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Abstract
This research aims to examine the changes in the availability and accessibility of health care available to Chinese citizens over a nine year period. I use market transition theory as a framework for examining these changes. Market transition theory posits that as a government moves from a socialist system to a market-based economy, a new stratification order will emerge. Changes in the Chinese health care system are examined using 1991 and 2000 data from the China Health and Nutrition Survey. Using ordinary least-squares and logistic regression, I analyze differences in access and availability of health care between ethnic groups, rural and urban residents, and respondents of different income levels. Five variables are used to measure access and availability of health care. The results from this study indicate that there have been changes in the availability of medical care during the research time frame, providing some evidence for market transition theory.

Keywords
Sociology, Public and Social Welfare, Health Sciences, Public Health, Sociology, Organizational

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BY

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Bachelor of Arts, Shippensburg University 2006

THESIS

Submitted to the University of New Hampshire in Partial Fulfillment of the Requirements for the Degree of Master of Arts in Sociology

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ABSTRACT


by

Rachel A. Marks

University of New Hampshire, September 2007

This research aims to examine the changes in the availability and accessibility of health care available to Chinese citizens over a nine year period. I use market transition theory as a framework for examining these changes. Market transition theory posits that as a government moves from a socialist system to a market-based economy, a new stratification order will emerge. Changes in the Chinese health care system are examined using 1991 and 2000 data from the China Health and Nutrition Survey. Using ordinary least-squares and logistic regression, I analyze differences in access and availability of health care between ethnic groups, rural and urban residents, and respondents of different income levels. Five variables are used to measure access and availability of health care. The results from this study indicate that there have been changes in the availability of medical care during the research time frame, providing some evidence for market transition theory.
CHAPTER I

SPECIFIC AIMS

Sociological Relevance

Globalization refers to the process by which nations become financially and politically interdependent on each other (Deng and Moore 2004). Globalization can aid economic and political growth for countries, but it may also pose threats such as terrorism, weapons proliferation, and the spread of infectious diseases (Deng et al. 2004). China is the most populated country in the world with 1.3 billion citizens and an economy that is rapidly growing (Europa 2006). Over the past decade, China’s merchandise exports have increased by 19% (WHO 2006). In 2005, China exported 7% of the world’s merchandise and 3% of the world’s commercial services. China is the third highest exporter of merchandise and the ninth highest exporter of commercial services in the world (WHO 2006). China’s link with the rest of the world continues to strengthen as foreign investors remain interested in China (Starr 1997). Since 1975, China’s annual economic growth rate has increased by 7.6% to 9.5% with some periods of accelerated growth (Starr 1997 and Bloom and Shenglan 1999), while the average annual economic growth rate for developed countries is 1-1.9% (World Bank 2003). Figure 1 shows the annual gross domestic product (GDP) of China in constant yuan for the years following the Cultural Revolution (1975-2005).
Recent SARS and Avian Flu outbreaks (WHO 2006) and the increasing HIV/AIDS rate in China make the Chinese health care system a global interest. In order to prevent further SARS, Avian Flu, and HIV/AIDS outbreaks and the possibility of global pandemics that begin in China, the Chinese health care system should be studied by policy makers. As international travel increases due to globalization, world public health is becoming an important issue (Hu 2004). A traveler who unknowingly has a disease like SARS or the Avian Flu can pass it along to individuals on an airplane whose final destinations may be in a variety of places throughout the world. Contact between an infected flight passenger and other travelers who have various destinations could lead to outbreaks in various regions of the world (St. John, King, Jong, Bodie-Collins, Squires, and Tam 2005). In order to protect the health of people throughout the
entire world, researchers and policy makers must make sure that health care systems of major world players are fully prepared for disease outbreaks.

**Hypotheses**

My research aims to explore the changes in the distribution of health care after China's economic reforms between the years of 1991 and 2000 using panel data from The China Health and Nutrition Survey. After the death of Chairman Mao in 1979, the Chinese Communist party began to lose influence in China and a market-based economy began to emerge that continues to grow today (Starr 1997). As a result of the emergence of a market-based economy, economic reforms have been implemented to allow more foreign investors access to the Chinese economy and to privatize formerly public, state-owned businesses, including hospitals and health clinics (Liu 1983, Shi 1996, Guitierrez, Mizota, and Yasuyuki 2003, Bloom and Tang 2004, and Blumenthal and Hsiao 2005).

While previous literature has focused on changes in the Chinese social structure immediately following the Cultural Revolution, my research examines the changes in the social structure in more recent years. Specifically, my research will attempt to answer the following four questions about changes in the distribution of health care as economic transition occurs in China:

1. Does economic reform lead to variations in health care costs to individuals in different income groups?
2. Does economic reform lead to differences in the availability of health care in rural and urban areas?
3. Does economic reform lead to a differential distribution of

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incidence of disease between marginalized and majority groups?

4. Does economic reform lead to the marginalization of ethnic minority groups by the health care system?

The purpose of my research is to examine the distribution of health care in China and to examine the applicability of market transition theory to specific social organizations, in my study, health care systems.
CHAPTER II

THEORETICAL RATIONALE

Market Transition Theory

Institutional theories are integral parts of sociology and were used by influential such as Max Weber (Nee and Cao 1999). Institutional theories attempt to explain how different types of social institutions influence everyday social interactions between groups of people. Institutional theories hold that "institutions shape the structure of incentives and thereby establish the constraints within which rational actors identify and pursue their interests" (Nee 1996:909). One specific institutional theory is market transition theory. Market transition theorists maintain that when societies transition from a socialist economy to a capitalist economy, changes within the society's stratification order will occur, which can be seen through the distribution of rewards (Nee 1996). Researchers have used market transition theory to build on institutional theories in attempts to describe how changes in economic systems affect social structures (Nee 1996).

Market transition theory posits that as the control over resources moves from a centralized authority based on politics (socialism or communism) to decentralized market institutions (capitalism), a change in the distribution of rewards and opportunities will result leading to changes in the stratification order (Nee 1996, Zhou 2000, Cao and Nee 2000, and Nee et al. 1999). In other words, market transition theory maintains that the changes in the stratification order in post-socialist countries are largely due to the development of a
capitalist economy (Cao et al. 2000). Although greater regards are granted to those who possess political power, socialist economies are described as redistributive because the rewards are generally evenly distributed (Nee 1996). As the influence of a socialist government decreases, the position one holds within the government bureaucracy becomes less important, and the position one holds within the economic sector becomes more important for receiving financial rewards (Wu 2002).

Market transition theory postulates that there are three main institutional mechanisms that lead to a change in the stratification order that result from the transition from a socialist economy to a capitalist economy: (1) expanding the private economic sector creates new opportunities that are governed by market forces rather than the state, (2) the emergence of a capitalist economy creates an emphasis on skills and services of employees rather than political connections, and (3) reward distribution within businesses changes in favor of skills and services as the market grows (Cao et al. 2000).

Market transition theory focuses on the role an emerging capitalist economy plays in changing the social structure in a society. In market transition theory the stratification system is expected to be shaped by the market rather than by politics (Nee 1996). After market transition occurs, a decrease in inequality is initially expected to occur because individuals begin to be rewarded based on their human capital, or their skills sets and labor. However, as a market-based economy leads individuals to acquire higher incomes, the division between those with high and low incomes increases, thereby increasing inequalities (Gerber and Hout 1998 and Wu 2002).
Support for Market Transition Theory

Multiple studies have conducted to examine market transition theories, and researchers have found some support for market transition theory (Verhoeven, Jansen, and Dessen 2005 and Nee 1991). Results from studies examining market transition theory have revealed that in the years immediately following market transition, gender inequality, income inequality, and the unequal rewards for those in political power have decreased. Researchers hypothesize that the decline of unequal rewards based on political power gives rise to new opportunities for women and the poor to participate in the market (Verhoeven et al. 2005). Additionally, Nee (1991) found that under only partial reform, political power remained the primary determinant of reward distribution.

When Wu (2002) examined the market transition effects on government work units in China, he found some support for market transition theory. He found that although redistributive power of political figures decreased during the transition, returns on human capital did not increase. Wu (2002) concluded that market transition theory may be limited to explaining changes in inequalities in the private economic sector.

Criticisms of Market Transition Theory

Critics of market transition theory argue that the process of social change is more complicated than market transition theory maintains (Zhou 2000). Critics also argue that there is a lack of empirical evidence to support market transition theory. Critics argue that the evidence that does exist is inadequate for studying changes over time because research only utilizes cross-sectional data rather than longitudinal data (Zhou 2000). Opponents of market transition theory argue that forces such as the underlying control of
political powers in institutions and community constraints, lead to changes in the stratification order rather than market transition (Nee et al. 1999). Market transition theory posits that the greatest predictor of changes in the stratification order is the transition from a socialist economy to a capitalist economy (Nee et al. 1999).

Gerber and Hout (1998) examined market transition theory using employment, earnings, and income data collected during the beginning of market reform in Russia between 1991 and 1995. The researchers found that market transition in Russia rewarded authoritative power within the economic sector rather than just one's merit and personal abilities, referred to hereafter as human capital. Further, Gerber and Hout (1998) found that human capital actually decreased in importance as a determinant of income after the market transition. Gerber and Hout (1998) concluded that large income disparities emerged in the immediate years after the reform. Market transition theorists would expect income disparities to decrease immediately following economic reform; however, the opposite occurred in Russia. Thus, market transition theory was not supported by Gerber and Hout's (1998) study.

