.); they may openly defy commercial logic in specific situations or providing adequate justifications for their actions (Gebreiter and Hidayah, 2019). Among these responses, situational combination, avoidance through transfer, and situational defiance were observed in clinical departments, and subsequently developed as sub-categories of main responses. However, in the laboratory department, doctors perceived a situation where the two logics coexisted without conflict. Building upon Oliver's (1991) framework, this study suggests that doctors in this department exhibit an inclination towards acquiring the values, norms, and practice of commercial logic, and this acquisition is developed through both habitual practices and imitation. The study provides additional clarity by explaining that these habits are culturally ingrained, and the act of imitation is also moulded by this prevailing culture.

The findings of this study have illustrated three key points. Firstly, doctors' perceptions of the interplay between commercial and medical logic are significantly influenced by the nature of their medical practice. In clinical departments where medicine is regarded as an art, the immeasurability of medical practice (Gebreiter, 2016) leads clinicians to perceive that the standardization process of accounting techniques clashes with their medical needs. While in the laboratory department, medical practice is standardized and quantifiable, leading doctors to believe that they can harmoniously integrate values, norms, and practices from both institutional logics. Secondly, it is feasible for doctors to control medical expenses while ensuring the maintenance of high medical quality. Doctors in the lab draw on culture of

frugality to create some cost control methods that centre on reusing and minimising waste, and their agency facilitate them in mediating between controlling costs and the pursuing the quality of medical care. Finally, in developing hybrid medical professionals, national culture plays an important role in this process. The culture of frugality in China promotes a way of life that emphasizes minimizing resource usage, aligning with some practical principles of cost control. Influenced by the national culture, doctors possess a fundamental understanding of cost control, making them more inclined to embrace hybridization in this context.

2. Contributions and implications

The findings of this study highlight the significance of conducting accounting research in diverse contexts. Organizational change driven by accounting is a complex process, and the compatibility or incompatibility of accounting with its applied environment is context-dependent. Localisation is happening at practical level, and may generate much more in-depth understanding of accounting practice (e.g., Lin and Yu, 2002).

It is argued that participation of clinicians in cost system designs will increase the usability of cost data in decision-making, and therefore increases the efficiency and effectiveness of organisational processes; while the increased usability of cost data leads to misalignment of operational processes and costing information, which requires further participation of clinicians in cost system design (Chapman and Kern, 2024). It is crucial to engage clinicians in the design of costing information systems because, being frontline staff, they possess first-hand insights into the uncertainties inherent in the actual production process. Their expertise informs enhancements to

the costing information system. This study also highlights clinicians' observations regarding conflicts between cost control and medical practice, as they suggest that certain discrepancies arise because SDP designers lack a comprehensive understanding of medical practice. Hence, this study suggests that future improvements in costing techniques should actively involve frontline doctors, because they may identify and correct misalignments and make costing information more accurate.

The literature on institutional logics offers diverse viewpoints on how individuals respond to the presence of multiple institutional demands. Oliver (1991) examined how organisations respond to the presence of multiple institutional logics, while Pache and Santos's (2013b) research explored individuals' responses to institutional pluralism. Gebreiter and Hidayah (2019) expanded upon these individual responses by offering additional sub-categories. This study further developed some sub-categories such as situational combination, avoidance through transfer, and situational defiance. These nuanced responses highlight the individual agency in navigating institutional pluralism. Therefore, this study recommends that future research delve into the micro-level institutional environment. The existence of multiple institutional logics may also lead to the development of hybrids aimed at meeting varied expectations from different institutional environments. The multiplicity and sometimes conflict of institutional requirements influence how hybrids generate value (Vakkuri and Johanson, 2021). This study thus suggests that researchers further analyse the mechanisms of value creation within hybrid settings, such as in public hospitals.

Culture has been relatively under-studied in public sector management accounting research (van Helden and Uddin, 2016), and previous studies of management accounting have demonstrated the important influence of culture and ethnicity (e.g., Wickramasinghe and Hopper, 2005). In this study, cultural elements play a significant role in shaping hybrid medical professionals and also contribute to explaining the potential compatibility between cost control and maintaining a high quality of medical care. Therefore, the researcher suggests future studies pay more attention to how cultural elements affect the application of accounting.

Although there is rich literature discussing public sector accounting after the NPM, they mainly focus on the central government (e.g. Harun et al., 2015; Adhikari et al., 2013) and the state-owned enterprises (e.g. Ashraf and Uddin, 2016), with only a few of them considering the NPM in public hospitals (e.g. Cui et al., 2019; Degeling et al., 2006; Hassan, 2005, 2008). Cost-effective healthcare provision can be further investigated, by breaking down this big question into smaller ones such as discussing cost effectiveness in acquiring resources, in putting resources into the healthcare production process, and the measurement of the healthcare outputs (Chapman, 2015). The quality of healthcare costing information can be another focus of research. Accuracy, managerial relevance at provider level, and standardisation cannot be met simultaneously and policy makers have to manage trade-offs between these different dimensions (Chapman et al., 2022). The DRG system alone may not lead to proper decision making at healthcare provider level because it requires specific costing guidance. Integration of costing guidance and the DRG system might be a choice, but integration may be also achieved through other ways. Therefore it is worth to consider how to improve the quality of healthcare costing information

considering the three dimensions mentioned above. Overall, the researcher would recommend future studies to expand the research area in public sector, such as public hospitals, universities (e.g., Gebreiter and Hidayah), and other types of organisations (e.g., Rozenfeld and Scapens, 2021).

3. Limitations

In 2021, when this study was conducted, the global COVID-19 pandemic led to travel restrictions in many countries. Consequently, the researcher had to adapt and employ remote data collection methods. Face-to-face interviews were replaced with online telephone interviews due to the prevailing circumstances. Since online telephone interviews lacked personal contact, there was limited interaction between the researcher and the participants. Another negative impact of COVID-19 on this study was the restriction on data diversity. For a case study, researchers typically rely on multiple data sources to provide comprehensive information. The ideal data collection approach for this study would have involved a combination of observation and semi-structured interviews. Observation would have initially helped the researcher understand the contextual characteristics of the hospitals and departments, enabling them to ask more targeted questions during interviews. However, this aspect was partially compensated for through information gathered from hospital websites and communication with relevant contacts. In this study, the activities of doctors related to cost control and their approaches to managing the two logics could have been more accurately verified through on-site observation. However, due to the restrictions imposed by COVID-19, conducting in-person observations was not feasible.

To sum up, as the manifestation of commercial logic, accounting technologies take on the responsibility of introducing commercial ideas in the administration of public hospitals. Medical professionals, as central actors in this context, perceive and respond to these accounting technologies based on their existing values, norms, and practices rooted in medical logic. To gain a comprehensive understanding of the role of accounting in the public sector, further investigations should be conducted at the micro-level, focusing on the point where public services are delivered.

Reference

Abbott, A. (1988) *The system of professions : an essay on the division of expert labor*. Chicago: Chicago.

Abernethy, M.A. (1996) Physicians and resource management: the role of accounting and non-accounting controls. *Financial accountability & management*, 12 (2): 141–156.

Abernethy, M.A. and Stoelwinder, J.U. (1990) Physicians and Resource Management in Hospitals: an Empirical Investigation. *Financial Accountability and Management*, 6 (1): 17–31. doi:10.1111/j.1468-0408.1990.tb00325.x.

Adhikari, P., Kuruppu, C. and Matilal, S. (2013) Dissemination and institutionalization of public sector accounting reforms in less developed countries: A comparative study of the Nepalese and Sri Lankan central governments. *Accounting Forum*, 37 (3): 213–230. doi:10.1016/j.accfor.2013.01.001.

Ahrens, T. and Ferry, L. (2018) Institutional entrepreneurship, practice memory, and cultural memory: Choice and creativity in the pursuit of endogenous change of local

authority budgeting. *Management Accounting Research*, 38: 12–21. doi:10.1016/j.mar.2016.11.001.

Ahrens, T. and Ferry, L. (2022) Accounting, hybrids and hybridity – attending to the value dimension in institutional logics. *Qualitative Research in Accounting and Management*, 19 (5): 696–715. doi:10.1108/QRAM-07-2022-0113.

Ahrens, T., Ferry, L. and Khalifa, R. (2018) The hybridising of financial and service expertise in English local authority budget control: A practice perspective. *Qualitative Research in Accounting and Management*, 15 (3): 341–357. doi:10.1108/QRAM-09-2017-0085.

