Making Connections:
Social Networks and Healthcare Access in China

By

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Abstract

When there are obstacles to access public services, citizens tend to resort to social connections to get things done. While the existing studies suggest that people rely on connections to compensate for ineffective formal institutions, it remains unclear if people rely less on social connections when the formal institutions are more effective. The use of connections entails unequal public service access between those with and without connections. Social connections may only fill in the gaps when the formal institutions are ineffective lacking adequate information and service provision. Effective formal institutions may mitigate the reliance on social connections to access public services. Therefore, this study examines the influence of formal institutional capacities on the use of social connections in the case of health service access in China. Using the China Family Panel Studies 2010 data and China Health Statistical Yearbook 2010 data, this study finds that greater health institutional capacities indeed mitigate the use of personal connections (*guanxi*) to access health services. The statistical analyses of the data suggest that there is less use of personal connections (*guanxi*) to see a doctor in provinces with greater health institutional capacities. The analyses of the Chinese General Social Survey 2010 data also find that the provincial health institutional capacities have a positive influence on perceived healthcare access. These results suggest that in provinces with greater health institutional capacities, people perceive that they can more easily access healthcare services, and they are less likely to rely on personal connections to access health services. Further, the qualitative analyses of the interview data add a more nuanced understanding to the roles of social connections and institutions, and suggest that social connections stay relevant and persist to play important roles even when the institutional capacities are greater. The interviews with women about their prenatal care service access in an urban city in China indicate that most interviewees had access to standardized care

services regardless of their use of social connections. Still, there were two institutional gaps: long wait time and short doctor-patient interaction time. These gaps stem from overcrowding hospitals, and made the access to services and information more difficult. Under this context, many interviewees used social connections with friends and colleagues to obtain information about pregnancy and prenatal exams, compensating for the lack of information provided by the doctors. The use of online networks was also popular among them to fill in the informational gap. Interpersonal connections (*guanxi*) can also facilitate prenatal care service access by making it easier to see a doctor in face of the long wait time and overcrowding hospitals. These findings suggest that social connections play different roles based on particular institutional gaps they fill in. No institutions are fully efficient in providing perfect information and services. While the reliance on or substitutive effect of connections can become mitigated when the formal institutions are more effective, social connections continue to play different roles under different institutional contexts. Social connections and formal institutions interact and shape people's behaviors and access to public services. This study offers implications for the studies on social connections and governance as well as public service institutional developments in other countries, ongoing health system reforms in China, and for the authoritarian resilience that stems from the government's public service provision.

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Chapter 1: Introduction and Literature Review

This section illustrates an overview of the dissertation, discusses the country case selection (i.e. why I examine healthcare services access in China), and clarifies the contributions this dissertation brings to the existing literature. The literature review section first defines informal and formal institutions. These are the two key factors this study examines regarding healthcare service access. Informal institutions such as informal social networks play a substitutive role when formal institutions are ineffective (Helmke and Levitsky 2004, 2006). In other words, people use social connections to fill in the gaps of ineffective formal institutions (Lowndes 2004; Molyneux 2002; Narayan 2002; Rose 2000; Woolcock and Narayan 2000). This suggests that social connections improve health service access when formal health service institutions are ineffective, while the presence of effective institutions can mitigate the use of connections to access healthcare. Thus, this study focuses on informal social networks that fill in the gaps of formal institutions. This conceptualization of social connections also encompasses the Chinese concept of personal connections *guanxi*. The effectiveness of formal healthcare institutions is based on the WHO's building blocks of health systems. The literature review section also discusses existing studies that find a positive influence of social connections (including *guanxi*) on healthcare service access, as well as the existing studies that suggest an interacting effect between social connections and institutions. This chapter proceeds as follows. First, the introduction section discusses an overview of this dissertation as well as the case selection and contributions of this study. Second, I discuss the definition of social connections and institution at the beginning of the literature review section. Lastly, I discuss the existing literature concerning influence of social connections and institutions on health service access, and generate two hypotheses.

1.1 Introduction

1.1.1 Dissertation Overview

When there are obstacles to access public services, citizens mobilize informal social networks to meet their everyday demands. In other words, people rely on social connections and networks to compensate for ineffective formal institutions (Lowndes 2004; Molyneux 2002; Narayan 2002; Rose 2000; Woolcock and Narayan 2000). Formal and informal institutions have an interactive relationship (Helmke and Levitsky 2004, 2006). When formal institutions are ineffective, informal institutions can play a substitutive role (Helmke and Levitsky 2004, 2006).

One such example is an use of inter-personal connections to access healthcare services in China (Chan and Yao 2018; Fu and Chan 2016; D. Wu et al. 2017; Zou et al. 2018). While China's government statistics suggest that over 90 percent of the population has some form of health insurance as of 2018 (National Bureau of Statistics of China 2019), the quality of and access to health services vary widely across China. In such a context, some individuals and families rely on inter-personal connections to gain access to better quality care, while those who lack these administrative relationships must rely on the existing overwhelmed health care institutions.

Some studies suggest that community and personal networks indeed improve people's access to healthcare services when there are obstacles to access. Social networks improve access to healthcare services by facilitating sharing of information needed to access the services, including information on how the healthcare system works, how to find the healthcare providers, and general health information (Amoah, Edusei, and Amuzu 2018; Deri 2005; Devlin and Rudolph-Zbarsky 2014; Dong 2016; Herberholz and Phuntsho 2018; Hou, Lin, and Zhang 2017;

Lindström et al. 2006). These networks are important because of the bureaucratic and other barriers that may restrict or even close off access to certain types of health care services (Amoah, Edusei, and Amuzu 2018; Deri 2005; Herberholz and Phuntsho 2018; Hou, Lin, and Zhang 2017). Public health care institutions are meant to provide services for those in need, but people require enough information about where, when and how these services are provided. Incomplete information results in inefficient services. The social networks help individuals navigate the medical bureaucracy and identify the obstacles as well as the opportunities to gain greater access (Chan and Yao 2018; Deri 2005; Devlin and Rudolph-Zbarsky 2014; Hou, Lin, and Zhang 2017; D. Wu et al. 2017; Zou et al. 2018). This includes pinpointing institutional arrangements or finding the right person or professional (Deri 2005; Devlin and Rudolph-Zbarsky 2014; Hou, Lin, and Zhang 2017; D. Wu et al. 2017; Zou et al. 2018). In short, social connections and networks provide critical information to gain better access to quality care.

However, a puzzle remains if citizens rely less on social connections when the formal institutions are more effective. Social connections may only fill in the gaps when the formal institutions are ineffective lacking public information and adequate public service provision. In other words, effective institutions may mitigate the reliance on social connections to access healthcare services. The existing studies suggest that social connections and networks as informal institutions can play substitutive roles when formal institutions are ineffective (Helmke and Levitsky 2004; Narayan 2002; Rose 2000; Woolcock and Narayan 2000). In China, people use their inter-personal connections (called *guanxi*) to compensate for weak formal institutions and limited public information (Chan and Yao 2018; Gold et al. 2002; Ruan 2017). The inter-personal connections (*guanxi*) as informal institutions substitute ineffective formal institutions (D. Li et al. 2021; P. P. Li 2007; H. Wang 2000; P. Wang and Wang 2018; Zhan 2012). At the

same time, some scholars suggest that local governments can take advantage of women's social networks and invest less in institutions that provide adequate public services to meet women's needs (Molyneux 2002; Mulcahy, Parry, and Glover 2010). This suggests that when there are efficient institutions, the substitutive effect of social connections may be mitigated (Helmke and Levitsky 2004, 2006). Instead, social connections can play an accommodative or complementary role to the effective formal institutions (Helmke and Levitsky 2004; Narayan 2002; Woolcock and Narayan 2000).

Therefore, this dissertation addresses the following research questions: When there is an efficient formal institution in place providing healthcare services, do social connections still have an influence on citizens' access to the services? That is, when there is enough public information and adequate access to health care facilities, do patients rely less on social networks and personal connections? Social connections may improve access to healthcare services when the formal institution (i.e. healthcare system) does not guarantee such access for citizens. At the same time, when there is an effective formal institution and adequate information, citizen do not have to rely on their social connections to gain access to healthcare services. In other words, when the healthcare system provides accessible, affordable, and equitable health services to citizens, social networks may no longer be needed.

Previous studies have demonstrated the use of social connections when people are faced with incomplete information and inefficient institutions (Amoah, Edusei, and Amuzu 2018; Chan and Yao 2018; Deri 2005; Fu and Chan 2016; Herberholz and Phuntsho 2018; Hou, Lin, and Zhang 2017; D. Wu et al. 2017; Zou et al. 2018), yet few studies have studied the influence of institutions on the roles of social connections. Thus, it remains unclear as to whether people still rely on social connections when these institutions are more efficient (i.e. provide wider access

and full information). The clarification of the effects of social connections vis-à-vis institutions have immediate policy implications, as it determines a focus of health policies: community network development or healthcare institutional development. Moreover, while social connections help citizens to meet their everyday needs, the substitutive use of connections creates inequality between those who have and don't have the informal social connections (Rose 2000).

The statistical analyses of the public opinion data suggest that people are indeed less likely to use social connections when health institutions are more effective. In order to examine the use of social connections relative to different levels of institutional efficiency, there needs to be a variation in the degree of institutional effectiveness. The case of China enables this study to consider the variation in institutional efficiency by geography. In China, the efficiency of healthcare service institutions varies across geographical locations (Chai et al. 2019; T. Chen et al. 2018; D. Li et al. 2018; J. Wu 2018; J. Wu and Yang 2019; T. Zhang et al. 2017). Thus, this study uses the China Family Panel Studies 2010 data and China Health Statistical Yearbook 2010 to examine the influence of provincial health institutional capacity on the use of personal connections (*guanxi*) to access health services, and finds that there is less use of personal connections (*guanxi*) to see a doctor in provinces with greater institutional capacities. The analyses of the Chinese General Social Survey 2010 also find that the provincial health institutional capacities have a positive influence on perceived healthcare access. These results suggest that greater health institutional capacities positively influence healthcare access and mitigates the reliance on personal connections to access health services. At the same time, the findings are inconclusive regarding the influence of broader social connections, such as networks among friends, neighbors and colleagues.

The qualitative analyses and interview data further support that people are less likely to rely on social connections when institutions provide basic access to standard care services, yet the findings also suggest that social connections play different roles based on difference institutional gaps they fill in. The interviews with women about their prenatal care service access indicate that most interviewees had access to standardized care services regardless of their use of social connections. Still, there were two institutional gaps: long wait time and short doctor-patient interaction time. These gaps stem from overcrowding hospitals, and continued difficulty regarding access to services and information. Under this context, many of the interviewees used social connections with friends and colleagues to obtain information about pregnancy and prenatal exams, compensating for the lack of information provided by their doctors. The use of online networks was also popular among them to fill in the informational gap. Some of them also used interpersonal connections (*guanxi*). Although the interpersonal connections do not determine a presence or absence of access, it can help shorten the wait time. This suggests that social connections do not become totally irrelevant under institutions with greater effectiveness. No institutions are perfect in providing full information and perfect services. Therefore, social connections continue to play different roles under different institutional circumstances.

Under relatively effective formal institutions, social connections especially play a critical role to provide information. The government has focused on increasing the proportion of the population with access to the healthcare system through the 2009 health system reform and expansion of insurance coverage. This may have mitigated the issue of unequal access to basic medical care services, unequal information about the administrative processes lead to a disparity in patients' experiences with the healthcare system. Those who have more information to navigate the medical bureaucracy are more likely to have better access to their preferred health

providers and services, and have better experiences with the healthcare system (by helping to reduce a wait time, benefit more from doctor-patient interactions, and so on). The level and type of social networks have a substantive influence on the information needed to better navigate the healthcare system and issues such as appointment system, overcrowding hospitals, and limited consultation time with doctors.

This dissertation proceeds as follows. For the remainder of this introduction section, I provide background information about China's health care system and discuss the reasons why I focus on China to address my research question. Then, I clarify contributions of this study. In the literature review section, I define both informal networks and formal health institutions, and discuss the literature on the roles of informal networks and institutions in health service access. In Chapter 2, I present this study's theory and hypotheses, and discuss research design for both quantitative and qualitative data and analyses. In Chapter 3, I analyze the statistical data to examine the influence of institutional capacity on the use of informal networks. In Chapter 4, I analyze the interview data to examine the roles of connections and institutions in women's access to prenatal care services. Since the interview data illuminates a prevalent use of online social networks, I also conduct a qualitative content analysis of an online social networking site to further examine the roles of online social networks in healthcare access. The Chapter 5 is the final chapter to present the summary of this dissertation. I conclude this dissertation by connecting the findings to the theory and the existing literature, and discussing the implications of this study.

1.1.2 Case Selection & Background Information: Healthcare System and Services in China

Access to healthcare services is a salient issue to the Chinese government and citizens. Since the market reform, access to healthcare services deteriorated and public discontent with healthcare services sored during the 1980s and 90s (Yip and Hsiao 2015). While the government-run healthcare system provided access to basic healthcare before the market reform era, many people became uninsured and lost access to basic healthcare services in the 1980s and 90s (J. Ma, Lu, and Quan 2008; Yip and Hsiao 2015). The government had little funding or regulations for healthcare, leading to profit-driven behaviors among healthcare providers including overtreatment, over-prescription, and extra charges for services and drug markups (Yip and Hsiao 2015). As a result, the cost of medical care inflated, inequality of access to healthcare increased, and quality of healthcare services decreased (J. Ma, Lu, and Quan 2008; Yip and Hsiao 2015). The public discontent with the healthcare services also rose with the sentiment of "*kan bing nan, kan bing gui*" ("insurmountable access barriers to healthcare, insurmountable high health costs" (translation by Yip and Hsiao 2015, 56)) (Yip and Hsiao 2008, 2009, 2015).

Facing the public discontent, the Chinese government has been rolling out various health system reforms in the recent years. The SARS pandemic in 2003 and Hu Jintao administration's (2002-2012) policy priority on equity also motivated the series of health system reforms (V. Lin 2012; Yip and Hsiao 2015). The new health insurance schemes were introduced in rural areas in 2003 (New Rural Cooperative Medical System (NCMS)) and in urban areas in 2007 (Urban Resident Basic Medical Insurance (URBMI)) (Y. Pan et al. 2016; Su et al. 2018). In 2009, the government declared its leading role and commitment in improving healthcare services including affordable and equitable access and significantly increased investment in the healthcare system (Yip and Hsiao 2009, 2015). The government announced a major health system reform plan in

2009, targeting the following five areas: (1) expansion of insurance coverage, (2) equitable access to public health services, (3) strengthening primary care institutions, (4) establishment of national essential medicine system (where the stock of listed medicines are ensured at primary care institutions without price markups (G. G. Liu, Vortherms, and Hong 2017)), and (5) public hospital reforms (Z. Chen 2009; V. Lin 2012; G. G. Liu, Vortherms, and Hong 2017; Tang, Brixi, and Bekedam 2014; Yip and Hsiao 2009, 2015). While the access to healthcare services has improved since then (including the expanded insurance coverage reaching the majority of the population), the health system reform is still ongoing to address some persisting issues (L. Li and Fu 2017; G. G. Liu, Vortherms, and Hong 2017; Tang, Brixi, and Bekedam 2014; Yip et al. 2019; Yip and Hsiao 2015). Since 2012, the government has been focusing on reforming inefficient public hospitals and creating primary care centered system with local-level pilot experiments (Yip et al. 2019). In 2016, the government announced the "Healthy China 2030" plan, further signifying its continued commitment to improving access to healthcare services and people's health in general (L. Li and Fu 2017; Yip et al. 2019).

Despite the series of health system reform, issues of healthcare service access still persist including the overwhelmed hospitals. China has a three-tier hospital system where hospitals are classified into: primary (tier 1), secondary (tier 2), and tertiary (tier 3) (Cai et al. 2018; Y. Li et al. 2020). The upper tier hospitals have greater capabilities for medical care, education, and research (Cai et al. 2018; Y. Li et al. 2020). For example, the tertiary hospitals are the largest city-, provincial- or national-level hospitals with more than 500 beds, and provide both general and specialist care (Cai et al. 2018; Y. Li et al. 2020). Primary care institutions have less than 100 beds (Cai et al. 2018; Y. Li et al. 2020), and includes community health centers (CHC) in urban areas and township/village clinics in rural areas (Jinghua Li et al. 2016). The upper tier

hospitals generally have greater and better resources including infrastructure/equipment and human resources (T. Zhang et al. 2017), whereas primary care institutions remain under-invested (Cheng et al. 2017; Jinghua Li et al. 2016; T. Zhang et al. 2017). Indeed, Yip et al. (2019) report that misdiagnosis and improper prescription of antibiotics are persistent among primary care institutions. As a result, people distrust the quality of medical care at primary care institutions and go directly to bigger and upper tier hospitals without referral regardless of urgency and severity of illness (Cheng et al. 2017; Jinghua Li et al. 2016; Yip et al. 2019; T. Zhang et al. 2017). This has led to the overcrowding hospitals (Hu et al. 2019; Jinghua Li et al. 2016; Y. Li et al. 2020). Some studies report that some tier 3 tertiary hospitals have more than 20,000 patients a day, resulting in 100 patients per doctor per day (Hu et al. 2019; Y. Li et al. 2020). This has led to a long waiting time and short doctor consultation time (often less than a few minutes (Cheng et al. 2017; T. Zhang et al. 2017)) among big hospitals (Cheng et al. 2017; Hu et al. 2019; T. Zhang et al. 2017). T. Zhang et al. (2017) report that the wait line is so long that there is even scalping of tickets. Under such a circumstance, obtaining access to the upper tier hospitals with greater resources and capacities depend on individual and regional level of wealth or personal/social networks.

Furthermore, public distrust in healthcare institutions remains high as faith in the healthcare system has been weakening for years. For example, the medical disturbance "*yinao*" is a social problem in China. The medical disturbance *yinao* refers to patients' violence against medical professionals, where dissatisfied patients attack medical professionals (Hesketh et al. 2012; Jiang et al. 2014; Xu 2014; Yueju 2014; Liuyi Zhang, Stone, and Zhang 2017; L. Zhao et al. 2014). Hesketh et al. (2012) cite the Chinese Ministry of Health's report indicating that the incidents of *yinao* have increased from 9,831 in 2006 to 17,243 in 2010. The causes of *yinao* are

indeed related to the issues of healthcare system as a whole, including patients' distrust in the profit-seeking healthcare institutions as well as overwhelmed healthcare system with overworked medical professionals (Hesketh et al. 2012; Liuyi Zhang, Stone, and Zhang 2017). The overwork and low pay among doctors also lead to poor quality services and the practice of informal payments (Hesketh et al. 2012; Liuyi Zhang, Stone, and Zhang 2017). The issues also include a lack of doctor-patient communication and informed decision makings by patients and their families. The overwhelmed hospitals and doctors lead to a lack of interactions between doctors and patients, and a lack of information to make informed decisions before procedures and to process medical outcomes after procedures.

The maternal and child health (MCH) along with immunization and infectious disease control were regarded as basic public health services to be provided by the state and gained the government's attention and investment comparatively early (L. Wang et al. 2019; Yuan et al. 2019). Although a major health system reform was not introduced until 2009, the Chinese government produced a series of legislations and national plans related to MCH from early 1990s to 2000s (Bogg et al. 2010; Yan Guo, Bai, and Na 2015; Youde Guo, Zakus, and Liang 2008; Z. Wu et al. 2012). Further, in 1998 the Ministry of Health established the Department of Maternal and Child Health Care and Community Health (Z. Wu et al. 2012), and Maternal and Child Care Hospitals and Centers were established around the country by 2008 (Yan Guo, Bai, and Na 2015). The 2009 reform also puts a priority on prenatal and maternal care among the public health services catering toward specific population groups (L. Wang et al. 2019). Along with the investment in MCH, the focus of the family planning policies has also slowly started shifting from target-focused population control to reproductive health and quality of care since 1995 (Jing 2004; Jianghong Li 2004; Zhenming and Mengjun 2011). The focus on population control

in the family planning apparatus has led to draconian measures and tensions between villagers and village cadres (Kennedy 2019; Zhenming and Mengjun 2011). Consequently, the "mutual noncompliance" between the villagers and village cadres has resulted in missing girls – unregistered daughters from the "out-of-plan" births (Kennedy 2019). Since 1995 the State Family Planning Commission started experimenting pilot projects to put a greater focus on reproductive health services, quality of care and informed choices (Zhenming and Mengjun 2011), and the single child policy was lifted in 2015.

The case of China is particularly suited for the current study because there is a variation in the capacity and efficiency of healthcare institutions within the country. The existing studies suggest that there is a geographical inequality in efficiency of healthcare system (Chai et al. 2019) and distributions of healthcare resources (T. Chen et al. 2018; D. Li et al. 2018; J. Wu 2018; J. Wu and Yang 2019; T. Zhang et al. 2017). For example, Chai et al. (2019) find that efficiency of healthcare system varies among provinces in China. Other scholars also find inequality in geographical distributions of healthcare resources including human resources (D. Li et al. 2018; J. Wu 2018; J. Wu and Yang 2019; T. Zhang et al. 2017), infrastructure (T. Zhang et al. 2017), and finances (Brixi et al. 2013; J. Pan and Liu 2012). This subnational-level variation in health institutional capacity stems from the health finance decentralization (Brixi et al. 2013; J. Pan and Liu 2012; Lufa Zhang and Liu 2014). In other words, the provincial governments are responsible for financing and providing healthcare services (Brixi et al. 2013; J. Pan and Liu 2012; Tan 2017). Indeed, the subnational governments account for more than 90% of the total public health expenditure (Brixi et al. 2013; J. Pan and Liu 2012; Tan 2017).

Scholars suggest that the inequality in geographical distributions of healthcare institutional resources attributes to both political and economic factors. For example, the

promotion system of local cadres along with financial factors influence inter-provincial inequality in healthcare resource distributions (T. Chen et al. 2018). T. Chen et al. (2018) argue that local public officials in the provinces with low fiscal capacities misappropriate the fiscal transfer payments intended for public health services in order to invest in economic development since their promotion is tied to local economic development. This results in both the inter-provincial inequality in healthcare resources and inefficiency of the fiscal transfer payment system (T. Chen et al. 2018). Moreover, more economically developed provinces are able to have greater investment in healthcare system and also attract more human resources, further contributing to the inequality (J. Wu 2018; J. Wu and Yang 2019). In short, these variations in institutional efficiency within China enable this study to examine effects of health service institutions on the use of social connections. More specifically, this study accounts for the differences in institutional efficiency across Chinese provinces. This within-country variations in institutional capacity also offer a great advantage to the current study because it enables this study to hold the country context constant and minimize the effect of other confounding contextual factors as much as possible.

Additionally, the case of China is also suited to examine the influence of social connections given the saliency of the use of social networks and inter-personal connections (*guanxi*) in daily lives. *Guanxi* refers to enduring personal or particularistic relations and connections that involve sentimental and instrumental values of mutual reciprocity (Gold et al. 2002; Kipnis 1997; N. Lin 2001; Qi 2013; Ruan 2017; Yang 1994). In China, people commonly practice and produce *guanxi* in their everyday lives (Kipnis 1997), and use *guanxi* to meet varieties of needs from obtaining employment and education to housing as well as conducting business (Yang 1994). The use of *guanxi* is also common in the field of healthcare (Chan and

Yao 2018; Fu and Chan 2016; D. Wu et al. 2017; Yang 1994; Zou et al. 2018). The common practice of using *guanxi* to access healthcare services is called "*guanxi jiuyi*" that is "the personal strategies adopted by patients to navigate the uncertainties of the healthcare system and manage their access to hospital-based medical care" (Zou et al. 2018, 47). This saliency of the use of social connections and networks is another reason why the current study focuses on the case of China.

1.1.3 Contributions of this Study

The current study offers four contributions to the existing literature. First, while the previous studies demonstrate the use of social connections when people are faced with incomplete information and inefficient institutions, few studies examine the need for social connections when these institutions are more efficient (i.e. provide wide access and full information). In other words, it has yet to be clarified whether social connections increase access to healthcare services even when there is an effective institution providing such services and information, and heath care services improve to a point where social connections are no longer needed. This study contributes to the existing literature by examining the interacting relations between social connections and institution as they relate to citizens' access to healthcare services. More specifically, rather than perceiving the effect of social connections as constant at the aggregated-level, this study considers the variability of the effects of individual-level social connections relative to the different levels of efficiency of institutions in regard to healthcare service access.

Similarly, although the existing studies demonstrate the prevalent use of *guanxi* (inter-personal connections) in healthcare system in China, it has yet to be clarified to what extent

guanxi affects people's access to healthcare under different institutional contexts. Scholars find a common use of *guanxi* in healthcare system in China (Chan and Yao 2018; Fu and Chan 2016; Tu 2019; D. Wu et al. 2017; Zou et al. 2018). Indeed, *guanxi* networks are a part of daily life in China. However, observing this relationship often requires fieldwork and interviews to examine how the services are provided to individuals and when social networks are needed (or not). This might be why the existing studies are largely based on fieldwork research including interviews (D. Wu et al. 2017; Zou et al. 2018) and ethnography (Chan and Yao 2018; Fu and Chan 2016; Tu 2019). Thus, this study further contributes to the existing studies by examining the role of *guanxi* and broader social connections in healthcare system under a specific institutional context through the qualitative analyses of interview data.

Second, this study's qualitative analyses also pay attention to different roles social connections play under different institutional contexts, going beyond statistical analyses of a presence or absence of social connection use. Social connections can help people obtain information to navigate medical bureaucracy and gain greater access to healthcare services (Chan and Yao 2018; Deri 2005; Devlin and Rudolph-Zbarsky 2014; Hou, Lin, and Zhang 2017; D. Wu et al. 2017; Zou et al. 2018). Through the interview data, this study also examines this informational role of social connections. Those who have more information to navigate the healthcare system are more likely to have better access to healthcare services and better experiences with the healthcare system. While social connections (including *guanxi*) can provide information that can improve access and experiences within the healthcare system, uneven levels of social networks among individuals lead to unequal information and a disparity in their access and experiences. Moreover, a specific role social connections play may shift from one institutional context to another. For instance, the roles of social connections can shift from

providing physical access to doctors to providing information about the healthcare system, when the health service institution becomes more effective. Indeed, the existing literature suggest that a substitutive role of social connections may be mitigated under effective formal institutions, yet social connections can remain relevant and at high levels to complement the workings of effective formal institutions (Helmke and Levitsky 2004, 2006; Narayan 2002; Woolcock and Narayan 2000).

Third, the existing studies focus on the demographics of individuals and the population as key factors influencing access to health care, whereas this study examines the impacts of structures (i.e. the effect of healthcare institutions) as well as social connections and *guanxi* on access to healthcare services. Indeed, studies that examine access to healthcare services based on the "Behavioral Model of Health Services Use" tend to focus on population characteristics (i.e. the individual-level variables) rather than the effect of formal healthcare institutions (Gong, Kendig, and He 2016; D. Liu et al. 2017; Xiang Liu et al. 2016; X. Ma and Cen 2017). The "Behavioral Model of Health Services Use" is a well cited model that conceptualizes access to healthcare services, proposed by a medical sociologist Ronald Andersen in 1960s and revised by Andersen and others in later years (Aday and Andersen 1974; R. Andersen 1968; R. Andersen and Newman 1973; Ronald M. Andersen 1995; Ronald Max Andersen 2008; Phillips et al. 1998). Although the model includes "healthcare system" as a factor that influences the use of healthcare services, the subsequent studies adopting the model tend to focus on the individual characteristics such as socio-economic status (Gong, Kendig, and He 2016; D. Liu et al. 2017; Xiang Liu et al. 2016; X. Ma and Cen 2017). Therefore, this study contributes to the existing literature by focusing on the role of healthcare system (formal institution) and social connections in healthcare service access.

Lastly, although the quantified indicators show that there is a high level of access to prenatal care services especially in urban China, this study pays a particular attention to unquantified measures of prenatal care services and examines the effect of social connections on women's access to prenatal care services. The existing studies on maternal care services in China tend to measure access based on quantified medical standards. In rural China, scholars have studied the factors influencing the use of prenatal care services by measuring the number of prenatal exams received (Anson 2004; Bogg, Wang, and Diwan 2002; Xiaoning Liu et al. 2011; Long, Zhang, Xu, et al. 2010; Short and Zhang 2004) and types of prenatal exams received (Chen, Xie, and Liu 2007; Long, Zhang, Hemminki, et al. 2010; Nwaru, Wu, and Hemminki 2012). Based on these measurements, there is a high level of access to prenatal care services especially in urban China (China Center for Health Statistics and Information 2015), and there is no roles for social connections to play. However, through qualitative interviews, this study pays more attention to women's experiences with prenatal care services in a more holistic manner including the quality of care such as interactions with doctors. A focus on "quality" of care is crucial in examining women's experiences during pregnancy. Because of the profit-seeking behaviors among the medical providers, some scholars report overmedicalization and over-intervention in maternal care (Bogg et al. 2010; Gao et al. 2017; Harris et al. 2007). Therefore, social connections may not influence the basic access to prenatal care services, yet it may still influence the access to "quality" care services and quality of information.

Furthermore, this study focuses on the roles of women's social connections because social networks among women tend to be overlooked in light of governance and public services. For instance, public policy scholar Vivien Lowndes (2000) points out that women's social networks (social capital) is overlooked because it is considered to be in the private sphere and

unrelated to politics or governance. Lowndes (2004) finds that women's social capital tends to be "informal" centering on local community and family (52), and tends to be ignored as a "private" matter (54). Other scholars similarly suggest that women's social capital is considered to be "informal" and "private" outside of political and public sphere (Harell 2009; Hodgkin 2008). This labeling of women's social capital as a private matter neglects women's contributions in producing social capital (Hodgkin 2009). Indeed, some scholars shed lights on women's "unpaid labour" from which social capital derives (Bezanson 2006, 436; Molyneux 2002, 179). Molyneux (2002) demonstrates that the community-led development projects in Latin American countries tend to rely on women volunteers, as women are more likely to be involved in local communities and women are also seen as natural care givers. Consequently, these social networks can position women in their biological/natural role as mothers and care givers rather than agents of social change and public service (Mulcahy, Parry, and Glover 2010).

Ironically, women's social networks directly relate to formal institutions and local governance, as women's informal networks tend to fill in the gaps of formal institutions such as uneven implementation of health polices or unequal access to public services. For instance, when formal institutions do not provide sufficient child care services, women's social capital can be a support network providing informal care (Lowndes 2004). As a result, formal institutions can even take advantage of the preexisting women's social capital without providing adequate public social services to meet women's needs (Molyneux 2002; Mulcahy, Parry, and Glover 2010). Therefore, this study pays a particular attention to how women use their social networks and institutional contexts where they use such networks.