**Market Transition Theory and the Chinese Health Care System**

From studying market transition theory, I would expect that in China as both political and economic transition continues, inequality in the distribution of rewards would result. Rewards may include access to health care, higher income, political representation, and equal opportunities. In my study, I expect to find the distribution of health care rewards to become more unequally distributed as marketization increases between 1991 and 2000.
CHAPTER III

CHINA'S HEALTH CARE SYSTEM

Historical Background

The Chinese health care system has changed greatly since 1949 when Chairman Mao and the Communist Party gained control over China and named it The People's Republic (Dong, Hoven, and Rosenfield 2005). Prior to the Communist party, the Chinese health care system was highly decentralized and disease was widespread (Akin, Dow, and Lance 2003 and Chen 1961). Mao and his party recognized these issues and set out to dramatically improve the system, particularly for China's peasants (Akin et al. 2003). To improve the health care system, China implemented a system that mimicked the Soviet Union's socialist health care system (Blumenthal and Hsiao 2005). Under Mao, the government created an efficient health care system that focused on preventative and communal health care (Blumenthal et al. 2005). Under Mao's rule, the government owned, operated, and funded all hospitals and clinics in both urban and rural areas (Blumenthal et al. 2005). From 1949 to 1982, the Chinese health care system was highly centralized and increased the overall health of the population; life expectancy increased from 35 years to 68 years, and the infant mortality rate fell from 200 per 1000 live births to 34 per 1000 live births during Mao's rule (Anderson 1992, Liu, Hsiao, and Eggleston 1999, Guitierrez, Mizota, and Yasuyuki 2003, Blumenthal et al. 2005 and Dong, et al. 2005). Furthermore, infectious diseases were replaced by chronic diseases as the leading causes of death (Anderson 1992, Liu et al. 1999, Guitierrez et al. 2003).

**China Today**

**Health care infrastructure**

Today the Chinese care system remains highly decentralized. In 2002, China established the Center for Disease Prevention and Control (Chinese CDC) to help regulate potential public health epidemics including SARS and AIDS (Liu 2004). Since its creation, however, the Chinese CDC has been unwilling to share information with other Chinese health agencies, which has created challenges in improving health care for Chinese public health officials and policy makers (Liu 2004). The administrative powers in the Chinese health system include the Ministry of Health and thirty separate provincial authorities that have little communication with each other and with the Chinese CDC (Jackson, Sleigh, Peng, and Xi-Li 2005). Other departments that play roles in the health care system are the State Development Planning Commission that oversees the creation and implementation of health plans, the Ministry of Finance that sets the annual budget, the Ministry of Labor and Social Security that controls urban health insurance, the Ministry of Civil Affairs
that insures emergency health care for the poor, the State Drug Management and Monitoring Bureau that ensures drug availability and safety, and the Price Bureau that sets the prices for routine health care procedures (Bloom et al. 2004).

Under the Ministry of Health, the Chinese health care system is divided into Epidemic Prevention Stations (EPS's) that are managed at the city, county, and provincial levels. The EPS's with the highest levels of authority report to the Ministry of Health and are supposed to guide the EPS's with lower levels of authority on health policy and system management in efforts to initiate and continue public health programs. The EPS's with the highest levels of authority are also supposed to collect reports on the success of the EPS's with lower levels of authority. The influence of the higher level EPS's on the lower level EPS's has been a subject of debate, as many critics argue that these stations actually have little influence over the communities in which they are located (Liu 2004). Recent discussion among Chinese health officials has led to the initiation of a new national multimillion dollar disease prevention and control system that will coordinate more with the Ministry of Health and other health agencies (APBN 2004). The new system aims to improve communication between health care administrators and improve health care for Chinese citizens (APBN 2004).

**Rural facilities.** In the rural areas, patients must first go to the village clinic for treatment. The doctor at the village clinic is usually a “barefoot doctor,” a community member who has volunteered to be the community “doctor” and has undergone a few months of basic medical training (Liu 1983, Liu et al. 1999, and Anderson 1992). From the village clinic, patients may then be referred to the township health center, and from there they may be referred to a...
country hospital if further treatment is deemed necessary.

**Urban facilities.** In urban areas, patients first visit the primary care or barefoot doctor (community “doctor”) at the local clinic. If their condition warrants it, the patient can then be referred to the county or regional hospital. If the patient still requires treatment after seeking care at a county or regional hospital, he or she may then go to a specialized treatment center located at an academic hospital (Coyne et al. 2002 and Jackson et al. 2005). The majority of hospitals with the newest medical technologies and most well-trained doctors are located in urban areas (Dong et al. 2005) and attract both urban and rural patients despite long travel distances (Henderson and Myron 1982). Because of the lack of privatization that has occurred in rural areas, doctors are fleeing these areas to seek higher profits in urban areas (Dong et al. 2005).

**Financing in the Public and Private Sectors**

The Chinese health care system is funded primarily through patients paying out-of-pocket fees for services and for prescription drugs (Coyne, Hou, Short, Zhe, and Wu 2002). The financial burden of administering a health care system has fallen onto local communities since the decentralization of the Chinese economy (Liu 2004). Ninety-five percent of Chinese health care facilities are public facilities. The government regulates the prices of basic care and services at public facilities, but it does not regulate prices for extra services and prescription drugs (Gu and Zhang 2006). The government subsidizes public facilities with 15% of the cost of operations. The government subsidy is not enough to support the public hospitals, and it forces public facilities to increase prices of their services to remain open (Jackson et al. 2005).
Government funding. Although China’s GDP has grown at nearly 9.5% per year since the late 1970’s (Bloom et al. 1999 and Liu et al. 1999), China’s funding for health care decreased from 32% in 1979 to 15% in 1999 (Blumenthal et al. 2005). In 2000, the World Health Organization ranked China 188 out of 191 countries for “fairness of financial contribution” in spending relative to gross domestic product for health care (Dong et al. 2005). In 2001 China spent $18 per citizen per year on health care. Other nations with similar personal incomes spend more per citizen on health care than China: Argentina spent $679 per citizen, Chile spent $303 per person, Brazil spent $222 per person, Cuba spent $185 per person, and Malaysia spent $77 per person. These examples illustrate that China’s health care spending is considerably less than other nations that are in similar economic situations (Dong et al. 2005).

Insuring health care throughout China. The insurance system in China is complicated as there are different systems in rural and urban areas and neither system is efficient (Akin et al. 2003). In the 1970’s, national insurance was available to almost all of China’s citizens through the government; 90% of those living in urban areas and 85% of those living in rural areas had insurance (Liu et al. 1999 and Akin et al. 2003). However, after the Cultural Revolution, the socialist health care system and its national insurance program slowly began to break down. Insurance coverage dramatically decreased after the reforms; in 1999 29% of all Chinese have health insurance (Liu et al. 1999 and Blumenthal et al. 2005). In 1999, 49% of China’s urban population was covered by health insurance and 7% of the rural population was covered by health insurance (Dong et al. 2005). The remainder of the Chinese population must pay out-of-pocket for their health care services, which is becoming
increasingly problematic as health care prices rise (Gao, Tang, Tohurst, and Rao 2001). A national health survey in 1993 found that approximately 60% of rural patients and 40% of urban patients refused medical services because they were unable to pay (Liu et al 1999 and Gao et al. 2001).

Insurance schemes in urban areas. Urban Chinese residents are more likely than their rural counterparts to be covered by health care insurance because of a 1998 reform mandated by the Department of Labor and Social Security. The reform, titled "The Basic Health Insurance Scheme (HIS)," required employers of both private and state owned businesses to offer workers some form of medical insurance. The HIS reform was based on the already existing Government Insurance Scheme of 1949 (GIS), which provided insurance for government employees, and the Labor Insurance Scheme of 1951 (LIS), which provided insurance for employees of state owned and privately owned enterprises. The HIS is offered by employers rather than by the government (Bloom et al. 2004 and Guittierrez et al. 2004). The number of urban business employees covered by insurance remains low because many employers refuse to comply, and the HIS is not strictly enforced by the government (Dong et al. 2005, Gu et al. 2006, and Gu 2001).

The Basic Health Insurance Scheme includes three types of insurance: basic coverage, supplementary insurance, and commercial insurance. Basic coverage is what the government mandates employers to provide to their employees, supplemental insurance is available to wealthier citizens who can purchase additional coverage through their companies, and commercial insurance is additional insurance that is purchased by an individual directly from an insurance agency or purchased by an employer group (Coyne 2002). Basic insurance is funded by employees' and employers' contributions to the
system. Each employee contributes 2% of his or her total yearly salary to the system, and the employer contributes 6% of its total payroll to the system. The contributions then get separated into a social pooling fund and individual medical accounts that creates a partially socialist and partially individual health care system. The social-pooling fund is utilized when a person has exhausted his or her personal medical account and has paid out-of-pocket fees for medical services equivalent to 5% of his or her annual salary (Bloom et al. 2004, Gu et al. 2006 and Rosner 2004). The HIS does not insure dependents of the employees and co-payments are required for services but ceilings cap individual payments (Bloom et al. 2004). Despite the HIS, insurance benefits and reimbursements for health care services are minimal for most urban residents (Hu 2004 and Gao et al. 2001).