Alam, M. (1997) Budgetary process in uncertain contexts: A study of state-owned enterprises in Bangladesh. *Management Accounting Research*, 8 (2): 147–167. doi:10.1006/mare.1996.0044.

Alford, R.R. and Freidland, R. (1985) “The Power of Contradictions.” In *Powers of Theory: Capitalism, the State, and Democracy*. Cambridge: Cambridge University Press. pp. 427–443.

Alonso, J.M., Clifton, J. and Díaz-Fuentes, D. (2015) The impact of New Public Management on efficiency: An analysis of Madrid’s hospitals. *Health Policy*, 119 (3): 333–340. doi:10.1016/j.healthpol.2014.12.001.

Ashraf, J. and Uddin, S. (2016) New public management, cost savings and regressive effects: A case from a less developed country. *Critical Perspectives on Accounting*, 41: 18–33. doi:10.1016/j.cpa.2015.07.002.

Baldwin, R. (2011) *Understanding regulation : theory, strategy, and practice*. 2nd editio. Cave, M. and Lodge, M. (eds.). Oxford. (Includes bibliographical references and index.).

Barber, B. (2016) Some Problems in the Sociology of the Professions. *Daedalus*, 92

(4): 669–688.

Battilana, J. and Dorado, S. (2010) Building sustainable hybrid organizations: The case of commercial microfinance organizations. *Academy of Management Journal*, 53 (6): 1419–1440.

Berg, L.N. and Pinheiro, R. (2016) Handling different institutional logics in the public sector: Comparing management in Norwegian universities and hospitals. *Research in the Sociology of Organizations*, 45 (May): 146–168.

Besharov, M.L. and Smith, W.K. (2014) Multiple Institutional Logics in Organizations: Explaining Their Varied Nature and Implications. *Academy of Management Review*, 39 (3): 364–381.

Bévort, F. and Suddaby, R. (2016) Scripting professional identities: How individuals make sense of contradictory institutional logics. *Journal of Professions and Organization*, 3 (1): 17–38.

Binder, A. (2007) For Love and Money : Organizations' Creative Responses to Multiple Environmental Logics. *Theory and society*, 36 (6): 547–571.

Blomgren, M. (2003) Ordering a Profession: Swedish Nurses Encounter New Public Management Reforms. *Financial Accountability and Management*, 19 (1): 45–71. doi:10.1111/1468-0408.00163.

Blumenthal, D. and Hsiao, W. (2015) Lessons from the East - China's Rapidly Evolving Health Care System. *The New England Journal of Medicine*, 372: 1281–1286.

Bourn, M. and Ezzamel, M. (1986) Organisational Culture in Hospitals in the National Health Service. *Financial Accountability & Management*, 2 (3): 203–225.

Boyatzis, R.E. (1998) *Transforming qualitative information : thematic analysis and code development*. Thousand Oaks, Calif: Thousand Oaks, Calif. (Includes

bibliographical references (p. 169-173) and index.).

Braun, V. and Clarke, V. (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3 (2): 77–101. doi:10.1191/1478088706qp063oa.

Broadbent, J. and Laughlin, R. (1998) Resisting the “new public management”: Absorption and absorbing groups in schools and GP practices in the UK. *Accounting, Auditing & Accountability Journal*, 11 (4): 403–435.

Broadbent, J., Laughlin, R. and Read, S. (1991) Recent Financial and Administrative Changes in the NHS: A Critical Theory Analysis. *Critical Perspectives on Accounting*, 2: 1–29.

Bryman, A. (2016) *Social research methods*. Fifth edit. Oxford : Oxford University Press, 2016. (Includes bibliographical references and index.).

Cardinaels, E. and Soderstrom, N. (2013) Managing in a Complex World: Accounting and Governance Choices in Hospitals. *European Accounting Review*, 22 (4): 647–684. doi:10.1080/09638180.2013.842493.

Chapman, C., Kern, A. and Laguecir, A. (2014) Costing practices in healthcare. *Accounting Horizons*, 28 (2): 353–364. doi:10.2308/acch-50713.

Chapman, C., Kern, A., Laguecir, A., et al. (2016) “Management accounting and efficiency in health services: the foundational role of cost analysis.” In *Health system efficiency: How to make measurement matter for policy and management*. pp. 75–98.

Chapman, C.S. (2015) Researching accounting in health care: Considering the nature of academic contribution. *Accounting and Finance*, 55 (2): 397–413. doi:10.1111/acfi.12142.

Chapman, C.S. and Kern, A. (2024) Development of costing systems as a process not outcome: a field study of Patient Level Information and Costing Systems (PLICS)

in UK health care. *Research Handbook on Accounting and Information Systems*, pp. 118–134. doi:10.4337/9781802200621.00018.

Chapman, C.S., Kern, A., Laguecir, A., et al. (2022) Managing quality of cost information in clinical costing: evidence across seven countries. *Journal of Public Budgeting, Accounting and Financial Management*, 34 (2): 310–329. doi:10.1108/JPBAFM-09-2020-0155.

Chen, X. (2007) “大医精诚”中医德思想探究. 医学与社会, 20 (5).

China Youth Daily (2005) 国务院研究机构最新报告说“中国医改不成功.” Available at: http://zqb.cyol.com/content/2005-07/29/content 1150962.htm (Accessed: 29 May 2023).

Chinese Medical Association (2018) 中华医学会简介. Available at: https://www.cma.org.cn/col/col1422/index.html (Accessed: 25 September 2023).

Chinese Medical Association (2019) *历久弥新 不忘初心——1933年9月，中华医学会编印首部医德规范《中华医学会医师条诫》*. Available at: https://www.cma.org.cn/art/2019/8/20/art 14 30520.html (Accessed: 21 May 2023).

Chinese Medical Doctor Association (2014) 《中国医师道德准则》全文.

Chua, W.F. (1995) Experts, networks and inscriptions in the fabrication of accounting images: a story of the representation of three public hospitals. *Accounting, Organizations & Society*, 20 (2/3): 111–146.

Chua, W.F. and Degeling, P. (1993) Interrogating an accounting-based intervention on three axes: Instrumental, moral and aesthetic. *Accounting, Organizations and Society*, 18 (4): 291–318. doi:10.1016/0361-3682(93)90018-2.

Confucius (2010) *The Analects*. Open Road Integrated Media.

Cooke, M., Irby, D.M., Sullivan, W., et al. (2006) Medical education: American medical education 100 years after the flexner report. *The New England journal of*

medicine, 355 (13): 1306–1344. doi:10.1056/NEJMra055445.

Coombs, R.W. (1987) Accounting for the Control of Doctors: Management Information Systems in Hospitals. *Accounting, Organizations and Society*, 12 (4): 389–404.

Covaleski, M.A. and Dirsmith, M.W. (1983) Budgeting as a means for control and loose coupling. *Accounting, Organizations and Society*, 8 (4): 323–340. doi:10.1016/0361-3682(83)90047-8.

Covaleski, M.A. and Dirsmith, M.W. (1991) The management of legitimacy and politics in public sector administration. *Journal of accounting and public policy*, 10 (2): 135–156. doi:10.1016/0278-4254(91)90009-9.

Covaleski, M.A., Dirsmith, M.W. and Michelman, J.E. (1993) An institutonal theory perspective on the DRG framework, case-mix accounting systems and health-care organizations. *Accounting, Organizations and Society*, 18 (1): 65–80.

Creswell, J.W. (2022) *Research design : qualitative, quantitative, and mixed methods approaches.* Sixth edit. Creswell, J.D. (ed.). Los Angeles : SAGE, 2022. (Includes bibliographical references and index.).

Crotty, M. (1998) “Constructionism: The Making of Meaning.” In *The Foundations of Social Research: Meaning and Perspective in the Research Process*. London: SAGE. pp. 42–65.

Cui, X., Li, P., Al-Sayed, M., et al. (2019) China’s Healthcare Costing in Times of Crisis: Conflicts, Interactions, and Hidden Agendas. *Abacus*, 55 (3): 610–633. doi:10.1111/abac.12169.

Degeling, P., Zhang, K., Coyle, B., et al. (2006) Clinicians and the governance of hospitals: A cross-cultural perspective on relations between profession and management. *Social Science and Medicine*, 63 (3): 757–775.

doi:10.1016/j.socscimed.2006.01.034.