1.2 Literature Review

1.2.1 Definition of Informal Institution and Informal Networks

Institutions play critical roles in various aspects of people's socio-political lives and behaviors. Scholars offer a largely consistent definition of institutions. For instance, Knight (1992) defines institution as "a set of rules that structure social interactions in particular ways" (2). North (1990) similarly defines institution as "the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction" (3). According to Helmke and Levitsky (2004), institutions are defined as "rules and procedures (both formal and informal) that structure social interaction by constraining and enabling actors' behavior" (727). In sum, institutions are rules that structure social interaction and condition individuals' behaviors within a society.

The two types of institutions are clearly distinguished: formal and informal. Helmke and Levitsky (2004) define formal institutions as official rules and procedures (Helmke and Levitsky 2004). On the other hand, informal institutions are "socially shared rules, usually unwritten, that are created, communicated, and enforced outside of officially sanctioned channels" (Helmke and Levitsky 2004, 727). In other words, informal institutions are "codes of conduct" and "norms of behavior" (North 1990, 36). According to Knight (1992), they are "the informal network of social conventions, norms, rules, and rights that forms the basis of society" (19). Thus, informal institutions shape social interaction and individuals' behaviors through their informal norms and informal rules internal to the informal networks within a society.

An example of informal institutions includes a variety of informal networks. These are personal networks, clientelist networks, and clan networks (Helmke and Levitsky 2004). One specific example is *blat* in Soviet Union, where individuals use personal connections to

circumvent formal institutions in order to meet their everyday needs (Helmke and Levitsky 2004). Another example is village leaders' use of local social networks and associations to substitute formal institutions in order to provide public services in rural China (Helmke and Levitsky 2004). In Japan, the informal networks between the government and industry have an internal and informal norm of *amakudari* (descent from heaven) where retired bureaucrats gain employment in a private industry (Helmke and Levitsky 2004). Some of these informal networks fill in the gaps of formal institutions and meet people's everyday needs when formal institutions are ineffective in meeting such demands. Some of them, such as clientelist and patronage networks, have negative connotations and are regarded as corrupt networks that may undermine formal institutions.

As these discussions suggest, informal networks by themselves are neither a positive nor negative phenomenon. Indeed, the theory of social capital generally conceptualizes social connections and networks in a positive light. According to Putnam (2000), the core idea of social capital is the values that derive from social networks and relationships. Putnam (2000) states that "the core idea of social capital theory is that social networks have value" (18-19). The use of the term "social capital" in academia can trace back to the sociological works in 70s and 80s (Bourdieu 1986; Coleman 1988; Loury 1977). For instance, Bourdieu (1986) discusses social capital as resources that arise from social networks (248). Similarly, Coleman (1988) argues that just as human and financial capital are beneficial to people, social capital is a valuable asset that arises from "social relations" (Coleman 1988, S102). According to Loury (1977) and Coleman (1988), social capital is an underlying factor that influence human capital developments. Thus, these scholars conceptualize social networks as a resource that brings positive benefits to people.

While informal networks are indeed a part of social capital, the concept of social capital is broader than informal networks that function as informal institutions. The concept of social capital encompasses two aspects: tangible social networks and immaterial feelings of connectedness that stem from the networks (Moody and Paxton 2009). Moody and Paxton (2009) suggest that a complete definition of social capital must encompass both "structure" and "content" of social connections (1494). The structure refers to tangible networks, whereas the content refers to incorporeal connectedness such as "fellow-feeling" and "shared values" (Moody and Paxton 2009, 1495). Indeed, Putnam's (2000) original definition involves the two aspects, physical networks and immaterial values deriving from the networks. The definition states: "social capital refers to connections among individuals – social networks and the norms of reciprocity and trust worthiness that arise from them" (Putnam 2000, 19). This definition shows the two components of social capital: social networks and connectedness. It also has a component of informal institutions, such as social networks that encompass the norms of reciprocity.

This study focuses on informal social connections and networks that function as informal institutions to structure social interaction and individual behaviors. This is closest to the tangible aspect of social capital, social relations and networks at the individual-level. For example, some studies suggest that social capital helps individuals to "get by" in their everyday life by providing social support and meeting their immediate needs at the individual level (Briggs 1998; Domínguez and Watkins 2003; Gosling 2008; Lowndes 2004). Briggs (1998) suggests that there are two types of social capital at the individual-level: "social support" and "social leverage" (178). Social support refers to a type of "social capital that helps one 'get by' or cope" (Briggs 1998, 178). This "get by" social capital helps people meet their everyday needs such as getting a

ride, borrowing money for an emergency, and childcare (Briggs 1998, 178-79). These social networks encompass the shared norms of reciprocity and mutual support in case of needs. On the other hand, social leverage refers to "social capital that helps one 'get ahead' or change one's opportunity set through access to job information, say, or a recommendation for a scholarship or loan" (Briggs 1998, 178). This "get ahead" social capital provides societal and economic upward mobility for people (Briggs 1998, 179). Although the "get by" social capital supports people in their daily lives, the level of "get by" social capital differs by individuals as the local support networks can include some people but exclude others (Gosling 2008). Moreover, the "get by" social capital does not necessarily create societal and economical upward mobility as the "get ahead" social capital does (Briggs 1998; Domínguez and Watkins 2003; Gosling 2008; Lowndes 2004). The "get by" social capital may even hinder the obtainment of "get ahead" social capital among women due to their role in maintaining the social support networks (Domínguez and Watkins 2003; Lowndes 2004). Nonetheless, the get by type of social connections serve as critical support networks for people to carry on their lives through the norms of mutual support.

On the other hand, the intangible aspect of social capital at the aggregated-level such as the common values and connectedness concern public spiritedness, collective action and organized civil society. Indeed, the studies on democratic countries suggest that social capital foster public spiritedness and creates favorable conditions for collective actions (Boix and Posner 1998; Putnam, Leonardi, and Nanetti 1994). For example, Putnam, Leonardi, and Nanetti (1994) argue that social capital improves local governance including public service provision in Italy by enabling citizens to prioritize the common good. Other studies also support this argument by similar findings that social capital improves governance and public service provisions (Andrews 2007, 2010; Andrews and Brewer 2010; Pierce, Lovrich, and Budd 2016; Rice 2001). According

to Boix and Posner (1998), the mechanisms connecting social capital to good governance include public spiritedness and (a potential of) collective actions. Social capital fosters public spiritedness that enables citizens to articulate their demands as a group and hold the government accountable collectively (Boix and Posner 1998). These studies suggest that social capital improves public service provisions by making people care about the common good (Andrews 2007; Andrews and Brewer 2010; Boix and Posner 1998; Putnam, Leonardi, and Nanetti 1994), which enables them to express their demands collectively to the government (Andrews 2007; Andrews and Brewer 2010; Boix and Posner 1998; Rice 2001) and exert pressures on the government to improve service delivery with a threat of collective action in democratic contexts (Andrews 2010; Boix and Posner 1998).

Therefore, the intangible aspect of social capital, especially at the aggregated-level, is critical to the studies of democratic governance since it reflects the public spiritedness and favorable conditions for collective actions. However, this study focuses on the effect of social connections on individual access and information regarding healthcare services rather than its effect on a government and policy making process at large in changing the service provision behaviors. Further, the current study examines the authoritarian country, where social capital as public spiritedness may not directly translate into improved governance via the democratic accountability channel.

Indeed, the studies on social capital in authoritarian contexts tend to focus on the tangible aspect of social capital, social connections and relations, rather than public spiritedness. Scholars conceptualize social capital as informal social connections in authoritarian contexts (Rose 1995, 2000; Rose, Mishler, and Haerpfer 1997). For example, Rose (2000) argues that in Russia where the formal public institutions are inefficient (including corruption and weak rule of law), citizens

rely on informal social networks to meet their everyday needs. Rose (2000) defines social capital as "the stock of formal or informal social networks that individuals use to produce or allocate goods and services" (149). This informal social networks substitutes the ineffective formal institutions by helping citizens to meet the daily demands and also "providing information and contacts to deal with an unfamiliar situation." (Rose 2000, 149).

Furthermore, Rose's (2000) conceptualization of social capital under the condition of inefficient institution points to the situational characteristic of social capital. In other words, the types of social networks citizens utilize and the extent to which citizens rely on social networks depend on particular contexts and situations (Rose 2000). Rose (2000) states that "because of the variability of networks and users from one situation to another, social capital cannot be reduced to a single unit of account and aggregated into a summary statistic characterizing the whole of society" (151). This points to the saliency of informal social connections and relations at the individual-level in an authoritarian context. The roles of social connections also depend on situations and contexts. In short, this study focuses on the individual-level social connections and networks that function as informal institutions to fill in the gaps of formal institutions and help citizens meet their daily demands through their shared norms and conventions.

1.2.2 Informal Networks in China: Guanxi as Informal Institution

The concept of social connections in the Chinese context entails the discussion of *guanxi*. G*uanxi* refers to an enduring inter-personal relationship that involves sentimental and instrumental values of mutual obligation and reciprocity (Gold, Guthrie, and Wank 2002; Kipnis 1997; N. Lin 2001; Qi 2013; Ruan 2017; Yang 1994). *Guanxi* is a long-term dyadic relationship that sustains over time, and the dyadic relationship is embedded in a web of broader social

networks constructed by direct and indirect inter-personal ties (Bian 2018; N. Lin 2001). The inter-personal relationship can arise from shared identities, such as family, classmates, colleagues, neighbors, sharing the same hometown, and so on (Bian 2018; Gold, Guthrie, and Wank 2002; N. Lin 2001). The relationship can also be constructed outside of shared identities through repeated interactions and exchanges that nurture affective sentiments, mutual trust, and normative obligations (N. Lin 2001; Smart 1993). In either case, a relationship only qualifies as *guanxi* when it is intentionally maintained through repeated exchanges of favors and reciprocity as well as mutual reinforcement of norms (Gold, Guthrie, and Wank 2002; N. Lin 2001; Qi 2013).

Guanxi has both instrumental and sentimental characteristics. It is instrumental in that people use it to meet varieties of needs from obtaining employment and education to housing as well as conducting business (Yang 1994). For example, people use *guanxi* for job mobility purposes (Bian and Ang 1997). Individuals activate different personal connections (from a family member to political official) depending on the instrumental purposes that they serve. At the same time, *guanxi* must be grounded on a sentiment and affect called *ganqing* (Gold, Guthrie, and Wank 2002; N. Lin 2001; Ruan 2017). Stronger *guanxi* has stronger *ganqing* that is "feelings of intimacy" (Ruan 2017, 43). Another affective element is *renqing*, referring to a sense of indebtedness and a norm of reciprocal obligation (Qi 2013; Ruan 2017).

The mutual reciprocity is central to the concept of *guanxi*. *Guanxi* is maintained through repeated exchanges of favors (Bian 2018; P. P. Li 2007; N. Lin 2001). Each exchange of favors is asymmetrical in that one party receives a favor from another, and the recipient does not pay back the favor immediately (Bian 2018; P. P. Li 2007; N. Lin 2001). Each exchange creates a

sense of indebtedness and a moral obligation of reciprocity (*renqing*), where the recipient of a favor is expected to return a favor in the future (Bian 2018; P. P. Li 2007; N. Lin 2001).

Guanxi functions as informal institutions through its rules of mutual reciprocity and face (*mianzi*), and structures social interaction (Qi 2013; P. Wang and Wang 2018). Face (*mianzi*) refers to a social standing, reputation and esteem (Gold, Guthrie, and Wank 2002; N. Lin 2001; Ruan 2017). Those who fulfill the reciprocal obligation embedded in *guanxi* will be rewarded with a social standing and reputation within the web of networks (Bian and Ang 1997; Gold, Guthrie, and Wank 2002). On the contrary, those who violate the norm of *renqing* (moral obligation of reciprocity and a sense of indebtedness) are sanctioned by a loss of face (*mianzi*) (P. Wang and Wang 2018). The loss of face (*mianzi*) means a loss of social trust as well as access to the instrumental values of the networks (Bian and Ang 1997). Thus, the norms of *renqing* and face (*mianzi*) function as rewarding and sanctioning mechanisms that render *guanxi* an informal institution.

People often build *guanxi* through gift-giving, however *guanxi* is not just a synonym of corruption (Qi 2013; Smart 1993). This is because the long-term interpersonal relationship itself is prioritized over immediate gains (Smart 1993). As Smart (1993) puts it, “the exchanges are used to cultivate and strengthen relationships that are expected to continue” (400). In other words, the exchange of favors is the means to the end (Smart and Hsu 2007). Moreover, the exchanges are embedded in a long-term relationship that also involves a sentiment and affect (H. Wang 2000). Still, *guanxi* can be used to facilitate corruption (Qi 2013; Zhan 2012). Thus, people skillfully conduct exchanges to distinguish *guanxi* related exchanges from corrupt exchanges (Smart and Hsu 2007).

Scholars conceptualize *guanxi* as a variation of social capital, but not equivalent of social capital (Bian 2001; Jie Chen and Lu 2007; Gold et al. 2002; Qi 2013; Ruan 2017; Smart 1993). The reason why *guanxi* is a variation and not equivalent of social capital is its emphasis on personalistic characteristics (Ruan 2017), sentimental characteristics of *ganqing* or *renqing* (Gold et al. 2002; N. Lin 2001; Qi 2013), and indebtedness (Gold et al. 2002; Qi 2013). Ruan (2017) argues that *guanxi* is a component of social capital rather than an equivalence of social capital because of its personalistic characteristics. Gold et al. (2002) further point out the distinctiveness of *guanxi* in terms of the element of sentiment and affect called *ganqing* as well as the emphasis on the sense of indebtedness.

Given the above discussions on social connections and networks (including the discussion of social capital and *guanxi*), this study conceptualizes social connections in a continuum. Figure 1 below illustrates the conceptualization of social connections in a continuum ranging from more personal connections to broader social connections. The individual-level social capital includes social relations, connections and networks (Briggs 1998; Domínguez and Watkins 2003; Gosling 2008; Lowndes 2004; Putnam 2000; Putnam, Leonardi, and Nanetti 1994), which fill in the gaps of inefficient institutions and provides information and support to meet every day needs including access to healthcare services (Rose 2000). However, this conceptualization does not fully account for the concept of *guanxi* despite the scholars' associations between the two concepts (Bian 2001; Jie Chen and Lu 2007; Gold et al. 2002; Qi 2013; Ruan 2017; Smart 1993).

Therefore, Figure 1 conceptualizes social connections as a continuum. On the left side of the continuum reflects the characteristics of *guanxi*, personal connections. Yet there is also a variety in the types of personal connections depending on its directness and depth. The scale 1 to

4 concern personal connections. The scale 1 is a direct and deep personal connection. This includes strong personal ties that are sustained over a long period of time and reinforced on a daily basis, such as immediate family members and close friends. The scale 2 is a direct and shallow personal connection. This is still a personal tie between two people who directly know each other, however their relationship is not as strong as the ones between family members and close friends. This can include former classmates, colleagues, neighbors, and relatives. The scale 3 is an indirect and deep personal connection. This includes personal connections one acquires through their strong direct connections. For example, your immediate family members and close friends have their own personal connections (close acquaintances) that you may not know directly. If your family members or close friends introduce their close acquaintances to you, your relationship to these introduced acquaintances is characterized as deep but indirect personal connections. The scale 4 is an indirect and shallow personal connection. This includes cases where your close contacts (e.g. family and close friends) introduce their distant acquaintances or your distant contacts (e.g. former classmates, colleagues, etc.) introduce their close acquaintances. In such cases, you are engaging in shallow and indirect personal connections.

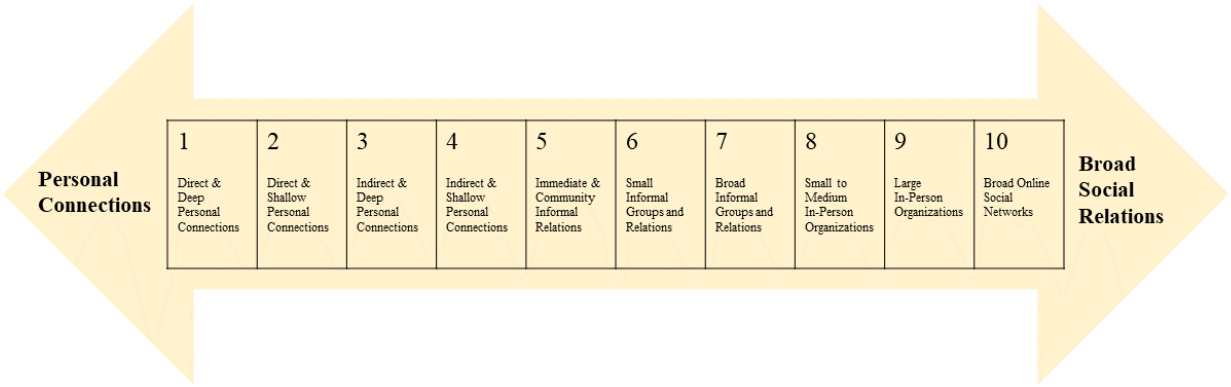
Starting from the middle of the continuous scale on Figure 1, the circle of connections/relations start to become broader and looser. The scale 5 is an immediate and community informal relation. You have immediate and community informal relations when you belong to informal social circles that are close-knit. You know everyone who belongs to the social circles. This can be a close circle of neighbors, friends, or colleagues who will offer social support when you need it. The scale 6 and 7 include social connections that stem from small to broad informal groups and social circles. These informal groups and social circles may include some acquaintances that you may know without one-on-one close personal relations or

acquaintances you may not necessarily have their contact information. Examples include playground friends, neighborhood community, informal jogging groups, and so on.

The right side of the continuum on Figure 1 encompasses much broader social networks including both in-person organizations and online social networks. The scale 8 and 9 encompass small, medium to large in-person formal organizations or associations. For example, the existing studies examine social capital as measured as associational memberships in various organizations such as fraternal, religious, professional, hobby groups and so on (Cigler and Joslyn 2002; Joslyn and Cigler 2001). While these organizations and groups may provide much broader social networks and connections, you may not know all the people who belong to the same social networks. The broadest social networks can stem from online social networks on the scale 10. This includes Social Networking Sites (e.g. Facebook, WhatsApp, WeChat, etc.). Using these platforms, people can connect with others very broadly even without in-person contacts.

In short, social connections vary from more intimate to broader ones on Figure 1. The levels of information provided by these networks also shift from more personalized to more general. The personal connections (on the left side of the continuum) provide more intimate, personalized, and sometimes confidential information. Within the broader and less intimate social connections (on the right side of the continuum), there are exchanges of more general, transparent, and public information. For instance, a deep and direct personal connection can provide a highly personalized and targeted information that help an individual to get things done. On the other hand, an online social network on a social networking site may only provide relevant but impersonalized information that an individual is looking for.

Figure 1. Conceptualization of Social Connections



Source: Author

1.2.3 Definition of Healthcare Institutions

This study also examines the effect of healthcare institutions on healthcare access. Specifically, the focus is an institutional capacity to provide healthcare services. While few studies have examined the influence of healthcare institutions on healthcare access, some studies nonetheless identify healthcare system as a critical factor in healthcare service use and access. For example, the "Behavioral Model of Health Services Use" accounts for the roles of healthcare systems. The model was first proposed by a medical sociologist Ronald Andersen in the 1960s, and Andersen and others have made multiple revisions to the model since then (Aday and Andersen 1974; R. Andersen 1968; R. Andersen and Newman 1973; Ronald M. Andersen 1995; Ronald Max Andersen 2008; Phillips et al. 1998). The most cited model is from Andersen's 1995 article "Revisiting the Behavioral Model and Access to Medical Care: Does it Matter?" (Babitsch, Gohl, and von Lengerke 2012). The Behavioral Model of Health Services Use conceptualizes the healthcare service access and defines factors influencing the use of healthcare services.

While the initial behavioral model of health services use in the 1960s focused on the population characteristics (e.g. socio-economic status, insurance coverage, and level of sickness), the model has included healthcare system as factors influencing the utilization of healthcare services since the 1970s (R. Andersen and Newman 1973; Ronald M. Andersen 1995). According to the behavioral model of health services use, the healthcare system is "those arrangements for the potential rendering of care to consumers" (Aday and Andersen 1974, 212) and it "structures the provision of formal health care goods and services in society" (R. Andersen and Newman 1973, 100). Therefore, the national and subnational-level health policies, investments, guidelines and regulations directly relate to the healthcare system. In other words, this is the "supply-side" of healthcare service access and use (Jacobs et al. 2012). In short, the formal healthcare institutions concern the systemic characteristics of healthcare and the supply of it in a particular national or subnational context. Thus, the healthcare institutional (or healthcare system's) capacity to provide and supply healthcare services may vary from a locale to a locale depending on policies and investments.

The World Health Organization (WHO) has identified the building blocks of healthcare systems. In the publication *Monitoring the Building Blocks of Health Systems: A Handbook of Indicators and Their Measurement Strategies*, healthcare system is defined as "all the organizations, institutions, resources and people whose primary purpose is to improve health" (World Health Organization 2010, vi). Accordingly, "the health system delivers preventive, promotive, curative and rehabilitative interventions through a combination of public health actions and the pyramid of health care facilities that deliver personal health care — by both State and non-State actors" (World Health Organization 2010, vi). This WHO report was written with an aim to develop measurements of health system strengths (World Health Organization 2010).

WHO conceptualizes the six building blocks that define healthcare systems: (1) health service delivery, (2) health workforce, (3) health information, (4) essential medicines, (5) health financing, and (6) leadership and governance (see Table 1). The health service delivery concerns the "physical availability of services" (World Health Organization 2010, 3). This includes the volume of health facilities, impatient beds, outpatient department visits, health facilities offering specific services and so on. The health workforce is health workers including "clinical staff, such as physicians, nurses, pharmacists and dentists, as well as management and support staff" (World Health Organization 2010, 24). The health information refers to health information systems that collect and analyze data on health to aid the decision and policy makings to meet the needs of population health (World Health Organization 2010). It concerns the country's capacity to collect and analyze data on health (World Health Organization 2010). The access to essential medicines concerns availability and affordability of essential medicines (World Health Organization 2010). The health financing concerns the availability of funds to meet the needs of population health and the provision of financial risk protection (World Health Organization 2010, 72). The leadership and governance concern an existence of national health policies and strategies.

In sum, this study defines healthcare institution as healthcare systems at the national or subnational-level that structures the provision of healthcare services. The healthcare systems are defined and composed by the six building blocks identified by WHO, including health workforce to health financing. The healthcare institutional capacity is then conceptualized as the institutional capacity to provide healthcare services. This capacity varies from a place to place depending on the levels of each building blocks of the healthcare systems, such as the levels of health workforce and health financing. The levels of institutional capacity to provide healthcare

services may impact people's healthcare service access as well as their use of social connections to access such services.

Table 1. WHO Building Blocks of Health Systems

	Building Blocks	Definition
1	Health Service Delivery	Availability of health services
2	Health Workforce	Health workers (human resources for health)
3	Health Information	Capacity to collect and analyze data on health
4	Essential Medicines	Availability and affordability of essential medicines
5	Health Financing	Availability of funds and provision of financial risk protection
6	Leadership and Governance	Existence of national health policies and strategies

Source: WHO (2010) "Monitoring the Building Blocks of Health Systems: A Handbook of Indicators and Their Measurement Strategies"

1.2.4 Factors Influencing Access to Healthcare: Social Connections Hypothesis

The existing literature finds that social connections and relations improve access to healthcare services (Amoah, Edusei, and Amuzu 2018; Deri 2005; Devlin and Rudolph-Zbarsky 2014; Dong 2016; Herberholz and Phuntsho 2018; Hou, Lin, and Zhang 2017). This is primarily through the mechanism of information sharing and dissemination (Deri 2005; Devlin and Rudolph-Zbarsky 2014; Dong 2016; Hou, Lin, and Zhang 2017). In other words, social networks and support increase access to healthcare services by an increased acquisition of needed information regarding how the healthcare system works and how to access the healthcare services (Deri 2005; Devlin and Rudolph-Zbarsky 2014; Hou, Lin, and Zhang 2017) as well as information on suitable medical care providers (Deri 2005; Devlin and Rudolph-Zbarsky 2014; Dong 2016) and more general health information and literacy (Amoah, Edusei, and Amuzu

2018; Dong 2016). For instance, Deri (2005) and Devlin and Rudolph-Zbarsky (2014) find that social networks increase healthcare service use among immigrants and general population in Canada by increasing the obtainment of information regarding the healthcare services. Similarly, Dong (2016) and Hou, Lin, and Zhang (2017) find that social capital increases the healthcare services use among domestic migrants and general population in China by increasing the exposures to information on healthcare services (Hou, Lin, and Zhang 2017) and also increasing the desirability of healthcare service use (Dong 2016; Hou, Lin, and Zhang 2017). Amoah, Edusei, and Amuzu (2018) also find people's use of social networks to access healthcare services in Ghana through the social networks' informational support along with financial and emotional support. These studies suggest that social connections fill in the gap of imperfect information and enhance access to healthcare services.

The existing studies also demonstrate the role of personal connections, *guanxi*, in access to healthcare services in China (Chan and Yao 2018; Fu and Chan 2016; D. Wu et al. 2017; Zou et al. 2018). Such common practice of using *guanxi* to access healthcare services is called "*guanxi jiuyi*" ("seeking medical care through *guanxi*" translated by Zou et al. (2018)), defined as "the personal strategies adopted by patients to navigate the uncertainties of the healthcare system and manage their access to hospital-based medical care" (Zou et al. 2018, 47). According to Chan and Yao (2018), the use of *guanxi* in accessing medical care existed since the 1980s, but has increased since the mid-2000s. Indeed, some scholars find that patients use *guanxi* to access better quality care (D. Wu et al. 2017; Zou et al. 2018). Wu et al. (2017) conducted focus groups, interviews, and surveys with doctors and found that patients are more likely to use *guanxi* to gain access to specialists. Similarly, Zou et al. (2018) interviewed both doctors and patients and found that the use of *guanxi* is prevalent at their interview sites and patients use *guanxi* to access

specialists skipping the line and formal processes. As discussed in the introduction section, since the upper-tier hospitals tend to have better resources and quality care, patients often directly go to the upper-tier hospitals without a referral (Cheng et al. 2017; Jinghua Li et al. 2016; Yip et al. 2019; T. Zhang et al. 2017). Therefore, patients use *guanxi* to both identify and secure access to specialists (Zou et al. 2018). Patients also use *guanxi* to obtain better information and explanations regarding the medical care from the physicians and also to reduce the risk of physicians' profit-driven behaviors such as over-prescription and over-diagnosis (Zou et al. 2018).

The studies also show that the patients' use of *guanxi* indeed affect physicians' behaviors and induce better treatments and quality of care from the physicians (Fu and Chan 2016; D. Wu et al. 2017). For example, the survey conducted by Wu et al. (2017) finds that more than 60% of the respondents (doctors) said that they are more dedicated to *guanxi* patients. Similarly, Fu and Chan (2016) find through ethnographic research that medical providers offer more information about medical care (such as diagnosis and treatments) for patients with moderate-level *guanxi* including "relatives, friends, colleagues, former classmates, neighbors, and people from the same hometown" (23), while they spend very little time for patients with weak *guanxi* or without *guanxi*. The medical providers also treat the *guanxi* patients with better attitudes and make their interactions more personal and caring, even offering emotional support and accompanying them to navigate the hospital (Fu and Chan 2016). Therefore, the existing studies suggest that *guanxi* has an influence on access to healthcare services by securing access to the specialists and treatments (D. Wu et al. 2017; Zou et al. 2018) and/or encouraging the medical providers to provide more personal and dedicated care out of the sentimental obligations (Fu and Chan 2016; D. Wu et al. 2017).

Other studies also report the patients' use of gifts and *hongbao* ("red envelop" containing cash money) in their attempts to obtain access to better quality services (Chan and Yao 2018; Tu 2019). As discussed earlier, the concept of *guanxi* is closely associated with gift-giving (Qi 2013; Smart 1993). Indeed, Tu's (2019) ethnographical work finds that patients give *hongbao* to physicians before the treatments to hold them accountable in providing better care out of the reciprocal obligations. According to Tu (2019), the patients' nonmonetary gifts to show a gratitude increasingly shift to *hongbao* (cash money in red envelope) after the market reform as people's income level increased. Similarly, Chan and Yao (2018) finds that patients give *hongbao*, however the meaning of *hongbao* differs depending on the strength of *guanxi*. According to Chan and Yao (2018), when patients have *guanxi* with a physician, *hongbao* from the patients only functions as a "gift" to show the patients' gratitude and repay a favor still in the context of the social and reciprocal *guanxi* relationship. In such a case, *hongbao* is a gift (Chan and Yao 2018). On the other hand, when patients do not have *guanxi* with the physician, they tend to give *hongbao* before the treatment to personalize the relationship in order to hold the physician accountable in offering better care out of the sentimental obligations that *hongbao* invokes (Chan and Yao 2018). Further, even among the *guanxi* patients, a precise usage of *hongbao* varies depending on a strength of *guanxi*. For example, when patients have strong and direct *guanxi* with a physician, they don't give *hongbao* but treat the physician for a meal instead because the strong *guanxi* does not require immediate reciprocity and *hongbao* can be even disrespectful to the already strong *guanxi* relationship (Chan and Yao 2018, 753-754). When patients have indirect *guanxi* to the physician (e.g. referred to the physician via another connection) patients are obligated to give *hongbao* to return the favor (Chan and Yao 2018). The

weaker the *guanxi*, the stronger the obligation of *hongbao* is and the meaning of *hongbao* as a "bribery" and an accountability mechanism also increases (Chan and Yao 2018)

However, Chan and Yao (2018) argue that the giving of *hongbao* not underpinned by *guanxi* has been decreasing, and the use of *guanxi* itself or *hongbao* through *guanxi* is more prevalent as of recent. This is because of both the stricter corruption regulations in the healthcare sector and the increased risks of accepting *hongbao* due to the increase of *yinao* (medical disturbances) (Chan and Yao 2018). According to Chan and Yao (2018), the Chinese Ministry of Health officially prohibited *hongbao* in the healthcare sector, and the "nationwide campaign against medical corruption" was carried out in the subsequent years (759). The Ministry of Health further tightened the regulations in 2007, and since then physicians who accept *hongbao* can even lose their doctor license (Chan and Yao 2018, 759). The increased occurrence of *yinao* (medical disturbances) also fueled physicians' distrust in patients (Chan and Yao 2018, 760). As discussed in the introduction section, *yinao* is violence or attacks against medical professionals by dissatisfied patients (Hesketh et al. 2012; Jiang et al. 2014; Xu 2014; Yueju 2014; Liuyi Zhang, Stone, and Zhang 2017; L. Zhao et al. 2014). As patients and patients' families often give *hongbao* to physicians before surgeries to hold them accountable in providing good care (Chan and Yao 2018; Tu 2019), the undesirable treatment outcomes may be seen by the patients as a violation of the informal contract they entered into through the transaction of *hongbao* (Tu 2019). As a result, physicians have high risks of getting attacked by patients as a revenge for breaking the informal contract of reciprocity (Tu 2019) or being reported later if the patients are dissatisfied with the treatment outcomes, as reflected on the increase of *yinao* (Chan and Yao 2018). Therefore, medical professionals no more trust *hongbao* that comes from patients without *guanxi*, while they still accept *hongbao* or gifts from patients with *guanxi* since it is still within

the context of *guanxi* (not bribe) and *guanxi* ensures the mutual trust (Chan and Yao 2018; Tu 2019).