Insurance schemes in rural areas. In rural areas, the Chinese government has recently experimented with various insurance schemes to increase coverage among rural citizens (Akin et al. 2003, Jackson et al. 2005). In 1994, the Chinese government began testing various Rural Cooperative Medical Systems (RCMS's) to improve the quality and availability of health care in rural areas (Jackson et al. 2005 and Carrin, Ron, Hui, hong, Tuohong, Lucheng, Shuo, Yide, Jiaying, Qicheng, Zhaoyang, Jun, and Xuesheng 1999). The Rural Cooperative Medical Systems are similar to health insurance systems, but they are managed by villages and townships. Rural cooperatives collect money from households, government subsidies, and contributions from local businesses through both taxes and fees to fund a communal health care fund; the taxes and fees collected are generally kept low for the citizens (Bloom et al. 1999). The collected funds help cover the costs of treatment, preventative health measures, and administrative costs (Carrin et al. 1999). The benefits of
the RCMS vary by individual community; some cover all health care services while others only cover outpatient services. Reimbursement rates and co-payments for services range from 15% to 50% (Bloom et al. 1999). Although China has been experimenting with different versions of RCMS's, none have been overwhelmingly successful because of poor management, lack of government regulation, and citizens' distrust of the system (Bloom et al. 1999 and Hu 2004).

Public Health. Some differences have been found in quality of health care between rural and urban health care facilities (Meng et al. 2000). One study defined quality of care as the amount of education of the health care workers, amount of medical equipment, working conditions, and clinical supervisors' evaluations. Results from research indicate that quality of care was lower in rural areas because treatment providers were less educated than government requirements (Meng 2000). Other researchers have also found that experienced and trained health care providers have migrated to urban areas in recent years (Bloom et al. 1999).

Although the Chinese health care system is complex, it has helped increase the amount of health care available to the Chinese population. In 1985 there were only 3.4 million health professionals, but in 2001 that number had increased to 5.5 million. The amount of hospital beds also increased from 1985 to 2001; in 1985 there were 2.4 million hospital beds, and in 2001 there were 3.2 million hospital beds (Liu 2004). More advanced health care is now accessible in many parts of China, but that care is not equally available to all Chinese citizens (Liu 2004).
CHAPTER IV

STRATIFICATION IN CHINA

China's long and rich history has played an important role in shaping its current social structure. China is composed of many different ethnic groups and has a wide range of income levels (Bian 2002). Both ethnicity and income level may have important implications for the health outcomes of Chinese citizens.

**Ethnic Groups in China**

China is made up of fifty-five officially recognized minority groups that make up 9% of the population. Minority citizens total over 110 million people (Sautman 1999 and Fuller, Morrison, Murphy, and Ridgley 2002). The two largest Chinese minority groups are the Zhaung, who make up 1.3% of the population, and the Manchu, who make up 0.86% of China’s total population (Europa World Yearbook 2006). The remaining 91% of China’s population is Han Chinese, a group that identifies with the Chinese of the Han Dynasty: 202 BC - 220 AD (Rowena and Spickard 1994, Fuller et al. 2002 and Europa World Yearbook 2006). The Chinese minority groups differ among each other and with the Han Chinese. Each ethnic group has its own language, culture, and region it occupies (Hannum and Xie 2006). Chinese minorities make up a small percentage of the population, but Chinese minorities occupy nearly 60% of China’s land, although much of this land is uninhabitable and unusable (Fuller et al. 2002).
Autonomous Regions

Since China's transition to a more decentralized government, disparities in occupational attainment, education, and income between ethnic minorities and the majority Chinese Han has grown (Sautman 1999 and Hannum et al. 2006). China has a long history of persecuting, arresting, and engaging in violent conflicts with Chinese ethnic minorities. In recent years, the Chinese government has made efforts to reduce discrimination against Chinese ethnic minorities (Fuller et al. 2002). As of 1997, 44 of the 55 ethnic minority groups had their own autonomous regions. Chinese ethnic minority groups living in these regions were granted protections and rights that were not offered to minorities living outside of their respective autonomous regions (Fuller et al. 2002).

Ethnic Laws

China's "ethnic laws" have been put in place to help decrease the socioeconomic disparities that exist between Chinese ethnic minorities and the Chinese Han majority (Sautman 1995). The major goals of the ethnic laws are to reverse the traditional patterns of minority group marginalization and to create a minority elite group that is an integral part of the political process (Sautman 1999). One way in which the ethnic laws increase the rights of ethnic minorities is by giving minorities preferential treatment in admissions to higher education. Preferential treatment in education is problematic in that ethnic minorities rarely complete primary and secondary schools and therefore do not have the opportunity to apply for admissions to institutions of higher education (Hannum 2006, Fuller et al. 2002, and Sautman 1999).
Attitudes Toward Minorities

In a study conducted in 1994 (Rowena et al.), the attitudes of Han Chinese toward fourteen ethnic minority groups were examined. The researchers administered a survey to 169 Han undergraduate students at a large urban university. The survey measured perceived social distance and images of non-Han Chinese using the Bogardus Social Distance Scale. The study results indicate that Han Chinese see themselves as being closer to other Han Chinese than to Chinese ethnic minorities; the surveyed students did not regard ethnic minorities as marriageable and described some of the groups as “primitive” and “barbaric” (Rowea et al. 1994).

Income Distribution in China

Since the death of Chairman Mao in 1976, a class system has developed in China as the economy has expanded (Bian 2002). China’s economy grew from being one of the poorest in the world in 1978 to the seventh largest economy in the world in 2000 (Bian 2002). Per capita income increased by 4.7 times in rural areas and 3.6 times in urban areas (Bian 2002). However, China also has one of the largest income disparities of all countries in the world with large groups of wealthy Chinese and larger groups of Chinese peasants (Yang 1999).

Increase in Industry

China’s economy has rapidly grown in the past three decades, resulting in large income disparities between regions in coastal and inland China (Ying 1999, Lin, Wang, and Zhou 2004, and Li 2006). Incomes in the coastal regions have increased the most rapidly as foreign investors have moved into these
areas forcing low-profiting, state-owned businesses to cease operations (Ying 1999). Foreign investments and economic growth in coastal regions has been due to China's reform policies that encourage the development of heavy-industry, which is typically controlled by foreign investors (Yang 1999). Due in part to new foreign investments in some regions, regional income disparities significantly grew between 1985 and 2000, especially between rural and urban areas in addition to the already existing coastal and inland income disparities (Lin et al. 2004).

The Middle Class

Nearly 50% of Chinese citizens consider themselves middle class, although the middle class has expanded since the death of Chairman Mao, it has not expanded to this extent (Li 2006). China's middle class has been consistently increasing by 1% every year since 1999. The Chinese population is composed of 1% capitalists or upper class, 12% middle class, 18% floating population or those with no permanent residence and employment, 17% working class, and the remaining 50% of Chinese are part of the peasantry (Bian 2002).

China's middle class has been referred to as the "silent class" because they do not uniformly respond to government policies that adversely affect their interests (Li 2006). Some contribute to the silence of the middle class because of a lack of uniform culture or political values within the class (Li 2006). Typically, those who are members of the middle class fall into one of five occupational categories: (1) scientific development entrepreneurs, (2) managerial staff in foreign businesses, (3) midlevel managerial staff in public financial institutions, (4) professional, specialized technicians, and (5) self-
employed private entrepreneurs. These five occupational categories only exist in urban areas as occupations in rural areas are primarily in the agricultural sector (Li 2006).

Despite the attempts of the Chinese government to create policies to reduce income disparities, the disparities remain stable (Yang 1999). Urban residents have access to welfare programs which rural dwellers do not (Sautman 1999 and Yang 1999). Rural dwellers are also rarely granted government permission to move to urban areas which prevents them from earning higher incomes (Yang 1999). Although the middle class has expanded since the economic reforms of the late 1970’s, the growth has primarily occurred in urban areas (Lin et al. 2004).

Hypotheses

Market transition theory suggests that as an economy shifts from a redistributive economy to a market-based economy, a new stratification order will emerge (Nee 1996 and Zhou 2000). Market transition theory is based on the idea that inequalities will emerge as individuals can earn profits and thus purchase luxuries and high quality services that they were not able to do in a redistributive economy. Transition to a market-based economy may lead to inequalities in the social system because rewards are now based on market forces rather than state governing (Cao et al. 2000). Findings from multiple studies indicate that the Chinese health care system has already been affected by market transition (Akin et al. 2003, Dong et al. 2005, and Liu et al. 1999). Health care facilities now receive decreased government funding, patients pay prices for services, and doctors are moving from rural areas to urban areas to earn higher profits (Akin et al. 2003, Dong et al. 2005, and Liu et al. 1999).

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Based on market transition theory and research exploring Chinese health care system, I expect to find inequalities in the access and distribution of health care to increase in 2000 compared to 1991. Specifically, I will examine the following four hypotheses:

Hypothesis #1: As market transition occurs, those with high incomes will have more health insurance coverage than those with low incomes.

Hypothesis #2: As market transition occurs, ethnic minority groups will have less insurance coverage compared to the Chinese Han.

Hypothesis #3: As market transition occurs, access to health care facilities in rural areas will decrease, as proxied by travel time and travel cost to health care facilities.