Dieleman, J.L., Squires, E., Bui, A.L., et al. (2017) Factors associated with increases in US health care spending, 1996-2013. *JAMA - Journal of the American Medical Association*, 318 (17): 1668–1678. doi:10.1001/jama.2017.15927.

Diener, E. and Crandall, R. (1978) *Ethics in social and behavioral research*. Crandall, R. (ed.). Chicago: University of Chicago Press.

DiMaggio, P.J. and Powell, W.W. (1983) The Iron Cage Revisited : Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review*, 48 (2): 147–160.

Doolin, B. (1999) Casemix Management in a New Zealand Hospital: Rationalisation and Resistance. *Financial Accountability & Management*, 15 (3-4): 397–417. doi:10.1111/1468-0408.00091.

Doolin, B. (2001) Doctors as managers: New public management in a New Zealand hospital. *Public Management Review*, 3 (2): 231–254. doi:10.1080/14616670010029601.

Du, L., Zhao, Y. and Liu, G. (2009) 建国60年政府卫生投入和卫生总费用核算的回顾与展望. 中国卫生政策研究, 2 (10): 15–20.

Du, Z. (2011) 论近代教会医药事业对中国医学 早期现代化的影响. 江汉论坛, 12.

Dunleavy, P. and Hood, C. (1994) From old public administration to new public management. *Public Money and Management*, 14 (3): 9–16. doi:10.1080/09540969409387823.

Eisenhardt, K.M. (1989) Building Theories from Case Study Research. *Academy of Management Review*, 14 (4): 532–551.

Engel, G. V (1970) *Professional Autonomy and Bureaucratic Organization Author (s): Gloria V . Engel Published by : Sage Publications , Inc . on behalf of the*

Johnson Graduate School of Management , Cornell University Stable URL : https://www.jstor.org/stable/2391182 REFER., 15 (1): 12–21.

Fahlevi, H. (2016) Understanding why the role of accounting is unchanged in Indonesian public hospitals. *Journal of Accounting and Organizational Change*, 12 (2): 203–222. doi:10.1108/JAOC-03-2014-0020.

Fahlevi, H., Irsyadillah, I., Indriani, M., et al. (2022) DRG-based payment system and management accounting changes in an Indonesian public hospital: exploring potential roles of big data analytics. *Journal of Accounting and Organizational Change*, 18 (2): 325–345. doi:10.1108/JAOC-10-2020-0179.

Fang, X. (2014) “Barefoot doctors and the provision of rural health care.” In Andrews, B. and Bullock, M.B. (eds.) *Medical Transitions in Twentieth-Century China*. Indiana University Press. pp. 267–282. Available at: https://ebookcentral.proquest.com/lib/bham/detail.action?docID=1782270&pq-origsite=primo.

Ferry, L. and Eckersley, P. (2020) Hybridizing the institutional logics of performance improvement and budgetary stewardship in English and Welsh local government. *Public Policy and Administration*, 35 (1): 45–64. doi:10.1177/0952076718781433.

Ferry, L., Wegorowski, P. and Andrews, R. (2023) Hybridity, institutional logics and value creation mechanisms in the corporatisation of social care. *British Accounting Review*, 56 (1): 101244. doi:10.1016/j.bar.2023.101244.

Fetter, R.B. and Freeman, J.L. (1986) Diagnosis Related Groups : Product Line Management within Hospitals. *Academy of Management*, 11 (1): 41–54.

Fitzgerald, L. and Dufour, Y. (1997) Clinical management as boundary management. *International Journal of Public Sector Management*, 10 (1/2): 5–20.

Flyvbjerg, B. (2011) “Case study.” In Denzin, N.K. and Lincoln, Y.S. (eds.) *The Sage*

Handbook of Qualitative Research. CA: Thousand Oaks. pp. 301–316.

Fowles, A.. (1993) Changing notions of accountability: A social policy view. *Accounting, auditing, & accountability*, 6 (3): 97–108. Available at: http://dx.doi.org/10.1016/j.jaci.2012.05.050.

Friedland, R. and Alford, R.R. (1991) “Bringing Society Back In: Symbols, Practices and Institutional Contradictions.” In Powell, W.W. and DiMaggio, P.J. (eds.) *The New Institutionalism in Organizational Analysis*. 1st ed. Chicago: University of Chicago Press. pp. 232–263.

Gao, Z. (2018) Mapping the official discourse of frugality in China between 1979 and 2015. *Journal of Historical Research in Marketing*, 10 (2): 151–174. doi:10.1108/JHRM-05-2017-0013.

Gebreiter, F. (2016) “Comparing the incomparable”: Hospital costing and the art of medicine in post-war Britain. *British Accounting Review*, 48 (2): 257–269.

Gebreiter, F. (2017) Accounting and the emergence of care pathways in the National Health Service. *Financial Accountability and Management*, 33 (3): 299–310. doi:10.1111/faam.12126.

Gebreiter, F. (2022) Accountingization, colonization and hybridization in historical perspective: the relationship between hospital accounting and clinical medicine in late 20th century Britain. *Accounting, Auditing and Accountability Journal*, 35 (5): 1189–1211. doi:10.1108/AAAJ-07-2016-2652.

Gebreiter, F. and Hidayah, N.N. (2019) Individual responses to competing accountability pressures in hybrid organisations: The case of an English business school. *Accounting, Auditing and Accountability Journal*, 32 (3): 727–749. doi:10.1108/AAAJ-08-2017-3098.

Gerald, B. and Gu, X. (1997) Health sector reform: Lessons from China. *Social*

Science and Medicine, 45 (3): 351–360. doi:10.1016/S0277-9536(96)00350-4.

Ghorbani, A. (2021) “Demand for Health and Healthcare.” In Agrawal, A. and Kosgi, S. (eds.) *Healthcare Access*. Rijeka: IntechOpen. doi:10.5772/intechopen.98915.

Glynn, M.A. and Lounsbury, M. (2005) From the critics corner: Logic blending, discursive change and authenticity in a cultural production system. *Journal of Management Studies*, 42 (5): 1031–1055.

Greenwood, R., Raynard, M., Kodeih, F., et al. (2011) Institutional complexity and organizational responses. *Academy of Management Annals*, 5 (1): 317–371. doi:10.1080/19416520.2011.590299.

Grossi, G., Kallio, K.M., Sargiacomo, M., et al. (2020) Accounting, performance management systems and accountability changes in knowledge-intensive public organizations: A literature review and research agenda. *Accounting, Auditing and Accountability Journal*, 33 (1): 256–280. doi:10.1108/AAAJ-02-2019-3869.

Gruening, G. (2001) Origin and theoretical basis of New Public Management. *International Public Management Journal.*, 4: 1–25.

Guthrie, J., Olson, O. and Humphrey, C. (1999) Debating Developments in New Public Financial Management: The Limits of Global Theorising and Some New Ways Forward. *Financial Accountability & Management*, 15 (3-4): 209–228. doi:10.1111/1468-0408.00082.

Hanyu, D. (n.d.) *字典-俭字的意思*.

Harun, H., Van-Peursem, K. and Eggleton, I.R.C. (2015) Indonesian public sector accounting reforms: Dialogic aspirations a step too far? *Accounting, Auditing and Accountability Journal*, 28 (5): 706–738. doi:10.1108/AAAJ-12-2012-1182.

Hassan, M.K. (2005) Management accounting and organisational change: an institutional perspective. *Journal of Accounting & Organizational Change*, 1 (2): 125–

140. doi:10.1108/18325910510635326.

Hassan, M.K. (2008) The corporate governance inertia: The role of management accounting and costing systems in a transitional public health organization. *Research in Accounting in Emerging Economies*, 8 (08): 409–454. doi:10.1016/S1479-3563(08)08014-6.

He, L. (2013) 中华医学会:近代医学伦理学的倡导者与实践者. *Chinese Medical Ethics*, 26 (5): 626–627.

Heimer, C.A. (1999) Competing Institutions : Law, Medicine, and Family in Neonatal Intensive Care. *Law & Society Review*, 33 (1): 17–66.

van Helden, J. and Uddin, S. (2016) Public sector management accounting in emerging economies: A literature review. *Critical Perspectives on Accounting*, 41: 34–62. doi:10.1016/j.cpa.2016.01.001.

