

Health equity in transition from planned to market economy in China

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This paper examines the impact of economic transition and health sector reform on health equities in the urban and rural populations of China in the 1990s. Since 1980, China has experienced a rapid economic development and fundamental transformation of its society. Three secondary data sources were used as the basis for the analysis and discussion: mortality data from the National Death Notification System; infant mortality from the National Maternal and Child Health Surveillance System; and morbidity, health care utilization and financing data from the National Health Household Interview Surveys. The analysis revealed a very complex picture with: general mortality rates decreasing in both urban and rural populations, but the differences between urban and rural increasing; declining infant mortality rates with narrowing of the urban–rural gap; health care needs declining in both urban and rural populations, but more rapidly in the urban areas; health service payments increasing in both urban and rural areas, while, at the same time, health insurance coverage decreased. The analysis suggests that despite overall improvements in the population's health status, the economic and health system policy reforms are leading to increased inequities in health care. The lowest income quintiles in both urban and rural areas are receiving less health care compared with their needs in 1998 than in 1993, and the urban–rural divide, in particular with regard to receiving inpatient health care, is widening appreciably. The reform of the health insurance system, combined with the market setting of prices for care, have had profound implications for all population groups, in particular the lower income segments and the rural populations. During the period 1993–98 the proportion of the urban population that had to cover the increasing cost of medical care themselves doubled.

Key words: health sector reform, equity, economic transition, China

Introduction

Since 1980, China's society and economy have undergone a profound reform process, transforming it from a planned economy to one increasingly relying on the market to regulate supply and demand. The Chinese economy has developed rapidly overall, but the improvement is not uniformly distributed over different sub-populations or regions. This is especially clear when comparing urban with rural areas. The view that the economic reform and growth would necessarily improve health status, nutrition and health care has been questioned (Hsiao and Liu 1996; Liu et al. 1999). However, many international studies have shown that income does play an important role in health improvement (Frank and Evans 1994). As economic development during the past 10 years in China was unbalanced between urban and rural areas, the gaps in socioeconomic status widened. Has health equity in China improved or deteriorated as a result? The question is of great importance also to other developing and transitional economies. Real per capita economic growth expands the total resources available in the society to pursue many socioeconomic goals, including better health for all citizens. Yet economic growth alone does not guarantee equal distribution of the resource gains (Liu et al. 1999).

Over the past 20 years, the annual output of China's economy increased, on average, by more than 8%. Productivity gains have permitted substantial improvements in real income and notable progress in reducing poverty has been achieved. However, following the policy of 'let some people get rich first' and the decentralization of the fiscal system to local governments for taking increased responsibility for their own communities, China has seen widening gaps in economic and social development between different regions (Hu 1995). According to the report of the National Statistics Bureau, by the end of 2000 there were about 32 million people living in poverty in the rural areas (the poverty line was 625 RMB per year pure income) (NSB 2001). Although different methods have been applied by different government departments to estimate the magnitude of poverty in the urban population, the overall estimates are quite similar at about 14 million in 2001 (Zhao 2002).

The Chinese government has begun to recognize the unintended effects caused by its economic and health policies, and is trying to map out new strategies to reduce poverty and to promote health. The First National Health Conference was held by the Central Party Committee and the State Council in 1996 to draft general guidelines for health care system development towards the 21st century. Some important

decisions on health reform policies were made at this conference, among these were: to restructure the government health insurance and labour health insurance, to set up new social medical insurance systems in urban populations, and to strengthen the Cooperative Medical Scheme (CMS) in rural populations. Other strategy decisions were to increase the efficiency of health resource allocation and utilization by implementing regional health plans and decentralizing the management of health institutions, to improve the health care access of urban and rural populations through the provision of community health care, and to strengthen primary health care programmes. All of these reform policies were related to addressing equity and system efficiency issues.