Hypothesis #4a: As market transition occurs, those who identify as ethnic minorities will have higher incidences of illnesses compared to the Chinese Han majority.

Hypothesis #4b: As market transition occurs, rural residents will have higher incidences of illnesses compared to urban residents.

Hypothesis #4c: As market transition occurs, those who have low incomes will have higher incidences of illnesses compared to those who have high incomes.
CHAPTER V

METHODOLOGY

Data

The China Health and Nutrition Survey (CHNS) is a longitudinal panel study conducted by the Carolina Population Center at the University of North Carolina at Chapel Hill in conjunction with the National Institute of Nutrition and Food Safety, and the Chinese Center for Disease Control and Prevention with the support of the Chinese Ministry of Health. The CHNS was conducted in 1989, 1991, 1993, 1997, 2000, and 2004 by an international team of researchers from a broad range of disciplines including sociology, economics, nutrition, and public health. The data were collected through face-to-face interviews over three consecutive days by researchers in the homes of the survey participants.

Design

The purpose of the China Health and Nutrition Survey was to gather information on how various social policies that have been implemented by the Chinese government have affected health, nutrition, and family structure. The survey is composed of two main parts: the household survey and the community survey. For my research, the household survey will be utilized. The household survey has six major sections: the Household Roster, Demographics, Work Activities and Income, Other Income and Expenses, Drinking Water, Sanitation, and Assets, and Accessibility of Health Care. For
my research, Demographics and Accessibility of Health Care will predominantly be used. Additionally, survey researchers have created a variable of "constructed income" for each year using variables from the sections Work Activities and Income and Other Income and Expenses that will be used in my research.

**Survey Population**

The CHNS was conducted in nine Chinese provinces: Liaoning, Hubei, Heilongjiang, Hunan, Jiangsu, Guangxi, Shandong, Guizhou, and Henan. These provinces are in the eastern part of China, and each province is composed of both rural and urban areas and has variations in its socioeconomic composition (UNC Population Center 2006).

**Survey Sample**

To gather the sample, a multistage random cluster process was used that stratified income and weighted income to choose four counties in each province for sampling. The capital city and a lower income city were also chosen from each province to sample. Villages and townships were then randomly sampled, and then households in these villages and townships were randomly selected. The 1991 survey included 14,778 individuals from 3,616 households, and the 2000 CHNS is composed of 15,648 individuals from 4,403 households. The increase in participants in 1991 and 2000 is due to adding new households and new communities to replace those that were no longer participating in the study (UNC Population Center 2006).

To make the data more useful and manageable, I have dropped all observations that were not those of the heads of households and their
spouses because these respondents do not typically handle household health care issues. Eliminating these observations reduces the sample size to 7,698 participants in 1991 and 8,255 participants in 2000. Therefore, the findings from my research may not be applicable to children and dependent elderly members of society.

Data Problems

The most concerning issue with the data from the CHNS is that it is not very conducive to longitudinal analysis. Because of the way the variable identification system has been implemented in the data, survey data collected in 1997, 2000, and 2004 are not appropriate for longitudinal analysis. A new participant identification system was implemented on the previous survey years after they were completed in 1989, 1991, and 1993 that makes merging the data with newer data difficult. The data for 1997, 2000, and 2004 has a different identification system than previous years, which makes longitudinal analysis inappropriate (UNC Population Center 2006).

The CHNS data also makes longitudinal analysis difficult because there are frequent changes to the survey questions each year. Each year's survey words questions differently than in previous years, new variables are added, and old variables are removed. These differences between the survey years make longitudinal analyses inappropriate for many variables. There is also a large amount of missing data, particularly in the 2000 survey.

Another problematic issue with data from the CHNS is that it is self-reported, which means there is no way of knowing how valid these responses are (Xie and Dow 2005). As noted earlier, a major problem with panel studies are the dropout rates of participants even though new households were added.
in the CHNS (Henderson, Akin, Hutchinson, Jin, Wang, Dietrich, and Mao 1998). Finally, when analyzing the data, it is important to note that the sample is not representative of China as a whole, though it does attempt to cover a wide variety of socioeconomic and geographic characteristics.

I will conduct my study by comparing two sets of panel data from 1991 and 2000 using ordinary least-squares regression and logistic regression for my statistical analyses. Used together, these two statistical techniques will give an overall picture of the change in health care distribution among different groups of people over time. To analyze data collected from the CHNS, I will be using Stata 9 for Macintosh OS X.

**Dependent Variables**

In this section I discuss the measures from the CHNS I use to proxy for health care access, health status, and insurance coverage.

**Health Insurance Coverage**

Health care coverage is proxied by two variables, health insurance and out-of-pocket fees for health care services. The first measure will be insurance coverage. To measure insurance coverage, respondents were asked whether or not they had health insurance. There responses were coded one for yes and zero for no.

The second measure of health care coverage is a measure of the total of out-of-pocket fees respondents must pay for both inpatient and outpatient medical services when seeking medical treatment in 1991 and 2000. Respondents were asked what percentage of the total cost of inpatient medical services was covered by health insurance. Respondents were then asked
what percentage of the total cost of outpatient fees was covered by their health insurance. I reverse coded my two variables by subtracting the percentage of total costs covered by health insurance from 100% to construct two variables of out-of-pocket fees for health care services. A new additive variable was then constructed combining my two reverse coded variables to create a variable of the total percentage of out-of-pocket fees incurred for health care services.

**Health Care Access**

I use travel time and travel cost to proxy an individual’s access to health care service. In the CHNS, the question “if you were ill and needed to seek treatment at a health care facility, how long would it take you to travel to this facility” is open-ended, and respondents’ answers are recorded in minutes. The second proxy for health care access is travel cost. Respondents were asked, “how much does it cost to travel to this facility?” which was also an open-ended question, and cost is measured in yuans. Although I am using travel cost to measure access to health care, it could also be viewed as measure of health care service utilization. Respondents who reported low travel times and low travel costs may not be utilizing the services as much as those respondents who reported higher travel times and higher travel costs rather than meaning they have greater access to health care services.

However, I will assume for my research that low travel times and low travel costs to health care facilities means greater access to health care.

**Health Status**

Health status is proxied by incidence of illness or injury reported within the past four weeks in 1991 and 2000. The CHNS asks if participants have
been ill or injured in the four weeks prior to the survey and the severity of the ailment. The health status variable was dummy-coded; those who reported having a recent illness or injury were coded as a one, and those who did not report a recent illness or injury were coded as zero.

**Independent Variables**

**Personal Income**

The data sets for each year of the CHNS include a measure of personal income for each respondent. The personal income measure is a composite of total income, including salaries and wages, government subsidies for a range of needs, handicraft items sold, produce and animal products sold, any rental properties, money gifts received, and monetary bonuses. Because personal income was negatively skewed, I have taken the logarithm of per capita income to use in my analysis to yield more interpretable results (Hamilton 1991).

**Ethnicity**

Because of the small proportion of each ethnic group, all minorities have been categorized together as “other.” The variable for ethnicity was dummy-coded; ones represented the Chinese Han majority and zeros represented Chinese minority groups.

**Region**

The region variable was also dummy-coded. For the region variable, respondents living in rural regions were coded as ones and respondents living in urban areas were coded as zeros.
Control Variables

Gender

The variable sex was dummy-coded as one for female and zero for male.

Age

Respondents were asked in which year they were born. For 2000, the variable age was constructed by finding the difference in years between the survey year and respondents’ years of birth. For 1991, the variable age was constructed using the variable from 1989 that specifically asked for respondents’ ages and then adding two years to each respondent’s reported age in 1989.

Marital Status

The variable for marital status was dummy-coded as one for married and zero for other. Because divorce and other nontraditional marital statuses are not common in China (Shu 2005 and WINN 1991), there were less than 10% of respondents who identified as unmarried. The category of “other” included widowed, divorced, separated, and never married.

Educational Attainment

The category of education originally included seven categories, but I have collapsed the seven categories into five categories. The first category is no education, and the second category is primary school. The third category, middle school, originally was broken down into lower middle school and upper
middle school. The fourth category is technical or vocational school. The fifth category is college or higher, which was collapsed from two previous categories of college and graduate education.

**Occupational Field**

The variable occupation originally was composed of thirteen categories. For my analysis, the thirteen categories have been collapsed to create six occupational categories. The category of "Professional" includes senior professionals, junior professionals, executives, and administrators. The category of "Service" includes general service workers, office staff, and drivers. The "Agriculture" category includes farmers, fisherman, and hunters. The "Skilled" category includes skilled craftsmen and the "Unskilled" category includes ordinary laborers in different industries. The category of "Other" includes members of the army or police force, actors, musicians, athletes, and any other occupations not listed as an option in the survey.
CHAPTER VI

RESULTS

To conduct my statistical analysis, I used Stata 9 for Mac OS X. Because some of my dependent variables are interval-ratio and some are dichotomous, I used both ordinary least-squares regression and logistic regression in my analysis. For the analyses of travel time to a health care facility, travel cost to a health care facility, and out-of-pocket fees for health care services, I use ordinary least-squares regression. For the analyses of recent injury or illness and insurance coverage, I use logistic regression. For all of my statistical analyses in my study for both 1991 and 2000, I use one model that includes all of my independent and control variables.