Henderson, G., Shuigao, J., Akin, J., et al. (1995) Distribution of medical insurance in China. *Social Science and Medicine*, 41 (8): 1119–1130. doi:10.1016/0277-9536(94)00420-X.

Hensmans, M. (2003) Social movement organizations: A metaphor for strategic actors in institutional fields. *Organization Studies*, 24 (3): 355–381.

Hillman, A.L., Nash, D.B., Kissick, W.L., et al. (1986) Managing the Medical–Industrial Complex. *The New England Journal of Medicine*, 315 (8): 511–513.

Hoff, T.J. (2000) Professional commitment among US physician executives in managed care. *Social Science and Medicine*, 50 (10): 1433–1444. doi:10.1016/S0277-9536(99)00410-4.

Hoffman, A.J. (1999) Institutional Evolution and Change : Environmentalism and the U . S . Chemical Industry. *The Academy of Management Journal*, 42 (4): 351–371.

Hong, F.F. (2004) History of medicine in China: When medicine took an alternative

path. *McGill Journal of Medicine*, 8 (1): 79–84. doi:10.26443/mjm.v8i1.381.

Hood, C. (1991) A Public Management for All Seasons? *Public Administration*, 69 (1): 3–19. doi:10.1111/j.1467-9299.1991.tb00779.x.

Hood, C. (1995) The “new public management” in the 1980s: Variations on a theme. *Accounting, Organizations and Society*, 20 (2–3): 93–109. doi:10.1016/0361-3682(93)E0001-W.

Hood, C. and Jackson, M. (1992) “The new public management: A recipe for disaster?” In Parker, D. and Handmer, J. (eds.) *Hazard Management and Emergency Planning: Perspectives in Britain*. London: Routledge. pp. 108–126.

Hopper, T., Tsamenyi, M., Uddin, S., et al. (2009) Management accounting in less developed countries: What is known and needs knowing. *Accounting, Auditing and Accountability Journal*, 22 (3): 469–514. doi:10.1108/09513570910945697.

Hopwood, A.G. (1990) Accounting and Organisation Change. *Accounting, Auditing & Accountability Journal*.

Hou, J., Michaud, C., Li, Z., et al. (2014) Transformation of the education of health professionals in China: Progress and challenges. *The Lancet*, 384 (9945): 819–827. doi:10.1016/S0140-6736(14)61307-6.

Huang, Z., Li, X., Deng, J., et al. (2023) “Research on the treatment method of COVID-19 sequelae with intelligent soft manipulator based on haptic feedback.” In *2023 IEEE International Conference on Real-time Computing and Robotics (RCAR)*. 2023. IEEE.

Humphrey, C., Miller, P. and Scapens, R.W. (1993) Accountability and accountable management in the UK public sector. *Accounting, Auditing and Accountability*, 6 (3): 556. Available at: http://dx.doi.org/10.1016/j.jaci.2012.05.050.

Jacobs, K. (1995) Budgets: a medium of organizational transformation. *Management*

Accounting Research, 6 (1): 59–75.

Jacobs, K. (2000) Evaluating accountability : finding a place for the Treaty of Waitangi in the New Zealand public sector. *Accounting, Auditing and Accountability Journal*, 13 (3): 360–380.

Jacobs, K. (2005) Hybridisation or Polarisation: Doctors and Accounting in the UK, Germany and Italy. *Financial Accountability and Management*, 21 (2): 135–162.

Jessop, B. (1989) “Conservative Regimes and the Transition to Post-Fordism: The Cases of Great Britain and West Germany.” In Gottdiener, M. and Komninos, N. (eds.) *Capitalist Development and Crisis Theory: Accumulation, Regulation and Spatial Restructuring*. London: Palgrave Macmillan UK. pp. 261–299. doi:10.1007/978-1-349-19960-0_11.

Jewell, J.A. (1983) “The development of Chinese health care, 1911-49.” In Jewell, S.M.H. and J.A. (ed.) *Health care and traditional medicine in China, 1800-1982*. London, UNITED KINGDOM: London : Routledge & Kegan Paul.

Jia, D. (1979) 中国医学史略. 山西科学技术出版社.

Jones, C.S. and Dewing, I.P. (1997) The Attitudes of NHS Clinicians and Medical Managers Towards Changes in Accounting Controls. *Financial Accountability & Management*, 13 (3): 261–280.

Jones, C.S. and Sefiane, S. (1992) The Use of Accounting Data in Operational Decision Making in Algeria. *Accounting, Auditing & Accountability Journal*, 5 (4): 71–83. Available at: http://dx.doi.org/10.1016/j.jaci.2012.05.050.

Ketokivi, M. and Mantere, S. (2010) Two strategies for inductive reasoning in organisational research. *The Academy of Management Review*, 35 (2): 315–333.

Kirkpatrick, I., Jespersen, P.K., Dent, M., et al. (2009) Medicine and management in a comparative perspective: The case of Denmark and England. *Sociology of Health*

and Illness, 31 (5): 642–658. doi:10.1111/j.1467-9566.2009.01157.x.

Kraatz, M.S. and Block, E.S. (2008) “Organizational implications of institutional pluralism.” In Greenwood, R., Oliver, C., Suddaby, R., et al. (eds.) *The SAGE Handbook of Organizational Institutionalism*. London: SAGE. pp. 243–274.

Kurunmäki, L. (1999a) Making an accounting entity: the case of the hospital in Finnish health care reforms. *European Accounting Review*, 8 (2): 219–237. doi:10.1080/096381899336005.

Kurunmäki, L. (1999b) Professional vs Financial in the Field of Health care-Struggles for the Redisribution of Power and Control. *Accounting, Organizations and Society*, 24: 95–124.

Kurunmäki, L. (2004) A Hybrid Profession—the Acquisition of Management Accounting Expertise by Medical Professionals. *Accounting, Organizations & Society*, 29 (3/4): 327–348.

Kurunmäki, L., Lapsley, I. and Melia, K. (2003) Accountingization v. Legitimation: A Comparative Study of the Use of Accounting Information in Intensive Care. *Management Accounting Research*, 14 (2): 112–139.

Kvale, S. (1996) *Interviews : an introduction to qualitative research interviewing*. Thousand Oaks, Calif.: Thousand Oaks, Calif. : Sage Pub. (Bibliography: p. 299-306.).

Lam, T.P., Wan, X.H. and Ip, M.S.M. (2006) Current perspectives on medical education in China. *Medical Education*, 40 (10): 940–949. doi:10.1111/j.1365-2929.2006.02552.x.

Lao, T. (2016) *Tao Te Ching*. The Electric Book Company Ltd.

Lapsley, I. (1994) Responsibility accounting revived? Market reforms and budgetary control in health care. *Management Accounting Research*. 5 (3–4) pp. 337–352.

doi:10.1006/mare.1994.1021.

Lapsley, I. (1997) Market mechanisms and the management of health care. The UK model and experience. *Journal of management in medicine*, 11 (5–6): 318–328.

Lapsley, I. (2001) The Accounting – Clinical Interface — Implementing Budgets for Hospital Doctors. *Abacus*, 37 (1): 79–109.

Lapsley, I. (2007) Accountingization, trust and medical dilemmas. *Journal of Health, Organisation and Management*, 21 (4–5): 368–380. doi:10.1108/14777260710778907.

Laughlin, R.;, Broadbent, J.; and Willig-Atherton, H. (1994) Recent Financial and Administrative Changes in GP Practices in the UK: Initial Experiences and Effects. *Accounting, auditing, & accountability*, 7 (3): 96–124. Available at: http://dx.doi.org/10.1016/j.jaci.2012.05.050.

Lee, R.M. (1993) *Doing research on sensitive topics*. London: London : Sage. (Bibliography: p211-242. - Includes index.).

Lee, T. (1943) Medical Ethics in Ancient China. *Bulletin of the History of Medicine*, 13: 268–277.

Lehtonen, T. (2007) DRG-based prospective pricing and case-mix accounting-Exploring the mechanisms of successful implementation. *Management Accounting Research*, 18 (3): 367–395. doi:10.1016/j.mar.2006.12.002.

Leotta, A. and Ruggeri, D. (2017) Performance measurement system innovations in hospitals as translation processes. *Accounting, Auditing and Accountability Journal*, 30 (4): 955–978. doi:10.1108/AAAJ-01-2014-1580.