Guided by the health reform policy, a series of actions were implemented. However, some policies were implemented too quickly and some were not well implemented, and as a result the outcome varied. Decentralization of health institution management, in general, moved quickly. The health insurance reform progressed in the urban areas, but the CMS in rural areas, which had almost collapsed in the mid-1980s, was facing difficulties in being re-established due to factors such as financing and management. The implementation of community health services made some progress but is still in the pilot phase.

As part of the reform, government subsidies to health care were reduced and health facilities had to generate most of their revenues from user fees to cover staff salaries and other running costs (Liu et al. 2000). It is generally believed that the resulting increase in prices of medical services and the decrease in health insurance coverage have created a serious financial burden for both urban and rural populations in general, and for the poor in particular. The major health insurance schemes in China were the Government Insurance Scheme (GIS), covering the government officials and employees, and the Labor Insurance Scheme (LIS), covering the workers of stated-owned enterprises. These schemes provided financial subsidy (usually between 50 and 90%) to the medical expense of the covered people. Since the late 1990s the government has tried to establish a basic medical insurance scheme in urban China and the GIS and LIS have been phased out. There is evidence that the population covered by the two health insurance schemes were those with relatively high income compared with the uncovered urban population (Gao et al. 2001).

Liu et al. (1999) carried out an analysis on health inequity from 1980 to early 1990. Their research indicates that the gaps in health status, population income and health care utilization widened during that period. Gao et al. (2001) have studied differences between social classes. However, the more recent development of health equity is not fully described and regional differences, in particular between urban and rural areas, have not been considered.

The study reported on in this paper is an attempt to use available secondary data to analyze the recent trends in health equity. Information from the national household interview databases and longitudinal population mortality data sets is used to examine the health equity situation and its trends

between and within urban and rural populations during the 1990s in China. The study aims to contribute to the discussion concerning the relationship between health, health equity and economic reform in developing countries and to provide input to the policy formulation processes.

Material and methods

The approach to examine health inequities follows the concept suggested by WHO in which health inequity is represented by inequalities in health status, health care utilization and health care financing (WHO 1996).

Three of the most comprehensive data bases of mainland China were used to compare the health status, health care utilization and health care financing in the urban and rural populations, i.e. the National Death Notification System (NDNS), the National Health Household Interview Survey (NHHIS), and the National Maternal and Child Health Surveillance System. The analysis focused on the period from 1993 to 1998.

The NDNS is a part of the national health reporting system established by the Chinese Ministry of Health. More than 30 urban districts and more than 70 rural counties, having different socioeconomic situations, were selected in 1988 as the notice sites of the NDNS. Local doctors are asked to record all deaths in the Death Notice database. The reported deaths are coded using the International Classification of Disease (ICD-9) by trained health workers in each notification area. The NDNS data sets were used to calculate the crude and age-specific mortality rates of urban and rural populations and the population age structure of the 1990 National Census was used to standardize the general mortality of urban and rural populations in each year using direct standardization.

The NHHIS, which is one part of the National Health Service Survey, is sponsored by the Ministry of Health and conducted every 5 years. The survey uses a multi-stage, stratified, random sampling process. The surveys have been conducted in 1993 and 1998 using the same protocols and sampling frame. The total sample size of the 1993 NHHIS was 54 984 households (215 163 people interviewed) and in 1998 a total of 56 994 households were sampled (216 101 people interviewed). Specifically trained health workers conducted these household interviews in which all family members of each selected household were interviewed. Questions concerning children were answered by parents or guardians. Information on the households' total income, illness and outpatient visits during the previous 2 weeks, hospitalizations during the previous 12 months, all expenditures relating to health care service use, as well as the health insurance situations of each family member, were collected in both surveys. The coverage of NDNS and NHHIS are given in Table 1.