Descriptive Results

In this section I present the descriptive results of demographic characteristics and my dependent variables from my analysis of the 1991 and 2000 Chinese Health and Nutrition Surveys. The descriptive results are displayed in Table 1.

Demographic Characteristics

Sample. The sample size for the 1991 China Health and Nutrition Survey was 9,292 participants, and in 2000 there were 8,328 survey participants. In both years, the sample was composed of about 50% males and 50%. In both 1991 and 2000, less than 2% of the sample was under 18
years old, 20% was between 19-30 years old, 30% was between 31-40 years old, 19% was between 41-50 years old, 17% was between 51-60 years old, 10% was between 61-70 years old, and 3% was 71 years or older, with a mean age of 42.5 years. In all years, over 90% of respondents reported being married at the time of the survey (see Table 1).

Of the sample, 67% resided in rural areas of China 1991, and 66% lived in rural areas in 2000. Less than 5% of the sample in all years had official roles in the Chinese government. The sample is not representative of the total population of China, as it has over sampled ethnic minorities. Figure 2 shows that in 1991, 79% of the sample identified with the Chinese Han majority group. In 2000, 87% of the sample identified with the Chinese Han majority group. In the 2000 survey, there were more Chinese Han majority members included in the survey than in 1991, which may be a function of the sampling technique that was used to replace those households that dropped out of the study.

Figure 2. Ethnic Distribution in 1991

Note: The ethnic distribution changed by less than 10% from 1991 to 2000.
Dependent Variables

Health Insurance Coverage. The average percentage of reported out-of-pocket fees paid for inpatient care received by participants in 1991 was 23%. In 2000 the mean percentage of inpatient care that was reportedly paid for out-of-pocket increased to 36%. The mean percentage of outpatient care reportedly received by the research participants that was paid for out-of-pocket in 1991 was 29%, and the mean percentage of outpatient care reportedly paid for out of pocket by study participants in 2000 increased to 58%. The average amount of total inpatient and outpatient out-of-pocket fees in 1991 paid by participants was 26%. In 2000, the total amount of inpatient and outpatient out-of-pocket fees increased to 44%.

In Table 1 I present the means and frequencies for health care insurance coverage in 1991 and 2000. In 1991, 31% of the survey respondents were covered by health insurance, and in 2000 23% of survey respondents were covered by health insurance. The difference between 1991 and 2000 indicates a decrease in insurance coverage. The variable for health care insurance coverage includes public health insurance, insurance through an employer, insurance through a spouse or other relative, insurance through a medical cooperative, and private insurance.

Health Care Access. In 1991, travel time to the nearest health care facility ranged between zero minutes and 7 hours, and the mean travel time was 15 minutes. Travel time to the nearest health care facility in 2000 ranged from zero minutes to 6.5 hours with a mean travel time of 17 minutes, which shows an increase in travel time in 2000 as compared to 1991. Responses indicating travel times of zero minutes were interpreted as not utilizing health care facilities.
Walking was the most common form of travel to a health care facility in 1991 and 2000. In 1991, 59% of those surveyed reported that they walked, 33% biked, 6% rode a bus, and 1% used some other form of transportation to travel to a practitioner. In 2000, 55% of the sample walked, 23% biked, 16% rode a bus, and 4% used another mode of transportation to travel to a practitioner. The statistics reveal that there was little change in travel methods from 1991 to 2000.

The mean cost to travel to the nearest health care facility in 1991 was 0.09 yuans. In 2000, the mean cost of travel to the nearest health care facility was 0.69 yuans, which is a 60% increase in travel cost during this nine year period.

Health Status. To evaluate individuals’ health statuses, a dummy-coded variable reflecting if the individual has been ill or injured in the four weeks prior to the survey was used. In 1991 13% of participants had been ill or injured the four weeks prior to the survey, and in 2000 11% had been ill or injured in the four weeks prior to the survey. These statistics reveal that there was little overall change in health status between 1991 and 2000.
### Table 1. Descriptive statistics of dependent and independent variables

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<tr>
<th></th>
<th>1991</th>
<th>2000</th>
</tr>
</thead>
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<td>Mean or % of N</td>
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<td>Travel Time, minutes</td>
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<td>Health Coverage</td>
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<td>Out-of-Pocket Fees (%)</td>
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<td>Insurance</td>
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<td>31.73</td>
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<th>SD</th>
<th>N</th>
<th>Mean or % of N</th>
<th>SD</th>
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<td>49.94</td>
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<td></td>
<td>8255</td>
<td>66.81</td>
<td></td>
</tr>
<tr>
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<td>91.28</td>
<td></td>
<td>7809</td>
<td>88.37</td>
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<tr>
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<td>11.63</td>
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<td></td>
<td>6050</td>
<td>12.61</td>
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<td></td>
<td>6050</td>
<td>12.58</td>
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<td>6050</td>
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<td>8.9</td>
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<td>6050</td>
<td>5.88</td>
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<td>9.57</td>
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<td>6050</td>
<td>6.4</td>
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<tr>
<td>Other</td>
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<td>5.66</td>
<td></td>
<td>6050</td>
<td>4.55</td>
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<td>15.48</td>
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<td>5626</td>
<td>28.55</td>
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</table>

### Statistical Analysis

**Health Insurance Coverage Results**

I used two measures to examine health insurance coverage: out-of-pocket fees paid for health care services and health insurance. In Table 2 I present the results of the ordinary least-squares regression of having out-of-
pocket fees for health care services in 1991 and 2000. I examine the effects of personal income, ethnicity, and region of residence on out-of-pocket fees for health care services while controlling for sex, age, marital status, educational attainment, and occupational field in 1991 and 2000.

Although not significant, I find that in both 1991 and 2000 out-of-pocket fees for health care services decreased as income increased (Table 2). In 1991 and 2000 ethnic minorities incurred higher out-of-pocket fees for health care services than the Chinese Han majority, although my finding was not significant. Rural residents incurred significantly lower out-of-pocket fees for health care services compared to urban residents in 1991. This trend continued in 2000, as I find that rural residents still incurred significantly lower out-of-pocket fees for health care services compared to urban residents.

My second variable for examining health insurance coverage was possessing some form of health insurance. In Table 3 I present the results of the logistic regression I use to examine health insurance in both survey years. I examine the effects of personal income, ethnicity, and region of residency on my second variable of health insurance coverage, having some form of health insurance, while controlling for sex, age, marital status, educational attainment, and occupational field.

In both 1991 and 2000, the odds of having health insurance significantly increased as income increased (Table 3). In 1991, the odds of having health insurance were significantly lower for ethnic minorities compared to the Chinese Han majority. Although not significant, the results indicate that in 2000 the odds of having health insurance were slightly higher for ethnic minorities as compared to the Chinese Han majority. In both years of the survey, the odds of having health insurance were significantly lower for rural residents compared
My findings for both my insurance coverage variables, out-of-pocket fees for health care services and having health insurance, indicate that increases in income in 1991 and in 2000, were associated with increases in having health insurance and decreases in out-of-pocket fees for health care services. Although not significant, I find that ethnic minorities had generally less insurance coverage than the Chinese Han majority in 1991 but had more insurance coverage than the Chinese Han majority in 2000. The results also indicate that in both 1991 and 2000, rural residents incurred significantly lower out-of-pocket fees for health care services, yet were significantly less likely to have health insurance compared to urban residents.

The R square values and pseudo R square values for my models that examine out-of-pocket fees for health care services (Table 2) and having health insurance (Table 3) explain a moderate amount of variation based on the independent and control variables I included in my analysis. In 1991, the independent and control variables in my model explained 17% of the variance in out-of-pocket fees for health care services, while in 2000 my independent and control variables explained 44% of the variance in out-of-pocket fees for health care services (Table 2). My finding may indicate that demographic characteristics had a greater impact on out-of-pocket fees for health care services in 2000 than they did in 1991. The amount of variance in having health insurance that was explained by my model was lower for 2000 as compared to 1991, though both pseudo R square values explained over 30% of the variance in having health insurance.

It is also important to note that the sample size for out-of-pocket fees for health care services in 1991 is 1540 and in 2000 is 165. The sample size for
the health insurance variable in 1991 is 5072 and in 2000 is 2115. The differences in sample sizes between 1991 and 2000 for my health insurance coverage variables is due to the attrition of respondents over the nine year period and to a surprisingly large number on missing values in the 2000 data for new survey participants. The differences in the R square values and the pseudo R square values in 1991 as compared to 2000 may be a function of the differences in sample size.