In such a context, *guanxi* may facilitate healthcare service access not only by direct personal connections but also by providing information on who, when and how much the patients should pay in the form of red envelopes or gifts. As Chan and Yao (2018) find, the physicians' perceived risk of accepting *hongbao* has increased due to the stricter corruption regulations and physicians' distrust in patients as a result of the prevalence of *yinao* (medical disturbances). Moreover, the existing studies find that medical providers also struggle in general between fulfilling the societal and sentimental obligations arising from *guanxi* and maintaining the ethical/moral and professional considerations (Fu and Chan 2016; Zou et al. 2018). For example, the interviews of doctors conducted by Zou et al. (2018) illustrate the doctors' negative sentiments of patients' use of *guanxi* as it increases the risk of medical errors and compromises ethics of providing equitable services. Fu and Chan's (2016) study also demonstrates the dilemma medical providers face in balancing professionalism and obligations that arise from *guanxi*. This suggests that the practice of gift-giving or red envelope may be risky in light of physicians' negative concerns regarding the use of *guanxi*. Indeed, Tu (2019) states that "gifting is anxiety-provoking for both patients and doctors who need to constantly speculate about whether to give and receive, the amount to give, the intentions of each other, amongst other factors" (125). Therefore, *guanxi* can provide more intimate or even private information on which doctor to consult (via the *guanxi* connection), which hospitals to go to, and how to maneuver the bureaucratic hurdles (including skipping a long queue), as well as when and how much gifts and red envelops to give. Since this information is not transparent and not publicly available, this suggests that *guanxi* fills in the gaps of imperfect information.

Furthermore, the existing literature suggests that social networks also increase access to maternal care services. The existing literature suggests that women have greater access to maternal care services when they share information with one another via informal social networks (Edmonds et al. 2012; Gage 2007; McTavish and Moore 2015). In Cameroon, McTavish and Moore (2015) find that having social networks characterized by high levels of education increases the number of maternity care visits. Similarly in Mali, Gage (2007) finds the positive effects of having social networks whose members are higher educated and have used prenatal care services in the past. Thus, "who your neighbors are" is an influential factor for the use of prenatal care services (Gage 2007, 1979). In Bangladesh, Edmonds et al. (2012) find women are more likely to receive skilled assistance for delivery when their social network members encourage them to do so. This suggests that a particular kind of social networks encourages access to healthcare services, further corroborating the effect of information dissemination via social connections.

These studies suggest that social connections (including *guanxi*) positively influence access to healthcare services. This is because social connections can provide direct connections to medical providers (D. Wu et al. 2017; Zou et al. 2018), and also disseminate needed information to gain access to the services (Amoah, Edusei, and Amuzu 2018; Deri 2005; Devlin and Rudolph-Zbarsky 2014; Dong 2016; Herberholz and Phuntsho 2018; Hou, Lin, and Zhang 2017). Especially, when there are obstacles and hurdles to access (e.g. financial, geographic, bureaucratic and informational hurdles), patients are more likely to rely on social connections to gain access to healthcare services (Amoah, Edusei, and Amuzu 2018; Deri 2005; Herberholz and Phuntsho 2018; Hou, Lin, and Zhang 2017). This suggests that social connections can mitigate

the institutional (including bureaucratic and informational) hurdles to obtainment of healthcare services. Therefore, this study examines the following hypothesis:

> **Social Connections Hypothesis (H1)**: When there are institutional gaps (ineffective institutions) in health care information and services, patients will rely on social connections to fill in these gaps.

1.2.5 Factors Influencing Access to Healthcare: Institutional Hypothesis

Besides social connections, effective institutions may also improve citizen's access to healthcare services. For example, Lindström et al. (2006) find both social capital and institutional (administrative) factors influence access to healthcare services in Sweden. Besides that social capital positively influence healthcare services access (measured as perceived access to regular doctors), the level of access also differs among each administrative district that has independent management of healthcare sector/institutions (Lindström et al. 2006). This suggests that administrative (institutional) factors also have an influence on healthcare service access (Lindström et al. 2006).

Further, Chan and Yao (2018) suggest the interacting relationship between *guanxi* and institutions in regard to healthcare service access in China. While Chan and Yao (2018) find a common use of *guanxi* and *hongbao*, they suggest a hypothesis to be tested in the future that "the availability and strength of institutional assurance may negatively correlate with the mobilization of interpersonal networks or the popularity of unofficial exchanges" (763). This is because patients use *guanxi* and *hongbao* out of distrust in healthcare institutions and professionals, and institutions that guarantee access to quality care may mitigate patients' use of *guanxi* and

hongbao (Chan and Yao 2018). Therefore, the use of connections (*guanxi*) depends on the effectiveness of institutions.

Helmke and Levitsky (2004; 2006) argue that a particular role that informal institutions play depends on effectiveness of formal institutions. For example, informal institutions can play a substitutive role when formal institutions are ineffective (Helmke and Levitsky 2004, 2006). The substitutive informal institutions compensate for weak state institutions, and "achieve what formal institutions were designed, but failed, to achieve" (Helmke and Levitsky 2004, 729). One of the examples Helmke and Levitsky (2004) cite is the village leaders' use of local social networks and associations to provide public services in rural China when formal state institutions are ineffective in providing such services (730). This suggests that not only local political leaders but citizens can also similarly mobilize social networks to access public services in face of ineffective public service institutions.

Indeed, some scholars suggest that social networks fill in the gaps of inefficient institutions (Helmke and Levitsky 2004; Narayan 2002; Rose 2000; Woolcock and Narayan 2000). For instance, informal social networks function as a substitute for formal bureaucracy organizations to meet everyday demands of citizens in Russia (Rose 2000). Since the formal state organizations do not provide adequate public services from social security to public security, citizens rely on informal networks to access services and meet their needs (Rose 2000).

On the other hand, when the institutions are efficient, social connections only play a complementary role to the institutions (Narayan 2002; Woolcock and Narayan 2000). Woolcock and Narayan (2000) and Narayan (2002) argue that bridging social capital (extra-community social networks) plays a complementary role to functioning state institutions, whereas it plays a substitutive role to dysfunctional state institutions. Again, informal and formal institutions have

an interactive relationship (see Narayan 2002, 63-64). Helmke and Levitsky (2004) also argue that informal institutions can play a complementary or accommodating role to effective formal institutions. As in the examples cited above, "when citizens are deprived of services and benefits, informal networks substitute for the failed state and form the basis of coping strategies" (Woolcock and Narayan 2000, 238). Therefore, citizens can mobilize informal social networks to meet their everyday needs when public service institutions are ineffective in providing such needs, however people rely less on social connections when the institutions are effective.

Similarly, the studies on *guanxi* suggest that people resort to *guanxi* due to inefficient institutions (Gold et al. 2002; Ruan 2017), meaning that the reliance on *guanxi* may decrease under efficient institutions. There are two views on underlying reasons for the use of *guanxi*: cultural perspective and institutional perspective (Gold et al. 2002; Ruan 2017). Scholars argue that these two perspectives are not zero-sum as *guanxi* is situated in both cultural and institutional contexts (Gold, Guthrie, and Wank 2002; P. P. Li 2007). The cultural perspective views that the use of *guanxi* attributes to the Confucianism (Ruan 2017). This perspective suggests that the use of *guanxi* will continue at the constant level regardless of institutional changes in China. On the other hand, the institutional perspective views *guanxi* is "an institutionally defined system – i.e. a system that depends on the institutional structure of society rather than on culture – that is changing in stride with the institutional changes of the reform era" in China (Guthrie 1998, 255). According to this perspective, the role of *guanxi* depends on institutional contexts.

Indeed, the existing studies suggest that *guanxi* as informal institutions substitute inefficient formal institutions (D. Li et al. 2021; P. P. Li 2007; H. Wang 2000; P. Wang and Wang 2018; Zhan 2012). For example, Wang and Wang (2018) find that *guanxi* as an informal

institution plays a substitutive role to an ineffective promotion system within China's People's Liberation Army. In the arenas of economy and business, H. Wang (2000) argues that *guanxi* as an informal institution compensated for the weak legal institutions to increase FDI inflow during the market reform in China. Similarly, Xin and Pearce (1996) argue that *guanxi* substitutes weak legal institutions, thus private company executives build and use their *guanxi* with government officials to protect their business. Accordingly, the significance of *guanxi* increases with the levels of institutional uncertainty (Bian 2018). *Guanxi* lessens transaction costs in face of institutional uncertainty (Qi 2013; Smart 1993).

At the same time, Guthrie (1998) argues that the reliance on *guanxi* in market and business is declining with the development of legal institutions. This suggests that the reliance on *guanxi* may decrease under efficient institutions or at least the specific role *guanxi* plays may shift depending on particular institutional contexts. As there is no perfect institutions (Bian 2018), g*uanxi* is likely to remain relevant regardless of institutional changes. It may also adopt to institutional changes and play different functions under different contexts. For instance, P. Wang and Wang (2018) argue that the role of *guanxi* has become more complementary than substitutive along with the formal institutional development (403). Horak and Restel (2016) argue that the formal institutions are still in transition (i.e. in the process of development) in China, meaning that the formal institutions are not fully effective or fully ineffective. Accordingly, "the central question remains less about whether *guanxi* will persist or recede but rather how it will change in nature over the course of institutional development" (Horak and Restel 2016, 538). Nonetheless, the necessitated and strong reliance to use *guanxi* (i.e. *guanxi*'s substitutive role) to meet daily demands such as health service access may be less when there is a greater institutional capacity.

Furthermore, the scholars on women's social capital critically point out that women's informal networks tend to fill in the gaps of formal institutions to meet their everyday demands, although women may need to rely less on social capital if there are efficient institutions that provide adequate social services. For instance, when formal institutions do not provide sufficient child care services, women's social capital can be a support network providing informal care (Lowndes 2004). One such example is women's use of informal support network for childcare in the UK because the public institutions do not sufficiently provide such services (Lowndes 2004). However, as a result, formal institutions can even take advantage of the preexisting women's social capital without providing adequate public social services to meet women's needs (Molyneux 2002; Mulcahy, Parry, and Glover 2010). In the context of poverty alleviation effort in Latin America, Molyneux (2002) argues that women's social capital "is mobilized as the safety net for irresponsible macro-economic politics and poor governance" (179).

Moreover, the generation and maintenance of social capital depends on women's "unpaid labour" (Bezanson 2006, 436; Molyneux 2002, 179) and this labor may even hinder them from developing the "get ahead" social capital (Domínguez and Watkins 2003; Lowndes 2004). Therefore, the change of larger structures (including the institutional structures) that demand women to generate and utilize informal social networks may mitigate the issues associated with the negative effects of social capital. In sum, the literature suggests that women's social capital (i.e. informal networks) tends to fill in the gaps of formal institutions by providing immediate support to women in their daily lives, yet efficient institutions that provide adequate social services may moderate the substitutive effect of social connections.

In short, these studies suggest that efficient institutions may improve people's access to healthcare services, and consequently patients will need to rely less on social connections.

Efficient healthcare service institutions may provide complete information regarding access and quality of health care services. Under such a circumstance, social connections may only play a complementary role to the efficient institutions (Helmke and Levitsky 2004, 2006; Narayan 2002; Woolcock and Narayan 2000). In other words, there will be less need to "substitute" the inefficient institutions with social connections (Narayan 2002; Woolcock and Narayan 2000). Indeed, Helmke and Levitsky (2004; 2006) argue that informal institutions may no longer play a substitutive role when the formal institutions become more effective. They state: "when the credibility of previously ineffective formal structures is enhanced, the benefits associated with the use of substitutive institutions may diminish, potentially to the point of their dispensability" (Helmke and Levitsky 2004, 732). Consequently, this study hypothesizes that greater health institutional capacity can mitigate the use of social connections. The existing studies on *guanxi* also suggest that *guanxi* as informal institutions substitute inefficient formal institutions (D. Li et al. 2021; P. P. Li 2007; H. Wang 2000; P. Wang and Wang 2018; Zhan 2012), and that the reliance on *guanxi* can decline with institutional developments (Guthrie 1998). Therefore, this study examines the following hypothesis:

> **Institutional Capacity Hypothesis (H2)**: When there are efficient institutions for health care such as more complete information and services, patients will have little need for social connections and networks.

1.2.6 Other Factors Influencing Access to Healthcare

According to the behavioral model of health services use, both the healthcare system and population characteristics influence health behaviors (e.g. healthcare service use) and outcomes (e.g. health status and patient satisfaction) (Ronald M. Andersen 1995). The population

characteristics have three components: predisposing characteristics, enabling resources, and need (Ronald M. Andersen 1995). Predisposing characteristics relate to factors influencing the likelihood of healthcare service use such as age and gender (Aday and Andersen 1974). Enabling resources include factors that enable healthcare service access such as income and insurance (Aday and Andersen 1974). The need component refers to the patients' need of healthcare services (Aday and Andersen 1974).

The existing studies that examine access to healthcare services based on the behavioral model of health services use in China tend to focus on the population characteristics (i.e. the individual-level variables) rather than the influence of formal healthcare system and institutions (Gong, Kendig, and He 2016; D. Liu et al. 2017; M. Liu et al. 2007; Xiang Liu et al. 2016; X. Ma and Cen 2017; S. Zhang, Chen, and Zhang 2019). Among the predisposing factors, scholars find that there is a higher level of healthcare service use among the older respondents (Gong, Kendig, and He 2016; Xiang Liu et al. 2016; X. Ma and Cen 2017), women (D. Liu et al. 2017; Xiang Liu et al. 2016), married respondents (D. Liu et al. 2017), and Chinese Communist Party members (Gong, Kendig, and He 2016). Scholars commonly examine insurance coverage and income as enabling factors (D. Liu et al. 2017; Xiang Liu et al. 2016). In terms of the need factors, perceived poor health status and chronic illness tend to increase health service use (Gong, Kendig, and He 2016; Xiang Liu et al. 2016; X. Ma and Cen 2017). Further, T. Zhang, Liu, and Liu (2019) use the behavioral model to examine perceived access to healthcare services among the elderly in China, and find that the out-of-pocket payment (OOP) ratio especially influences the perceived healthcare service access.

Some studies suggest that factors associated with healthcare system also influence the healthcare service access. For example, X. Ma and Cen (2017) find that the level of healthcare

service use varies among provinces in China. As a result, X. Ma and Cen (2017) suggest that the geographical (provincial) distributions of healthcare institutional resources such as the number of hospitals and doctors may influence the healthcare service use, and call for a greater government attention on this issue. Indeed, Jin et al. (2017) find that the number of physicians at primary care institutions increases healthcare service use among patients with diabetes mellitus in China. Therefore, while the existing studies tend to focus on the individual-level factors such as socio-economic status, healthcare system related factors, such as health institutional capacity, can also influence access to healthcare services.

Chapter 2: Theory, Hypotheses, and Research Design

This chapter discusses the main theoretical argument of the dissertation, hypotheses, and the research design including data, variables, and methods to be used for the subsequent analysis sections. This dissertation examines two hypotheses: Institutional Capacity Hypothesis (H2) when there are efficient institutions for health care such as more complete information and services, patients will have little need for social connections (social networks), and Social Connection Hypothesis (H1) when there are institutional gaps (inefficient institutions) in health care information and services, patients will rely on social connections to fill in these gaps. I use both quantitative and qualitative data to examine the two hypotheses. The quantitative data includes the Chinese General Social Survey 2010, China Family Panel Studies 2010, and China Health Statistical Yearbook 2010. The qualitative data is derived from the interviews my collaborators and I conducted on women's access to prenatal care services in China in 2019. The chapter also details the operationalization of the key variables: social connections, institution, and access to healthcare services. This chapter proceeds as follows. First, I discuss theory and hypotheses. Second, I discuss quantitative data, variables, and methods. Lastly, I discuss qualitative data and methods.

2.1 Theory and Hypotheses

Figure 2 illustrates this study's theoretical framework and expectation, with each cell (I, II, III, IV) representing citizen access to health services and the theoretical condition to access. The Cell I is lower institutional capacity and lower social connection dependency. In Cell I, the level of access is the lowest because the inefficient institution does not provide access and social connections also fail to provide instrumental support or targeted information for each citizen to

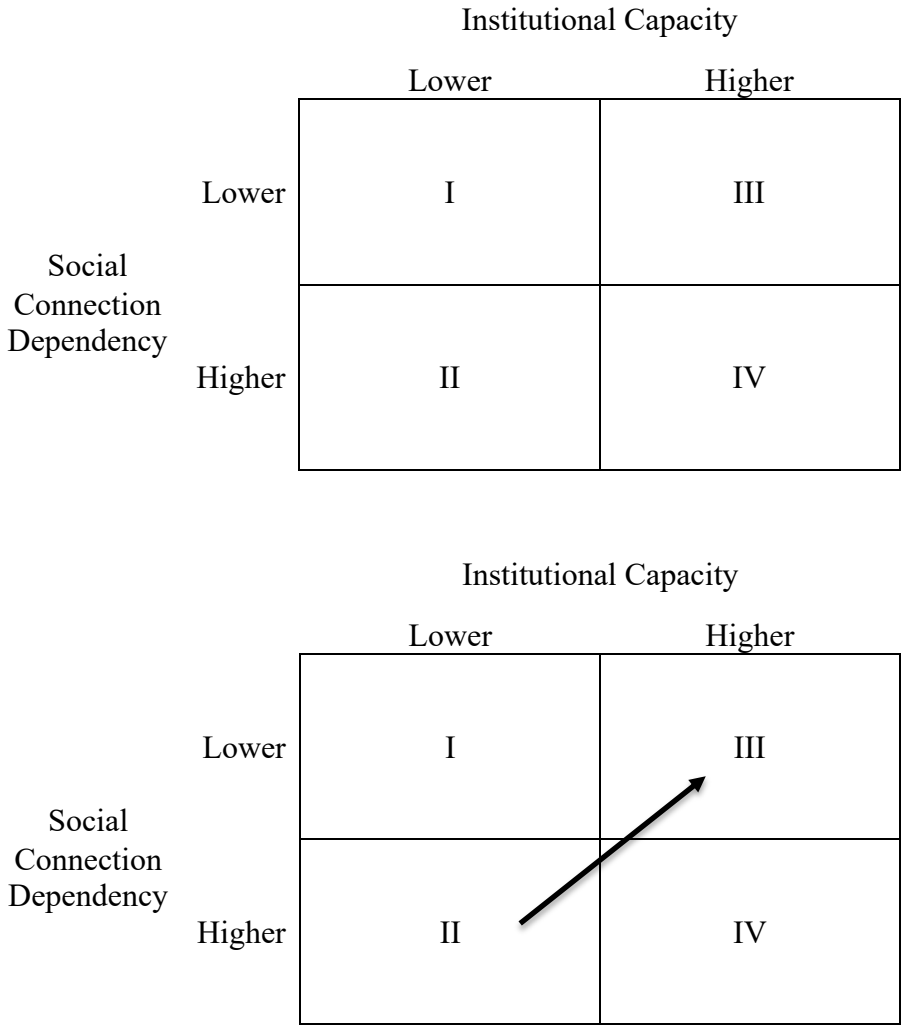
gain access to healthcare services. In other words, when the institutional capacity is lower, people who are not endowed with a high level of social connections may lack access to health services.

The Cell II is lower institutional capacity and higher social connection dependency. In Cell II citizens rely more on social connections to fill in the gaps of formal institutions. The previous studies examine Cell II where citizens use social networks in face of incomplete information and inefficient institutions (Amoah, Edusei, and Amuzu 2018; Chan and Yao 2018; Deri 2005; Fu and Chan 2016; Herberholz and Phuntsho 2018; Hou, Lin, and Zhang 2017; D. Wu et al. 2017; Zou et al. 2018). Therefore, citizens' reliance on social connections is comparatively higher because the institutional capacity is lower.

The Cell III is higher institutional capacity and lower social connection dependency. Few studies examine Cell III (high institutional efficiency and low social connection dependency), and there tends to be little discussion in the literature on how citizen access may move from II to III (indicated by an arrow in Figure 2). In other words, do citizens still rely on social connections when the institutional capacity improves? The Cell III suggests a case where the greater institutional capacity mitigates the reliance on social connections. Indeed, the existing studies suggests that informal networks play only a complementary role when the institutions are efficient (Helmke and Levitsky 2004; Narayan 2002; Rose 2000; Woolcock and Narayan 2000). This suggest that the "reliance" on social connections in place of formal institutions may be mitigated when the formal institutional capacity is high. Similarly, the studies on *guanxi* also suggest that people's reliance on *guanxi* is due to inefficient institutions (Chan and Yao 2018; Gold et al. 2002; Ruan 2017). Therefore, citizens' reliance on social connections is comparatively lower because the institutional capacity is higher.

The Cell IV is higher institutional capacity and higher social connection dependency. In Cell IV, institution and social connections both play a large role in facilitating access. In such a case, the use of social connections still remains relevant in accessing health services, although there is a high level of health institutional capacity. While this is also a likely scenario, this study focuses on the Cell II and III based on the existing literature discussed in the previous section.

Figure 2. Citizen Access to Health Services and the Relationship between Institutional Capacity and Social Connection Dependency



Source: Author

In short, this dissertation's hypotheses concern the Cell II and the Cell III. The main research question of this study is indicated by the arrow in Figure 2. When there is an efficient formal institution in place providing healthcare services, do social connections still have an influence on citizens' access to the services? That is, when there is enough public information and equitable access to health care facilities, do patients rely less on social networks and personal connections? Therefore, this dissertation examines the first hypothesis (H1: Social Connection Hypothesis) corresponding to the Cell II and the second hypothesis (H2: Institutional Capacity Hypothesis) corresponding to the Cell III as below:

> **Social Connection Hypothesis (H1)**: When there are institutional gaps (inefficient institutions) in health care information and services, patients will rely on social connections to fill in these gaps.
>
> **Institutional Capacity Hypothesis (H2)**: When there are efficient institutions for health care such as more complete information and services, patients will have little need for social connections and networks.

In examining these hypotheses, this study conceptualizes both the institutional capacity and the level of individual social connections as a continuum. For example, the health service institutional capacity is conceptualized as a continuum, meaning that the healthcare service institution is not always completely perfect (efficient) or flawed (inefficient). The institutional capacity may depend on health issue areas. The institutions may be more efficient for certain types of healthcare services depending on the government's priorities (e.g. immunization, maternal care). This suggests that patients may rely more on social connections to access certain types of medical care especially when there is a need to see a specialist or need to access higher

levels of hospitals. Further, the degree of institutional efficiency may also vary among provinces. The health system reforms in the recent years may have increased the efficiency of institutions, but has not reached the maximum levels of efficiency as the problems of access persist (discussed in the introduction section). Similarly, the level of reliance on social connections to substitute or complement the formal institutions also vary in a continuous manner. Therefore, although the Figure 2 simplifies these key concepts as the two-by-two diagram, it does not mean that social connections and institution are conceptualized as dichotomy.

The case of China enables this study to examine effects of institutional capacity on a use of social connections to access healthcare services. This is because there is a variation in institutional capacity within China. For instance, there is a geographical variation in the distributions of healthcare resources (T. Chen et al. 2018; D. Li et al. 2018; J. Wu 2018; J. Wu and Yang 2019; T. Zhang et al. 2017). The amount of health finances also varies from a province to a province due to the health finance decentralization (Brixi et al. 2013; J. Pan and Liu 2012; Lufa Zhang and Liu 2014). Therefore, the healthcare institutional capacity varies among the 31 provinces (and autonomous regions) within China, and consequently this study examines effects of provincial healthcare institutional capacity on a use of social connections to access healthcare services.

This variation in institutional capacity within a single country offers a strength to the current study. One challenge in examining effects of institutions is that there may be other structural factors that influence the study results. For example, if a study was to examine effects of healthcare institutional capacity across countries, there might be other country-specific factors that play roles in healthcare access. This study is able to examine effects of healthcare institutional capacities varied among Chinese provinces while holding the country context

constant. While this does not completely eliminate the possibility that some local factors other than the healthcare institutional capacity influence healthcare access, it minimizes confounding effects of contextual factors.

2.2 Quantitative Data and Research Design

2.2.1 Quantitative Data

This study draws quantitative data from three data sources: China Family Panel Studies (CFPS) 2010, Chinese General Social Survey (CGSS) 2010, and China Health Statistical Yearbook (CHSY) 2010. I use the survey data to examine effects of provincial healthcare institutional capacity on a use of personal connections to access healthcare services. CFPS is a nationally representative survey conducted by the Institute of Social Science Survey (ISSS) at Peking University. The survey is conducted using the computer assisted personal interviewing (CAPI) method. The CFPS 2010 has a sample size of 33,600, and includes respondents from 25 provinces and autonomous regions[1]. The CFPS 2010 has the sample size of 33,600. The CGSS was originally launched by the Renmin University of China (Department of Sociology) and the Hong Kong University of Science and Technology (Survey Research Center) in 2003. The CGSS 2010 was conducted by National Survey Research Center at Renmin University of China. Since this study uses a survey question from the M part of the survey where a part of the sample answers the questions, the CGSS 2010 sample size for this study is about 3,800.

The CFPS 2010 and CGSS 2010 are suitable for this study for two reasons. First of all, they are suitable for this study to examine an influence of healthcare institutional capacity across

[1] This includes Anhui, Beijing, Chongqing, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Shanghai, Shanxi, Sichuan, Tianjin, Yunnan, Zhejiang.

provinces because the first phase of the health system reform (2009-11) encompassing the survey year focused on infrastructure building and equity. This also means that there was likely to be greater variation among provinces in terms of healthcare institutional capacities during this early period of the major health system reform. With the progress of the health system reform that aims to improve healthcare access and equity, the variation among provinces should narrow down.

Second, both CFPS 2010 and CGSS 2010 include questions on social connections and healthcare service access. The CFPS 2010 contains a question on a use of personal connections to access healthcare services. Although the CFPS 2010 is a part of the larger panel studies, only the 2010 wave includes this question. Similarly, the CGSS 2010 has a section dedicated to a topic of health unlike other waves of CGSS.

I also use the data from the China Statistical Yearbook (CSY) 2010 and China Health Statistical Yearbook (CHSY) 2010 to examine the healthcare institutional capacity of each province. The China Statistical Yearbooks and China Health Statistical Yearbook are Chinese government statistics published every year. This study uses the data from the CHSY 2010 to estimate the healthcare institutional capacity in each of the 31 provinces (and autonomous regions). The CHSY 2010 contains data from 2009, and this study purposefully uses the 2009 data since the respondents' answers in the 2010 survey (CFPS 2010 and CGSS 2010) may be derived from their experiences and observations of the healthcare service institutions in the past one year. I use the CSY 2010 for the data on provincial governments' general expenditure and their health expenditure. The data on provincial population and GDP is also derived from the CSY 2010.

2.2.2 Social Connections Variables

As discussed in the literature review section, this study conceptualizes social networks, connections and relations at the individual level. Figure 1 shows that social connections ranges from personal connections (*guanxi*) to broader social networks that stem from informal groups, formal associations, and online networks. This study conceptualizes that the level of social connections varies by individuals (Briggs 1998; Domínguez and Watkins 2003; Gosling 2008; Lowndes 2004). Some individuals have more *guanxi* (personal) connections than others. Similarly, the level of social support people has from their social connections differs by individuals. In sum, some people are more connected than others, and those people with higher levels of social connections should have greater access to daily support and information to obtain needed social services.

This study measures social connections based on survey questions that ask individual survey respondent about their personal to broad social connections, relations, and networks. I use different survey questions from CFPS 2010 and CGSS 2010 to measure social connections. Table 2 summarizes the survey questions from each data set I use to measure social connections. Each survey question measures different points on the scale of social connections conceptualization (on Figure 1). Although social connections are conceptualized in a continuum (scale) manner, I sort the social connections variables under the two labels for a simplicity of presentation: personal connections and broader social connections.

The variable, ***personal connections***, concerns the use of personal connections for healthcare service access. This is a dichotomous variable: have used personal connections to see a doctor (1) and otherwise (0). This variable is derived from the survey question in CFPS 2010:

"Up until now, have you ever sought for personal connection (people for help) for the following affairs? See a doctor." If the answer is yes, it is coded as 1. If the answer is no, it is coded as 0.

The variable, ***social connections***, concerns social connections that provide support when needed. It measures if a respondent can obtain support from their social connections in case of need. The variable is from CGSS 2010, and the survey question asks: "Have your friends, colleagues and neighbors have done the following thing when you needed in the past one year? listened to your personal issues or concerns; provided financial support; done household work such as housework, childcare, and nursing." For each of the three questions, the respondents had seven answer options to choose from: do not have such people around me, never, very little, sometimes, often, always, and did not have such needs. Thus, the first six answers are chosen by respondents who encountered the need to ask for help from their friends, colleagues or neighbors in the past one year, and the last answer is chosen by respondents who did not have the need to ask for help. I create an additive index summing the three variables on the frequency of receiving support in case of need in three areas: listening to concerns, financial support, and household work. I subset the respondents who needed support from their social connections, and code their answers in six ordered categories based on the frequency of social support their social connections provided: do not have such people around me (1), never (2), very little (3), sometimes (4), often (5), and always (6). The Cronbach's alpha is 0.8. The resulting variable ranges from 3 to 18.

I also create a dichotomous variable to account for the respondents who did not have the need to ask for social support from their social connections last year. If a respondent did not need social support, I code 1 and otherwise 0. Thus, 0 includes all the respondents who answered the frequency of social support received. The resulting variable, ***Social Support Not Needed***, is a

dichotomous variable: did not need social support last year (1) or otherwise (0). Accounting for this variable is beneficial for this study for two reasons. First, it is critical to differentiate the respondents who lacked social connections despite their need and the respondents who did not have such needs. The code 1 in the social connections variable include the respondents who do not have friends, colleagues, and neighbors that they can ask for support even though they had the need to ask for help last year. Therefore, this is the group of people who are endowed with the lowest level of social connections. On the other hand, the code 1 in the social support not needed variable includes the respondents who did not have the need to ask for help from their social connections. Second, there is a possibility that people who had no need to ask for any types of social support, from listening to personal concerns to financial support, are socio-economically privileged people. Their everyday needs are met without any support from friends, neighbors or colleagues. If this is a group of people who have socio-economic advantages, then they may also have greater access to healthcare services.