The National Maternal and Child Health Surveillance System was set up in 1991 to collect longitudinal information on maternal and child health, including maternal mortality rate (MMR), infant mortality rate (IMR), and under-5 child mortality rate (U5MR). A stratified sampling process was used to select 116 sentinel surveillance sites covering 80 rural

Table 1. Population coverage by urban–rural areas from National Death Notification System (NDNS) and National Household Interview Survey (NHHIS)

Year	Population coverage (NDNS)			Population coverage (NHHIS)		
	Urban	Rural	Total	Urban	Rural	Total
1990	56 863 043	42 836 397	99 701 430	n.a.	n.a.	n.a.
1993	63 960 359	49 902 761	113 865 113	54 249	160 914	215 163
1995	63 171 613	45 360 296	108 533 904	n.a.	n.a.	n.a.
1998	63 198 319	40 600 196	103 800 513	54 549	161 552	216 101

n.a. = not available.

counties and 36 cities; the total population of these counties and cities was approximately 12 million, with 8 million in urban and 4 million in rural areas.

The population mortality and infant mortality rates, self-reported morbidity rates and bed-day due to illness were used to describe the health status situation during the study period. The morbidity rate was calculated from the NHHIS as the number of persons who reported feeling sick in the previous 2 weeks divided by the number of interviewed persons. The bed-days due to illness were calculated as the total number of bed-days divided by the total number of interviewed persons times 1000.

The outpatient and inpatient health service utilization rates from the NHHIS were used to examine equity of health care service utilization. The outpatient utilization rate was calculated as the number of outpatient consultations within the last 2 weeks divided by the total number of interviewed persons. The inpatient utilization rate was calculated as the number of hospital admissions during the previous 12 months divided by the total number of interviewed persons.

The price of health care, payment of outpatient and inpatient services, the percentage of the population without health insurance, and health expenditure's share of total annual income were used to analyze equity in health care financing. The health care payments of outpatient and inpatient services were calculated as the sum of reported medical

payments made for outpatient or inpatient services divided by the total number of outpatient visits or inpatient admissions in the population. The reimbursements from health insurance schemes were not taken into account, as the rates of reimbursements differed depending on the insurance scheme and institution used and it was not possible to obtain accurate information concerning this from the survey data. The share of health care payments in total annual income was calculated as the sum of outpatient and inpatient health care payments, divided by the total annual income. As the comparisons of this study are focused on the differences and ratios between and within urban and rural population in each year, current prices were used.

The data sets used in this study were nationwide and the number of observations was very large, so even minor differences between the different populations and years are statistically significant, even while considering the sampling design. In view of this, we do not report p-values. The three data sources were not formally merged due to the differences in time and coverage.

Results

Health status

The standardized mortality declined between 1990 and 1998, in both urban and rural areas (Table 2). In urban areas, the mortality rate decreased from 5.1 to 4.5 per 1000 from 1990

Table 2. Overall and infant mortality rates and Relative Risks (RR) by population group and year; overall mortality standardized using national population, 1990

Year	Overall mortality per 1000 population (NDNS)			Year	Infant mortality per 1000 live births ^a		
	Urban	Rural	RR rural–urban		Urban	Rural	RR rural–urban
1990	5.1	5.9	1.14	1991	17.3	58.0	3.35
1993	4.8	5.6	1.16	1993	15.9	50.0	3.14
1995	4.7	5.6	1.21	1995	14.2	41.6	2.93
1998	4.5	5.5	1.24	1998	13.5	37.7	2.79

^a MOH. 2001. Chinese Health Statistical Digest, Ministry of Health, p. 102.