Table 2. Regression coefficients for out-of-pocket fees

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<thead>
<tr>
<th></th>
<th>Out-of-Pocket Fees</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1991</td>
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<tr>
<td><strong>Independent Variables</strong></td>
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<tr>
<td>Personal income, yuans</td>
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<td>Ethnic minority</td>
<td>4.08</td>
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<td><em>Han is the reference category</em></td>
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</tr>
<tr>
<td><strong>Region Type</strong></td>
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<tr>
<td>Rural</td>
<td>-7.21**</td>
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<tr>
<td><em>Urban is the reference category</em></td>
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<td><strong>Control Variables</strong></td>
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<td>Female</td>
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<tr>
<td>Age</td>
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<tr>
<td>R-squared</td>
<td>0.17</td>
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<td>N</td>
<td>1540</td>
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*= p-value<.05  **= p-value<.01  †= no data available
### Table 3. Logistic odds ratios for health insurance coverage

<table>
<thead>
<tr>
<th>Insurance</th>
<th>1991</th>
<th>2000</th>
</tr>
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<td><strong>Independent Variables</strong></td>
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<td>Personal income, yuan</td>
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<td>0.24**</td>
<td>0.33**</td>
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<tr>
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<tr>
<td>Age</td>
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<td>1.00</td>
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<tr>
<td>Married</td>
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<tr>
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<tr>
<td>Less than college</td>
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<td>0.50**</td>
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<td><strong>Occupational Field</strong></td>
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<tr>
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</tr>
<tr>
<td>Agriculture</td>
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<td>0.12**</td>
</tr>
<tr>
<td>Service</td>
<td>0.74</td>
<td>0.53**</td>
</tr>
<tr>
<td>Skilled</td>
<td>1.37</td>
<td>0.85</td>
</tr>
<tr>
<td>Other</td>
<td>0.09**</td>
<td>0.30**</td>
</tr>
<tr>
<td><strong>Pseudo R-squared</strong></td>
<td>0.44</td>
<td>0.32</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>5072</td>
<td>2115</td>
</tr>
</tbody>
</table>

* = p-value<.05  ** = p-value<.01  † = no data available

### Health Care Access Results

I used two variables, reported travel time to the nearest health care facility and reported travel cost to the nearest health care facility, to proxy access to health care facilities. I present the results of ordinary least-squares regression of travel time and travel cost to the nearest health care facility in 1991 and 2000 in Table 4. I examine the effects of personal income, ethnicity, and region of residence on travel time and travel cost to the nearest health care facility.
facility while controlling for sex, age, marital status, educational attainment, and occupational field.

I find that region of residence had no significant effect in 1991 on travel time to the nearest health care facilities, while I find that in 2000 rural residents had significantly shorter travel times to the nearest health care facility compared to urban residents (Table 4). In 1991 there was no significant difference in travel costs to the nearest health care facilities between rural and urban residents. In 2000, this changed and travel costs to health care facilities were significantly lower for rural residents compared to urban residents. In both 1991 and 2000, one’s ethnicity or personal income had no effect on travel time or travel cost to the nearest health care facilities.

When I look at the control variables, I find that in 1991 females had significantly higher travel times and travel costs to health care facilities than males (Table 4). In 2000, the difference in travel times and travel costs between females and males was no longer significant. I also find that in 2000, those who worked in the agricultural field had significantly higher travel times to health care facilities than those who identified as professional workers. My finding is particularly concerning because in 2000 rural residents reported significantly lower travel times to the nearest health care facilities than urban residents, yet I would assume that those who work in the agricultural field would typically reside in rural areas.

The R square values for travel time and travel cost to the nearest health care facilities in both 1991 and 2000 were less than 0.03. The R square value indicates that less than 3% of the variance in travel time and travel cost to the nearest health care facility can be explained by the independent and control variables used in my analysis. The low R square values (less than 0.03) may
indicate that more independent variables should be included in my model to more thoroughly explain the variance in my variables for health care access.

Although the sample sizes appear to have no effect on the results, it is important to note that the sample size for travel time in 1991 was 5082 and in 2000 was 2066. The sample size for travel cost in 1991 was 4969 and in 2000 was 2001. The differences in sample sizes between 1991 and 2000 are due to high attrition rates of original survey participants and a large amount of missing values in the 2000 survey.
Table 4. Regression coefficients for travel time and travel cost

<table>
<thead>
<tr>
<th></th>
<th>Travel Time</th>
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<th>Travel Cost</th>
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<tr>
<td>Independent Variables</td>
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<tr>
<td>Personal income, yuans</td>
<td>-0.75 1.04</td>
<td>0.00 0.18</td>
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<tr>
<td>Ethnic minority</td>
<td>1.54 0.20</td>
<td>0.02 0.00</td>
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<td></td>
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<tr>
<td></td>
<td>Han is the reference category</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Region Type</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>-0.05 -3.48**</td>
<td>0.02 -0.29*</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Urban is the reference category</td>
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<tr>
<td>Control Variables</td>
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</tr>
<tr>
<td>Female</td>
<td>3.82** 0.25</td>
<td>0.05** -0.02</td>
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<tr>
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<td>Male is the reference category</td>
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<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.03 0.05</td>
<td>0.00* 0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>-1.54 0.72</td>
<td>-0.02 0.00</td>
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<tr>
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<td>Not married is the reference category</td>
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<tr>
<td>Educational Attainment</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No education</td>
<td>4.00** †</td>
<td>-0.02 †</td>
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<td></td>
</tr>
<tr>
<td>Less than college</td>
<td>0.01 2.05</td>
<td>0.02 0.16</td>
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</tr>
<tr>
<td></td>
<td>Professional is the reference category</td>
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</tr>
<tr>
<td>Occupational Field</td>
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<tr>
<td>Agriculture</td>
<td>0.67 4.49**</td>
<td>0.01 -0.16</td>
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<td>Service</td>
<td>-0.19 1.75</td>
<td>0.00 -0.03</td>
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<tr>
<td>Skilled</td>
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<td>-0.02 -0.31</td>
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<tr>
<td>Other</td>
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<tr>
<td>R-squared</td>
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<td>0.01 0.01</td>
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<td></td>
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<tr>
<td>N</td>
<td>5082 2066</td>
<td>4969 2001</td>
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</tr>
</tbody>
</table>

*= p-value<.05  **= p-value<.01 †= no data available

Health Status Results

To measure health status, I use the variable of reported illness or injury in the four weeks prior to the survey. In Table 5 I present the results of the logistic regression of recent illness or injury for 1991 and 2000. I examine how recent illness or injury is affected by personal income, ethnicity and region of residency while controlling for sex, age, marital status, educational attainment, and occupational field.
I find that personal income had a different effect on health status in 1991 as compared to 2000 (Table 5). In 1991 an increase in income significantly decreased the odds of the participant reporting an incidence of illness or injury in the four weeks prior to the survey. Alternatively, in 2000 I find that an increase in income significantly increased the odds of a participant reporting an incidence of illness or injury in the four weeks prior to the survey.

I find that minority status did not significantly affect the odds of an incidence of a reported recent illness or injury in either of the survey years (Table 5). Although not significant, the odds of reporting a recent illness or injury in 1991 were lower for ethnic minorities, while the opposite was found in 2000. In 1991, the odds of being recently ill or injured were significantly lower for rural residents compared to urban residents. In 2000 the odds of being recently ill or injured remained lower for rural residents compared to urban residents, though my finding was not significant.

When I examine the control variables used in the analysis, I find that in 1991 the odds of being recently ill or injured were significantly higher for females than males. In 2000, however, there was no significant effect of gender on health status. I also find that the odds of being recently ill or injured significantly increased as age increased in 1991, while age did not have a significant effect in 2000.

The sample size for my recent illness or injury variable is 5084 in 1991 and 2130 in 2000. The difference in sample size is due to high dropout rates of original study participants and a large amount of missing data in the 2000 data set. The difference in sample sizes between the two years appears to have had little effect on my results when examining health status using the recent illness or injury variable.
The pseudo R square value for my model examining recent illness or injury is 0.03 in 1991 and 0.02 in 2000. These values indicate that in both 1991 and 2000, 3% or less of the variation in the odds of reporting a recent illness or injury can be explained by the independent and control variables used in my model. Because the pseudo R square value for my model is low (0.03 in 1991 and 0.02 in 2000), more independent and control variables should be added to the model in future analyses to further explain the variation in recent illness or injury.
Table 5. Logistic odds ratios for recent illness or injury

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<tbody>
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<td></td>
<td>1991</td>
<td>2000</td>
</tr>
<tr>
<td><strong>Independent Variables</strong></td>
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<tr>
<td>Personal income, yuans</td>
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<td>0.64*</td>
<td>1.84*</td>
</tr>
<tr>
<td>Ethnic minority</td>
<td></td>
<td>0.82</td>
<td>1.13</td>
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<tr>
<td><strong>Region Type</strong></td>
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<td></td>
<td></td>
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<tr>
<td>Rural</td>
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<td>0.65**</td>
<td>0.70</td>
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<td><strong>Control Variables</strong></td>
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</tr>
<tr>
<td>Female</td>
<td></td>
<td>1.22*</td>
<td>0.98</td>
</tr>
<tr>
<td>Age</td>
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<td>1.02**</td>
<td>1.00</td>
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<tr>
<td>Married</td>
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<tr>
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<td>1.14</td>
<td>†</td>
</tr>
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<td>1.04</td>
<td>1.03</td>
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<td>Service</td>
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<td>Skilled</td>
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<tr>
<td>Pseudo R-squared</td>
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<td>0.02</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>5084</td>
<td>2130</td>
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</table>

*= p-value<.05  **= p-value<.01  †= no data available
CHAPTER VII

DISCUSSION AND CONCLUSIONS

Findings

Previous researchers have found that countries that have undergone transitions from socialist to capitalist economies have experienced differential distributions of rewards (Verhoeven et al. 1991). My research examines particular components of the Chinese health care system to determine if changes in the distribution of health care in China over the nine year period between 1991 and 2000 have occurred. I examine changes in the Chinese health care system by analyzing data from the 1991 and 2000 China Health and Nutrition Surveys. I used market transition theory as a framework for examining these changes.