Li, L. (2022) Development of China's health care system in the time of COVID-19: Challenges, opportunities, and call for actions. *Health Care Science*, 1 (1): 33–40. doi:10.1002/hcs2.4.

Li, L., Jiang, Y. and Chen, Q. (2008) 改革开放背景下的我国医改30年 A Review of China's Health Care Reform After the Reform and Open Policy in 1978. *Chinese Health Economics*, 27 (2): 5–9.

Lin, Z.J. and Yu, Z. (2002) Responsibility cost control system in China: A case of management accounting application. *Management Accounting Research*, 13 (4): 447–467. doi:10.1006/mare.2002.0200.

Lindlbauer, I., Winter, V. and Schreyögg, J. (2016) Antecedents and Consequences of Corporatization: An Empirical Analysis of German Public Hospitals. *Journal of Public Administration Research and Theory*, 26 (2): 309–326. doi:10.1093/jopart/muv016.

Llewellyn, S. (2001) "Two-way Windows": Clinicians as Medical Managers. *Organization Studies*, 22 (4): 593–623.

Llewellyn, S. and Northcott, D. (2005) The average hospital. *Accounting, Organizations and Society*, 30 (6): 555–583. doi:10.1016/j.aos.2004.05.005.

Lounsbury, M. and Crumley, E.T. (2007) New practice creation: An institutional perspective on innovation: Michael Lounsbury and Ellen T. Crumley. *Organization Studies*, 28 (7): 993–1012. doi:10.1177/0170840607078111.

Lowe, A. and Doolin, B. (1999) Casemix accounting systems: new spaces for action. *Management Accounting Research*, (10): 181–201.

Maguire, S., Hardy, C. and Lawrence, T.B. (2004) Institutional entrepreneurship in emerging fields: HIV/AIDS treatment advocacy in Canada. *Academy of Management Journal*, 47 (5): 657–679.

Manning, J. (2017) "In Vivo Coding." In Matthes, J. (ed.) *The International Encyclopedia of Communication Research Methods*. New York, NY: Wiley-Blackwell. doi:10.1002/9781118901731.iecrm0270.

Manning, N. (2001) The legacy of the New Public Management in developing countries. *International Review of Administrative Sciences*, 67 (2): 297–312. doi:10.1177/0020852301672009.

Maran, L. and Lowe, A. (2022) Competing logics in a hybrid organization: ICT service provision in the Italian health care sector. *Accounting, Auditing and Accountability Journal*, 35 (3): 770–800.

Marcon, G. and Panozzo, F. (1998) Reforming the reform: Changing roles for accounting and management in the italian health care sector. *International Journal of Phytoremediation*, 21 (1): 185–208. doi:10.1080/096381898336448.

Mcgivern, G., Currie, G., Ferlie, E., et al. (2015) Hybrid manager-professionals' identity work: The maintenance and hybridization of medical professionalism in managerial contexts. *Public Administration*, 93 (2): 412–432. doi:10.1111/padm.12119.

McPherson, C.M. and Sauder, M. (2013) Logics in Action: Managing Institutional Complexity in a Drug Court. *Administrative Science Quarterly*, 58 (2): 165–196.

Merriam, S.B. and Tisdell, E.J. (2016) *Qualitative research : a guide to design and implementation*. Fourth edi. Tisdell, E.J. (ed.). San Francisco, CA : Jossey-Bass, a Wiley Brand, 2016. (Includes bibliographical references (pages 301-322) and indexes.).

Meyer, J.W. and Rowan, B. (1977) Institutionalized Organizations: Formal Structure as Myth and Ceremony. *American Journal of Sociology*, 83 (2): 340–363.

Miller, P. and O'Leary, T. (1987) Accounting and the construction of the governable person. *Accounting, Organizations and Society*, 12 (3): 235–265. doi:10.1016/b978-008044725-4/50012-6.

Mills, A. (1997) Improving the efficiency of public sector health services in developing

countries: bureaucratic versus market approaches. *Marketizing education and health in developing countries: Miracle or mirage*, (17): 245–74.

Montgomery, K. (1990) A Prospective Look at the Specialty of Medical Management. *Work and Occupations*, 17 (2): 178–198.

Morris, M.W. and Gelfand, M.J. (2004) “Cultural differences and cognitive dynamics: Expanding the cognitive perspective on negotiation.” In Gelfand, M.J. and Brett, J.M. (eds.) *The Handbook of Negotiation and Culture*. 1st ed. Stanford Business Books.

National Health Commission (2023) *国家卫生健康委办公厅关于印发国家三级公立医院绩效考核操作手册（2023版）的通知*. Available at: https://www.gov.cn/zhengce/zhengceku/2023-03/02/content_5744105.htm (Accessed: 29 May 2023).

National Health Commission of People’s Republic of China (2012) 中国医师协会.

National Health Commission of People’s Republic of China (2021) 人力资源社会保障部、国家卫生健康委、国家中医药局关于深化卫生专业技术人员职称制度改革的指导意见. Available at: http://www.nhc.gov.cn/renshi/s3572/202108/b77ef44b1f7c40bfb8a4381c2f70dc8e.shtml (Accessed: 29 May 2023).

Norman, D.A. and Shallice, T. (1986) “Attention to action: Willed and automatic control of behavior.” In Davidson, R.J., Schwartz, G.E. and Shapiro, D. (eds.) *Consciousness and Self-Regulation*. Boston: Springer. pp. 1–18.

Nyland, K. and Pettersen, I.J. (2004) The Control Gap: The Role of Budgets, Accounting Information and (Non-) Decisions in Hospital Settings. *Financial Accountability and Management*, 20 (1): 77–102. doi:10.1111/j.1468-0408.2004.00187.x.

Ocasio, W. (1997) Towards an attention-based view of the firm. *Strategic*

management journal, 18 (S1): 187–206. doi:10.1002/(sici)1097-0266(199707)18:1+<187::aid-smj936>3.3.co.

Oliver, C. (1991) Strategic Responses to Institutional Processes. *The Academy of Management Review*, 16 (1): 145–179.

Oppi, C., Campanale, C., Cinquini, L., et al. (2019) Clinicians and accounting: A systematic review and research directions. *Financial Accountability and Management*, 35 (3): 290–312. doi:10.1111/faam.12195.

Pache, A.-C. and Santos, F. (2013a) Inside the Hybrid Organisation: Selective Coupling as a Response to Competing Institutional Logics. *The Academy of Managemet Journal*, 56 (4): 972–1001.

Pache, A.C. and Santos, F. (2013b) Embedded in hybrid contexts: How individuals in organizations respond to competing institutional logics. *Research in the Sociology of Organizations*, 39 Part B (November): 3–35. doi:10.1108/S0733-558X(2013)0039A&B014.

Patton, M.Q. (2014) *Qualitative Research & Evaluation Methods*. 4th ed. Thousand Oaks: SAGE Publications US.

Peng, R. (2000) How Professional Values Are Developed and Applied in Medical Practice in China. *The Hastings Center Report*, 30 (4): S23–S26. doi:10.2307/3527660.

Pettersen, I.J. (1995) Budgetary Control of Hospitals — Ritual Rhetorics and Rationalized Myths? *Financial Accountability & Management*, 11 (3): 207–221.

Pettersen, I.J. (2001) Hesitation and rapid action: The new public management reforms in the Norwegian hospital sector. *Scandinavian Journal of Management*, 17 (1): 19–39. doi:10.1016/S0956-5221(00)00031-2.

Pettersen, I.J. and Nyland, K. (2006) Management and control of public hospitals -

The use of performance measures in Norwegian hospitals. A case-study. *International Journal of Health Planning and Management*, 21 (2): 133–149. doi:10.1002/hpm.835.

Polidano, C. and Hulme, D. (1999) Public Management Reform Im Developing Countries. *Public Management: An International Journal of Research and Theory*, 1 (1): 121–132. doi:10.1080/14719037800000007.

Pollitt, C., Harrison, S., Hunter, D., et al. (1988) The Reluctant Managers: Clinicians and Budgets in the NHS. *Financial Accountability and Management*, 4 (3): 213–233. doi:10.1111/j.1468-0408.1988.tb00299.x.