Table 2. Measurement (Survey Questions) of Social Connections

CFPS 2010	• Up until now, have you ever sought for personal connection (people for help) for the following affairs? See a doctor. (到目前为止，您是否因以下事务找人帮过忙？看病。)
CGSS 2010	• In the past one year, have your friends, colleagues and neighbors listened to your personal issues or concerns when you needed? (在过去的一年时间里，当您有需要的时候，您的朋友、同事、邻居是否做了以下这些事情? 倾听个人问题或者个人关心的事情。) • In the past one year, have your friends, colleagues and neighbors provided financial support to you when you needed? (在过去的一年时间里，当您有需要的时候，您的朋友、同事、邻居是否做了以下这些事情? 提供经济上的支持。) • In the past one year, have your friends, colleagues and neighbors done household work such as housework, childcare, and nursing for you when you needed? (在过去的一年时间里，当您有需要的时候，您的朋友、同事、邻居是否做了以下这些事情? 做一些家庭杂事（例如：家务、照顾小孩、护理）。)

The personal connections and social connections variable each gauge different points on the scale of social connections conceptualization. Figure 3 maps the two variables on the social connections conceptual scale (see Figure 1 for the original scale). The *personal connections* gauges more personalistic social connections (scale 1 to 4 on Figure 3). The survey question from the CFPS 2010 asking if a respondent has used personal connections to see a doctor belongs to this range. This type of social connections is particularistic and instrumental in providing direct and critical support needed to meet demands such as social service access. It also corresponds with the Chinese concept of *guanxi* - an enduring inter-personal relationship that involves sentimental and instrumental values of mutual obligation and reciprocity (Gold, Guthrie, and Wank 2002; Kipnis 1997; N. Lin 2001; Qi 2013; Ruan 2017; Yang 1994).

The *social connections* measures social connections in an aspect of immediate and community informal relations (scale 5 on Figure 3). This is broader than the personalistic

connections and involves an immediate circle of friends, colleagues, neighbors, and so on. These immediate and community social connections can provide social support when needed. In other words, this type of immediate and close-knit social connections offer daily support to meet everyday demands as well as support and information needed to obtain social services. The survey question from the CGSS 2010 asks if the respondents have anyone (friends, colleagues, neighbors) who offer emotional, financial or housework support.

Figure 3. Social Connection Variables on the Conceptual Scale

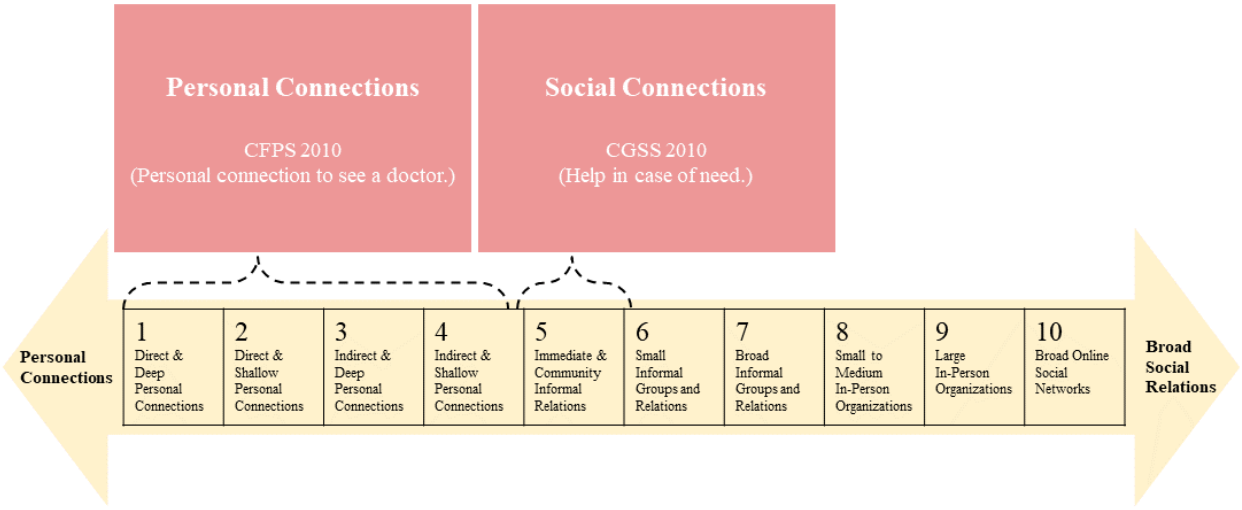


Figure 4 and 5 show the distribution of the personal connections and social connections variable. Figure 4 displays the distribution of the personal connections variable from the CFPS 2010. It shows that the majority of the people have not used personal connections (*guanxi*) to access healthcare services. About 89% of the respondents have not used personal connections to see a doctor, and about 11% of the respondents have used personal connections to access

healthcare services. Since the sample size is large (N=33,600), this 11% still has a larger number of respondents (3,787 people) although it is proportionally smaller.

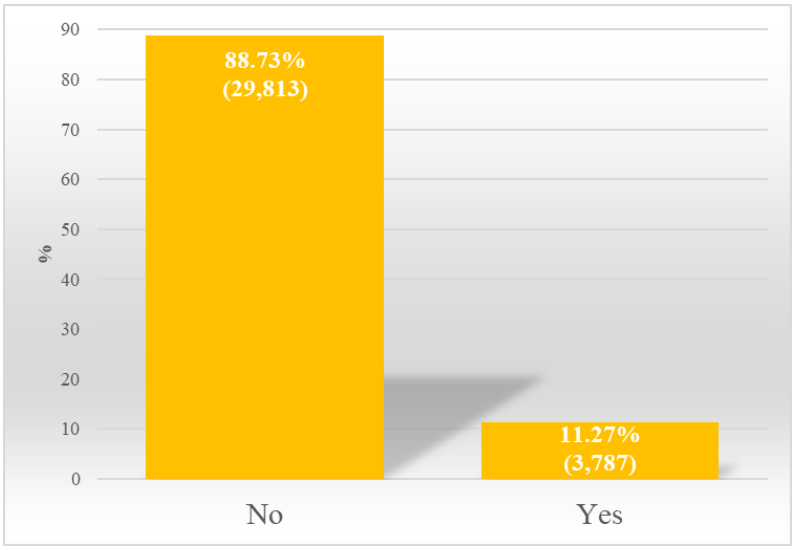
There are three possible explanations as to why a majority of the respondents do not rely on personal connections (*guanxi*) to access healthcare services. One is that not everyone has personal connections that help them access healthcare services. The levels of *guanxi* varies from a person to a person, and *guanxi* must also be a specific connection to the hospital or doctor's office. Therefore, in Chapter 3, I analyze what factors influence the use of *guanxi* in healthcare service access (i.e. who is more likely to use *guanxi* to see a doctor), and whether people are more likely to use *guanxi* in places with weaker capacities of healthcare institutions.

Another possible reason why a majority of the respondents do not use personal connections to see a doctor is that they do not need to use personal connections to access healthcare services in most cases. The personal connections *guanxi* is a long-term mutually reciprocal relationship. Thus, people may only resort to *guanxi* for more serious cases of healthcare services such as seeing a specialist, securing impatient beds, or going through a surgery. Further, the Chinese government has been investing in and reforming the healthcare system since the early 2000s. Therefore, people may have access to basic healthcare services and do not need to use *guanxi*.

Additionally, a social desirability bias may be reducing the yes answer. While *guanxi* is not a synonym of corruption (Qi 2013; Smart 1993), the respondents may still have ethical considerations for going around the official procedures to see a doctor (Yang 2002). Therefore, I do not conclude that a majority of Chinese citizens do not use personal connections to see a doctor just from this survey result. Rather, the focus of this study is to examine a covariation between the institutional contexts and the use of connections.

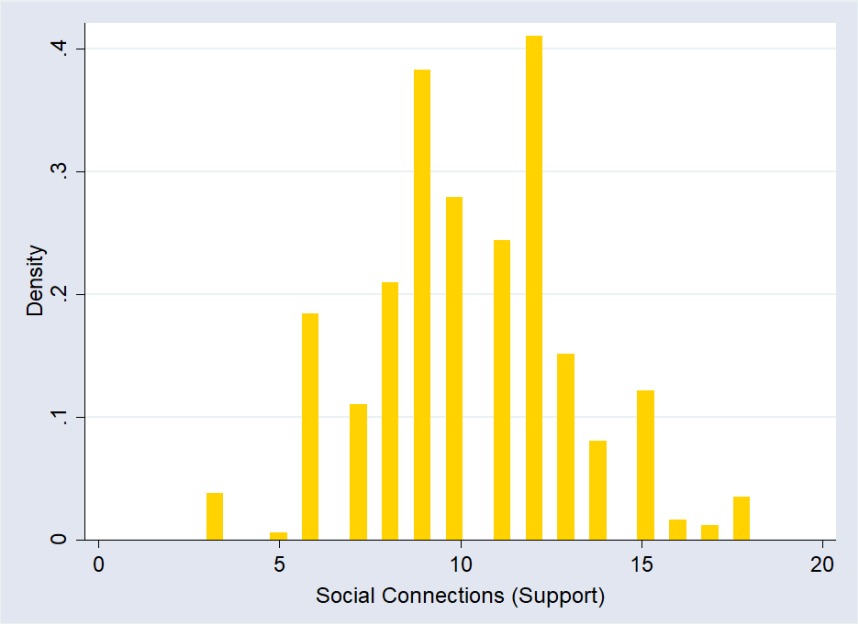
Figure 5 plots the distribution of the social connections variable from the CGSS 2010. This variable is an additive index measuring the levels of social support received from the immediate social connections such as friends, colleagues, neighbors in three areas: emotional, financial, and housework support. The variable ranges from 3 to 18, and has a normal distribution as shown on Figure 5. The mean and median is 10.

Figure 4. Have Used Personal Connections to See a Doctor



Source: CFPS 2010

Figure 5. Distribution of the Additive Index: Social Connections



Source: CGSS 2010

2.2.3 Healthcare Institution Variables

This study operationalizes healthcare institutional capacity using indicators from the WHO health system building blocks. Table 3 lists the 17 indicators defined by WHO for each of the six building blocks of health systems. Based on relevance (in China case) and data availability, this study selects 8 indicators in three categories: health service delivery, health workforce, and health financing. Table 4 lists the selected 8 indicators.

First of all, the existing studies identify inequality in distribution of healthcare resources within China in regard to infrastructure (e.g. number of healthcare institutions and hospital beds) (T. Zhang et al. 2017) and human resources (e.g. number of doctors and nurses) (D. Li et al. 2018; J. Wu 2018; J. Wu and Yang 2019; T. Zhang et al. 2017). This suggests that there are substantial subnational variations for the category on health service delivery and its indicators measuring the infrastructural capacity of service delivery as well as the category on health

workforce. Therefore, I select all the indicators that have available data at subnational-level in China from the categories on health service delivery and health workforce.

Moreover, the health finance is decentralized in China (Brixi et al. 2013; J. Pan and Liu 2012; Lufa Zhang and Liu 2014). The provincial governments are responsible for financing and providing healthcare services, and account for more than 90% of the total public health expenditure (Brixi et al. 2013; J. Pan and Liu 2012; Tan 2017). A sub-national level disparity exists in health finances due to the local governments' fiscal capacity and incentive structure (Brixi et al. 2013; T. Chen et al. 2018). The provincial governments' fiscal capacities largely depend on the levels of local economic development and financial transfers from the central government (Brixi et al. 2013; J. Pan and Liu 2012; Tan 2017). The incentive structure relates to a promotion system of local government officials (Brixi et al. 2013; T. Chen et al. 2018). Since promotions are based on local economic performance, local cadres are incentivized to prioritize investment in economic growth rather than public services such as health (T. Chen et al. 2018). Thus, I also expect to see a substantial subnational variation for the category on health financing, and I include all the indicators from the category on health financing as long as the data is available at subnational-level in China.

On the other hand, I do not include the indicators from the other three categories on health information, essential medicines, and leadership and governance. Despite its importance, the indicator on policy under the leadership and governance is irrelevant at the subnational-level in China. China has a unitary system, and the Chinese Communist Party (CCP) makes policies. While some policies are not evenly implemented across China (Kennedy 2019; Kennedy and Chen 2018), policy-making is primarily at the national-level and subnational governments are in charge of policy implementation rather than policy creation.

The category on essential medicines is also eliminated because the Chinese government established the National Essential Medicine System in 2009, guaranteeing the availability of essential medicines across China. Thus, the subnational variations may be limited in 2010. Further, scholars report an issue of over prescription of medication in China, and this suggests that accurate prescription of medication may be more of a relevant issue rather than availability and affordability of the basic medicines.

Lastly, I also do not include the category on health information. As this study conceptualizes health institutional capacity as the institutional capacity to provide healthcare services, this category serves as an indirect measurement compared to other categories. For instance, the categories on health service delivery, health workforce, and health financing are directly related to health service provision. As information system enables an optimum provision of health services, this indicator may increase its relevancy in a longer-term as the health system reform deepens. However, this study examines the conditions in 2010 (a year after the beginning of the major health system reform), and does not consider information system in measuring health institutional capacity.

All the indicators on healthcare institutions are at the provincial-level. The data is drawn from the China Statistical Yearbook (CSY) 2010 and China Health Statistical Yearbook (CHSY) 2010. The data on indicators for the health service delivery and health workforce categories are from the China Health Statistical Yearbook (CHSY). The data on population size and the provincial government expenditure (total expenditure and health expenditure) are from the China Statistical Yearbook (CSY) 2010. The data includes 31 provinces (and autonomous regions).

For the category on health service delivery, there are five variables: the number of health facilities, health facility beds, outpatient department visit, specific services facilities per 10,000

people as well as the proportion of specific services facilities to total health facilities. The health facilities include hospitals, primary care institutions, outpatient and ambulatory departments/centers, and clinics. The special services facilities are specialized hospitals, including maternal and child health and specialized disease hospitals. The category on health workforce has a variable: the number of health workers per 10,000 people. The health workers include doctors, nurses, pharmacists, technicians, and village doctors. The category on health financing has two variables: the amount of total health expenditure per 10,000 people and the proportion of provincial government health expenditure to total provincial government expenditure.

Table 3. WHO Building Blocks of Health Systems and Indicators

	Building Blocks	Indicators
1	Health Service Delivery	• Number and distribution of health facilities per 10000 population • Number and distribution of inpatient beds per 10000 population • Number of outpatient department visits per 10000 population per year • General service readiness score for health facilities • Proportion of health facilities offering specific services • Number and distribution of health facilities offering specific services per 10000 population • Specific-services readiness score for health facilities
2	Health Workforce	• Number of health workers per 10000 population • Distribution of health workers by occupation/specialization, region, place of work and sex • Annual number of graduates of health professions educational institutions per 100 000 population, by level and field of education
3	Health Information	• Health information system performance index
4	Essential Medicines	• Average availability of 14 selected essential medicines in public and private health facilities • Median consumer price ratio of 14 selected essential medicines in public and private health facilities
5	Health Financing	• Total expenditure on health • General government expenditure on health as a proportion of general government expenditure (GGHE/GGE) • The ratio of household out-of-pocket payments for health to total expenditure on health
6	Leadership and Governance	• Policy Index

Source: WHO (2010) "Monitoring the Building Blocks of Health Systems: A Handbook of Indicators and Their Measurement Strategies"

Table 4. Healthcare Institutional Capacity Indicators in This Study

Building Blocks	Indicators
Health Service Delivery	• Number and distribution of health facilities per 10000 population • Number and distribution of inpatient beds per 10000 population • Number of outpatient department visits per 10000 population per year • Proportion of health facilities offering specific services • Number and distribution of health facilities offering specific services per 10000 population
Health Workforce	• Number of health workers per 10000 population
Health Financing	• Total expenditure on health • General government expenditure on health as a proportion of general government expenditure (GGHE/GGE)

Source: This is based on the WHO (2010) "Monitoring the Building Blocks of Health Systems: A Handbook of Indicators and Their Measurement Strategies"

2.2.4 Healthcare Service Access Variables

The studies using Andersen's behavioral model of health services use tend to measure access as an actual "use" of healthcare services. Levesque, Harris, and Russell (2013) define access as "the opportunity to identify healthcare needs, to seek healthcare services, to reach, to obtain or use health care services and to actually have the need for services fulfilled" (8). Penchansky and Thomas (1981) define access as "the degree of 'fit' between the clients and system" (128).

This study measures the access using people's subjective perception of access (i.e. whether or not they think there is a difficulty of access) for three reasons. First, the perceived difficulty of access can distinguish "access" from institutions. When access is defined with the concepts of accessibility, the demarcation between institution (that facilitates accessibility) and access become ambiguous. On the other hand, people's perceptions of access are separate from institutions that facilitate access. This study examines the effects institutional capacity (or increased accessibility) and social connection (that may also facilitate access without institutional accessibility), thus it is critical to clearly separate access and institutions.

Second, measuring access as use of care services may be challenging when quality and demands differ among different levels of hospitals. In China, the upper-tier hospitals are overutilized and crowded, and the primary care institutions are not preferred as they provide lower quality services. Thus, an increased use of care services may signify further strains on upper-level hospitals that in turn decrease the overall access to the hospitals or may also signify increased amount of people accessing primary care institutions simply because they cannot gain access to upper-level hospitals. In both cases, the use of services may increase but perceived access to services may decrease.

Third, compared to objective measurements of access such as healthcare service use, perceived healthcare service access can better address people's "lived experiences" (Tanner, Vann, and Kizilova 2020). Scholars also suggest that perceived access precedes healthcare service use (Fone, Christie, and Lester 2006; Tanner, Vann, and Kizilova 2020), and also precedes health behaviors and outcomes (Tanner, Vann, and Kizilova 2020). An objective measure of healthcare service use also does not fully account for people who do not have access because they do not "use" the services to begin with (thus unobserved in the use measure), and also does not account for potential healthcare service users' sense of uncertainty in accessing healthcare services (Cylus and Papanicolas 2015, 1133-34).

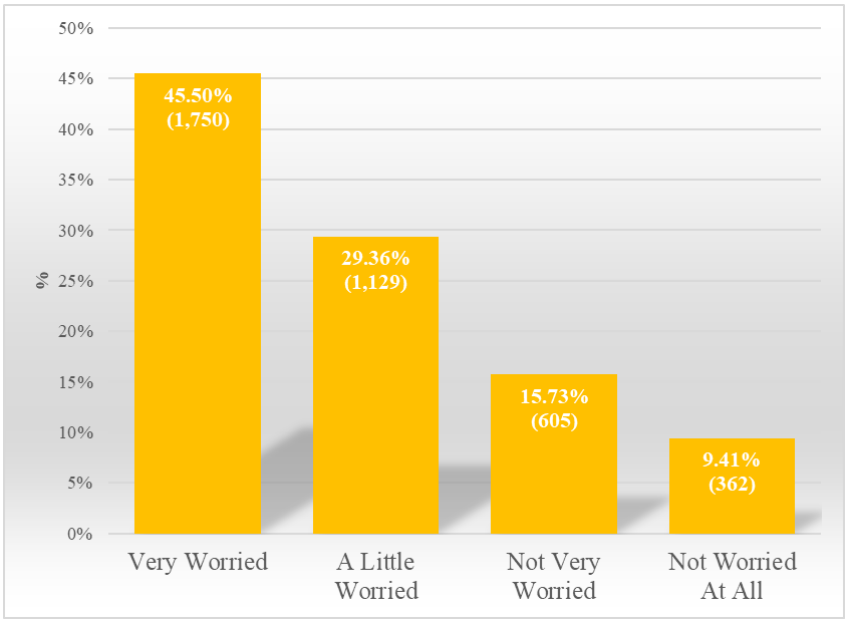
Additionally, perceived healthcare access is more directly related to public content/discontent with healthcare system and consequently people's evaluation of the government's public service provisions. The public opinion is more of a concern for the government and affects a political saliency of the issue. In other words, public opinion on difficulty of obtaining healthcare services impacts government and regime legitimacy in providing public services. Therefore, perceived (subjective) measure of healthcare service access has direct political implications.

Therefore, this study measures ***perceived healthcare service access*** with a public opinion survey question asking about a level of difficulty in accessing healthcare services. It estimates the perceived difficulty of healthcare services access. The CGSS 2010 survey question asks: "How worried are you that you or your family members cannot obtain medical care services when needed?" (您 是否 担心下列情况发生在您或者您家人身上？当需要医疗服务的时候，不能获得。) The answers are coded from 1 to 4: very worried (1), a little worried (2), not very worried (3), and not worried at all (4). This means that the higher value denotes less

perceived difficulty of healthcare service access. Therefore, the healthcare service access variable is coded in a way that the higher values denote greater perceived access to healthcare services.

Figure 6 shows the distribution of the healthcare service access variable. Figure 6 shows that a majority of the respondents in the CGSS 2010 perceives a difficulty in healthcare service access. About 46% of the respondents are worried that they cannot obtain medical care services when needed. Combined with the "a little worried" category, a total of about 75% of the respondents are worried about the healthcare service access. This suggests that there was still a high level of concern about healthcare service access at the point of 2010 despite the ongoing healthcare reforms. At the same time, since the survey question asks about medical care services in general, this question by itself cannot tell us what types of medical care services the respondents had in mind. There may be differences in the level of access depending on types of medical care services, such as basic care, specialist care, maternal care, outpatient care, impatient care, and so on. Nonetheless, this survey results demonstrate an issue with healthcare service access and why the government launched the major health system reform in the preceding year of 2009.

Figure 6. Perceived Healthcare Service Access in 2010



Source: CGSS 2010

2.2.5 Control Variables

This study also includes a series of control variables: gender, age, education, income, CCP membership, medical insurance, and rural-urban. The variable ***women*** is a dichotomous variable coded as men (0) and women (1). This variable's coding is consistent across the two survey dataset: CFPS 2010 and CGSS 2010.

The variable ***age*** is a continuous variable. In the CFPS 2010 data, age ranges from 18 to 110 years old, and the mean and median is 45 years old. In the CGSS 2010 data, age ranges from 18 to 96 years old. The mean is 47 years old and the median is 46 years old.

The variable ***education*** concerns the respondent's highest level of educational attainment. In the CFPS 2010 data, education ranges from 1 to 8: illiterate (1), primary (2), middle (3), high school (including technical and vocational schools) (4), junior college (5), university (6), masters

(7), and doctorate (8). In the CGSS 2010 data, education ranges from 1 to 7: no formal education (1), primary (2), middle (3), high school (including technical and vocational schools) (4), junior college (5), university (6), and graduate school (7).

The variable ***income*** is a continuous variable. In the CFPS 2010 data, income ranges from 0 to 800,000 RMB with a mean of 8,784 RMB. In the CGSS 2010 data, income ranges from 0 to 6,000,000 RMB with a mean of 19,210 RMB. The reason why the income mean for the CFPS 2010 is lower is probably because of the oversampling of rural respondents.

The variable ***CCP membership*** is a dichotomous variable: Chinese Community Party (CCP) member (1) or not (0). In the CFPS 2010 data, about 8% of the respondents are CCP members. In the CGSS 2010 data, about 12% of the respondents are CCP members.

The variable ***insurance*** is a dichotomous variable measuring if the respondent has a medical insurance (1) or not (0). In the CFPS 2010 data, the respondents' answers are coded as 1 if they have any of the following medical insurance: Public Medical Care (for public sector employees), Urban Employee's Basic Medical Insurance, Urban Resident Basic Medical Insurance, New Rural Cooperative Medical Insurance, and supplementary medical insurance. The variable shows that about 78% of the respondents have a medical insurance. In the CGSS 2010 data, the survey question asks whether the respondent is enrolled in Public Medical Care (for public sector employees), Urban Basic Medical Insurance, and New Rural Cooperative Medical Insurance. If they are enrolled, their answers are coded as 1, otherwise 0. The variable shows that about 87% of the respondents are enrolled in a medical insurance.

The variable ***rural*** is a dichotomous variable: rural (1) or urban (0). In the CFPS 2010 data, the survey question asks about the respondents' household registration (*hukou*) status. The agricultural *hukou* is coded as 1, and non-agricultural *hukou* is coded as 0. The CFPS 2010

oversamples the rural respondents. About 71% of the respondents (N=23,702) have the rural household registration, and about 29% (N=9,826) have the urban household registration. Similarly, in the CGSS 2010 data, the agricultural *hukou* is coded as 1, and non-agricultural *hukou* (along with blue and resident *hukou*) are coded as 0. This results in a sample of 51% rural (N=6,040) and 49% urban (N=5,714).

2.2.6 Method for Quantitative Data

In Chapter 3, I conduct descriptive and regression statistical analysis of the survey data (CFPS 2010 and CGSS 2010) as well as the data from the China Health Statistical Yearbook 2010. The analyses proceed in three steps. First, I will conduct correlational analysis and exploratory factor analysis of the eight health institutional capacity indicators to produce a single health institutional capacity index. As shown on Table 4, this study considers eight health institutional capacity indicators. The goal of the factor analysis is to examine whether these eight indicators measure a single dimension of health institutional capacity and to extract a single index composed by the health institutional capacity indicators.

Second, I conduct logistic regression analysis with the dependent variable, *personal connections*, to examine factors influencing the use of personal connections. A key independent variable is the health institutional capacity index to examine the influence of health institutional capacity on the use of personal connections to access healthcare services. Based on the institutional capacity hypothesis (H2), I expect to observe a negative relationship between the provincial health institutional capacity and people's use of personal connections for healthcare service access. In other words, the H2 hypothesizes that the higher levels of healthcare institutional capacity mitigate the use of personal connections to access healthcare services.

Lastly, I conduct ordered logit regression analysis with the dependent variable, *healthcare service access*, to examine the influence of both health institutional capacity and social connections on perceived health service access. The key independent variables are health institutional capacity and social connections. Based on the social connections hypothesis (H1) and institutional capacity hypothesis (H2), I expect that the effect of social connections on perceived healthcare service access is conditional on the levels of health institutional capacity. Social connections may have positive effects on healthcare service access when healthcare institutional capacity is lower. On the other hand, social connections may have no effect on healthcare service access when healthcare institutional capacity is higher. Therefore, I expect to observe an interacting effect between the social connections and healthcare institutional capacity variable.

2.3 Qualitative Data and Research Design

2.3.1 Qualitative Data

The qualitative data is used to examine the effect of social connections on access to prenatal care services. The data is derived from the semi-structured interview my collaborators and I conducted on women's access to prenatal care services in China in 2019. We conducted semi-structured interviews with 38 women who have experience of child birth within the last five years. All of the interview participants are from urban China, however we recruited women from varieties of socio-economic status. The interviews were conducted in an urban city in Northwest China. The study was approved by the University of Kansas Institutional Review Board. The oral consent was granted from the interview participants.

A qualitative methodology is suitable for the current study to examine the quality of prenatal care services. Based on the quantified measurements of prenatal care services (e.g. the number of prenatal exams received), there is a high level of access to prenatal care services especially in urban China (China Center for Health Statistics and Information 2015). However, these results do not account for quality of care. The WHO suggests that "positive pregnancy experience" encompasses "maternal self-esteem, competence and autonomy" (World Health Organization 2016b, 2). In fact, Raven et al. (2015) find through interviews that women are dissatisfied with a lack of inclusion in the decision making processes during provisions of delivery services in China. Other studies also find that doctors provide better quality and more personalized care to the patients with *guanxi* (Fu and Chan 2016; D. Wu et al. 2017). Therefore, a qualitative methodology is suitable to examine quality of services from women's perspectives.

2.3.2 Sampling Method: Purposeful Sample

The sampling method is a purposeful sampling. In order to diversify the interview participants' socio-economic backgrounds, we conducted interviews at multiple sites including both mid-high income and low income communities. This includes five communities in three different administrative units. Among the three administrative units, two are mid-high income areas and one is a low-income area. We sampled from one to two communities in each administrative unit (called "district" in Table 5). Among the five communities, three are mid-high income communities and two are low-income communities. As a result, about 40% of the respondents are recruited in the mid-high income communities and the other 60% are recruited in the low-income communities. We recruited the interview participants at local parks, clinics, and pre-school institutions.

Table 5. Code for Interviews

Administrative Unit	Administrative Code	Individual Code
District 1		
Community 1	D1C1	D1C1_1
Community 1	D1C1	D1C1_2
Community 1	D1C1	D1C1_3
District 2		
Community 1	D2C1	D2C1_1
Community 1	D2C1	D2C1_2
Community 1	D2C1	D2C1_3
Community 1	D2C1	D2C1_4
Community 1	D2C1	D2C1_5
Community 1	D2C1	D2C1_6
Community 1	D2C1	D2C1_7
Community 1	D2C1	D2C1_8
Community 1	D2C1	D2C1_9
Community 2	D2C2	D2C2_1
Community 2	D2C2	D2C2_2
Community 2	D2C2	D2C2_3
District 3		
Community 1	D3C1	D3C1_1
Community 1	D3C1	D3C1_2
Community 1	D3C1	D3C1_3
Community 1	D3C1	D3C1_4
Community 1	D3C1	D3C1_5
Community 1	D3C1	D3C1_6
Community 2	D3C2	D3C2_1
Community 2	D3C2	D3C2_2
Community 2	D3C2	D3C2_3
Community 2	D3C2	D3C2_4
Community 2	D3C2	D3C2_5
Community 2	D3C2	D3C2_6
Community 2	D3C2	D3C2_7
Community 2	D3C2	D3C2_8
Community 2	D3C2	D3C2_9
Community 2	D3C2	D3C2_10
Community 2	D3C2	D3C2_11
Community 2	D3C2	D3C2_12
Community 2	D3C2	D3C2_13
Community 2	D3C2	D3C2_14
Community 2	D3C2	D3C2_15
Community 2	D3C2	D3C2_16
Community 2	D3C2	D3C2_17

2.3.3 Sample Characteristics

We interviewed 38 women who have experience of child birth within the last five years. A majority of them (over 80%) had their child delivery within the last three years, and several of them had just delivered their children within the last several months. The interview participants' age ranges between 26 and 41 years old, and their levels of education attainment also varies from middle school, high school, secondary vocational school, junior college, to college and graduate degree. However, about 79% of the participants have a college degree (including junior colleges), thus the sample's educational attainment is overall high. Due to the purposeful sampling method described above, their economic status also varies. The participants also have a variety of occupations, including employment in public sector, private sector, self-employed, and full-time mothers. A majority of them (over 70%) have received antenatal care at Tier 3 hospitals and the rest have received care at Tier 2 hospitals.

2.3.4 Interview Questions

The interview method was semi-structured interview. Semi-structured interview is suitable for the present study due to its flexibility and structure. The flexibility of semi-structured interviews is beneficial in discovering the complex processes of information obtainment and decision makings of the use of certain prenatal care services. Further, individual interviews will allow the interviewees to express their own experiences of pregnancy from their own perspectives including whether the service providers considered women's agency and autonomy in providing the care. On the other hand, a certain degree of structure in semi-structured interviews assure that the study finds answers to the research question and the hypotheses.

Table 6 shows the semi-structure interview framework. Since these were semi-structure interviews, we added, skipped, revised the questions or changed the question order depending on the flow of the conversations with each participant. The framework only serves as a guidance for the focus of the interviews. Typically, the interviews begin with introductory questions about their children and their life in the community (e.g. see questions 1 and 2).