My study examined a range of demographic characteristics, including ethnicity, region of residency, income level, gender, age, educational attainment, and occupation, which may contribute to one’s access and availability to health care in China. Although I examined many demographic characteristics, I was particularly interested in how market transition affected the distribution of health care to those with lower incomes, ethnic minorities, and rural residents. My research also led to unexpected findings and new questions about how the effects of gender on health care access and availability have been affected by market transition in China.

Previous literature indicates that the health insurance system in China is becoming more privatized, and health insurance is now often supplied by
employers as opposed to the federal government (Bloom et al. 2004 and Guitierrez et al. 2004). Because of this association between health insurance and employment, I expected that those who had higher incomes and higher level jobs would have had greater access to health insurance coverage.

In my study I used two variables, out-of-pocket fees for health care services and having health insurance, to measure health insurance coverage in 1991 and 2000. Hypothesis one states that survey participants with high incomes would have more health insurance coverage than those with low incomes as market transition occurs. I examined the effects of personal income, ethnicity, and region of residence on out-of-pocket fees. Although it was not significant, I found that as income increased in both 1991 and 2000, out-of-pocket fees for health care services decreased (Table 2). When I examined my second variable for health insurance coverage, having health insurance, I found that in both survey years the odds of having health insurance significantly increased as income increased (Table 3). The findings from my two analyses make it clear that as income increased, respondents had more health insurance coverage for services and more access to health insurance as evidenced by the decrease in out-of-pocket-fees for health care services.

As market transition occurred, I found that those with higher incomes incurred lower out-of-pocket fees for health care services than those with lower incomes in both 1991 and 2000. My finding is consistent with market transition theory because market transition theorists would expect out-of-pocket fees to decline over time for those with higher incomes. However, in 1991 income had a much greater positive effect on the odds of having health insurance as compared to 2000. My first hypothesis states that as market transition occurs, those with high incomes will incur lower out-of-pocket fees for health care
services than those with low incomes. My finding does not seem to support my hypothesis as it indicates that in 1991, income was a much stronger predictor of having health insurance than it was in 2000. My finding does not support market transition theory because according to market transition theory, income should be a stronger predictor of having health insurance in 2000 than it was in 1991.

My second hypothesis states that as market transition occurs, ethnic minority groups will have less insurance coverage compared to the Chinese Han majority. I find that although in 1991 the odds of having health insurance were significantly lower for Chinese ethnic minorities than for the Chinese Han majority, in 2000 there was little difference in the odds of having health insurance coverage based on ethnicity (Table 3). My finding does not support hypothesis two, and it is not supported by existing literature that describes the collapse of many rural cooperatives that provided a form of health insurance to rural residents (Meng et al. 2000 and Anderson 1992). Because there is a strong relationship between living in a rural area and identifying as a Chinese ethnic minority (Fuller et al. 2002), the closure of many rural cooperatives would lead me to expect that ethnic minorities would have less insurance coverage in 2000 than in 1991 as more cooperatives closed, however, my results contradict this idea. One explanation for my results may be that as marketization occurs, those living in rural areas may be migrating to urban areas to earn more money, though no research has been done on this idea as of yet.

Based on market transition theory, I hypothesized that access to health care facilities in rural areas would decrease from 1991 to 2000. Although the China Health and Nutrition Survey did not have a direct measure access to health care facilities within regions, I proxied access to health care facilities
with travel time and travel cost to the nearest health care facilities. I expected that survey participants who reported longer travel times and higher travel costs would have less access to health care.

Contrary to my expectations and the suggestions in existing literature on the Chinese health care system, I found that region of residence did not significantly affect travel time or travel cost to the nearest health care facilities in 1991 (Table 4). In 2000, I found that rural residents reported significantly shorter travel times and significantly lower travel costs to the nearest health care facilities than urban residents, which would seem to indicate that rural residents had greater access to health care facilities. My finding may reflect an underutilization of health care facilities by rural residents rather than a lack of access to health care facilities. Rural residents may not have enough money to seek medical care, they may have different belief systems that prevent them from seeking medical care, or they may be healthier and thus have less need for medical care than their urban counterparts. Additionally, I found no effect of ethnicity on travel time or travel cost in 2000, which is surprising because the majority of rural residents identify as ethnic minorities and rural residents reported significantly shorter travel times.

Another finding that contradicts conventional wisdom was that in 2000, those who worked in the agricultural field reported significantly higher travel times to health care facilities than those who identified as professional workers even though rural residents reported significantly lower travel times to health care facilities than urban residents (Table 4). Results from existing research led me to expect that those working in the agricultural industry would reside in rural regions and those working in professional industries would reside in urban areas, but my results contradict my assumption. My finding is important
because it may indicate that there are some problems with the survey data or it may indicate that there other factors I have not examined that could explain why I found these contradictions between related demographics. There may be something about Chinese culture, such as living with one's family into adulthood or better public transportation systems, that may explain why Chinese citizens may not live in close proximity to where they work. A particular aspect of Chinese culture could explain the discrepancies I found in the statistics between agricultural workers and rural residents and professional workers and urban residents.

An important limitation to acknowledge in my analysis is the validity of the measures of travel time and travel cost to the nearest health care facilities. I use travel time and travel cost as indicators of access and distribution of health care facilities, but they may be more valid as indicators of health care utilization. It may be that respondents with low travel times and travel costs to the nearest health care facilities are actually not utilizing health care services and thus reporting no travel times. Because of the contradictions within the findings in my analyses of travel time and travel cost to the nearest health facilities and the questionable validity of the variables for travel time and travel cost to measure the number of health care facilities, my results may not provide support for hypothesis three. My results may indicate that rural residents who have shorter travel times and lower travel costs to health care facilities compared to urban residents may have a lower rate of utilization of health care facilities rather than a lower number of health care facilities available to them. It may be that rural residents are not utilizing traditional health care facilities but that they are seeking health care within the community from an elder or a neighbor who is knowledgeable about illnesses. Further research on the
subject should examine from whom rural residents receive health care treatment in conjunction with analyzing travel time and travel costs to health care facilities.

In my study, I found a gender effect when analyzing travel time and travel cost to the nearest health care facility. In 1991 females had significantly higher travel times and travel costs than males to health care facilities (Table 4). In 2000 the gender effect disappeared and there was very little difference between males and females in travel times and travel costs to the nearest health care facilities. When analyzing health status, I find that in 1991 the odds of being ill or injured in the four weeks prior to the survey were significantly higher for females than males, yet this gender effect also disappeared in 2000 (Table 5). A higher rate of illness or injury for females in 1991 compared to males could explain higher travel times and travel costs to health care facilities. Regardless of health status, it may also be that women are not utilizing health care services as frequently as they have in the past due to the changing roles of women in modern China (Shu 2005 and WINN 1995). As previously discussed, the variables for travel times and travel costs to the nearest health care facilities may actually be measuring utilization of health care services rather than access to health care services.

Researchers have found that employment trends have been changing in China in recent years, and more women are beginning to enter the work force (Shu 2005 and WINN 1995). Traditionally women have been the primary caretakers of children, but as they begin to enter the work force, both mothers and fathers may begin to share more child rearing responsibilities (WINN 1995). My results may indicate that in 1991 less women were in the workforce and thus may have been utilizing health care services more frequently because
they would be the primary parent taking children to physicians. The results from 2000 indicate that men and women may utilize health care services at similar rates, which may indicate that both parents are sharing the responsibility of bringing their children to health care facilities. Further research on changing family roles in modern China should be conducted to examine how changing roles may affect utilization of health care services and other social institutions.

Literature on the Chinese health care system indicates that there has been a migration of health care practitioners from rural areas to urban areas (Anderson 1992, Dong et al. 2005, and Liu 1999), but my results do not support previous findings. I found that there was little difference in access to health care between urban and rural workers, which indicates that there has not been a migration of health care practitioners to urban areas from rural areas. If there was a migration of physicians from rural to urban areas, I would expect to find increased access to health care facilities in 2000 compared to 1991 in urban areas and decreased access to health care facilities in rural areas in 2000 compared to 1991. One possible explanation for my finding that there was little difference in access to health care between urban and rural residents may be that survey respondents living in rural areas reported that they were less likely to be ill or injured in the four weeks prior to the survey, which may have led them to report no travel time and no travel costs. My finding that there was little difference in travel times and travel costs to health care facilities between rural and urban residents is another reflection of how travel cost and travel time to the nearest health care facilities may be measuring utilization of health care services. It should also be taken into consideration that rural residents and urban residents may interpret illness in different ways and thus respond to
illnesses in different ways. Urban residents are likely to have higher levels of education and be more knowledgeable about diseases than rural residents. Because of differences in educational attainment, urban residents may be able to identify some symptoms of diseases easier than rural residents. If rural residents are not interpreting some behaviors or ailments as symptoms of disease, they may be underreporting incidence of disease. Additionally, rural resident may respond to illnesses with different types of treatment, such as traditional medicine, because of differences in values or knowledge of medicine.

Hypothesis 4a states that as market transition occurs, those who identify as ethnic minorities will have higher incidences of illness and injury compared to the Chinese Han majority. In 1991, I found that the odds of being recently ill or injured was lower for Chinese ethnic minorities compared to the Chinese Han majority, while in 2000 I found that ethnic minorities had higher odds of being recently ill or injured compared to the Chinese Han. Although my finding was not significant, it may suggest that between 1991 and 2000, the health status of ethnic minorities may have declined, which may provide some support for hypothesis 4a. Further research should be done to examine the strength of the relationship and possible explanations in more detail.