Pomberg, M., Pourjalali, H., Daniel, S., et al. (2012) Management accounting information systems: a case of a developing country: Vietnam. *Asia-Pacific Journal of Accounting & Economics*, 19 (1): 100–114. doi:10.2307/3527656.

Preston, A.M., Cooper, D.J. and Coombs, R.W. (1992) Fabricating budgets: A Study of the Production of Management Budgeting in the National Health Service. *Accounting, Organizations and Society*, 17 (6): 561–593.

Qiu, Y. (2019) 中国医疗保障70年：回顾与解析. 社会保障评论, 3 (1).

Rao, H., Monin, P. and Durand, R. (2003) Institutional change in toque ville: Nouvelle cuisine as an identity movement in French gastronomy. *American Journal of Sociology*, 108 (4): 795-843+i. doi:10.1086/367917.

Rautiainen, A., Mättö, T., Sippola, K., et al. (2022) Accounting, microfoundations, hybridization and longitudinal conflict in a Finnish health care organization. *Accounting, Auditing and Accountability Journal*, 35 (3): 863–886.

Rea, D.M. (1994) Better Informed Judgements:Resource Management in the NHS. *Accounting Auditing and Accountability*, 7 (1): 86–110. Available at: http://dx.doi.org/10.1016/j.jaci.2012.05.050.

Reay, T., Golden-Biddle, K. and Germann, K. (2006) Legitimizing a new role: Small wins and microprocesses of change. *Academy of Management Journal*, 49 (5): 977–998.

Reay, T. and Hinings, C.R. (2005) The recomposition of an organizational field: Health care in Alberta. *Organization Studies*, 26 (3): 351–384.

Reay, T. and Hinings, C.R. (2009) Managing the Rivalry of Competing Institutional Logics. *Organization Studies*, 30 (6): 629–652.

Rego, G., Nunes, R. and Costa, J. (2010) The challenge of corporatisation: The experience of Portuguese public hospitals. *European Journal of Health Economics*, 11 (4): 367–381. doi:10.1007/s10198-009-0198-6.

Renmin Zhengxie Daily (2015) 我国医改迎来而立之年. Available at: https://www.rmzxb.com.cn/xywy/yxtqs/2015/02/11/446036.shtml (Accessed: 29 May 2023).

Roulston, K. and Choi, M. (2018) *The SAGE Handbook of Qualitative Data Collection*. doi:10.4135/9781526416070.

Rozenfeld, G.C. and Scapens, R.W. (2021) Forming mixed-type inter-organisational relationships in Sub-Saharan Africa: The role of institutional logics, social identities and institutionally embedded agency. *Critical Perspectives on Accounting*, 78: 102–232.

Rubin, H.J. and Rubin., I.S. (2012) *Qualitative interviewing : the art of hearing data*. 3rd ed. Rubin, I. (ed.). Thousand Oaks, Calif.: Thousand Oaks, Calif. : SAGE. (Includes bibliographical references and indexes.).

Russell, S., Bennett, S. and Mills, A. (1999) Reforming the health sector: Towards a healthy new public management. *Journal of International Development*, 11 (5): 767–775. doi:10.1002/(SICI)1099-1328(199907/08)11:5<767::AID-JID617>3.0.CO;2-G.

Samuel, S., Dirsmith, M.W. and McElroy, B. (2005) Monetized medicine: From the physical to the fiscal. *Accounting, Organizations and Society*, 30 (3): 249–278. doi:10.1016/j.aos.2004.02.001.

Sarker, A.E. (2006) New public management in developing countries: An analysis of success and failure with particular reference to Singapore and Bangladesh. *International Journal of Public Sector Management*, 19 (2): 180–203. doi:10.1108/09513550610650437.

Sartirana, M. (2019) Beyond hybrid professionals: evidence from the hospital sector. *BMC health services research*, 19 (1): 634. doi:10.1186/s12913-019-4442-1.

Saunders, B., Sim, J., Kingstone, T., et al. (2018) Saturation in qualitative research: exploring its conceptualization and operationalization. *Quality and Quantity*, 52 (4): 1893–1907. doi:10.1007/s11135-017-0574-8.

Saunders, M.N.K., Adrian, T. and Philip, L. (2019) *Research Methods for Business Students.* 8th ed. Harlow, United Kingdom: Pearson Education Limited.

Saunders, M.N.K. and Townsend, K. (2016) Reporting and Justifying the Number of Interview Participants in Organization and Workplace Research. *British Journal of Management*, 27 (4): 836–852. doi:10.1111/1467-8551.12182.

Scott, W.R. (2008) Lords of the dance: Professionals as institutional agents. *Organization Studies*, 29 (2): 219–238.

Scott, W.R. (2014) *Institutions and organizations : ideas, interests, and identities*. 4th ed. Los Angeles: SAGE.

Scott, W.R., Ruef, M., Mendel, P.J., et al. (2000) *Institutional Change and Healthcare Organizations: From Professional Dominance to Managed Care*. Caronna. Chicago: University of Chicago Press.

Selznick, P. (1966) *TVA and the grass roots: A study in the sociology of formal*

organization. New York: Harper & Row.

Shambaugh, D. (2016) *China's Future*. Polity Press.

Simon, H.A. (1976) *Administrative behavior; a study of decision-making processes in administrative organization.* 3rd ed. New York; London: New York : Free Press ; London : Collier Macmillan.

Simonet, D. (2013) New public management and the reform of French public hospitals. *Journal of Public Affairs*, 13 (3): 260–271. doi:10.1002/pa.1465.

Skelcher, C. and Smith, S.R. (2015) Theorizing hybridity: Institutional logics, complex organizations, and actor identities: The case of nonprofits. *Public Administration*, 93 (2): 433–448. doi:10.1111/padm.12105.

Song, X. (2009) 建国60年我国医疗保障体系的回顾与展望. *Chinese Journal of Health Policy*, 2 (10): 6–14.

Strauss, A.L. (1978) *Negotiations: Varieties, Contexts, Processes and Social Order*. 1st ed. Jossey-Bass Inc.

Suddaby, R. (2006) From the editors: What grounded theory is not. *Academy of Management Journal*, 49 (4): 633–642. doi:10.5465/AMJ.2006.22083020.

The Ministry of Health, The Ministry of Finance and The National Labour Bureau (1979) 关于加强医院经济管理试点工作的通知. Available at: http://www.reformdata.org/1979/0428/5223.shtml (Accessed: 29 May 2023).

The Ministry of Human Resources and Social Security, The Ministry of Health and The Ministry of Finance (2012) 人力资源社会保障部、财政部、卫生部关于开展基本医疗保险付费总额控制的意见. Available at: https://www.gov.cn/zwgk/2012-12/04/content 2281928.htm (Accessed: 25 September 2023).

The National Committee of the Chinese People's Political Consultative Conference (1949) 中国人民政治协商会议共同纲领. Available at:

http://www.cppcc.gov.cn/2011/12/16/ARTI1513309181327976.shtml (Accessed: 25 September 2023).

The State Council (1989) 关于扩大医疗卫生服务有关问题的意见. Available at: http://www.reformdata.org/1989/0115/5249.shtml (Accessed: 29 May 2023).

The State Council (2009a) 关于深化医药卫生体制改革的意见. Available at: https://www.gov.cn/jrzg/2009-04/06/content_1278721.htm (Accessed: 27 September 2023).

The State Council (2009b) *国务院关于印发医药卫生体制改革近期重点实施方案（2009—2011年）的通知*. Available at: https://www.gov.cn/zwgk/2009-04/07/content_1279256.htm (Accessed: 29 May 2023).

The State Council (2012) *深化医药卫生体制改革2012年主要工作安排*.

The State Council (2017) *China issues plan on medical education reform*. Available at: http://english.www.gov.cn/policies/latest_releases/2017/07/11/content_281475721608510.htm (Accessed: 29 May 2023).

The State Council (2019) 国务院办公厅关于加强三级公立医院绩效考核工作的意见. Available at: https://www.gov.cn/zhengce/content/2019-01/30/content_5362266.htm (Accessed: 29 May 2023).

The World Bank (1993) *World development report: Investing in health*.

The World Bank (2010) 中国卫生政策报告系列二：如何解决中国公立医院系统存在的问题. Available at: https://documents1.worldbank.org/curated/en/748861468218992891/pdf/584110NWP0v20c0l0Reform0chn0updated.pdf.