Then, we asked about the participants' experiences with prenatal care services they received. This includes the quantity, types and quality of prenatal care services received in order to examine the effectiveness of institutions. The main aim was to examine whether the provision of care services differ among the patients. Regarding the *quantity* of the services, the interview question asks "How many times did you see a doctor for prenatal care?" (question 3). Besides the quantity, scholars find there are more variations in access to prenatal care services once types of care are considered (Long, Zhang, Hemminki, et al. 2010; Lu et al. 2011; Nwaru, Wu, and Hemminki 2012). Thus, we also asked about *types* of the prenatal care services received, by asking question: "What kinds of prenatal exams did you receive?" (question 7). In Chapter 4, I compare the participants' answers to the international and national standards of prenatal exams to examine the effectiveness of institutions in providing the prenatal care services. The questions on the *quality* of care address "maternal self-esteem, competence and autonomy" (World Health Organization 2016b, 2) and "informed consent" (Raven et al. 2015). Thus, the questions ask about the participants experiences in terms of wait time, interaction with doctors, doctors' attitudes and medical advice from doctors (e.g. see questions 5 and 8). The questions also asked about the interview participants' opinions and levels of satisfaction with doctor's services and prenatal public health services in general (e.g. see questions 6 and 9). The interviews also explored a possibility of financial considerations in seeking for prenatal care services including

perceived cost and use of insurance. We also asked about the hospitals they went to and their motives behind their selections of the particular hospitals (question 4).

The interviews also encompassed discussion on the participants' social connections and their informational roles in seeking for prenatal care services (e.g. see questions 11 to 15). Note that there are no direct questions on the use of *guanxi* so as to avoid a social desirability bias. While *guanxi* is not a synonym of corruption (Qi 2013; Smart 1993), *guanxi* can be used to facilitate corruption (Qi 2013; Zhan 2012). Thus, the participants may have ethical considerations in answering direct questions on *guanxi*. Indeed, Yang (2002) argues that:

> "As most Chinese are aware, *guanxixue* is something that most people practise, to varying degrees of effectiveness and artistry, but few people would admit to publicly. There is *guanxixue*'s association in public discourse with the grey areas between proper and improper behaviour and with getting around rules and regulations" (Yang 2002, 461).

Therefore, this study avoids making the participants feel a social desirability by directly inquiring about the use of *guanxi*, but rather asks indirect questions about their social connections, hospital choice, wait time, and doctors' attitudes and medical advice to illuminate a potential relevance of *guanxi*. The existing studies suggest that *guanxi* can provide information on which doctor to consult and help skip a line (Zou et al. 2018) as well as helping to obtain better attitudes and medical advice from doctors (Fu and Chan 2016; D. Wu et al. 2017). Thus, these questions address areas where the use of *guanxi* is relevant.

2.3.5 Method for Qualitative Data

In Chapter 4, I conduct qualitative analysis of the interview data on women's access to prenatal care services. In order to analyze the interview data, I first transcribed the interview data

and made a spreadsheet organizing the participants' responses in terms of their prenatal care experiences, use of social connections, and socio-economic status. Then, I condensed the spreadsheet by coding the participants' answers. This helps me examine whether their prenatal care experiences and use of social connections are driven by their socio-economic status or hospitals they received the medical care from. This also helps examine whether or not and how their prenatal care experiences are related to their social networks and connections. I also conduct close examination of individual interview to make connections within in each individual interview to have a holistic view of individual stories. I also conduct analysis across interviews on different topics, such as hospital choice, types of prenatal care, experiences at the hospital, finances of medical care, social connections, and so on. This helps me identify emerging themes or stories overall. Chapter 4 is organized based on the identified themes.

Table 6. Semi-Structured Interview Framework

知情同意 Obtain an oral consent.	
1.	您的孩子多大年纪了？是您第几个孩子？ How old is your child? Is this your first child?
2.	您家在这个小区住了多长时间？ How long has your household been living in this community?
3.	您为受到产前检查几次看医生了？您认为孕妇要有几次的检查？您为什么认为---次是需要的？（您看医生之前已经知道这些事情吗？） How many times did you see a doctor for prenatal care? How many times of prenatal exams do you think pregnant women should have? Why do you think (interviewee answer) times of prenatal exams are needed? (Did you know the information before you saw the doctor?)
4.	您去哪个医院？您怎么选那个医院？ Which hospital did you go to? Why did you choose this hospital?
5.	每次产前检查，看到医生前，您需要在医院等多久？医生与您交谈多久？医生是否向您解释产检内容？ How long did you have to wait in the hospital before you can see a doctor every time you received the prenatal care? How long was your interaction with the doctor? Did the doctor explain the content of the prenatal exams?
6.	医生的服务怎么样了？ How was the doctor's services?
7.	您受到什么样的产前检查？您觉得什么样的产前检查是需要的？为什么您觉得---是重要？ What kinds of prenatal exams did you receive? What kinds of prenatal exams do you think are necessary? Why do you think (interviewee answer) are important?
8.	医生给不给你营养有关的东西或指教？ Did the doctor give you nutrition-related things or advice?
9.	您对孕妇医疗卫生公共服务满意不满意？ How satisfied are you with the maternal care public health services?
10.	您受到的产前检查一共多少钱了？贵不贵？您使用医保了吗？ How much did the prenatal care cost you in total? Do you feel this is expensive? Did you use your insurance?
11.	您从别人（家人，朋友，同事，邻居等）受到关于怀孕的信息和推荐吗？（比如：产前检查数量和内容，哪个医院好，食物和营养有关的信息） Did you receive pregnancy-related information or advice from others? (For example, information regarding prenatal care, hospitals, and nutrition.)
12.	他们是…（家人，邻居，同一单位同事，老同学等）？ Are they your: family members, neighbors, colleagues, former classmates, etc.?
13.	您怀孕之前已经认识那些人吗？那些人您怀孕的时候也怀孕或你怀孕之前怀孕吗？ Did you know them before your pregnancy? Do they also have experiences of pregnancy?
14.	您怀孕的时候跟他们见面的频繁程度怎么样？您还见他们吗？ How frequent did you see them during your pregnancy? Do you still see them?
15.	您用不用怀孕和宝宝有关的网址、公众号或 APP？ Do you use any websites, WeChat official accounts or APP related to pregnancy or baby?
16.	您今年几岁？ How old are you?
17.	您在哪里工作？您丈夫在哪里工作？ What is your occupation? What is your husband's occupation?
18.	您家庭有没有房产？汽车？ Does your household own a house and/or a car?
19.	您目前的最高教育程度是什么？您的丈夫呢？ What is your education level? How about your husband?

Chapter 3: Social Connections, Institutional Capacity and Healthcare Access

This chapter conducts descriptive and regression statistical analysis of CFPS 2010, CGSS 2010, and China Health Statistical Yearbook 2010. It examines the effect of healthcare institutions on the use of personal connections to access healthcare services. It also examines the effect of healthcare institutional capacities and social connections on perceived access to healthcare services. I will also examine the effect of social connections relative to the different levels of provincial health institutional capacities within China. Based on the Institutional Capacity Hypothesis (H2) and Social Connections Hypothesis (H1), I hypothesize that both social connections and institutional capacity have positive influence on perceived healthcare service access, and the effect of social connections is more prevalent in the provinces with lower levels of healthcare institutional capacities. On the other hand, the effect of social connections is less prevalent in the provinces with more efficient healthcare institutions. I also expect that provincial health institutional capacity has a mitigating influence on the use of personal connections to access healthcare services. The findings indeed suggest that greater health institutional capacity has a positive influence on perceived health service access, and has a mitigating effect on the use of personal connections to access healthcare. At the same time, the findings are inconclusive in regard to the influence of broader social connections (with friends, neighbors, and colleagues), and warrants further analyses of the roles of these broader social connections in the subsequent chapter.

3.1 Chapter Introduction

This study hypothesizes that effective institutions may improve people's access to healthcare services, and consequently patients will need to rely less on social connections. Given

the conceptualization of social connections as shown on Figure 1, I account for the influence of both personal connections and broader social connections with friends, colleagues, and neighbors. The Social Connection Hypothesis (H1) is that when there are institutional gaps (inefficient institutions), people are more likely to rely on social connections to fill in these gaps. The Institutional Capacity Hypothesis (H2) is that people are less likely to rely on social connections, when there are efficient institutions. The variation in health institutional efficiency at the provincial-level enables this study to examine the influence of institutional efficiency on the use of social connections to access health services.

Based on H1 and H2, I expect to observe three results in the quantitative analyses. First, the H2 expects that the higher levels of provincial healthcare institutional capacity mitigate the use of personal connections to access healthcare services. In provinces that have greater healthcare institutional capacities, people should be less likely to use personal connections to see a doctor. This is because the health institutions with greater capacities enable people's access to needed health services and they don't need to rely on their social connections to gain such access. Therefore, I expect to observe a negative relationship between the provincial health institutional capacity and people's use of personal connections for healthcare service access.

Second, the provincial health institutional capacity should have a positive influence on perceived health service access. According to the H2, higher levels of institutional capacity improves health service access and mitigates people's use of social connections. Thus, I expect to observe a positive relationship between provincial health institutional capacity and perceived healthcare access.

Third, the H1 and H2 expects that the effect of social connections on healthcare service access depends on the levels of healthcare institutional capacity. Social connections may have

positive effects on perceived healthcare service access in provinces with lower levels of healthcare institutional capacities. On the other hand, social connections may have no effect on perceived healthcare service access in provinces with greater healthcare institutional capacities. Thus, social connections and healthcare institutional capacity may interact and influence healthcare service access, and I expect there to be a statistically significant interaction effect between social connections and provincial health institutional capacity.

The findings suggest that provincial health institutional capacity indeed have a mitigating effect on the use of personal connections (*guanxi*) to see a doctor. The findings also suggest that provincial health institutional capacity has a positive relationship with perceived health service access. These results suggest that greater health institutional capacity positively influence health service access, and mitigates the need for people to use their personal connections to access healthcare. At the same time, the findings are inconclusive in regard to the influence of broader social connections with friends, neighbors, and colleagues. The interaction effect between these broader social connections and provincial health institutional capacity is statistically insignificant. This result warrants further analyses of the roles of social connections with friends and colleagues in the subsequent chapter.

This chapter proceeds as follows. First, I conduct correlational and factor analyses of the health institutional capacity indicators in order to construct a single health institutional capacity index. Second, I conduct regression analysis to examine the influence of health institutional capacity on the use of personal connections to access health services. Third, I conduct regression analysis to examine the interacting influence of social connections and health institutional capacity on perceived health services access.

3.2 Analysis of Healthcare Institutional Capacity by Province

In this section, I analyze the healthcare institution variables with a final aim to construct a single index of healthcare institutional capacity. Table 7 displays the descriptive statistics of the eight healthcare institution variables identified based on the WHO Building Blocks of Health Systems (see Chapter 1 and 2 for discussion on the conceptualization and operationalization of healthcare institution). The eight variables are: the number of health facilities per 10,000 people, health facility beds per 10,000 people, outpatient department visits per 10,000 people, the proportion of specific services facilities to total health facilities, the number of specific services facilities per 10,000 people, number of health workers per 10,000 people, total health expenditure within each province per 10,000 people, and the proportion of provincial government health expenditure to total provincial government expenditure. All the variables are at the provincial-level. Tables 7 shows that there is a subnational variation for each of the eight variables.

Table 7. Descriptive Statistics of Healthcare Institution Variables

		Mean	Std. Dev.	Min	Max
1	Number of Health Facilities (per 10,000 people)	7.12	2.87	2.26	16.74
2	Number of Health Facility Beds (per 10,000 people)	31.00	6.26	22.96	46.93
3	Outpatient Dpt. Visit (per 10,000 people)	39254	15173	22018	94419
4	Proportion of Specific Services Facilities to Total Health Facilities (%)	1.11	0.56	0.47	2.90
5	Number of Specific Services Facilities (per 10,000 people)	0.07	0.03	0.04	0.20
6	Number of Health Workers (per 10,000 people)	51.83	11.28	33.11	93.91
7	Total Health Expenditure (per 10,000 people)	0.04	0.02	0.02	0.09
8	Proportion of Gov't Health Expenditure to Total Gov't Expenditure (%)	6.47	0.97	4.44	7.75

Source: China Health Statistical Yearbook 2010

In order to examine whether these eight variables construct a single latent variable, healthcare institutional capacity, I conduct correlation analysis and exploratory factor analysis. Table 8 shows the correlation matrix of the eight healthcare institution variables. All the variables are standardized for the subsequent analyses. Tables 8 shows that there is a substantial positive correlation at the correlation coefficient of 0.4 to 0.81 among the variables: the number of health facility beds (2), outpatient department visit (3), proportion of specific services facilities (4), the number of health workers (6), and health expenditure (7). On the other hand, the number of health facilities (1) and the government health expenditure (8) appear to be outliers, having negative correlations with most of the other variables. The number of specific services facilities is positively correlated with the number of health facilities, suggesting that this variable

might also be an outlier. Therefore, the result of the correlation analysis suggests that the eight variables might not be measuring a single dimension of health institutional capacity.

Table 8. Correlation Matrix of Healthcare Institution Variables

	1	2	3	4	5	6	7	8
1 Health Facilities	1.00							
2 Health Facility Beds	-0.16	1.00						
3 Outpatient Dpt. Visit	-0.45	0.44	1.00					
4 Specific Services Facilities (%)	-0.52	0.56	0.56	1.00				
5 Specific Services Facilities (#)	0.53	0.29	-0.11	0.34	1.00			
6 Health Workers	-0.05	0.81	0.54	0.50	0.37	1.00		
7 Health Expenditure	0.13	0.55	0.48	0.52	0.55	0.68	1.00	
8 Gov't Health Expenditure	0.04	-0.30	-0.40	-0.49	-0.36	-0.27	-0.32	1.00

Note: All the variables are standardized.
Source: China Health Statistical Yearbook 2010

Consequently, I conduct an exploratory factor analysis for the eight healthcare institution variables in order to examine whether these variables constitute a single variable of health institutional capacity. Table 9 presents the result of the exploratory factor analysis. The Factor 1 shows the high positive loadings for the number of health facility beds (2), outpatient department visits (3), the proportion of specific services facilities (4), the number of health workers (6), and health expenditure (7). This largely corroborates the result of the correlational analysis. As seen in the correlational analysis, the number of health facilities (1) and government health expenditure (8) show negative loadings in Factor 1. Further, the number of health facilities (1) and specific service facilities (5) have high loadings in Factor 2, constituting a separate dimension from Factor 1. Based on this result, I identify that the variables 2, 3, 4, 6, and 7

construct a single latent variable of healthcare institutional capacity, whereas the variables 1, 5, and 8 measure different aspects of healthcare institutions.

Table 9. Exploratory Factor Analysis of Healthcare Institution Variables

	Factor 1	Factor 2	Uniqueness
1 Health Facilities	-0.2049	0.9213	0.1093
2 Health Facility Beds	0.8108	-0.0052	0.3426
3 Outpatient Dpt. Visit	0.6963	-0.4829	0.2819
4 Specific Services Facilities (%)	0.8112	-0.2685	0.2698
5 Specific Services Facilities (#)	0.4710	0.7829	0.1653
6 Health Workers	0.8463	0.0984	0.2741
7 Health Expenditure	0.7972	0.3134	0.2662
8 Gov't Health Expenditure	-0.5758	-0.0605	0.6648

Note: All the variables are standardized. Extraction method is principal components. Variance contribution is 0.70.
Source: China Health Statistical Yearbook 2010

One potential reason why the number of health facilities is negatively correlated with other variables is because of the effects of the number of village clinics. The correlation coefficient between the number of health facilities and the number of village clinics is high at 0.96. This means that the number of health facilities is high in provinces where there are many village clinics. The quality of medical care and people's trust are generally higher for upper-tier larger hospitals than clinics. The number of health facilities has a negative correlation with the proportion of level three hospitals (highest tier/quality hospitals) with the correlation coefficient at -0.39. Therefore, the provinces with a large number of health facilities have lots of village clinics but have less upper-tier hospitals. This suggests that the number of health facilities (village clinics) may be an indicator of lesser institutional capacity. In other words, there are

more small-scale and lesser quality clinics in provinces with less health institutional capacities. On the other hand, there may be more larger and higher quality hospitals in provinces with greater health institutional capacities. This may be the reason why the number of health facilities is negatively correlated with other variables, and not suitable for a measurement of health institutional capacity.

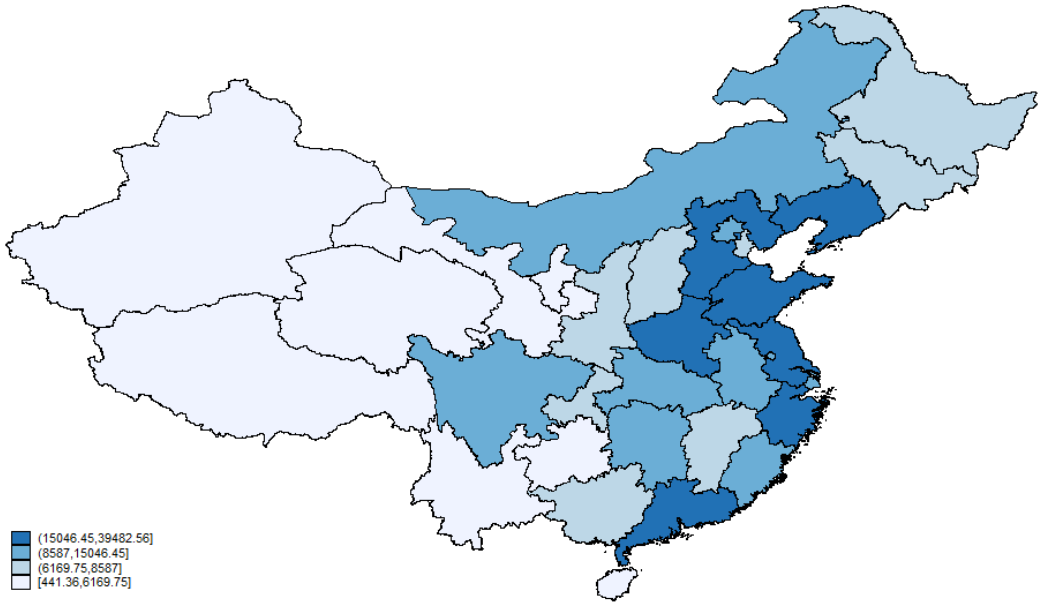
A potential reason why the government health expenditure is negatively correlated with the other variables is the disparity in provincial governments' fiscal capacities. There is a large economic disparity between provinces. Figure 7 shows the levels of GDP by province in China and shows that the provincial GDP varies from 441 (Tibet) to 39,482 (Guangdong). Table 10 shows that the proportion of government health expenditure to total expenditure is higher in less wealthy regions compared to the wealthy East China. For the wealthy provinces with large government expenditure, the proportion of government health expenditure necessarily becomes smaller. Indeed, there is a large disparity in provincial governments' total expenditure, and it varies from 432 (Ningxia) to 4334 (Guangdong) hundred million RMB. This suggests that wealthier provinces can invest more in health institutions, and may have greater health institutional capacity. Yet, their government health expenditure remains small relative to their total expenditure because they are wealthy. Thus, there is a negative correlation between health institutional capacity and the percentage of government health expenditure. Similarly, Table 10 also shows that there is the greater number of health facilities in less wealthy regions of Central and West China. This suggests that the less wealthy provinces also tend to have more village clinics.

Table 10. Healthcare Facility and Provincial Government Health Expenditure by Region

Region	Number of Health Facilities (per 10,000 people)	Proportion of Gov't Health Expenditure to Total Gov't Expenditure (%)
East	5.56	5.99
Northeast	6.71	6.85
Central	7.52	7.25
West	8.32	6.39

Source: China Health Statistical Yearbook 2010

Figure 7. Map of GDP by Province in 2009



Source: China Statistical Yearbook 2010 [GDP Data]; Minnesota Population Center IPUMS International [Map Data]

Since the indicators 1, 5, and 8 may not be capturing the same dimension of health institutional capacity, I exclude these three variables and conduct a factor analysis again with the remaining five variables. Table 11 presents the result of the factor analysis for the selected five

variables: the number of health facility beds, outpatient department visits, specific services facilities, health workers, and the amount of health expenditure. All the five variables have the loadings of above 0.7. This shows that the five variables can constitute a single variable. Therefore, I extract an index from this factor analysis, constructed by the five variables. The index ranges from -1.3 to 3.3, and the higher value denotes greater health institutional capacity at a provincial-level.

Table 11. Factor Analysis of Healthcare Institution Variables

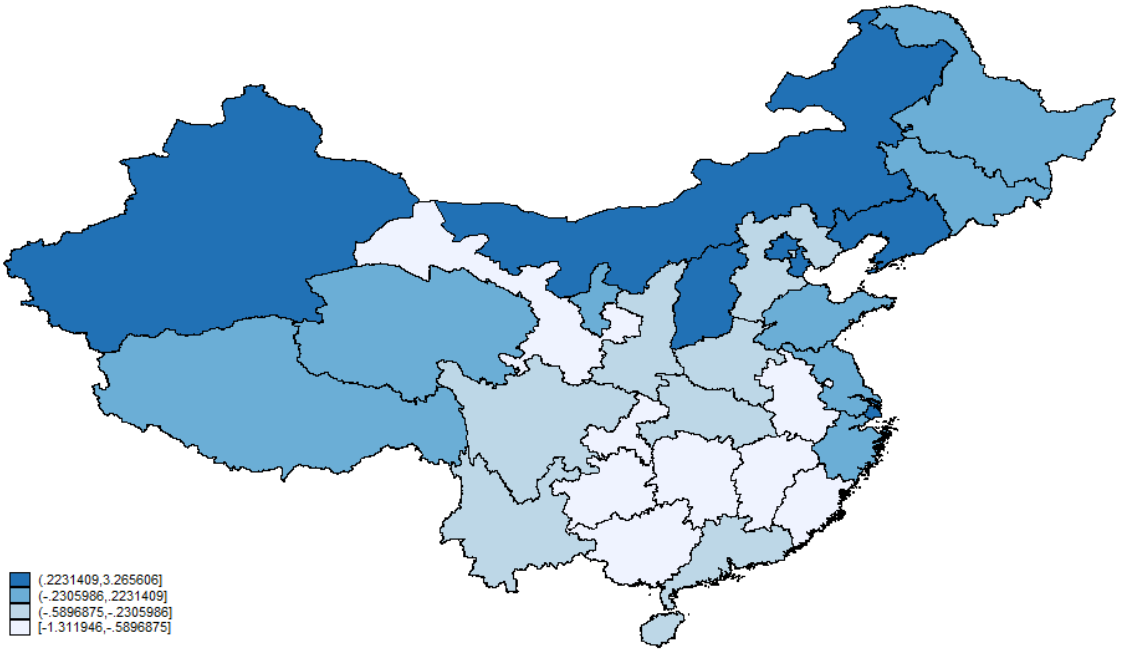
	Factor 1	Uniqueness
Health Facility Beds	0.8446	0.2867
Outpatient Dpt. Visit	0.7332	0.4624
Specific Services Facilities (%)	0.7674	0.4111
Health Workers	0.8870	0.2132
Health Expenditure	0.8000	0.3600

Note: Extraction method is principal components. One factor was extracted. Variance contribution is 0.65.
Source: China Health Statistical Yearbook 2010

Using the index created by the factor analysis above, Figure 8 maps the provincial-level healthcare institutional capacity in China in 2009. The darker shaded provinces have greater health institutional capacities, whereas the lighter shaded provinces have less health institutional capacities. Figure 9 shows the index scores by province. While there are several dark shaded provinces and autonomous regions on the map (Figure 8), Figure 9 shows that there is a large gap between the index scores of Beijing/Shanghai and the rest of the provinces. The index scores of both Beijing and Shanghai exceed 3 followed by Tianjin with a score at around 1, while the rest of the provinces do not reach the score of 1. This means that the health institutional capacity

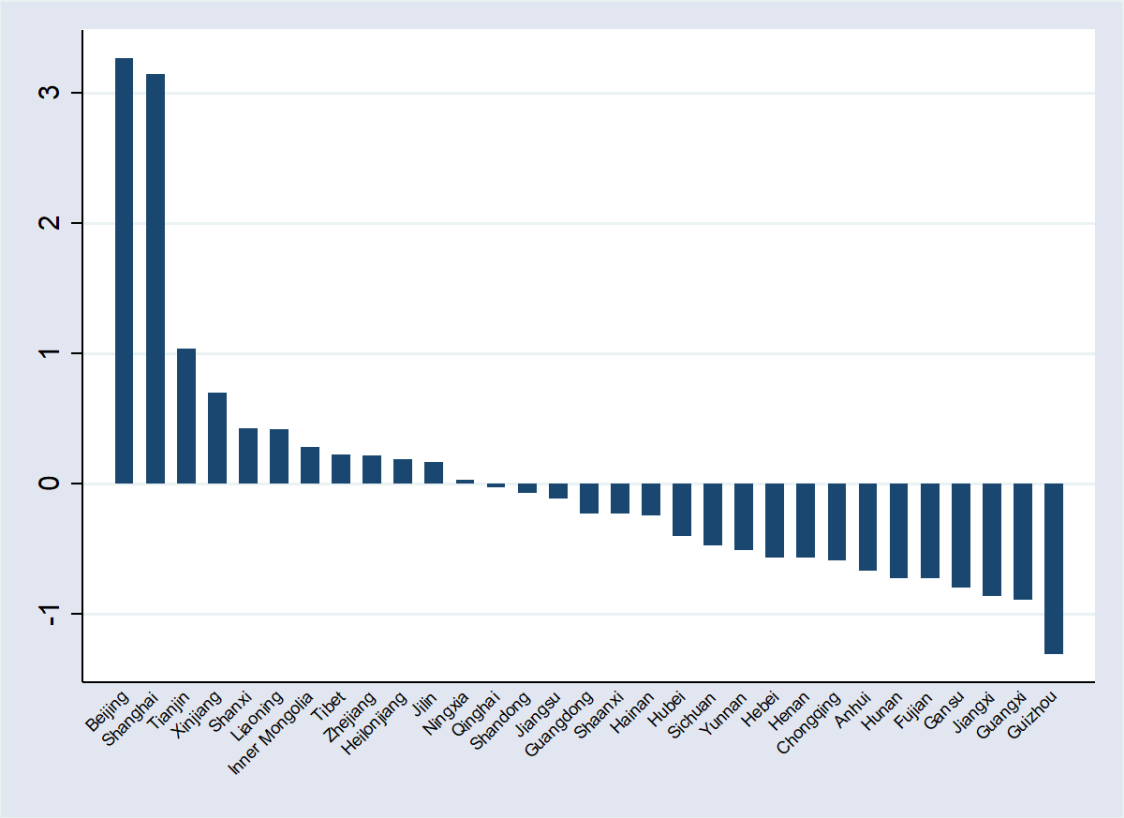
is the highest in Beijing and Shanghai, and there is a large disparity in institutional capacities between these two cities and the rest. In other words, the health institutional resources (both infrastructure and human resources) are disproportionally concentrated in Beijing and Shanghai, so as the health service use and finances.

Figure 8. Map of Healthcare Institutional Capacity by Province in 2009



Source: China Health Statistical Yearbook 2010 [Healthcare Institutional Capacity Data]; Minnesota Population Center IPUMS International [Map Data]

Figure 9. Health Institutional Capacity Index Score by Province in 2009

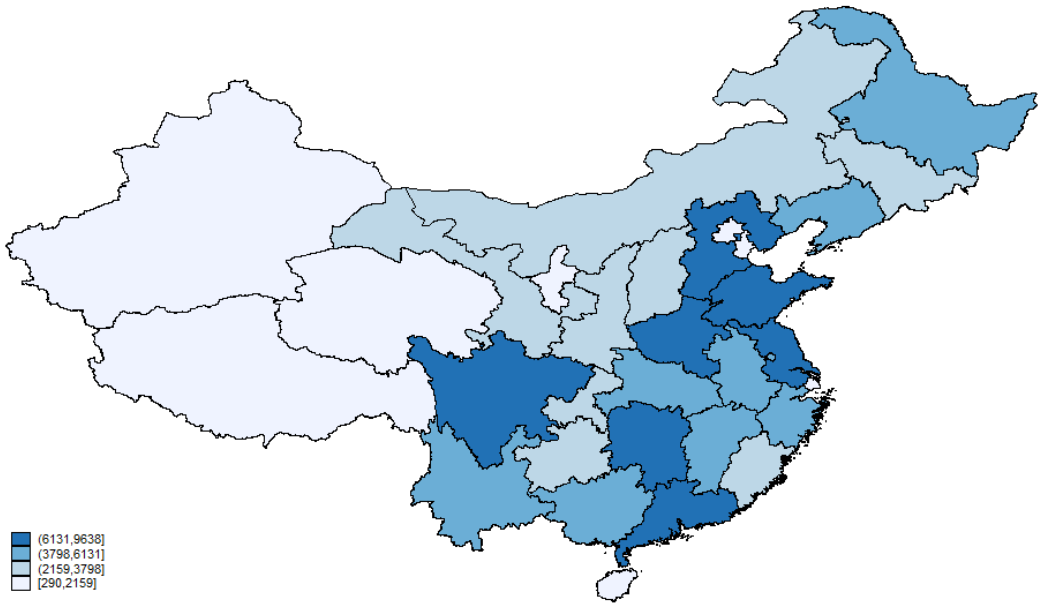


Source: China Health Statistical Yearbook 2010

One potential reason why some of the less wealthy provinces and autonomous regions have high institutional capacity scores is probably because of the population-based measurements of the institutional capacity. The map (Figure 8) shows that less wealthy Western region is darker shaded with higher institutional capacity scores. This region is also the least populated region in China. Figure 10 shows the population size by province. The darker shaded regions are the most populated mainly in the Eastern region on the coast, and the least amount of population in the Northwest. The four out of the five variables that constructed the health instructional capacity index are calculated using the population size. The number of health facility beds, outpatient department visits, health workers, and the amount of health expenditure

are all measured per 10,000 people. Therefore, the regions that have smaller population size tend to get higher institutional capacity scores. As the existing studies suggest that there is a greater disparity in the distribution of health institutional resources when the resources are measured as per square kilometers rather than per capita (J. Wu 2018; J. Wu and Yang 2019; T. Zhang et al. 2017), future studies can also consider health institutional resources and capacity as measured per geographical area size.

Figure 10. Map of Population by Province in 2009



Source: China Statistical Yearbook 2010 [Population Data]; Minnesota Population Center IPUMS International [Map Data]

3.3 Analysis of the Use of Personal Connections for Healthcare Access

In this section, I use the health institutional capacity index to examine the influence of health institutional capacity on the use of personal connections to access healthcare services. Specifically, I examine the influence of provincial health institutional capacity index on the variable on personal connections through regression analyses. Table 12 presents the results of the logistic regression analysis with the dependent variable, *personal connections*. This is a dichotomous variable of having used personal connections to see a doctor or not, and the key independent variable is the health institutional capacity index.