In hypothesis 4b, I stated that as market transition occurs, rural residents will have higher incidences of illness and injury compared to urban residents. Again, the results were not significant, but my results may suggest that in both 1991 and 2000, rural residents had lower health statuses than urban residents, and that the health statuses or rural residents may not have changed between 1991 and 2000. My finding may indicate that rural residents do not receive the same preventative or necessary treatment as their urban
Hypothesis 4c states that as market transition occurs, those who have low incomes will have higher incidences of illness and injury compared to those who have high incomes. My findings indicate that health status, proxied by reported illness or injury in the four weeks prior to the survey, improved as income increased in 1991, while in 2000 health status declined as income increased (Table 5). These findings were the opposite of what I had expected and may be explained by certain lifestyle choices or behaviors and values associated with those with higher incomes or in the higher classes. Overall, the results from my analysis of health status suggest that ethnic minorities are the only marginalized group found to have declined health statuses in 2000 as compared to 1991.

Contradictory Findings

It is important to note that the findings from my study indicate that some changes have occurred in China during the nine year period between 1991 and 2000. The results of my study give an overview of the Chinese health care system but they may not be an accurate depiction of what has really been occurring in China during this time period, but they may be a reflection of the limitations of the data from the China Health and Nutrition Survey. I found contradictory findings in the data that signaled errors within the data set. Some of the contradictory results I found were discrepancies between rural and ethnic minority results and discrepancies between agricultural occupations and rural residents. I expected that the effects of rural residency and ethnic minorities would have been similar in all analyses as ethnic minority status and rural residency are strongly positively correlated. However, my findings were
different for rural residents and ethnic minorities for travel time to the nearest
health care facility (Table 4) and for out-of-pocket fees for health care services
(Table 2). The effects of agricultural occupation and rural residency on travel
time to the nearest health care facility were opposite of each other (Table 2)
when I would expect these to be similar. These findings may indicate some
problems within the survey data.

In addition to the seemingly contradictory results I have found, the R
square values for some of models are very low (less than 0.03), which raises
questions about the validity of the variables I used in the models and about the
survey data. In particular, the models I used to measure differences in travel
time to the nearest health care facilities, travel cost to the nearest health care
facilities, and reported recent illness or injury had R square values of less than
0.05 (Table 4 and Table 5). An R square value of 0.05 indicates that all the
independent and control variables I included in the models only explain less
than 5% of the variation in travel time to the nearest health care facilities, travel
cost to the nearest health care facilities, and reported recent illness and injury.
It would be useful to include other control variables such as preexisting health
conditions and belief systems that may explain more of the variation in the
dependent variables in future analyses.

One control variable that should be included in future studies is
preexisting health conditions that may require regular visits to health care
facilities. A preexisting health condition could influence travel times and travel
costs and perhaps increase the likelihood of developing other illnesses.
Another variable that may explain some of the variance in the dependent
variables that should be included in future analyses is the strength of one's
belief in traditional medicine, which has been a highly utilized form of medical
care for thousands of years in China (Liu 1991). Those who prefer to use traditional medicine may be less likely to seek treatment at a modern health care facility and more likely to seek treatment from an elder in the village, which may have an affect on travel times and travel costs to the nearest health care facilities.

The R square values are high for my model when analyzing out-of-pocket fees for health care services and health insurance coverage in 1991 and 2000 (0.17 in 1991 and 0.44 in 2000). Health insurance in China is strongly correlated with educational attainment and occupational field, two of the control variables in the model, which may explain the relatively high R square values (0.17 in 1991 and 0.44 in 2000).

The R square values seem to indicate that, although I used the same model for examining each dependent variable, my model is only useful in explaining a moderate amount of variance when I examine out-of-pocket fees for health care services and having health care insurance (Table 2 and Table 3). When I examined travel time to the nearest health care facilities, travel cost to the nearest health care facilities, and reported recent illness or injury, the amount of variance explained by the model was less than 5%. More control variables such as preexisting health conditions and belief systems should be added to the model to help explain more of the variance in the dependent variables. Low R square values (less than 0.05) may also be an indication of a problem with the data or with the variables I used as proxies. The variables for travel time to the nearest health care facility, travel cost to the nearest health care facility, and reported recent illness or injury may be more heavily influenced by control variables I did not include than the variables for out-of-pocket fees for health care services and having health insurance. If a future
model of analysis included preexisting health conditions and family history of illness, the R square values would likely increase for travel time to the nearest health care facility (Table 4), travel cost to the nearest health care facility (Table 4), and reported recent illness or injury (Table 5). Adding control variables to my model may also increase the R square values for out-of-pocket fees for health care services (Table 2) and having health insurance (Table 3), though the effect is likely to be stronger for the other previously mentioned dependent variables.

**Market Transition Theory**

The findings from my study provide some support for market transition theory. Market transition theory posits that as an economy moves from socialism to capitalism, an unequal distribution of rewards will emerge (Nee 1996 and Cao et al. 2000). In my study, I found mixed support for market transition theory. Some of my findings indicated that market transition did have an effect on the Chinese health care system while other findings indicated that market transition had no effect on the Chinese health care system.

In my study I found that there was little difference in out-of-pocket fees for health care services between 1991 and 2000 based on income. I also found that there does not appear to be a migration of rural physicians to urban areas. My two findings on out-of-pocket fees for health care services and access to health care do not support market transition theory. However, I did find some support for market transition theory when I examined health status by ethnicity and access to health care by gender. My research indicates that ethnic minorities were the only marginalized group to have significantly lower health statuses in 2000 than in 1991, and ethnic minorities were more likely to have
health insurance coverage in 2000 than in 1991. I also found that in 2000, as compared to 1991, gender had a decreased effect on access to health care and on health statuses.

Contrary to what market transition posits, access to health care facilities in China did not decrease for marginalized groups, and out-of-pocket fees for health care did not increase for marginalized groups over this nine year period (1991-2000). Based on my findings and findings from previous research, market transition theory may not be applicable to all nations and all rewards systems. Researchers should use caution when using market transition theory as a theoretical framework in future studies.

My findings provide some support for market transition theory. My mixed results may be due to errors within the analysis and models, which have been previously mentioned, or my mixed results may be due incorrect assumptions that are used as the basis for market transition theory. It may be that for some groups, such as women, transition from a redistributive economy to a market-based economy has actually been beneficial to them in terms or health care access and availability. There may also be other factors in China that make the underlying assumptions of market transition theory inapplicable in this case. One such factor could be that there may be a migration of not only health care practitioners to urban areas but also an illegal migration of rural residents, who are more likely to be ethnic minorities and of lower income levels, to urban areas. As China has transitioned from a redistributive economy to a market-based economy, many types of organizations, including educational, financial, and health care, have slowly been moving to urban areas, and the migration to urban areas may be forcing rural residents to move with these services. If rural residents are also migrating to urban areas, it may be that these groups
actually have experienced the same amount or even increased access and availability of health care services over time because they have migrated with the health care services.

**Implications for Future Research**

My study examines how market transition has affected the health care system in China over the nine year period between 1991 and 2000. I have found that over this nine year period, there appear to have been substantial changes in the access and availability of health care services to different groups of people. However, it is important to note that although I found some significant changes, due to many of the contradictory findings and the limitations of some of my models, these results may not be representative of changes in China but instead reflect errors within the data. As with any international study, there are always communication problems with interpretation and translation of survey questions and survey responses that can lead to errors, and the researcher should be cautious of such errors.

The results of my study provide mixed support for market transition theory, much like previous studies have indicated. Future researchers should utilize more than one theory as a framework for examining changes in Chinese society because market transition theory may not be capturing what is actually happening in China in its entirety.

As the Chinese economy becomes more privatized, the Chinese health care system also is becoming more privatized. The privatization of the Chinese health care system is an important consideration for policy makers both in China and around the world as China continues to increase in world economic power. Little research has been conducted on the social changes that have
occurred in China since market transition began. Research on economic change and its effects on China should continue to occur as other social systems in the country, such as the educational system, may also see important changes.
LIST OF REFERENCES


APPENDIX
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IRB #: 3834
Study: The Effects of Market Transition on the Distribution of Health Care in China
Approval Date: 16-Nov-2006

The Institutional Review Board for the Protection of Human Subjects in Research (IRB) has reviewed and approved the protocol for your study as Exempt as described in Title 45, Code of Federal Regulations (CFR), Part 46, Subsection 101(b). Approval is granted to conduct your study as described in your protocol.

Researchers who conduct studies involving human subjects have responsibilities as outlined in the attached document, Responsibilities of Directors of Research Studies Involving Human Subjects. (This document is also available at http://www.unh.edu/osr/compliance/irb.html.) Please read this document carefully before commencing your work involving human subjects.

Upon completion of your study, please complete the enclosed pink Exempt Study Final Report form and return it to this office along with a report of your findings.

If you have questions or concerns about your study or this approval, please feel free to contact me at 603-862-2003 or julie.simpson@unh.edu. Please refer to the IRB # above in all correspondence related to this study. The IRB wishes you success with your research.

For the IRB,

Julie F. Simpson
Manager

cc: File
Potter, Sharyn