Thornton, P.H. (2004) *Markets from Culture: Institutional Logics and Organizational*

Decisions in Higher Education Publishing. Stanford University Press.

Thornton, P.H., Jones, C. and Kury, K. (2005) Institutional Logics and Institutional Change in Organizations: Transformation in Accounting, Architecture, and Publishing. *Research in the Sociology of Organizations*, 23 (September 2019): 125–170.

Thornton, P.H. and Ocasio, W. (1999) Institutional logics and the historical contingency of power in organizations: Executive succession in the higher education publishing industry. *American Journal of Sociology*, 105 (3): 801–843.

Thornton, P.H. and Ocasio, W. (2008) "Institutional Logics." In *The SAGE Handbook of Organizational Institutionalism*. London: London : SAGE. pp. 99–129.

Thornton, P.H. and Ocasio, W. (2012) "Institutional Logics." In Suddaby, R., Greenwood, R., Oliver, C., et al. (eds.) *The SAGE Handbook of Organizational Institutionalism*. London: SAGE. pp. 99–128.

Thornton, P.H., Ocasio, W. and Lounsbury, M. (2012a) "Defining the Interinstitutional System." In Thornton, P.H., Ocasio, W. and Lounsbury, M. (eds.) *The Institutional Logics Perspective: A New Approach to Culture, Structure and Process*. Oxford: Oxford University Press. doi:10.1093/acprof.

Thornton, P.H., Ocasio, W. and Lounsbury, M. (2012b) "Introduction to the Institutional Logics Perspective." In Thornton, P.H., Ocasio, W. and Lounsbury, M. (eds.) *The Institutional Logics Perspective: A New Approach to Culture, Structure and Process*. Oxford: Oxford University Pres. pp. 583–605. doi:10.1093/acprof.

Thornton, P.H., Ocasio, W. and Lounsbury, M. (2012c) "Microfoundations of Institutional Logics." In Thornton, P.H., Ocasio, W. and Lounsbury, M. (eds.) *The Institutional Logics Perspective: A New Approach to Culture, Structure and Process*. 1st ed. Oxford, UK: Oxford University Press. pp. 583–605. doi:10.1093/acprof.

Thornton, P.H., Ocasio, W. and Lounsbury, M. (2012d) *The institutional logics perspective: foundations, research, and theoretical elaboration*. Oxford: Oxford University Press. (Includes bibliographical references and index.).

Townley, B. (2002) The Role of Competing Rationalities in Institutional Change. *The Academy of Management Journal*, 45 (1): 163–179.

Tsai, T.-C. (2014) When Hippocrates and Sun Simiao met in Taiwan in a highly efficient health care system. *Med Educ*, 48 (1): 14–16. doi:10.1111/medu.12388.

Tsuei, W. (1989) *Roots of Chinese culture and medicine*. Oakland, California, U.S.A.: Chinese Culture Books Co.

Vakkuri, J. and Johanson, J.E. (2021) “Value creation among hybrids.” In Vakkuri, J. and Johanson, J.E. (eds.) *Hybrid Governance, Organisations and Society: Value Creation Perspectives*. 1st ed. Routledge. pp. 3–25. doi:10.4324/9780429286247-2.

Veith, I. (2015) *The Yellow Emperor’s classic of internal medicine: the yellow emperor’s classic of internal medicine*. 1st ed. Berkeley: Berkeley: University of California Press. doi:10.1525/j.ctv1wxs1d.

Wang, H. and Wang, X. (2015) “Medical Ethics Education in China.” In Have, H.A.M.J. ten (ed.) *Bioethics Education in a Global Perspective: Challenges in global bioethics*. Springer Dordrecht. pp. 81–92. doi:10.1007/978-94-017-9232-5 7.

Weber, K. and Glynn, M.A. (2006) Making sense with institutions: Context, thought and action in Karl Weick’s theory. *Organization Studies*, 27 (11): 1639–1660. doi:10.1177/0170840606068343.

Wickramasinghe, D. and Hopper, T. (2005) A cultural political economy of management accounting controls: A case study of a textile Mill in a traditional Sinhalese village. *Critical Perspectives on Accounting*, 16 (4): 473–503. doi:10.1016/j.cpa.2003.07.001.

Wu, F. and Shen, Y. (2016) 公立医院改革——历史演进、制度困境与路径选择. *Chinese Journal of Health Policy*, 9 (1): 34–39.

Wu, H. and Zhang, M. (2020) 唐代医学教育制度及教材. *Medical Research and Education*, 37 (6): 67–74.

Xinhua News Agency (2011) *卫生部部长陈竺回应"看病难、看病贵"6大问题*. Available at: https://www.gov.cn/jrzg/2011-02/19/content_1806198.htm (Accessed: 29 May 2023).

Xinhua News Agency (2017) *内蒙古：确保年底前100个以上病种实行按病种付费*. Available at: https://www.gov.cn/xinwen/2017-12/05/content_5244563.htm (Accessed: 29 May 2023).

Xiong, M. (2015) *医保支付制度改革：按人头付费VS总额预付*. Available at: https://www.zgylbx.com/index.php?m=content&c=index&a=show&catid=13&id=27160 (Accessed: 20 May 2023).

Xu, D., Sun, B., Wan, X., et al. (2010) Reformation of medical education in China. *The Lancet*, 375 (9725): 1502–1504. doi:10.1016/S0140-6736(10)60241-3.

Xu, J., Jian, W., Zhu, K., et al. (2019) 中国公立医院补偿制度改革：进展与挑战. *The BMJ*, 365: 20–24. doi:10.1136/bmj.l4015.

Xunzi (2003) *Xunzi : basic writings / translated by Burton Watson.* Translations from the Asian Classics.

Yao, Z. (2015) 近代以来中国医生职业与国家关系的演变——一种职业社会学的解释. 社会学研究, 30 (03): 46–68.

Yee, H. (2009) The re-emergence of the public accounting profession in China: A hegemonic analysis. *Critical Perspectives on Accounting*, 20 (1): 71–92. doi:10.1016/j.cpa.2007.03.008.

Yin, Q. (2007) 中国近代自由职业群体研究述评. 近代史研究, (6): 110–119. doi:10.1017/CBO9781107415324.004.

Yin, R.K. (2014) *Case study research : design and methods / Robert K. Yin.* 5. ed. Los Angeles: Los Angeles. (Bibliography: p. 243-257.).

Yip, W.C.M., Hsiao, W.C., Chen, W., et al. (2012) Early appraisal of China's huge and complex health-care reforms. *The Lancet*, 379 (9818): 833–842. doi:10.1016/S0140-6736(11)61880-1.

Yu, K.H. (2015) Institutional Pluralism, Organizations, and Actors: A Review. *Sociology Compass*, 9 (6): 464–476. doi:10.1111/soc4.12269.

Zhang, D. and Cheng, Z. (2000) Medicine Is a Humane Art: The Basic Principles of Professional Ethics in Chinese Medicine. *The Hastings Center Report*, 30 (4): S8–S12.

Zhang, D. and Unschuld, P.U. (2008) China's barefoot doctor: past, present, and future. *The Lancet*, 372 (9653): 1865–1867. doi:10.1016/S0140-6736(08)61355-0.

Zhang, Z. and Gao, J. (2002) 实施临床路径的意义和方法. 中华医院管理杂志, 18 (9).

Zhu, H., Zan, X. and Xiang, H. (2014) 财政补偿体制演变与公立医院去行政化改革. 经济学动态, 12: 61–71.

Zhu, Y. and Wei, W. (2009) "近代医师群体与医师公会研究." In Zhu, Y. and Wei, W. (eds.) 近代中国自由职业者群体与社会变迁. 北京: 北京大学出版社. pp. 204–302.

Zucker, L.G. (1977) The Role of Institutionalization in Cultural Persistence. *American Sociological Review*, 42 (5): 726–743.

Appendices

Appendix A Interview Guide for Pilot Interview

Interview Guide

Date:

Time:

Place:

Interviewee:

Interviewer:

Introduction

Thank you for participating this interview. I am a PhD student from the Department of Accounting in University of Birmingham. I am interviewing you to better understand how accounting connects with medicine in Chinese public hospitals.

In this research, I will keep your data confidential and anonymous. This interview will be audio recorded subject to your approval. During the interview, you have the right not to answer a question if you do not wish to, and you also have the right to stop the interview at any time without jeopardy. Here is the documentation that provides detailed information.