Based on the institutional capacity hypothesis (H2), I expect that the health institutional capacity has a negative relationship with the use of personal connections. In other words, a greater health institutional capacity mitigates the use of personal connections to see a doctor. Model 1 only includes the individual-level control variables. Model 2 adds the key independent variable, healthcare institutional capacity at the provincial-level, and excludes the rural variable measuring the rural-urban distinction. Model 3 includes both the provincial-level health institutional capacity variable and rural-urban control variable.

Model 2 supports the Institutional Capacity Hypothesis (H2) that patients will have little need for connections when there are efficient health institutions. Model 2 includes the provincial-level health institutional capacity index, and shows that health institutional capacity has a negative and statistically significant influence on the use of personal connections. This means that there is a lesser propensity of using personal connections in provinces with greater health institutional capacities. In other words, the higher levels of health institutional capacity at the provincial-level mitigates the use of personal connections to see a doctor.

Among the control variables, there is a greater likelihood of using personal connections among men, more educated, CCP member, and rural respondents. People who have health insurance are also more likely to have used personal connections to see a doctor in the past. The use of personal connections is more prevalent among rural respondents potentially because of weaker health institutional capacities in rural areas. This supports the Social Connections Hypothesis (H1) that people rely on social connections to fill in the gaps when the health institutional capacity is weaker. The result is also consistent with the existing literature's argument that *guanxi* plays a substitute role to fill in the gaps of inefficient formal institutions (D. Li et al. 2021; P. P. Li 2007; H. Wang 2000; P. Wang and Wang 2018; Zhan 2012). A potential reason why the propensity of connection use is higher among men, more educated, and CCP members is that these groups of people may be more likely to have *guanxi* that can be activated for health service access. This suggests that there might be a socio-economic inequality in how much *guanxi* an individual has. This explanation may also apply to the insurance access. Those who are more socio-economically privileged tend to have greater access to insurance as well as *guanxi* in health service access.

Model 3 includes both the health institutional capacity index and rural-urban distinction, and offers further support to the institutional capacity hypothesis. The health institutional capacity index remains negative and statistically significant, meaning that there is less use of personal connections in provinces with higher health institutional capacities. On the other hand, the rural variable loses its statistical significance when controlling for the health institutional capacities in Model 3. There are rural and urban areas in each province. This may suggest that there is a large disparity between provinces in terms of their health institutional capacities,

impacting the health service access. There is also a disparity between the rural areas in a high capacity province and the rural areas in a low capacity province.

To summarize, the results of the logistic regression analyses offer support for the Institutional Capacity Hypothesis (H2) that people will have little need for social connections when the level of health institutional capacity is high. The findings suggest that people are less likely to use personal connections to see a doctor in provinces with greater health institutional capacities. As Helmke and Levitsky (2004; 2006) argue, informal institutions do not play a substitutive role when formal institutions are effective. While *guanxi* as an informal institutions play a substitutive role to ineffective formal institutions (D. Li et al. 2021; P. P. Li 2007; H. Wang 2000; P. Wang and Wang 2018; Zhan 2012), the role of *guanxi* shifts with changes of institutional contexts. Therefore, when there is sufficient health institutional infrastructure, service delivery, human resources, and finances, people may not need to rely on social connections to access healthcare services. The use of personal connections *guanxi* is conditional on institutional characteristics and environments.

Table 12. Factors Influencing the Use of Personal Connection for Healthcare Access

	Model 1 Individual-level	**Model 2** Healthcare Institution	**Model 3** Healthcare Institution + Rural-Urban
Individual-level			
Women	-0.0782* (-2.11)	-0.0595 (-1.61)	-0.0600 (-1.62)
Age	-0.00119 (-0.90)	0.000173 (0.13)	0.000365 (0.27)
Education	0.0563** (3.17)	0.0705*** (4.39)	0.0734*** (4.13)
Income	-0.0184 (-0.92)	0.0118 (0.64)	0.0103 (0.56)
CCP member	0.218*** (3.31)	0.175** (2.66)	0.166* (2.50)
Insurance	0.269*** (5.36)	0.238*** (4.78)	0.237*** (4.70)
Rural	0.126** (2.69)		0.0147 (0.31)
Provincial-level			
Healthcare institution		-0.200*** (-10.38)	-0.197*** (-10.00)
Constant	-2.427*** (-20.81)	-2.429*** (-24.70)	-2.455*** (-21.06)
N	31422	31483	31422

Logistic regression analysis, Coefficient with t statistics in parentheses, * p<0.05 ** p<0.01 *** p<0.001
Source: CFPS 2010 and CHSY 2010

3.4 Analysis of Factors Influencing Perceived Healthcare Access

In this section, I examine the influence of both health institutional capacity and social connections on perceived health service access. While the analyses in the previous section find that the greater health institutional capacity mitigates the use of personal connections in health service access, it has yet to be examined whether the institutional capacity and social connections influence health service access itself. Table 13 presents the results of ordered logistic regression analyses with the dependent variable, *perceived healthcare service access*. This variable is based on the CGSS 2010 question regarding the level of worries that one cannot obtain medical care services when needed. The variable ranges from 1 to 4, and the higher value denotes greater perceived healthcare service access (= less worries about health service access). The key independent variables are health institutional capacity and social connections. This section focuses on broader social connections with friends, neighbors, and colleagues, rather than personal connections (*guanxi*).

Based on the social connections hypothesis (H1) and institutional capacity hypothesis (H2), I expect that the effect of social connections is conditional on the levels of health institutional capacity. According to the social connections hypothesis, social connections positively influence perceived health service access when the level of health institutional capacity is lower. On the contrary, the institutional capacity hypothesis suggests that social connections do not influence perceived health service access when the level of health institutional capacity is higher. Therefore, I examine interacting effects between social connections and health institutional capacity.

Model 1 only includes the individual-level variables, and finds that social connections do not have a statistically significant influence on perceived health service access. The social

connections are measured as the levels of frequency in which friends, colleagues and neighbors have provided support in listening (to personal issues), finances, and household work in the past one year. This result suggests that these untargeted (healthcare unrelated) general social support networks do not improve perceived health service access. One possibility is that the general social support networks do not provide direct channel in enhancing one's healthcare access, although they may provide indirect support in improving one's healthcare access. For example, having close friends, colleagues and neighbors who frequently offer social support may provide psychological support (listening to one's concern about seeking for healthcare) or supplemental support (providing partial funds for medical fee or filling in for household chores during hospital visit) in regard to health service access. However, it may not help to secure an impatient bed or cover catastrophic medical expenses. Therefore, this result does not necessarily rule out the possibilities that more particularistic personal connections (i.e. direct connections to hospital employees) can have direct impacts on healthcare access, and general social support networks can have indirect impacts on healthcare access. The qualitative analyses of the interview data in Chapter 4 discusses these nuances more in detail.

Model 2 and 3 add the health institutional capacity variable, and finds that provincial health institutional capacity has a positive influence on perceived health service access. This means that there are higher levels of perceived healthcare services access in provinces that have greater health institutional capacities. This result is consistent with this study's expectation regarding the effects of institutions. The previous section's analysis finds that the provincial health institutional capacity has a negative influence on the use of personal connections to see a doctor. Therefore, in concomitant with the previous section's result, this section's result supports

the institutional capacity hypothesis. Greater institutional capacities positively influence healthcare service access and mitigate the need for personal connections.

At the same time, the findings from Table 13 suggest that broader social connections may not have such an interacting effect with institutional capacity. Model 4 adds the interaction term between social connections and health institutional capacity, and shows that the interaction term is not statistically significant. Thus, the effect of social connections on perceived health service access is not conditional on institutional capacities. This does not offer support for the institutional capacity hypothesis. Again, one possibility behind this result is that these social connections are measured in broad terms and unrelated to healthcare access. Therefore, this finding does not necessarily lead to a conclusion that broader social connections do not play any roles in health service access under various institutional contexts. The Chapter 4 examines the roles of broader social connections that are specifically related to healthcare access through the analyses of interview data.

Model 5 introduces the variable, *social support not needed*, in place of the social connections variable. The survey questions used to estimate the social connections variable had a response option of "did not have such needs" to ask for help from their social connections. However, this response was excluded from the social connections variable. There is a possibility that people who had no need to ask for any types of social support (from listening to personal concerns to financial support) are socio-economically privileged people. Their everyday needs are met without any support from their social networks, thus they may also have greater access to healthcare services. Indeed, Model 5 shows that the social support not needed variable is positive and significant. This means that those who did not need any social support from their networks

have greater perceived health service access. This suggests that the socio-economic status may also influence perceived health service access.

However, among the control variables, only education shows a consistently positive relationship with the perceived health service access across all the models. Those with higher levels of educational attainment have greater perceived health service access. On the other hand, the rural respondents tend to have lower levels of perceived health service access, and income and CCP membership status do not have a statistically significant relationship with perceived health service access. While the results of the education and rural variables may suggest that socio-economically privileged people have greater health service access, the results of the income and CCP membership variables make such argument inconclusive. This points to a need for further analyses of the roles of education in health service access. Therefore, in the next chapter, this study conducts analyses of interviews among a purposeful sample of educated women about their prenatal care service access.

Table 13. Factors Influencing Perceived Healthcare Access in China in 2010

	Model 1 Individual-level	**Model 2** Healthcare Institution	**Model 3** Healthcare Institution + Rural-Urban	**Model 4** Interaction Effect	**Model 5** Social Support Not Needed
Individual-level					
Social Connections	-0.00262 (-0.19)	-0.00298 (-0.22)	-0.00134 (-0.10)	-0.00143 (-0.11)	
Social Support Not Needed					0.304*** (7.56)
Women	-0.0419 (-0.57)	-0.0405 (-0.55)	-0.0503 (-0.68)	-0.0503 (-0.68)	-0.0920 (-1.39)
Age	-0.00295 (-1.03)	-0.00315 (-1.12)	-0.00432 (-1.49)	-0.00430 (-1.48)	-0.00170 (-0.66)
Education	0.139*** (3.80)	0.143*** (4.24)	0.114** (3.04)	0.114** (3.03)	0.107** (3.22)
Income	0.000726 (0.03)	-0.00634 (-0.24)	-0.00685 (-0.26)	-0.00596 (-0.23)	-0.00239 (-0.09)
CCP member	0.188 (1.51)	0.240 (1.94)	0.217 (1.74)	0.216 (1.73)	0.259* (2.42)
Insurance	0.0200 (0.18)	-0.0110 (-0.10)	0.0169 (0.15)	0.0175 (0.16)	0.0731 (0.73)
Rural	-0.208* (-2.37)		-0.153 (-1.71)	-0.153 (-1.72)	-0.158* (-1.97)
Provincial-level					
Healthcare Institution		0.150*** (3.84)	0.135*** (3.42)	0.0835 (0.62)	0.0871** (2.63)
Interaction					
Healthcare Institution x Social Connections				0.00515 (0.40)	
Cut 1 (constant)	0.103 (0.36)	0.188 (0.71)	-0.00377 (-0.01)	-0.00462 (-0.02)	0.137 (0.60)
Cut 2 (constant)	1.397*** (4.84)	1.483*** (5.56)	1.295*** (4.45)	1.294*** (4.45)	1.443*** (6.29)
Cut 3 (constant)	2.589*** (8.81)	2.676*** (9.84)	2.489*** (8.41)	2.488*** (8.41)	2.641*** (11.27)
N	2676	2679	2676	2676	3304

Coefficient with t statistics in parentheses, * p<0.05 ** p<0.01 *** p<0.001

Source: CGSS 2010 and CHSY 2010

3.5 Chapter Discussion and Conclusion

The findings of this chapter suggest that people are less likely to use personal connections to see a doctor when the levels of health institutional capacities are higher. This result is consistent with the existing literature that informal institutions do not play a substitutive role when formal institutions are effective (Helmke and Levitsky 2004, 2006). While *guanxi* as an informal institutions play a substitutive role to ineffective formal institutions (D. Li et al. 2021; P. P. Li 2007; H. Wang 2000; P. Wang and Wang 2018; Zhan 2012), the role of *guanxi* depends on institutional contexts. When formal institutions are efficient, informal networks only play a complementary role to the formal institutions (Helmke and Levitsky 2004, 2006; Narayan 2002; Woolcock and Narayan 2000). Thus, this study does not argue that informal networks disappear when institutions are effective. Even when institutions are effective, g*uanxi* can remain relevant to play a complementary role (P. Wang and Wang 2018). Nonetheless, greater health institutional capacities can mitigate the substitutive role of *guanxi* to access health services. In short, when the levels of health institutional capacities are high (with sufficient health institutional infrastructure, service delivery, human resources, and finances), people do not need to rely on personal connections to access health services.

The analyses also find a positive relationship between provincial health institutional capacities and perceived health service access. There are higher levels of perceived healthcare services access in provinces that have greater health institutional capacities. This result further supports this study's argument that people rely less on social connections when health institutions are effective. When the levels of health institutional capacities are higher, people can more easily access healthcare services. Therefore, they do not need to rely on personal

connections to access health services. These results contribute to the existing literature by showing that the use of informal networks to meet daily demands such as public service access is conditional on institutional contexts. While this study focuses on health service access in China, the findings have implications for other public services and other countries. Development of public service institution can mitigate the use of informal networks to access public services. This can also mitigate unequal access to public services.

At the same time, the findings are inconclusive when it comes to the roles of broader social networks with friends, neighbors, and colleagues. Theses social connections do not have a statistically significant relationship with perceived healthcare access. Contrary to the expectation, the statistical analyses also suggest that they do not have an interacting relationship with health institutional capacities. A potential reason is that the survey question asked about the levels of *general* social connections out of context of health service access. Thus, asking about the use of social connections in healthcare access in particular may produce a different result, and warrant further examination. The findings also suggest that higher levels of educational attainment have a positive relationship with perceived healthcare access. This points to a need for further analyses of the roles of education in health service access.

Therefore, the next chapter examines the roles of both personal connections and broader social connections in prenatal care services through qualitative analyses of interview data. The interviews explore roles of social networks with friends and colleagues in prenatal care services in particular. The interviews also focus on a purposeful sample of women with high levels of educational attainment to explore the roles of education in prenatal care services.

Chapter 4: Roles of Social Connections in Access to Prenatal Care Services

This chapter conducts qualitative analyses of the interview data on women's access to prenatal care services in China. We conducted semi-structured interviews in June and July in 2019 with 38 women who had experience of child birth within the last five years. All the interview participants are from urban China, however we recruited women from varieties of socio-economic status. This chapter examines the effect of social connections (including *guanxi*) on women's access to prenatal care services. The qualitative analysis in this chapter allows this study to conduct more nuanced examination of the roles of social connections as well as women's experiences at the healthcare institutions. This chapter also delves into distinct functions different types of social connections (e.g. personal connections vs. broad online networks) play in regard to healthcare services access. The findings suggest that almost all the interview participants had access to the standardized prenatal care services regardless of their use of social connections. Still, there remain two institutional gaps: long wait time and short doctor-patient interaction time. In face of the long wait time and overcrowding hospitals, interpersonal connections *guanxi* can help patients access prenatal care services by making it easier to see a doctor. Broader social connections with friends, colleagues, and former classmates can fill in the gap of short doctor-patient interaction by providing relevant information about pregnancy and prenatal care services. The analyses of interviews and qualitative content analyses of a social networking site also suggest that online social networks play a similar role to fill in the informational gap. No institution is perfect, and social connections play different roles depending on institutional contexts.

4.1 Chapter Introduction

Prenatal care has direct influence on birth outcomes and pregnant people's wellbeing. The 2016 report *WHO Recommendations on Antenatal Care for a Positive Pregnancy Experience* indicates that prenatal care has direct impacts on birth outcomes as it "reduces maternal and perinatal morbidity and mortality" (1). Further, prenatal care also serves as a channel through which "social, cultural, emotional and psychological support" can be provided to pregnant people to ensure their wellbeing and positive experiences (World Health Organization 2016b, ix).

There are standards for prenatal care services in terms of a frequency as well as types and quality of prenatal care provided. For instance, the WHO recommends eight contacts with prenatal care providers (World Health Organization 2016b). China's Ministry of Health (MOH) recommends five prenatal care visits for rural and eight prenatal care visits for urban areas (Z. Wu et al. 2012). In terms of types of prenatal care, WHO recommend consultations on diet/tobacco/alcohol use/eating/exercising, provisions of nutritional supplements and antibiotics for asymptomatic bacteriuria, gestational diabetes mellitus, HIV and syphilis testing, ultrasound, tetanus toxoid vaccination, and interventions for pregnancy-related physical symptoms (World Health Organization 2016b).[2] The MOH's recommendations also include blood pressure, blood test, and advice on nutrition (Z. Wu et al. 2008). The national guideline also includes fetal heart monitoring, urine tests, and ultrasound tests (in addition to blood test and blood pressure) (Long, Zhang, Hemminki, et al. 2010). Based on the recommendation by the WHO, China's MOH, and experts, Lu et al. (2011) also include exams on weight and fetus/uterus positions as well as lab

[2] See *WHO Recommendations on Antenatal Care for a Positive Pregnancy Experience* for the details of WHO recommended prenatal care services (Accessible at https://www.who.int/reproductivehealth/publications/maternal_perinatal_health/anc-positive-pregnancy-experience/en/).

tests on leucorrhea, liver function, and hepatitis B (in addition to blood test, blood pressure, feral heart monitoring, and urine test). The WHO further addresses quality of care by including "maternal self-esteem, competence and autonomy" into "positive pregnancy experiences" (World Health Organization 2016b, 2). This shows the policy importance of considering not only how many times the prenatal cares are provided, but also what types of care are provided and how these cares are provided.

Indeed, some studies find that the level of access to prenatal care services displays a greater variation in China when the types and quality of care are considered. For example, Long et al. (2010) find that few women receive hemoglobin and urine tests while most of them receive advice on nutrition/tobacco/alcohol use, blood pressure tests and fetal heart monitoring. Lu et al. (2011) similarly find women receive less lab tests such as blood and urine tests than non-lab exams such as blood pressure tests and fetal heart monitoring. Nwaru, Wu, and Hemminki (2012) also emphasize the consideration of the types of care. For instance, the effect of income on access to prenatal care becomes stronger once the types of care are considered (Nwaru, Wu, and Hemminki 2012). These studies' results suggest that interview questions should ask about types of prenatal care services provided in addition to the quantity of prenatal care exams. In terms of quality of care, Raven et al. (2015) find that the interviewed women showed discontent with the lack of participation in decision making processes during the care, provision of pain relief, and cleanliness of hospitals in regard to delivery services. This finding clearly shows the importance of paying attention to patients' experiences in receiving the care services. Therefore, the fieldwork interviews are critical to evaluate women's experiences concerning the processes of prenatal care services.

Scholars identify various factors influencing access to prenatal care services in China. The most commonly named determinant is women's socio-economic status (SES) such as education and wealth. The existing studies agree that those with higher levels of education are more likely to have a greater use of prenatal care services (Anson 2004; Jiajian Chen, Xie, and Liu 2007; Xiaoning Liu et al. 2011; Short and Zhang 2004). Similarly, the use of prenatal care services is greater among those wealthier (Xiaoning Liu et al. 2011) or living in wealthier communities (Jiajian Chen, Xie, and Liu 2007). In short, women with more privileged SES have greater access to prenatal care services.

While building on these previous studies, this study offers unique contributions. First of all, this study focuses on urban China with a sample of women with higher levels of education. There is scant literature studying prenatal care services in urban China. The existing literature studying urban areas tends to focus on migrant workers (Feng et al. 2004; Q. Zhao et al. 2009). Further, a focus on patients with higher levels of education enables this study to clarify the roles of education. The existing studies suggest that education has a positive correlation with prenatal care services use (Anson 2004; Jiajian Chen, Xie, and Liu 2007; Xiaoning Liu et al. 2011; Short and Zhang 2004), and the statistical analysis in the previous chapter also demonstrated that education also has a positive correlation with perceived healthcare access. Furthermore, this study also offers a contribution to the existing literature by assessing the "quality" of prenatal care services by focusing on women's experiences in seeking for such services. This approach goes beyond an assessment of a presence or absence of basic access to prenatal care services. Consequently, this approach enables this study to examine more nuanced roles of social connections, including informational roles of social connections.

The findings suggest that almost all the interview participants had access to the standardized prenatal care services, and they do not need to use social connections to receive the standardized care services. Still, there remain institutional gaps, and social connections function to fill in these gaps. The two gaps are: long wait time and short doctor-patient interaction time. The interpersonal connections *guanxi* can help mitigate the long wait time, and broader social connections with friends, colleagues, and former classmates can compensate for the lack of doctor-patient interaction by providing relevant information about prenatal care services. Online social networks also play a similar role to fill in the informational gap. The institutional gaps are not necessarily a presence or absence of basic access to services. Social connections play different roles to fill in particular institutional gaps depending on institutional contexts.

This chapter proceeds as follows. First, I discuss the standardized antenatal care process described by the interview participants. There was a basic access to the standardized care services regardless of the participants' socio-economic status and use of social connections. However, the analysis of the interviews proceeds to illuminate the remaining institutional gaps: long wait time and short doctor-patient interaction time. Then, I discuss the nuanced roles of social connections that fill in these institutional gaps. I also discuss the roles of online social networks, and conduct qualitative content analysis of a social networking site.

4.2 Standardized Antenatal Care Process

The WHO and China's Ministry of Health (MOH) set standards for a quantity of prenatal care services (World Health Organization 2016b; Wu et al. 2008). The WHO recommends eight

contacts with prenatal care providers[3] (World Health Organization 2016b). China's MOH recommends five prenatal care visits for rural and eight prenatal care visits for urban areas (Z. Wu et al. 2012).

The analysis of the interview data indicates that almost all the interview participants had more than eight prenatal care exams, exceeding both the WHO and China's MOH standard. Over 85% of the participants received more than 10 prenatal care exams. Among them, about 30% received more than 20 prenatal care exams. More importantly, many participants described a "standard" process of prenatal care exams, increasing in frequency during the time of pregnancy: once a month, once in two weeks, and once a week.[4] According to some, the frequency changes by a trimester: once a month in the first trimester, once in two weeks in the second trimester, and once a week in the final trimester.[5] One participant describes this frequency of exams as a standardized or institutionalized process by stating that: "I received the number of exams according to the *regulation*" (emphasis added).[6] Another participant states that: "I know a majority of people receive exams once a month in the first trimester, once in two weeks in the second trimester, and once a week in the third trimester. But I received exams once a month or once in three weeks because I had little problems."[7] She suggests that her case was deviant from the standard frequency of exams (i.e. what most people received), and she goes on to explain the reason why. These statements suggest that there is a standardized frequency and interval of prenatal care exams at least in this particular urban city. This standardized process was described

[3] WHO updated the recommended minimum number of prenatal care contacts with health professionals from four to eight in 2016 (World Health Organization 2016a). According to the data by UNICEF, 69% had a minimum of four prenatal care contacts in China in 2013 (United Nations International Children's Emergency Fund 2018).
[4] Interviews: D1C1_3, D2C1_1, D2C1_2, D2C1_4, D2C2_2, D2C2_3, D3C1_6, D3C2_13. Another frequently cited frequency starts from once a month and shifts to once a week (D2C1_7, D3C1_3, D3C2_1, D3C2_2).
[5] Interviews: D1C1_3, D2C1_4, D2C2_3, D3C1_6, D3C2_13
[6] Interview: D1C1_3
[7] Interview: D1C1_2

consistently across different hospitals and the interviewee's socio-economic backgrounds. This means that the standardized process is not particular to a single hospital or women from certain socio-economic backgrounds.

Further, most participants also described the types of prenatal care services received in a mostly similar manner. The two most commonly mentioned prenatal care exams were ultrasound (including 4D ultrasound) and down syndrome exams. A majority of the participants said that they have received these two exams. Other frequently mentioned exams include: fetal heart monitoring, blood test, blood sugar and diabetes exam, cardiac screening test, congenital anomalies exam, blood pressure, infectious disease test, and liver function test. The cardiac screening tests include echocardiogram and electrocardiogram. The congenital anomalies exams include chromosome exam, amniocentesis, noninvasive prenatal testing (NIPT), and so on. The infectious disease tests include hepatitis B and other infectious diseases.

Furthermore, many participants indicated that they followed their doctor's instruction to receive the prenatal care services. There was a common phrase that many participants used: "I listen to what the doctor says (听医生说的)".[8] This means that many interviewees followed their doctors' direction to receive the certain types of prenatal care exams in a certain frequency. Some participants also phrased it as: "according to the doctor's plan,"[9] "they are all what the doctor arranged,"[10] and "I did all the exams that the doctor said."[11] One participant said: "doing all the exams according to the doctor feels right and safe."[12] Another participant shared a similar

[8] Interviews: D2C1_7, D2C1_9, D2C2_3, D3C1_1, D3C1_2, D3C1_3, D3C1_5, D3C1_6, D3C2_1, D3C2_3, D3C2_5, D3C2_6, D3C2_9, D3C2_10, D3C2_14, D3C2_15, D3C2_16, D3C2_17
[9] Interviews: D2C1_2, D2C2_1
[10] Interview: D2C1_3
[11] Interviews: D2C2_1, D2C2_2, D3C2_12
[12] Interview: D2C2_1

sentiment that all the exams must be done "just in case" (以防万一).[13] This points to the inherent information asymmetry between doctors and patients. The doctors always have more information and knowledge about medical care. If a patient wants to secure maternal health, they need to follow doctors' decisions in providing care because doctors are the experts. The interview results also suggest that the decision-making power regarding the frequency and types of prenatal care exams are largely with the doctors and medical care institutions. There is a fundamental power asymmetry between doctors and patients, and societal power relations also manifest in doctor-patient relationships (Peck and Conner 2011). This study's interviews also illuminate the inherent power balance and information asymmetry within the doctor-patient relationships.

This power and information asymmetry inherent in doctor-patient relationships point to an importance of the roles of medical "institutions." The existing studies find that women's socio-economic status such as education and income levels impact their use of prenatal care services (Anson 2004; Chen, Xie, and Liu 2007; Liu et al. 2011; Short and Zhang 2004). In addition to these individual-level factors, this study also points to institutional factors that can impact prenatal care service use. It is not surprising that doctors always have more information about medical care compared to patients. This is precisely why most patients have consultation time with doctors to obtain diagnosis, exams and treatment rather than ordering and shopping exams and treatment based on self-diagnosis and without a need for doctors. This indicates the importance of medical care standards that the doctors adhere to. In other words, the standardized and institutionalized antenatal care process is a prerequisite for the general population to meet the national and international standards of such care. The information and power asymmetry

[13] Interview: D3C2_13

inherent in doctor-patient relationships also cast a severe limitation on patients' decision-making power.

However, patients are also not just passively receiving prenatal care services. Many participants (over 40%) mentioned that they looked up information about prenatal care exams online. For example, when discussing the frequency of prenatal care exams, one participant said: "Before seeing the doctor, I knew the basics. I saw them online, and other people have also told me." She also obtained the information about the types of prenatal exams from the internet and friends (including former classmates and neighbors).[14] Another participant similarly told us that she knew the information about prenatal care exams from the internet and her friends before seeing a doctor.[15] Thus, some women actively look into information about prenatal care exams even before seeing a doctor. This suggests that they are not just passively and blindly following what doctors say. They "listen to what the doctor says" because it is safer to do so since the doctors have the expertise. However, this does not mean that patients do not have any knowledge. They are actually active seekers for information about medical care processes and both willing and capable of participating in the decision-making processes. The online social networks sites also provide a means for patients to fill in the gap of information asymmetry. One participant said: "I listen to what the doctor says. There is also information that I obtained from the WeChat official accounts". She told us that these accounts are obstetrics-related accounts.[16] Patients with prior information about medical procedures are better prepared to ask questions and understand their doctor's suggestions and diagnosis.

[14] Interview: D3C2_4
[15] Interview: D3C1_2
[16] Interview: D3C2_5

Women also share information among each other. Several participants talked about how they obtained information about prenatal care exams from their friends, including colleagues, former classmates, and neighbors. For instance, one participant talked about the types of prenatal care exams and said: "I already knew before seeing the doctor because my friends talked about them".[17] Similarly, another participant stated: "I heard from my friends about the general information about pregnancy and information about prenatal care exams. I also saw them online." These are the friends who experienced pregnancy before her.[18] The immediate social networks among women facilitate sharing of information. Another information source is books and magazines. One participant explained to us that: "I acquired them from the prenatal care book and the internet. On the prenatal care book, each section has explanations of prenatal care exams."[19]

Therefore, many of our interviewees were aware of the standard of care as well as similarities and differences of their own experiences and other people's experiences. Many of them were very knowledgeable about prenatal care in general and talked about them in length with no hesitation. Some participants even emphasized to us the importance of prenatal care in our conversation. For instance, one participant discussed how only prenatal exams can spot potential problems and ensure the fetus's health, such as which nutrition is lacking.[20] Another participant talked about the importance of ultrasound, and she says this is because her former classmate had a miscarriage due to the fetus having a stomach issue.[21] These findings suggest that many of the interview participants are active seekers of information and knowledge, and an

[17] Interview: D3C2_7
[18] Interview: D3C2_8
[19] Interview: D2C1_5
[20] Interview: D3C2_12
[21] Interview: D2C1_3

active agents seeking for prenatal care services to ensure maternal and fetus health. However, besides the information asymmetry between doctors and patients, there is also an information inequality among patients. The impacts of this information inequality on prenatal care service access will be further elaborated in the remainder of this chapter.

4.3 Hospital Choice: Brand + Word of Mouth

Despite the standardized prenatal care services, there exists a disparity between patients who can access higher ranked hospitals and those who lack such access. The hospitals are classified into three ranks: Tier 1 (primary), Tier 2 (secondary), and Tier 3 (tertiary) (Cai et al. 2018; Y. Li et al. 2020). Each tier has three ranks: A rank (甲), B rank (乙), and C rank (丙). The upper tier hospitals have greater capabilities for medical care, education, and research (Cai et al. 2018; Y. Li et al. 2020) as well as better infrastructure/equipment and human resources (T. Zhang et al. 2017). In terms of maternal care services, there are also two types of hospitals among the Tier 3 hospitals: general hospitals and specialized hospitals. The specialized hospitals are "maternal and child health hospitals (妇幼保健院)" and they specialize in maternal and child healthcare services. Most of our interview participants chose Tier 3 hospitals to receive prenatal care services. About 76% of the participants chose the Tier 3 hospitals. Among the Tier 3 hospitals, especially specialized hospitals (maternal and child care hospitals) were popular among the participants. Among those who selected the Tier 3 hospitals, a little less than a half chose the specialized hospitals (maternal and child health hospitals). The rest of the participants chose the Tier 2 hospitals.

Among those who chose the Tier 3 hospitals, the most cited reason for their selection of a particular hospital is the perceived quality of care, reputation, and the brand of Tier 3 hospitals.

About a half of them mentioned one of the three factors (quality, reputation, and brand) as a reason why they selected a particular Tier 3 hospital. For example, among those who mentioned the quality or reputation of a hospital, one participant said "I feel like the overall standard is relatively high"[22] and another said "it is close to home, and the reputation is good (口碑好)."[23] For some participants, the mere fact that the hospital is classified as Tier 3 A rank or specialized is the most important factor. For instance, a participant who chose a Tier 3 hospital said she selected the hospital because of "Tier 3 A rank hospital brand,"[24] and another participant even more simply stated that "it is a Tier 3 A rank hospital (三甲医院)."[25] Similarly, some of those who selected the maternal and child care hospitals emphasized that these hospitals are *specialized* hospitals by stating that: "It specializes in OBGYN, and better than general hospitals"[26] and "It is an experienced hospital and a specialized hospital. Everyone goes there".[27] This result presents a striking difference from the motivation among those who chose the Tier 2 hospitals. The participants who chose the Tier 2 hospitals only mentioned one of the following two reasons for their selection of the hospitals: close to home and not crowded.

The result is consistent with the existing studies' findings that people in China have a greater trust in upper-level hospitals. The existing studies suggest that people distrust the quality of medical care at primary care institutions and prefer to go to bigger and upper tier hospitals (Cheng et al. 2017; Jinghua Li et al. 2016; Yip et al. 2019; T. Zhang et al. 2017). Our interview result also reflects this general sentiment that the upper-level hospitals are better and more trustworthy. Due to the hierarchical hospital system that classifies hospitals into ranks based on

[22] Interview: D2C1_2
[23] Interview: D3C2_1
[24] Interview: D2C1_8
[25] Interview: D3C1_1
[26] Interview: D2C1_5
[27] Interview: D3C1_6

their capabilities and resources, there is a prevalent perception among people that the upper-tier hospitals and higher ranked hospitals are better and provide a higher standard care. Thus, for many patients, it is important that the hospitals are classified as Tier 3 A rank and specialized, communicating a general impression of a higher standard and good reputation.

While the major reason behind the popularity of the specialized hospitals and Tier 3 hospitals is due to the common perception that the upper-level hospital provides better quality care, some women also pointed to a critical role of recommendation and social connections. For instance, one participant said that she selected the private hospital because "I have a friend who has been there, and my friend said the services are pretty good."[28] Other participants also similarly discussed their selection of the Tier 3 maternal and child health hospitals as: "a close friend (熟人) recommended"[29] and "My friend recommended this hospital."[30] These quotes suggest that social connections among friends play an role to circulate information about hospitals and influence people's hospital choice. In other words, these participants are endowed with social connections that help them obtain information. Having a direct connection within a particular hospital is also another motivation to choose the hospital. For instance, one participant told us that she picked her hospital because "my husband works at this hospital." She told us that her friend recommended a private hospital, but she chose the hospital where her husband works.[31] Another participant similarly said that: "I picked this hospital because I have a close friend."[32] There was also a participant who talked about her husband's sister who works at a hospital she went to.[33] All of these three patients received care at the Tier 3 rank A hospitals. The

[28] Interview: D2C1_6
[29] Interview: D2C1_9
[30] Interview: D3C2_17
[31] Interview: D3C2_7
[32] Interview: C3C2_12
[33] Interview: D1C1_1

findings also suggest that these are participants who are endowed with inter-personal connections (*guanxi*) that they can potentially activate in the process of seeking for prenatal care services.

While the interview data shows the overwhelming popularity of the Tier 3 hospitals, this popularity leads to an issue of overcrowding Tier 3 hospitals. There were two participants who had to switch from a Tier 3 hospital to a Tier 2 hospital, because the Tier 3 hospitals were too crowded. The first interviewee who said that she had to move from a Tier 3 to Tier 2 hospital said that "the first hospital was difficult to register (挂号)." This means that she faced difficulty in the process of queueing up to get registered before she sees the doctor or receives prenatal care services. She also told us that the wait time at the first Tier 3 hospital was about two to three hours, whereas it was about 30 minutes to one hour and "a little faster" at the Tier 2 hospital.[34] The second interviewee who also moved from a Tier 3 to Tier 2 hospital said: "there were too many people at the first hospital, and the second hospital had less people." She also told us the differences in the wait time between the Tier 3 and Tier 2 hospital she went to. The wait time at the Tier 3 hospital was one to two hours, while it was about 30 minutes at the Tier 2 hospital.[35] Another participant who selected a Tier 2 hospital also discussed a short wait time as one of the reasons she chose the hospital, and said: "it is close to home, and I don't need to always stand in line."[36] These interviews suggest that the Tier 3 hospitals are crowded with a lot people, making a wait time long and even creating difficulties to stand in queue and get registered.

This finding is also consistent with the previous studies' findings. The existing studies suggest that the upper-tier hospitals are crowded because people prefer to pursue care at the upper-tier hospitals (Hu et al. 2019; Jinghua Li et al. 2016; Y. Li et al. 2020). Some studies

[34] Interview: D3C1_3
[35] Interview: D3C1_5
[36] Interview: D2C1_3

report that some Tier 3 hospitals have more than 100 patients per doctor per day (Hu et al. 2019; Y. Li et al. 2020). This has led to the long wait time and short doctor consultation time among the upper-tier hospitals (Cheng et al. 2017; Hu et al. 2019; T. Zhang et al. 2017). This study's findings also present a new puzzle: what are the differences between those who were able to receive care at the Tier 3 hospitals and those who had to give up on the Tier 3 hospitals and move to Tier 2 hospitals? Are there any factors that influence individual's wait time at the Tier 3 hospitals? Do social connections play any roles? The following sections elaborate on these issues of long wait time and short doctor consultation time as the main grievances among our interview participants, and also discuss how social connections fill in these institutional gaps.

4.4 Institutional Gap: Too Long Wait & Too Short Interaction

Among our interview participants, the three most common grievances about prenatal care services are: (1) overcrowding hospitals, (2) long wait time, and (3) short doctor-patient interaction time. Table 14 presents the grievances that the interview participants discussed when asked about their experiences at the hospitals and their evaluation of public health system/services in terms of prenatal care.[37] Twelve respondents (over 30%) mentioned overcrowding hospitals, and this is the most frequently mentioned grievance. Eight participants mentioned the long wait time as their grievances. These two grievances combined account for about a half of the participants. For instance, when we asked about her opinions on public

[37] This analysis paid a particular attention to the interview participants' open-ended answers rather than the short words of evaluation (e.g. good, so-so, bad) that they have provided when we asked about doctors' services and public prenatal health services. These short words of evaluation would most likely be their answers if this was a survey study. However, I find that even those who initially said the doctors' services or public prenatal health services were "not bad" or "so-so" started discussing their grievances as they proceeded to elaborate their answers and our conversation went on. This further underscores the important of conducting qualitative interviews to delve into the patients' perspectives and experiences.

prenatal care services, one participant answered: “There are too many people, it cannot be very good.”[38] Another participant similarly answered to the question on public prenatal care service evaluation: “It is 50 out of 100. There are too many people in public hospitals.” She further explained to us that the reason her hospital (Tier 3 A rank maternal and child health hospital) was crowded is because there is only one good public hospital and everyone goes to the same hospital. [39] The overcrowding hospitals can result in a long wait time and short doctor consultation time.

Indeed, the interview results show that the issue of crowding hospitals and a long wait time go hand in hand. For example, two participants stated respectively that: “There were too many people and I waited very long”[40] and “there are too many people and a wait time is long.”[41] This shows that the long wait time stems from the crowding hospitals. One interviewee showed her dissatisfaction with the long wait time by stating that the need to “stand in line is unreasonable.”[42] About 60% of the respondents said that they had to wait one hour or more before they can see a doctor. Among them, 10 of them had the wait time of between two and four hours, and five of them had to wait half a day or more. One participant had to wait two to three hours before every prenatal care service and she said it was “too long and too inconvenient.”[43] Waiting all morning was also not uncommon. One interviewee described the wait time as “normally all morning. The fastest is 30 to 60 minutes.”[44] Another interviewee similarly referred to the wait time as “half a day if it is fast. All day if it is late.”[45] These results point to the long

[38] Interview: D2C1_7
[39] Interview: D3C1_6
[40] Interview: D3C1_5
[41] Interview: D3C2_1
[42] Interview: D2C1_3
[43] Interview: D3C2_16
[44] Interview: D2C1_7
[45] Interview: D2C1_2

wait time both in terms of patients' perceptions and the actual length of wait time. If a patient has to wait half a day and then go through the exams, it almost consumes their whole day. Even if the wait time was two to four hours, this does not include the actual time to go through the exams. In this case, it is still likely to consume half a day. A patient needs to take half a day or all day off from work in order to see a doctor. Given that most of our participants received 10 or more prenatal care exams, the frequency of doctor visit is more than once a month during the nine months of pregnancy. This shows the magnitude of time cost on women.

Further analyses of the interviews also indicate that the issue of long wait time is a systemic issue that is present across different hospitals, and ordinary people have no choice but to deal with it. One interviewee stated that: "The wait time is too long, but there is nothing that can be done about it."[46] Another interviewee said: "It is the same thing in every hospital, the time to stand in line is long."[47] These quotes suggest that the overcrowding hospitals and long wait time is not just a problem of one or two most popular Tier 3 rank A hospitals, but a feature of the health system at large. Some interviews illuminate the sentiments that it is just how it is and there is nothing individual patients can do to change the situation about the long wait time. Although the interviews focused on prenatal care services, a few participants also talked about a shortage of inpatient beds.[48] In regard to public prenatal care services, one participant told us that: "The supporting facilities are not perfect. The inpatient beds are especially crowded at the peak time. But, I heard that the S hospital's inpatient beds are even more crowded, so I feel like my hospital is not bad" (the name of the hospital was substituted with the letter S to maintain an anonymity of the interview).[49]

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[46] Interview: D3C2_5
[47] Interview: D3C2_16
[48] Interviews: D2C1_1, D2C1_2, D2C1_5, D3C2_3
[49] Interview: D2C1_1

The long wait time is also often contrasted with the short amount of time a doctor spends with patients. Thirteen participants (over 30%) expressed discontent about the short doctor consultation time. Moreover, almost all the participants who discussed the particular length of doctor-patient interaction time (this is over 75% of the participants) said that the doctors only spend less than ten minutes with them. Among them, 69% said that the interaction time with the doctors was five to ten minutes, and 31% said it was even less than a few minutes. One participant said that her interaction time with the doctor was two minutes and that "I need to ask and the doctor finally explains" about prenatal care exams. When we asked her about her opinion of her doctor's services, she said it is "bad" and the interaction time is short. After completing the exams, she had to leave right away.[50] Another participant similarly described her interaction time with doctor as "short" (one to two minutes), and she thinks that the doctor's services were "not very good" because "the doctor's attitudes were bad, and there was no interaction (交流)" on top of the long time she had to spend standing in line.[51]

Some other participants further elaborate on their experiences in interacting with their doctors and pointed out that their doctors generally do not provide explanations about prenatal care exams and mechanically perform the exams. One participant said: "I am not very satisfied with the hospital's services. The doctor only conducted exams" without providing any explanations, advice or interaction.[52] Another participant expressed her discontent by stating that: "The doctor generally does not speak, and explains very little" and "I am very dissatisfied. They don't provide services for the sake of the child, the nurses' morals are bad, the doctor does not voluntarily provide a lot of information."[53] These interview results illustrate a normal mode

[50] Interview: D3C2_15
[51] Interview: D3C2_16
[52] Interview: D1C1_2
[53] Interview: D2C1_8

of doctor-patient interaction where doctors just follow the standardized procedure of prenatal care exams while providing little to no explanation about the exams (both before and after the exams) and almost no involvement of patients in decision making processes. There is a standardized procedure of prenatal care services (as discussed in the previous section), and the doctor just follows these procedures to perform exams. They do not discuss these procedures with patients before exams nor explain the results of the exams.

Some participants attribute the short doctor-patient interaction time to the crowding hospitals. For instance, one participant said: "When I have questions the doctor can explain, but normally does not talk. There are too many people, and little explanations."[54] Another participant similarly stated that the doctor spends about ten minutes to look at the exam results and that "there are too many people, so when I ask, the doctor finally explains."[55] These quotes also suggest that the doctors "can" provide explanations only if the patients ask questions. This modus operandi is also reflected on other interview quotes such as: "The doctor *can* explain. I need to ask the doctor, and the doctor *can* explain"[56] and "I ask the doctor, and the doctor finally explains"[57] (the emphasis added). For a few patients, their doctors did not provide any explanations about prenatal care exams.[58] These findings suggest that it requires the patients to know the right questions to ask the doctor in order for them to receive explanations about exams and exam results and also to involve in any decision-making processes. This means that the patients need to inform themselves of procedures of prenatal care exams despite the large information asymmetry between doctors and patients. This is the potential reason why many of

[54] Interview: D2C1_5
[55] Interview: D2C1_7
[56] Interview: D3C1_5
[57] Interview: D3C2_6
[58] Interviews: D1C1_3, D2C1_9, D3C1_4, D3C1_6

our interview participants have searched online for information about prenatal care exams and also shared information amongst friends (as discussed in the section 4.2). The greater the level of information that patients have prior to the short doctor visit, the more benefits they get from the visit and the doctor. Patients with less information will get fewer explanations and opportunities to ask questions.

These three most common grievances are present across different communities (both high and low income communities), different educational levels of the participants, and different hospitals. This suggests that the long wait time and short doctor-patient interaction time within overcrowding hospitals are broader and systemic issues of the healthcare system in general. The analyses in the previous section along with the existing literature suggest that the Tier 3 hospitals are the most crowded. Indeed, there were two interviewees who had to switch hospitals from a Tier 3 to a Tier 2 hospital because the Tier 3 hospital was too crowded. At the same time, the Tier 2 hospitals are also not free from the issues of overcrowding, long wait time, and short doctor-patient interaction (see Table 14). Therefore, it may be the issue of the health system as a whole that lacks a sufficient number of doctors, resulting in the long wait time and short doctor consultation time. Consequently, some participants described the issue of long wait time as something that cannot be helped or something that is the same in any hospitals.[59] The short doctor consultation time may also stem from a norm of doctor-patient interaction mode within the health system.

In sum, these interview results present two critical findings. First, the institutional gap in prenatal care service access within this urban locality is a long wait time and a lack of doctor-patient interaction, deriving from the overcrowding hospitals. In terms of the basic access to

[59] Interviews: D3C2_5 and D3C2_16

necessary care, there does not seem to be any major obstacles or barriers. As discussed in the previous section, there is a standardized prenatal care process, so patients receive roughly similar prenatal care services in terms of "frequency" and "types" of prenatal care services. In other words, the institutions are capable of providing basic access to the standardized care procedure. However, there still exists institutional gaps, and these gaps are the long wait time and short doctor-patient interaction. The doctors appear to mechanically follow the standardized care procedures while providing little to no explanations about the exams they perform and women are not involved in the decision-making processes in receiving these care services. The severely short doctor-patient interaction time limits the possibility that the patients can ask doctors questions even though some interviews suggest that doctors do answer questions when they ask. This short doctor consultation time follows the long wait time that ranges between a few hours to half a day, costing women their time. These two institutional gaps go hand in hand to raise discontent among the patients. It is not difficult to imagine a sense of frustration when someone needs to wait half a day in the waiting room to receive care services, but receives no personalized interaction from the medical professionals before or after the care services. Therefore, the institutional gaps exist in the "process" of receiving care rather than a presence or absence of access.

Second, these institutional gaps are also related with the norm of doctor paternalism. The paternalistic mode of doctor-patient relations refers to a situation "…where the physician is the dominant parental figure in the relationship, making decisions that he or she (the physician) believes is the best for the patient" (Peck and Conner 2011, 547). In the paternalistic doctor-patient relations, patients are not involved in decision makings, and there is a power asymmetry between a doctor and a patient in terms of their power to control communication, information

and decision makings (Peck and Conner 2011). The doctor paternalism builds on the asymmetrical power balance between a doctor and a patient (Peck and Conner 2011). The result is limited roles of patients in informed decision makings and the prevalence of un-transparent decision makings on the doctor's side. This is reflected on the common phrase of "I listen to what the doctor says" and the short doctor-patient interactions. This also means that doctors do not spend sufficient time with patients to address questions they may have about their pregnancy (including nutrition and pregnancy-related illness/discomfort) and prenatal care exam results. The WHO report discusses the importance of quality of care that provides "maternal self-esteem, competence and autonomy" (World Health Organization 2016b, 2). Therefore, the high quality care services are the ones that respect women's autonomy as well as their self-esteem and competence. The full involvement of women in informed decision makings and transparent information sharing and communication from the medical practitioners are critical to ensure such quality. The norm of doctor paternalism reflected on the lack of doctor-patient interaction can undermine the quality of care. This finding is also consistent with a previous interview study's finding that women expressed their discontent with a lack of their involvement in decision making processes during the delivery services (Raven et al. 2015).

4.5 Toward Nuanced Understandings: The Roles of Social Connections

This section examines the roles of social connections in filling in the two institutional gaps discussed above: the long wait time and the short doctor-patient interaction time. The prenatal care procedure is institutionalized and most of the interview participants had access to this standardized procedure regardless of their socio-economic backgrounds or different hospitals. Consequently, the analyses of the interview data also indicate that social connections

do not determine whether an individual has access or completely lack access. Regardless of the social connections each individual is endowed, most of them have basic access to the standardized care services and there were no interviewees who could not access the prenatal care services. This supports the Institutional Capacity Hypothesis (H2) that patients have little need for social connections, when there are effective institutions for health care. Therefore, the results suggest that the institutions are sufficiently effective and capable to provide basic access to the standardized prenatal care services.

However, everyone having access to the standardized prenatal care services does not mean that there is no gap in the institutions. It also doesn't mean that everyone has the same experiences in the *process* of receiving care. This study finds that the issue in this particular case is not a presence or absence of access, but the two institutional gaps are long wait time and short interaction time. Further, these two institutional gaps are still issues of *access*. A long wait time can prohibit a patient from obtaining access as seen in the cases of two interview participants who had to switch (downgrade) a hospital from a Tier 3 to a Tier 2 hospital. In these cases, they still had access to the standardized care at the Tier 2 hospital, but they could not obtain care at the hospital of their original choice and preference. The long wait time can also impact the process of receiving care. Many participants said that the usual wait time varies from a few hours, half a day, to sometimes all day. This long wait time negatively impacts the overall experiences of prenatal care services. It, of course, consumes women's time that they could have invested in other activities. As described by the participants, the standard frequency of prenatal care requires women to go to a hospital at least once a month (and once a week toward the end of their pregnancy). When the long wait time consumes their time, it can have adverse impacts on their work and career. The other institutional gap is that the doctors do not spend enough time to

interact with their patients. Thus, women cannot ask questions or obtain interpretation of the prenatal care exams (other than that there is no problem). According to the Social Connection Hypothesis (H1), social connections can fill in these institutional gaps.

Indeed, the analyses find that the interpersonal connections *guanxi* can fill in the first gap of long wait time. As previously discussed, there were three participants who had *guanxi* at the hospitals they went to (see also Table 14). One of the participants discussed the easiness of seeing a doctor due to her *guanxi*. She told us that her husband's sister works in the hospital, and she can see the doctor easily with the help of her sister-in-law. She was also aware of the differences between her experiences and her friends' experiences. She said: "According to my friends, they are all not very satisfied with the hospitals' services. They wake up at 6 am to go to the hospitals, and still have to wait long."[60] There were also two other participants who had direct interpersonal connections at the hospitals they went to. One participant had her husband working at the hospital,[61] and the other had a close friend (熟人) at the hospital.[62] Although these two participants did not explicitly mention the specific benefits that their *guanxi* has provided, their experiences are consistent: their usual wait time was short. They all described the wait time as: "not that long," "10 minutes" and "not long."[63] This is a big difference from waiting for a few hours or half a day.

Further, one of these participants said that she is satisfied with the public prenatal care services because the local public service office even gave her a call to check on the conditions of her pregnancy. A further analysis suggests that her social connections flow from her social position: her spouse works for a local government (she is a full-time mother). Thus, this is a case

[60] Interview: D1C1_1
[61] Interview: D3C2_7
[62] Interview: D3C2_12
[63] Interviews: D1C1_1, D3C2_7, D3C2_12

where interpersonal connections *guanxi* are associated with socio-political status. The findings also suggest that there are different types of interpersonal connections. For instance, the other two participants' interpersonal connections are the ones based on familial ties. Thus, they may not necessarily have a privileged socio-economic status. In fact, one of them is a street vendor (so as her husband) and there is a large gap between her income and the household income of the other participant whose spouse is a public sector employee. A commonality, however, among these three participants is that they did not have any grievances about prenatal care services in general.

At the same time, I also find that some institutional features such as an appointment system can also reduce the wait time besides social connections. There were few participants whose wait time was also short without *guanxi*, and they mention that the wait time was short due to the appointment system. For instance, one participant said her usual wait time was 10 minutes because she made an appointment online.[64] A few other participants also indicated that they didn't have to wait long because they made appointments before visiting doctors' offices.[65] Although they still talked about the crowing hospitals, they didn't mention wait time as their grievances. There were also few participants who still had to wait one to two hours even with their appointments.[66] One participant with *guanxi* also attributed her short wait time to the appointment system.[67] However, the findings also suggest that some people knew about the appointment system while some didn't. Among the participants who went to the same hospital, some used an appointment system while others still had to wait for a long time without an

[64] Interview: D3C1_4
[65] Interviews: D2C1_1, D2C1_5
[66] Interviews: D2C1_4, D2C2_2, D3C2_10
[67] Interview: D3C2_12. Another participant (D1C1_1) discussed that she had a list of exams for every prenatal exam along with her doctor's permission to go directly to take exams without seeing a doctor, shortening her wait time.

appointment. A potential reason behind this discrepancy is that not everyone had information about an online appointment system and how to make an appointment. Therefore, having additional information about the system and process (including an appointment system) can reduce a wait time without using personal connections.

This result points toward a more nuanced understanding of the interaction between formal institutions and informal networks. Both institutional features (such as an appointment system) and the connections (*guanxi*) can aid in reducing the wait time and improving the overall access and experiences. In the current institutional setting (at our interview site), they also seem to coexist to shape women's experiences in accessing prenatal care services. Therefore, it does not have to be either institutions or connections at work. Both of them can function simultaneously to influence citizen experiences in seeking for public services. Social connections can also provide information about the institutional features for patients to make use of them. In contexts that completely lack institutions, social connections may fully substitute the institutions. However, there are more circumstances where meaningful institutions exist but not fully effective. This is a more likely scenario even in other public service fields and other countries. Under these conditions (including this study's case), institutions and connections do not have a zero-sum relationship. Rather, they coexist and interact to shape citizen behaviors and experiences. Nonetheless, this study's findings also indicate that the interpersonal connections *guanxi* can improve prenatal care access by shortening the wait time, and this supports the Social Connection Hypothesis (H1) that patients rely on social connections when there are institutional gaps.

The findings also indicate that the broader social connections tend to fill in the second gap of the lack of doctor-patient interactions. As previously discussed, several participants

obtained information about prenatal care exams from their social connections such as their friends, including colleagues, former classmates, and neighbors. Some participants also obtained information about hospitals from their social connections when they were selecting a hospital. The information about hospital reputation circulate within friendship networks and impact which hospitals individuals select. These examples suggest that social connections function to share and disseminate information about prenatal care services. Especially the sharing of information concerning prenatal care exams may be related to the lack of doctor-patient interactions. A majority of the participants reported that their interaction or consultation time with their doctors were less than 10 minutes, and it is common for doctors to provide little to no explanation about the prenatal exams due to the crowding hospitals. Therefore, social connections play a role to facilitate information sharing to compensate for the lack of information provided by the medical practitioners. Patients need to inform themselves of prenatal care exams they are going to receive or they have received. They also potentially need to know how to interpret prenatal care exam results by themselves if they want to know more than the fact that the doctor does not find any problems. Some participants also indicated that doctors *can* provide explanations only if they ask questions. This means that the patients must have sufficient knowledge about prenatal care exams to know the right questions to ask. Thus, having more information can also improve the doctor-patient interactions by enabling the patients to benefit more from the interactions. A problem is that there is a disparity among patients regarding their levels of access to information since they have different levels of social connections.

Table 14 shows how many interview participants obtained information about pregnancy in general and prenatal care services from their social networks, including family members, friends, colleagues, former classmates, neighbors, and online networks. About 68% of the

participants said that they obtained pregnancy-related information from their immediate informal social networks. 21 participants obtained information from their friends, and 12 participants obtained information from their colleagues. There are also a few to several women who obtained information from their family members, former classmates, and neighbors (see Table 14). The analyses of the interview data suggest that these tend to be preexisting social connections that the women have, meaning that they knew these friends and colleagues before they were pregnant. The women also tend to obtain information from their friends who were pregnant before them or were pregnant at the same time with them. Thus, while these social connections are preexisting ones, the information sharing mostly happen among women who have experiences of pregnancy.

Some quotes demonstrate these points that women tend to obtain pregnancy-related information from their immediate circles of social contacts who have experiences of pregnancy. For instance, one participant stated that: "I had pregnancy-related information from the colleagues around me. I could ask them questions." She told us that they are all around her age, and that some were pregnant before her and some were pregnant at the same time with her.[68] Another participant also told us that she obtained information from her friends and colleagues she knew before her pregnancy, and they had experiences of pregnancy prior to her. Since she worked at the same workplace with them, she saw them on a daily basis.[69] Similarly, another participant obtained information from two of her colleagues who had experiences of pregnancy, and she saw them frequently at work.[70] These quotes suggest that information tend to be shared among those who are around similar age and see each other frequently such as colleagues. Further, one participant elaborates the kinds of information she obtained from her family

[68] Interview: D2C1_2
[69] Interview: D2C1_6
[70] Interview: D3C1_1

members, friends, and colleagues who had pregnancy experiences and whom she saw on a daily basis. The information includes "prenatal care exam types, which hospitals are good, and recommendation related to food."[71] This is one of the participants who had a grievance about the lack of interaction with her doctor, although she did not make an explicit connection between her grievance and use of social connections for information purposes during the interview. Another participant who also had a grievance about short interaction time with her doctor similarly obtained information from her family members and friends who had prior pregnancy experiences.[72]

There were also a few participants who built new social networks during their pregnancy, and they obtained information from these new social contacts. One participant received pregnancy-related information and recommendation from family members, friends, colleagues, and neighbors. She said: "Some of them are people I already knew before my pregnancy, and some are people I didn't know before my pregnancy. At the time of prenatal exams, we pregnant women all chatted together when we stood in line."[73] Another participant similarly stated that among her friends and colleagues from whom she obtained information: "some people I knew before my pregnancy. Some are friends I made at the hospital."[74] She also told us that she interacted with them a lot on WeChat (social networking site with instant messaging function). These quotes suggest that some women built new social networks at hospitals where they received prenatal care services, and exchange information with these new friends who are also pregnant at the same time. Ironically, the long wait time may also facilitate the new social

[71] Interview: D3C2_16
[72] Interview: D3C2_15
[73] Interview: D2C1_1
[74] Interview: D3C2_1

networks because women can talk with each other while they wait to see a doctor for prenatal care exams.

Therefore, these informal social networks can improve doctor-patient interaction and fill in the informational gap. The lack of doctor-patient interaction means that women don't have opportunities to ask questions about their pregnancy, health, and prenatal care exam results. Their social networks fill in this gap by creating a space where women can ask questions to other people who have experiences of pregnancy or who are also pregnant at the same time. In these cases, social connections compensate for the lack of information provided by doctors and impersonalized interaction with their doctors by relaying relevant information and sometimes even providing personalized information. This results support the Social Connection Hypothesis (H1) that when there are institutional gaps in health care information and services, patients rely on social connections to fill in these gaps.

Table 14. Grievances and Social Networks

Individual Code	Hospital Tier	Grievances	Social networks
D1C1_1	3S	None	*Guanxi*; Friends; Online
D1C1_2	3S	Short interaction	Classmates
D1C1_3	2	Overcrowded; Short interaction	Friends; Online
D2C1_1	3	Overcrowded; Poor facility	Friends, classmates, neighbors, family, other pregnant women; Online
D2C1_2	3	Overcrowded	Colleagues
D2C1_3	2	Long wait time	Friends, colleagues; Online
D2C1_4	3S	Overcrowded	Friends; Online
D2C1_5	3S	Overcrowded; Short interaction	Online
D2C1_6	P	Overcrowded	Friends, colleagues; Online
D2C1_7	3	Overcrowded; Short interaction	Online
D2C1_8	3	Short interaction; Poor attitude	None
D2C1_9	3S	Short interaction	Friends; Online
D2C2_1	3	None	None
D2C2_2	3S	None	None
D2C2_3	3	None	Online
D3C1_1	3	Long wait time	Friends, colleagues, family
D3C1_2	3	None	Friends, colleagues, family; Online
D3C1_3	2	None	Friends, colleagues, neighbors, other pregnant women; Online
D3C1_4	3	Short interaction; Poor facility	Online
D3C1_5	2	Long wait time/Overcrowded; Short interaction	None
D3C1_6	3S	Overcrowded; Short interaction	None
D3C2_1	3S	Long wait time/Overcrowded	Friends, colleagues, other pregnant women; Online
D3C2_2	2	None	Classmates; Online
D3C2_3	3	Overcrowded	Colleagues; Online
D3C2_4	3	None	Friends, neighbors; Online
D3C2_5	3S	Long wait time	Online
D3C2_6	2	Short interaction	Colleagues; Online
D3C2_7	3	None	*Guanxi*; Friends, classmates, colleagues; Online
D3C2_8	3	None	Friends, colleagues; Online
D3C2_9	3	None	Friends; Online
D3C2_10	3S	Short interaction	Online
D3C2_11	3S	Long wait time	Online
D3C2_12	3	None	*Guanxi*; Friends; Online
D3C2_13	2	None	Friends; Online
D3C2_14	3	Overcrowded	Friends, family; Online
D3C2_15	3	Short interaction	Friends, family; Online
D3C2_16	2	Long wait time; Short interaction; Poor attitude	Friends, family, colleagues; Online
D3C2_17	3S	Long wait time	Friends; Online

Note: The hospital tier 3S indicates Tier 3 specialized hospitals. P is for private hospitals.

4.6 Prevalent Use of Online Social Networks

Besides the in-person social networks, online social networks also play a large role in filling in the informational gap. Indeed, most interview participants mentioned that they belong to online social networks via social networking sites. Almost 80% of the participants used online social networks during their pregnancy (see Table 14). These online social networks and social networking sites specialize in topics of pregnancy and childcare. The most popular is smart phone APPs with nearly 70% of the participants having used an app that specializes in pregnancy and childcare. Just among our 38 interview participants, there were mentions of more than 10 different apps on pregnancy and childcare. The most frequently mentioned apps include: babytree (*baobaoshu*), *yuxueyuan* (childcare academy), meet you (*meiyou*), *qinbaobao* (dear baby), and *mamawang* (mom net). These platforms also have websites. They all provide information about pregnancy, prenatal care exams, and childcare along with functions to track and record processes of pregnancy and childcare. They also function as social networking sites where users can connect and interact with each other. One participant has used two apps (meet you and *mamabang*) because her friend recommended she try these apps. The sheer popularity of these pregnancy and childcare related apps/websites among the interviewees and the varieties of such platforms suggest that these online social networking sites are popular beyond this study's interview participants.