Background Questions：

1. Could you please introduce yourself?

- *Department and position*
- *Title*
- *Experience of working in this hospital*

2. Could you please describe your daily routine and job responsibility?

Middle section:

3. Do you ever hear of 'controlling cost'? From your perspective, in what aspects does your department control costs? Which one is the most expensive? Which one has the lowest cost? How does the department control these costs? Where did you get the knowledge of cost classification and ways of controlling cost? why do you think the department control costs and what are the effects it wants to achieve?
4. Do you ever consider controlling costs in medical activities?

   if yes:

   - *Give examples on how you control costs?*
   - *Why do you control costs?*
   - *In this process, how do you think controlling cost affects medical decision, medical process, medical quality and your practice?*
   - *How do you learn to control costs in this way?*

   if no:

   - *Why?*

5. Do you ever find there is a conflict between costing needs and medical needs? If yes, what was it and how did you address it? what do you think other doctors will do when they are in the same situation?
6. Is controlling costs important in the hospital and in your department? What do you think determines its position?

7. What does the department do to increase bonus? is there any cost deduction?
8. Do you ever consider maximizing bonus in medical activities?

   if yes:

   - *Give examples on how you do this?*
   - *Why do you do this?*
   - *In this process, how do you think it affects medical decision, medical process, medical quality and your practice?*

   if no:

   Why?
9. Do you ever consider maximizing bonus and controlling costs at the same time in medical activities? Increasing bonus and controlling bonus, which one do you prefer? Why? what do you think other doctors' choices?
10. Why do you think controlling costs is tied to increasing bonus? what do you think are effects that this combination is expected to achieve? How do you think about this combination? If the hospital does not consider costs when calculating your bonus, will you still pay attention to controlling costs? Why? if you do not gain bonus for controlling costs but are required to do so, are you still willing to do this?
11. Before the case-based payment is introduced, did your department control cost at the time? Could you please give an example on how you/your department control costs? Compared to that period, what do you think is the difference in ways of controlling costs? Does this difference affect your practice? In what ways?
12. Before the case-based payment is introduced, did your department engage in

increasing bonus at the time? Could you please give an example on how you/your department did this? Compared to that period, what do you think is the difference in ways of increasing bonus? Does this difference affect your practice? In what ways?

13. Is it important in the hospital and in your department? What do you think determines its position? Compared to costing system, which one do you think is more important in the hospital and in your department and why?
14. Do you think using cost control to affect medical activities is a good or bad thing? Why?

    Do you think using bonus system to affect medical activities is a good or bad thing? Why?

Concluding Statement

Thanks again for participating this interview. If you need any information about the study, please contact the researcher Jing Liu.

Appendix B Informed Consent Form

Participant Information Leaflet

Description of the Study

This research, Hospital Accounting in China, is a research project for PhD student Jing Liu from University of Birmingham. The purpose of this study is to discover the relationship between medicine and accounting in Chinese hospitals so as to contribute to the promotion of Chinese hospital accounting.

Your Participation

We sincerely invite you to participate in this research. This study mainly invites medical staff, administrators and accountants who are or used to work in 3A hospitals in this region to learn about these professionals' views on the development of accounting in hospitals through interviews. Your participation will provide useful information for improving the understanding of hospital accounting in China and will assist scholars expand their research scopes. Participating in this research will not cause any risk or harm to you.

Your participation in this study will consist of an interview lasting approximately 60-90 minutes. The main questions include how you apply accounting knowledge in

your work and how you obtained accounting knowledge, etc. You are also welcomed to ask questions about the nature of the research or research methods during the interview. If you would like to stop the interview and your participation in the study, you may notify the researcher. There is no penalty for discontinuing participation.

The interview will be recorded to help the researcher capture relevant tips during the research; however, your name will not be recorded. Your name and other identifiable information will not appear in any form of writing report.

Confidentiality

All your personal information and interview will be kept confidential. The researcher will not share your personal information and interview answers with anyone other than her supervisors.

During the research, your data will be stored and backed up on the Research Data Storage (RDS) and the BEAR data share of the University of Birmingham. All data will be transferred to the University of Birmingham Research Data Archive (RDA). Once transferred the data will be set to read-only to prevent any inadvertent additions or deletions of the dataset. The data will be stored at the University of Birmingham for 10 years for verification. If research data needs to be disposed of, the researcher will communicate with professionals in the IT Service of the University of Birmingham to ensure that the data is securely disposed of. The reason for disposal will be recorded in the latest data management plan (DMP) of this research.

Results of the study

The results of this research may be presented and published in academic

conferences and journals in China and abroad. If you are interested in the research results, please leave your contact information.

Contact Information

If you have any questions or concerns, please contact the researcher Jing Liu:

[redacted]

Informed Consent Form

Title of the study

Hospital Accounting in China

Fair Processing Statement

This information is being collected as part of a research project for PhD student Jing Liu from the Department of Accounting in the University of Birmingham. The research project will be entered into a filing system or database and will only be accessed by authorised personnel involved in the project. The information will be retained by the University of Birmingham and will only be used for the purpose of research, and statistical and audit purposes.

By supplying this information you are consenting to the University storing your information for the purposes stated above. The information will be processed by the University of Birmingham in accordance with the provisions of the Data Protection Act 2018①. No identifiable personal data will be published.

Statements of Consent

- I confirm that I have read and understand the participant information leaflet for

this study. I have had the opportunity to ask questions if necessary and have had these answered satisfactorily.

- I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason. If I withdraw my data will be removed from the study and will be destroyed.
- I understand that my personal data will be processed for the purposes detailed above, in accordance with the Data Protection Act 2018.
- I understand that my interview will be recorded.
- Based upon the above, I agree to take part in this study.

Name, signature and date

Name of participant…… Date……

Signature……..

Name of researcher…….. Date……

Signature……..

Appendix C Summary of Interviewees

Department	Interviewee Position	Pseudonym	Interview length (in minutes)
Lab Department	Senior Doctor	L1	45: 31
	Senior Doctor	L2	48: 53
	Deputy Head of the Department	L3	35: 42
	Deputy Head of the Department	L4	53: 23
	Senior Doctor	L5	68: 27
	Senior Doctor	L6	32: 42
	Senior Doctor	L7	37: 51
	Junior Doctor	L8	52: 11
	Junior Doctor	L9	53: 21
	Junior Doctor	L10	32: 07
	Junior Doctor	L11	49: 56
	Junior Doctor	L12	35: 11
	Junior Doctor	L13	31: 19
	Senior Doctor	L14	38: 59
Clinical	Head of the	C1	39: 30

departments	Department		
	Senior Doctor	C2	29: 54
	Senior Doctor	C3	26: 27
	Junior Doctor	C4	37: 20
	Senior Doctor	C5	35: 48
	Head of the Department	C6	55: 49
	Head Nurse	C7	35: 03
	Senior Doctor	C8	25: 05
	Head of the Department	C9	35: 49
	Head of the Department	C10	52: 51
	Senior Nurse	C11	22: 11
	Senior Doctor	C12	31: 03
	Junior Doctor	C13	22: 04
	Senior Doctor	C14	24: 45
	Junior Doctor	C15	42: 51
	Junior Doctor	C16	28: 17
	Senior Doctor	C17	26: 51

Appendix D Interview Guide for Formal Interviews

Interview Guide

Date:

Time:

Place:

Interviewee:

Interviewer:

Thank you for taking the time to participate in this interview amidst your busy schedule. I hope to gain insights into the application of management accounting in public hospitals in China through our conversation. During the actual interview, I will adjust the questions based on your responses. Please answer based on your own experiences and understanding of the questions. This interview outline is for reference only.

1. Background Questions

- Your position, title, and work experience.
- The department you work in and the nature of your daily responsibilities.

2. Cost-related Questions

- What are the costs associated with your department?

- Do you engage in cost control in your work?

If yes:

- How do you control costs in your work?
- How do you deal with situations where cost control conflicted with medical standards in your work, if any?
- What are the reasons for your cost control efforts?
- How does cost control impact your medical work?

If no:

- why?

3. Bonus-related Questions

- What performance evaluation criteria, objectives, or tasks are established for individuals in your department?

- Which type of criteria are you most concerned about, and why?

- How do you believe the implementation of performance evaluation affects you?

- How do you evaluate the use of metrics to measure medical work?