These online social networking sites provide specialized information about pregnancy and childcare. Similar to the in-person social networks, these online networks also fill in the informational gaps derived from the lack of doctor-patient interaction. The targeted and temporal use of these networks may indeed suggest that their main role is to supply specialized information only relevant during the period of pregnancy or infant care. Some participants whose

children are older than one year indicated that they don't use the pregnancy-related apps as frequently anymore. For instance, a participant who used to use two apps regarding pregnancy and childcare said "I used to use, but I use little now."[75] Other similar comments included: "I used to use, but I don't use it anymore. It was called mama-something. I can't remember clearly" and "I used an APP, but I forgot."[76] This suggests that women utilize the online networks for a specific purpose of obtaining specialized information during their pregnancy, underscoring the roles of social connections to fill in informational gaps.

In addition to apps, some participants also mentioned that they follow social media accounts related to pregnancy or belong to social media groups to obtain pregnancy-related information. WeChat (*weixin*) and Weibo are popular social media platforms in China. WeChat has an individual and group chat function as well as photos and contents sharing function (along with all other varieties of functions), and Weibo is a Twitter-like microblogging site. Some participants follow WeChat official accounts (公众号) and Weibo accounts that are related to pregnancy. Some participants belong to WeChat groups (群). For instance, one participant said: "On WeChat there is a mothers' group. On this group, I can receive responses when I have questions." She also told us that she has not met the members of this online group in-person. Sometimes someone answers her questions, and sometimes no one answers her questions.[77] Another participant similarly stated that she has a WeChat group and she can consult and seek for advice in this group, such as which hospitals are good.[78] Thus, these results further corroborate that the online social networks mainly function to provide information. The

[75] Interview: D2C1_7
[76] Interviews: D2C1_9, D3C1_4
[77] Interview: D1C1_3
[78] Interview: D2C1_1

prevalence of the online networks reflects the lack of opportunities for patients to ask doctors questions due to the lack of consultation time.

In order to further my understanding of the online social networking platforms, I also conduct qualitative content analysis of an online social networking site (SNS).[79] I choose the most commonly mentioned social networking site among this study's interview participants for my analysis – the app and website called *babytree*. The *babytree* is a social networking site specializes in topics of pregnancy, baby care, and child care. I conduct analysis of the contents of *babytree* to find out the functions of the website as well as public interactions that occur on this online platform. The analyses are based on the publicly available website of *babytree*.

The results of the analyses suggest that the two main functions of *babytree* are: (1) providing information and (2) providing a platform where people can interact with one another. In regard to the first function, *babytree* provides information on pregnancy and childcare via articles/posts and online tools. For example, the "pregnancy and baby care weekly" provides information and descriptions on what to expect for each week of pregnancy (from 4th week to 40th week) and each week of baby's development after birth (from 1st week until 1 year old). The information includes types of prenatal exams, what symptoms to look for, and recommended food recipes. The users can also obtain personalized "immunization timeline" or "prenatal care exam timeline" by selecting either a birthdate of a baby or an estimated date of conception and the website shows the specific dates when users need to get certain immunization for their babies or prenatal care examinations. There are also abundant informational posts/articles. The examples from April 2020 include "4 food recipes to treat baby eczema" (viewed 4894 times), "baby does not sleep during the day, what to do" (viewed 5075 times), and a food recipe video

[79] The analysis was conducted in April 2020.

for pregnant women in their first trimester who are struggling with eating and heat of summer (viewed 5613 times). There are also Q&A pages where users can ask questions about pregnancy preparation (e.g. “is this a sign of pregnancy?”) and baby care. They can also find out how to interpret the results of their ultrasound examination under the “understand ultrasound results” section. The section provides detailed explanation of each exam item of ultrasound and referential “normal” scores for each item.

Furthermore, *babytree* also provides a platform where women with similar experiences or interests can interact with one another. These platforms are called *quan* (圈) or *quanzi* (圈子), meaning circles or groups. There are topical *quan* (groups) on baby care, breastfeeding and baby food, etc. where users can post a thread about their experiences and questions, and other users can respond to the post. The *quan* on babycare has more than 42 million members with more than 7 million threads. There are also same age *quan* (groups) such as “June 2020 same age *quan*” where users who are to give birth in June 2020 belong and chat with each other. The contents of the threads vary from a user’s philosophy of raising a child to topics such as “I quarreled with my husband” and “father-in-law entered me and my husband’s bedroom.”

The analyses of the contents of *babytree* suggest that there is a need among women for detailed information regarding pregnancy and childcare, a casual space where they can ask questions, and social networks for emotional and psychological support. Since *babytree* is operated by a private company, its contents are driven by consumer demands to some extent. The abundant contents on pregnancy and childcare-related information and knowledge as reflected on “pregnancy and baby care weekly,” “prenatal care exam timeline,” and “understand ultrasound results” suggest that there is a need for detailed and definite information about pregnancy and prenatal care services. This suggests that having basic “access” to standardized prenatal care

services may not be sufficient to support women during their pregnancy. Given the short doctor-patient interaction time, patients are not given enough time and care at healthcare institutions in addressing their questions. In order to fill in this informational gap, they use the SNS supplementary to address their questions and concerns. This finding corroborates the informational roles that social networks play to compensate for institutions not fully effective in providing information.

Another emerging role of social networks is emotional and psychological support that they provide. The existence of various "topical *quan* (groups)" and "same age *quan* (groups)" where users can interact with one another suggest that there is a demand for social networks among people who are having similar experiences. The contents of the posts in these *quan* (groups) suggest that what people are seeking for might be connections and assurance by sharing experiences of struggles and challenges with other similarly situated people rather than an instrumental connection that can bring material benefits or physical access to healthcare services. Indeed, on *babytree* online groups there are posts and comments about challenges in getting sleep (while providing baby care), difficulty in eating during pregnancy, or relationship troubles with their partners. There are also other topical *quan* (groups) that offer emotional support. One example is a *quan* on "pregnancy preparation" titled "exchange pregnancy preparation experiences, wish for everyone to have successful pregnancy" for people who are attempting to be pregnant. Another example is a *quan* on "women's minds" titled "exchange emotions and state of mind, wish you a light in darkness and company in your dream." These examples suggest that social connections may also provide psychological support besides providing information. It also might be the case that these types of social networks fill in the gaps of the lack of personalized interaction with medical professionals. According to this study's interviews, the

medical professionals appear to focus on providing medical services without providing opportunities for women to ask questions, tailoring care services for their needs, or involving them in decision making processes. The interaction at healthcare service institutions are impersonalized and highly procedural. Under such contexts, social networks provide a space where patients can express their needs and emptions and approach their health in a more holistic manner.

Accordingly, the online social networks also play a role in improving doctor-patient interaction and information. The online social networks provide a space where women can ask questions to others with experiences of pregnancy and obtain information that is tailored to their needs. Women can inform themselves of prenatal exams, symptoms, coping methods with symptoms, and diet recommendation through their online social networks. They can even use their online social networks to interpret prenatal care exams. This results support the Social Connection Hypothesis (H1) that when there are institutional gaps in health care information and services, patients rely on social connections to fill in these gaps. The findings also suggest that social connections can provide psychological support beyond helping to cut the long queue and obtain information. As positive pregnancy experiences include “maternal self-esteem, competence and autonomy” (World Health Organization 2016b, 2), it is critical to go beyond basic access to standardized care and have a more holistic approach to prenatal care service access. Thus, effective institutions are the ones that provide sufficient information and personalized patient-doctor interaction so that the care services are responsive to women’s needs and built on respect for their competencies.

4.7 Cost as a Secondary Concern: No Insurance Reimbursements

Another potential gap that the interviews illuminate is a financial cost and lack of insurance use for prenatal care services, although these were not a primary concern for the participants. As discussed above, the grievances focused on wait time, crowding hospitals, and a lack of doctor-patient interaction when the participants were asked about their experiences and evaluation regarding prenatal care services and public health institutions. All the participants only mentioned the financial aspect of the care only when we specifically asked about the financial cost and insurance. Further, the cost of prenatal care services did not prevent any of the participants from seeking for the care. The primary institutional gap concerns "process" (such as wait time and interaction with doctors) rather than "cost."

The overall opinion about the cost of prenatal care services is that they are expensive. About a half of the participants said that prenatal care services were expensive. One participant said that "it is expensive, but it cannot be helped."[80] Another said "I feel it is expensive, but it is necessary."[81] This reflects the general sentiment that the prenatal care services are expensive, but it is a necessary investment so there is nothing they can do about it but to pay for them. The actual cost of prenatal care services varied across participants between 2000 and 20000 yuan (between 300 and 3000 USD). However, the most common range of cost was 5000-6000 yuan (800-900 USD). More than a half of the participants paid between 4000 and 7000 yuan (600-1000 USD). The intriguing cases are the discrepancy between the lowest and the highest cost: the several participants paid less than 3000 yuan and the several participants paid more than 10000 yuan.

[80] Interview: D2C1_7
[81] Interview: D3C1_2

A potential explanation for this discrepancy may be a use of insurance. China's government statistics suggest that over 90 percent of the population has some form of health insurance as of 2018 (National Bureau of Statistics of China 2019). However, among the interview participants, the insurances' reimbursement rate for prenatal care services was extremely low. More than a half of the respondents did not get any reimbursements for the prenatal care services they received. In fact, almost all the participants who spent more than 10000 yuan did not get any reimbursements from their insurance. On the other hand, most of the people who only paid less than 3000 yuan received reimbursements.

Different types of insurance have different coverage. There are three national health insurance schemes in China: the Urban Employee Basic Medical Insurance (UEBMI) for urban workers, Urban Resident Basic Medical Insurance (URBMI) for unemployed urban residents, and NCMS for rural residents (Y. Pan et al. 2016; Su et al. 2018). While the government started merging the rural and urban resident insurance since 2016 (Yip 2019), the reimbursement rates vary among the insurance schemes with the UEBMI (urban workers) having the highest rates and NCMS (rural residents) with the lowest rates (Y. Pan et al. 2016)[82]. Bogg, Wang, and Diwan (2002) find that employees in formal sectors with government or labor insurance had more use of prenatal care services than those participating in the cooperative medical scheme and those uninsured in rural China in 1995.

This variation in coverage may explain the variation in reimbursement rates among those who did receive reimbursements. For instance, one participant received a reimbursement of 7600 yuan from her work unit insurance (she works at a hospital). She said the maximum amount that

[82] The reimbursements also vary by different levels of hospitals (Y. Pan et al. 2016). The reimbursement rates are stable for UEBMI (urban workers) regardless of the levels of hospitals, whereas URBMI and NCMS have lower reimbursement rates for the upper level hospitals such as county and province hospitals compared to township hospitals (Y. Pan et al. 2016).

her insurance was going to cover was 8000 yuan.[83] Another public-sector employee said that she used a public insurance and had a reimbursement of about 2000-3000 yuan, costing her 2000 yuan out-of-pocket.[84] Another participant who is also a public-sector employee received a reimbursement of 4000-5000 yuan, costing her 3000 yuan out-of-pocket.[85] This indicates that the amount of reimbursements can vary from 2000 yuan to 8000 yuan.

Still, it does not explain the cases where there was no reimbursement. One possible explanation for these cases is a lack of awareness about the insurance package or how to use the insurance. For example, Long, Zhang, Hemminki, et al. (2010) found little impact of NCMS because people were not aware that they can get reimbursements for the prenatal care services they receive. If this was the case, the issue is an informational gap. However, several of our participants stated that they used the insurance but they did not get reimbursements.[86] These are cases where they have insurance, and they used the insurance but the insurance did not cover the prenatal care service costs. This study's interview data alone does not fully explain why some women received reimbursements (of varying amount) and some women did not receive any reimbursements within the same city. Therefore, future study can further delve into the workings of the public insurance system in prenatal care services. Still, the interviews indicate that the primary institutional gap lies in the process to prenatal care services as most grievances focus on overcrowding hospitals, long wait time, and short doctor interaction. The direct financial cost is not the only cost of health care services. If women need to wait half a day for their monthly or weekly doctor visits, it costs their time and time is money.

[83] Interview: D2C2_1
[84] Interview: D3C2_16
[85] Interview: D3C2_13
[86] Interview: D2C1_1, D2C1_6, D3C1_3, D3C2_8, D3C2_15

4.8 Chapter Discussion and Conclusion

The findings of this chapter suggest that an institutional gap is not only a presence or absence of access. In our study area, the institutional gaps were the long wait time and short doctor-patient interaction time. Although almost all of our interview participants had access to the standardized prenatal care services, the wait time and lack of consultation time still present obstacles to prenatal care access. A few participants could not gain access to prenatal care services at their preferred healthcare institutions due to the long wait time. The long wait time also negatively impacts overall experiences of prenatal care services and cost patients their time. The lack of doctor-patient interaction creates an informational gap where patients cannot obtain full information about their health and prenatal care services they receive. The paternalistic mode of doctor-patient interaction also leads to a lack of women's involvement in decision making processes and negatively impacts their pregnancy experiences. This is also an issue of quality of care that respects "maternal self-esteem, competence and autonomy" (World Health Organization 2016b, 2).

While this study focuses on prenatal care services, these institutional gaps are consistent with the issues of healthcare access in general. The existing studies find that the upper-tier hospitals are overcrowded because people prefer to pursue care at upper-tier hospitals (Hu et al. 2019; Jinghua Li et al. 2016; Y. Li et al. 2020). This is because people prefer to go to bigger and upper tier hospitals (Cheng et al. 2017; Jinghua Li et al. 2016; Yip et al. 2019; T. Zhang et al. 2017). The interview responses about hospital selections in this study also reflect this general sentiment that the higher ranked hospitals are better and more trustworthy. However, this has led to the long waiting time and short doctor consultation time among the upper-tier hospitals (Cheng et al. 2017; Hu et al. 2019; T. Zhang et al. 2017). The prevalence of these issues across

different hospitals also suggest that these are systemic issues that are beyond just a few high ranked hospitals, such as the issues of patient-to-doctor ratio, the number of upper-tier hospitals, and even modes of medical trainings that medical practitioners receive. This result also corroborates the findings from the previous chapter that perceived healthcare access is better in provinces with greater health institutional capacities, including human resources and infrastructure.

Under these circumstances, social connections play different roles, including making the access easier by cutting wait time, providing information, and psychological support. These roles are not mutually exclusive and a particular social connection can play multiple roles. Moreover, which roles social connections are more likely to play depends on a particular gap that exists in the institutional context. This study finds that interpersonal connections *guanxi* can help patients access prenatal care services by making it easier to see a doctor in face of the long wait time and overcrowding hospitals. Broader social connections such as friends, colleagues, and former classmates can fill in the gap of short doctor-patient interaction by providing relevant information about pregnancy and prenatal care services. This includes information necessary prior to visiting a doctor such as reputation of hospitals, prenatal care service availability, and prenatal care procedures, as well as information necessary after visiting a doctor such as how to interpret prenatal care exams and remaining questions about maternal health. Online social networks also play a similar function to provide information and a space where women can ask each other questions since they do not get opportunities to ask questions to their doctors. The findings are consistent with the previous studies' findings that social networks improve access to healthcare services by facilitating sharing of information needed to access services (Amoah, Edusei, and Amuzu 2018; Deri 2005; Devlin and Rudolph-Zbarsky 2014; Dong 2016;

Herberholz and Phuntsho 2018; Hou, Lin, and Zhang 2017; Lindström et al. 2006). The analyses of a popular online platform *babycare* also suggest that these social networks can provide psychological support, filling in the gap of impersonalized and highly procedural prenatal care service provisions.

The findings of this study also suggest that social connections do not disappear with institutional developments. They just play different functions and roles depending on institutional contexts. In the case of prenatal care services in urban China, there is basic access to standardized prenatal care services. Thus, social connections mostly play a role in providing information and psychological support. At the same time, the inter-personal connections also play a role when it comes to shortening the wait time. This presents more nuanced understandings of the interaction between institutions and social connections. While the previous chapter demonstrated that there is a negative correlation statistically between health institutional capacities and the use of interpersonal connections, this chapter's finding suggests that this does not mean that social connections become totally irrelevant under institutions with greater effectiveness. No institutions are perfect in providing full information and perfect services. Social connections persist and continue to play different roles under different institutional circumstances.

Lastly, the findings also suggest that one of the roles of education is to equip people with greater capacities to seek for and obtain information. While both the existing studies and previous chapter's analyses suggest that education has a positive correlation with healthcare access, the underlying mechanism remains unclear. Since out interview participants are mostly college educated, the results of this chapter suggest that one way education positively influence healthcare access is its role in equipping people to gain access to necessary information and

maneuver the bureaucratic hurdles associated with healthcare access. Understanding how the system works is critical to improving access. Since the doctors provide very little explanation and information about prenatal care, women need to seek for relevant information via in-person and online networks in order to gain a full control of their health and procedure of receiving prenatal care services. Higher levels of education can equip people to gain access to needed information and enhance their overall healthcare access.

Chapter 5: Conclusions and Implications

This chapter concludes the dissertation by discussing an answer to the research question and the hypotheses as well as summarizing the findings of the study and how the findings relate to the existing studies. I will also discuss contributions of the current study and implications of the study's findings. The chapter ends with a discussion of this study's limitations and directions for future research.

5.1 Conclusions

The existing studies suggest that informal institutions play a substitutive role when formal institutions are ineffective (Helmke and Levitsky 2004, 2006). Indeed, social connections and networks help people compensate for ineffective formal institutions (Lowndes 2004; Molyneux 2002; Narayan 2002; Rose 2000; Woolcock and Narayan 2000). Accordingly, when there are obstacles to health service access, social connections help people gain such access. The existing studies suggest that social networks improve access to healthcare services by facilitating sharing of information needed to access the services (Deri 2005; Devlin and Rudolph-Zbarsky 2014; Dong 2016; Hou, Lin, and Zhang 2017). This includes information on how the healthcare system works (Deri 2005; Devlin and Rudolph-Zbarsky 2014; Hou, Lin, and Zhang 2017), how to find healthcare providers (Deri 2005; Devlin and Rudolph-Zbarsky 2014; Dong 2016), and general health information (Amoah, Edusei, and Amuzu 2018; Dong 2016). In China, personal connections (*guanxi*) also help people access health services. It can provide information on which doctor to consult and direct access to a doctor, help maneuver bureaucratic hurdles (including skipping a long queue), and reduce a risk of physicians' profit-driven behaviors such as over-prescription and over-diagnosis (Zou et al. 2018). It also helps obtain more information

about the medical care and better quality care by encouraging the medical providers to provide more personal and dedicated care out of sentimental obligations (Fu and Chan 2016; D. Wu et al. 2017). Thus, social networks and connections help individuals navigate the medical bureaucracy and obtain information to gain greater access (Chan and Yao 2018; Deri 2005; Devlin and Rudolph-Zbarsky 2014; Hou, Lin, and Zhang 2017; D. Wu et al. 2017; Zou et al. 2018).

Therefore, this study examines the following question: When there is an efficient formal institution in place providing healthcare services, do people rely less on social networks and personal connections to access the services? This study hypothesizes that when there are institutional gaps in health care information and services, people are more likely to rely on social connections to fill in these gaps (H1: social connection hypothesis). On the other hand, when there are efficient institutions for health care such as more complete information and services, people are less likely to rely on social connections and networks (H2: institutional capacity hypothesis). This study examines these two hypotheses through statistical analyses of public opinion data and national statistics on health institutions as well as qualitative analyses and interviews on women's access to prenatal care services in China.

The statistical analyses in Chapter 3 find that people indeed rely less on social connections under effective formal institutions. Based on the analyses of the China Family Panel Studies 2010 data and China Health Statistical Yearbook 2010 data, this study finds that there was less likelihood of using personal connections (*guanxi*) to access health services in provinces with greater health institutional capacities. Greater health institutional capacities can mitigate the substitutive role of *guanxi* to access health services. This result supports the institutional capacity hypothesis (H2), and is also consistent with the existing literature that informal institutions do not play a substitutive role when formal institutions are effective (Helmke and Levitsky 2004,

2006). The analyses of the Chinese General Social Survey 2010 also find that the health institutional capacities have a positive influence on perceived healthcare access. Therefore, in provinces with greater health institutional capacities, people perceive that they can more easily access healthcare services, and they rely less on personal connections to access health services.

The findings also suggest that rural respondents are more likely to use personal connections because of weaker health institutional capacities in rural areas. This supports the social connections hypothesis (H1). The result is also consistent with the existing literature that *guanxi* plays a substitute role to fill in the gaps of inefficient formal institutions (D. Li et al. 2021; P. P. Li 2007; H. Wang 2000; P. Wang and Wang 2018; Zhan 2012). Overall, the results suggest that the role of *guanxi* depends on institutional contexts.

At the same time, the findings also suggest that social connections stay relevant and persist to play important roles even when the institutional capacities are greater. The qualitative analyses of the interview data in Chapter 4 provide a more nuanced understanding of roles of social connections and institutions in health service access. The interviews with women about their prenatal care service access indicate that most interviewees had access to standardized care services regardless of their use of social connections. This supports the institutional capacity hypothesis (H2). However, this does not signify a perfect institution or access. There were two institutional gaps: long wait time and short doctor-patient interaction time. These two institutional gaps undermine access to services and information. A long wait time prevents some from accessing their preferred providers and cost patients' time. The lack of doctor-patient interaction leads to patients' lack of full information and their involvement in making decisions on service provisions. While our interviews focus on prenatal care services, these institutional gaps are consistent with the issues of health system in general. The existing studies report the

issues of long wait time and short doctor consultation time that stem from the overcrowding hospitals (Cheng et al. 2017; Hu et al. 2019; T. Zhang et al. 2017).

The findings suggest that social connections function to fill in these particular institutional gaps. Interpersonal connections (*guanxi*) can facilitate prenatal care service access by making it easier to see a doctor in face of the long wait time and overcrowded hospitals. Broader social connections such as networks among friends, colleagues, and former classmates compensate for the lack of interaction with doctors by providing information about pregnancy and prenatal care services. Many of our interviewees also used online networks to fill in the informational gap. These results support the social connections hypothesis (H1), and are consistent with the existing studies' findings that social networks improve access to healthcare services by facilitating sharing of information (Deri 2005; Devlin and Rudolph-Zbarsky 2014; Dong 2016; Hou, Lin, and Zhang 2017).

No institutions are fully efficient in providing perfect information and services. Social connections continue to play different functions and roles under different institutional contexts. Indeed, the existing literature suggests that social connections can remain relevant and at high levels to complement the workings of formal institutions (Helmke and Levitsky 2004, 2006; Narayan 2002; Woolcock and Narayan 2000). Informal institutions can play a complementary or accommodating role to effective formal institutions (Helmke and Levitsky 2004). Therefore, this study argues that the reliance on or substitutive effect of connections to meet people's basic needs such as healthcare access can become mitigated when the formal institutions are more effective. However, this does not mean that social connections disappear or become irrelevant under effective formal institutions. They just play different roles depending on particular institutional gaps that exist. Under more effective institutions, social connections especially

function to provide information needed to better navigate the healthcare system. Social connections and formal institutions coexist together and complement each other to shape people's behaviors and access to public services.

5.2 Contributions

This study offers contributions to the existing studies on institutions by showing the conditioning effects of formal institutions on citizen behaviors. The degree of reliance on social connections depends on institutional contexts. The current study also contributes to the existing literature that studies interacting relations between formal and informal institutions by examining such interacting relations in regard to public service access. An effectiveness of formal public service institutions interacts with individuals' use of social connections to influence their access to public services and information.

Social connections help people to meet their needs under a variety of institutional contexts, but they also create unequal access to public services and information. Despite the benefits of social connections, this inequality is the main issue of using social connections in getting things done. People who have connections can gain better access and information than those who don't have the connections. The findings of this study point to the importance of examining structural and institutional source of such inequality. The existing studies tend to focus on demographics of individuals and the population as key factors influencing access to health care. This study contributes to the existing literature by focusing on the role of healthcare system (formal institution) in healthcare service access and information.

Additionally, this study's findings point to an importance of considering the impacts of unequal information on patients' experiences with the healthcare system. Those who have more

information to navigate the medical bureaucracy are more likely to have better access to their preferred health providers and services, and have better experiences with the healthcare system (by reducing the wait time, benefit more from doctor-patient interactions, and so on). Social connections can provide information that improves access and experiences with the healthcare system. However, there is an uneven level of social connections among people, leading to unequal access to information. This inequality in information in turn leads to unequal experiences with the healthcare system. This study's findings also suggest that when the health service institution becomes more effective, the roles of social connections shift from providing physical access to doctors to providing information about the health service process and system. The informational role of social connections is especially critical when the doctor-patient interaction is short and does not provide sufficient information or opportunities for patients to ask questions.

Lastly, this study also contributes to understanding healthcare access in a more holistic manner through the qualitative interviews. An issue of access is more than a simplistic dichotomy of a presence or absence of access. This study has paid attention to women's experiences with prenatal care services as a whole including the quality of care and interactions with doctors, and found that issues of access can manifest in different faucets of access such as long wait time and short consultation time. This point will be further discussed in the last section of this chapter.

5.3 Implications

This study offers implications for health service institutional developments in other countries and for other public service areas. While this study focuses on China, the findings have

general implications for other countries. Social connections can help people obtain necessary public services, but it also creates unequal access. An increased public service institutional capacity can improve general access and also mitigate an access disparity that stems from the use of social connections. This study also offers implications for other public service issue areas such as childcare, long-term care, public education, obtaining identity documents, and so on.

The findings of this study also have some general policy implications. For instance, when it comes to improving health service access, some public policy options include institutional development and community network development. The findings suggest that addressing structural and institutional determinants may be the first priority in improving access and reducing access disparities. Once the formal institutions provide as accessible, affordable, and equitable services as possible, then a community network development may function to facilitate information circulation that further aids healthcare access. There are also some implications for policies that aim to reduce informal ways to get things done (such as the use of connections to access public services). One option may be to crack down on them as a part of anti-corruption policies. Yet, the findings suggest that institutional development and institutionalization can mitigate such practices.

The findings also have implications for the ongoing health system reforms in China. While this study's interviews focused on prenatal care services, the identified issues (such as overcrowding hospitals, long wait time, and short doctor consultation time) may be wider systemic issues. According to the interview results, these issues were prevalent across different hospitals beyond just a few high ranked hospitals. This implies that there may be a systemic problem such as issues of patient-to-doctor ratio, the number of upper-tier hospitals, quality of lower-tier health institutions, and even modes of medical trainings that medical practitioners

receive. A high patient-to-doctor ratio and overcrowding upper-tier hospitals due to quality issues of primary care institutions can lead to a long wait time among the patients. When doctors need to see a large volume of patients, consultation time necessarily becomes shorter. When it comes to modes of doctor-patient interactions and norms of doctor paternalism, there is also a possibility that modes of medical trainings have an influence. There is always an inherent power imbalance and information asymmetry between doctors and patients. A paternalistic mode of doctor-patient relations can exacerbate such asymmetry and lead to limited roles of patients in informed decision makings. This may also be an issue beyond a particular country case.

Further, the study also offers implications for regime legitimacy that stems from public service provision and economic equality. The Chinese government's legitimacy and durability partly stems from public service provision and addressing the large economic inequality that emerged in the last few decades. Thus, health service access disparity if left unaddressed can pose a threat to the regime legitimacy. On the contrary, the continuous policy investment in improving health service access and reducing the disparity may aid the regime durability.

5.4 Limitations and Future Research

The current research also has some limitations, and these limitations shed lights on avenues for future research. First of all, while this study examines prenatal care services in Chapter 4, there are other health care issue areas that are not covered in the current study, such as general care, specialized care, chronic disease care, emergency care, mental health care, etc. The survey questions used in the statistical analyses in Chapter 3 only ask about medical care services in general and do not differentiate specific types of care. The question on the use of personal connections ask about "seeing a doctor," and the question on perceived healthcare

access asks about "medical care services" in general. The differences among specific types of health care services may be critical to levels of institutional capacities and use of social connections. Institutional capacities may be higher in some care services than others. A use of social connections might be more relevant for specialized care. The existing studies find that patients tend to use *guanxi* to access specialists (D. Wu et al. 2017; Zou et al. 2018). This suggests that people may only resort to *guanxi* for serious cases of healthcare services such as seeing a specialist, securing impatient beds, or going through a surgery. Therefore, future study can examine the levels of institutional capacities and use of social connections in different types of care.

Another limitation is the operationalization of the social connections variable in Chapter 3. The results of the statistical analyses in Chapter 3 find that the social connections variable does not have a statistically significant association with perceived healthcare access (see Section 3.4). One possibility behind this null result is because the survey questions asked about levels of general social support networks with friends, colleagues, and neighbors rather than healthcare-related support networks each respondent has. Indeed, the qualitative analyses in Chapter 4 suggest that social networks with friends and colleagues play a role to facilitate access by sharing relevant information. The interview questions used in Chapter 4 asked about the roles of these networks in the context of prenatal care access. It also may be the case that the informational roles these networks play may not manifest in a statistical correlation with perceived healthcare access. Nonetheless, asking about a use of social connections with friends and colleagues in healthcare access in particular may produce a different result in quantitative analyses, and warrant further examination.

A future research can also delve further into a conceptualization of "healthcare access" to consider different dimensions of access. The findings in Chapter 4 suggest that an issue of access is more than just a presence or absence of access to basic care services. In our interview site, the issues were long wait time and short doctor consultation time. Some studies suggest that there are multiple dimensions to healthcare access: availability, accommodation, accessibility, affordability, acceptability, approachability, and appropriateness (Levesque, Harris, and Russell 2013; Penchansky and Thomas 1981).[87] The definition of each concept is as follows: (1) availability: volume of physicians, facilities, and services, (2) accommodation: "appointment systems, hours of operation, walk-in facilities, telephone services," (3) accessibility: geographical proximity to services, (4) affordability: cost of services, (5) acceptability: patients' attitudes toward provider characteristics and providers' attitudes toward patient characteristics (e.g. gender, race, religion, social status) (Penchansky and Thomas 1981, 128-129), (6) approachability: transparency and information about existing services, and (7) appropriateness: quality of services (Levesque, Harris, and Russell 2013). Accordingly, a future research can examine how institutions and social connections impact these different dimensions of access differently.

Lastly, future research can also examine this study's research question and hypotheses in different locations and countries. For instance, our interviews focused on an urban city, and more interview studies can be done in other cities and villages. Similarly, while this study focuses on a case of China, the current study's research question and hypothesis can be examined in other

[87] Penchansky and Thomas (1981) suggested the first five concepts (from availability to acceptability) as the dimensions of access to healthcare services, and Levesque, Harris, and Russell (2013) add the latter two concepts (approachability and appropriateness).

country contexts. Future studies can also examine the interactive relations between formal institutions and social connections in other public service issue areas.

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