Table 3. Self-reported morbidity within last 2 weeks prior to interview and self reported bed-days during past 12 months per 1000 population by income quintile and rural/urban (NHHIS)

Year	Income quintiles	Self-reported morbidity per 1000 population			Bed-days per 1000 population		
		Urban	Rural	RR rural–urban	Urban	Rural	RR rural–urban
1993	First	161.7	112.2	0.69	112.4	111.7	0.99
	Second	155.6	121.2	0.78	124.8	135.6	1.09
	Third	182.1	126.7	0.70	133.7	123.1	0.92
	Fourth	196.2	127.2	0.65	132.3	120.4	0.91
	Fifth	203.0	155.3	0.77	130.5	123.1	0.94
	<i>Overall</i>	<i>178.6</i>	<i>128.0</i>	<i>0.72</i>	<i>126.1</i>	<i>122.4</i>	<i>0.97</i>
1998	First	176.9	140.7	0.80	105.6	160.5	1.52
	Second	188.7	135.7	0.72	96.3	124.0	1.29
	Third	181.1	132.4	0.73	90.8	108.4	1.19
	Fourth	198.4	134.3	0.68	90.0	106.0	1.18
	Fifth	224.9	134.2	0.60	102.6	93.1	0.91
	<i>Overall</i>	<i>193.0</i>	<i>135.5</i>	<i>0.70</i>	<i>96.7</i>	<i>118.6</i>	<i>1.23</i>

to 1998, i.e. by 13%. In rural areas, the mortality rate decreased from 5.9 in 1990 to 5.5 in 1998, by around 6%. The Relative Risk (RR) or rural over-mortality compared with the urban population slowly increased during the period from 1.14 to 1.24. Likewise, the IMR decreased in both populations, although considerably faster in the rural population. While the IMR fell by 22% in urban areas (from 17.3 to 13.5), it fell by 35% (58.0 to 37.7) in rural areas (Table 2). This meant that contrary to the case for the overall mortality, the gap in IMR between the rural and urban areas steadily narrowed during the period, with RR falling from 3.35 in 1991 to 2.79 in 1998.

The self-reported 2-week morbidity rates for almost all income quintiles went up between 1993 and 1998, and were higher in urban than in rural areas in both the 1993 and

the 1998 surveys. In 1993, the overall self-reported 2-week morbidity rates were 178.6 and 128.0 increasing to 193.0 and 135.5 in 1998 per 1000 in urban and rural areas, respectively. With the exception of the third urban and fifth rural quintiles, all quintiles showed increased morbidity during the period, and overall, the RR for rural population fell slightly.

In 1993 the number of annual bed-days per 1000 population due to illness was similar in urban and rural populations, i.e. 126.1 and 122.4. In 1998 these rates had dropped to 96.7 and 118.6, respectively. Hence, in 1998 a gap could be observed which was not present in 1993, i.e. the RR of rural over urban population increased from 0.97 to 1.23. This overall gap covered two different trends: a faster decrease in the urban than the rural population and faster decrease in the higher income quintiles than in the lowest. The gap between

Table 4. Health care service utilization by income quintile and rural/urban (NHHIS)

Year	Income quintiles	Self-reported outpatient visits (during past 2 weeks per 1000 population)			Self-reported inpatient admissions (during past 1 year per 1000 population)		
		Urban	Rural	Ratio rural–urban	Urban	Rural	Ratio rural–urban
1993	First	225.9	137.7	0.61	45.9	25.6	0.56
	Second	159.1	146.7	0.92	50.7	27.7	0.55
	Third	188.9	147.7	0.78	53.6	28.9	0.54
	Fourth	195.3	155.1	0.79	51.8	31.2	0.60
	Fifth	206.0	194.6	0.94	57.1	40.3	0.71
	<i>Overall</i>	<i>196.5</i>	<i>155.6</i>	<i>0.79</i>	<i>51.5</i>	<i>30.5</i>	<i>0.59</i>
1998	First	145.8	164.0	1.12	41.3	27.9	0.68
	Second	156.9	156.2	1.00	42.9	28.7	0.67
	Third	142.9	158.1	1.11	53.8	29.0	0.54
	Fourth	164.7	162.3	0.99	51.0	31.1	0.61
	Fifth	182.4	156.9	0.86	63.5	35.5	0.56
	<i>Overall</i>	<i>157.8</i>	<i>159.6</i>	<i>1.01</i>	<i>50.1</i>	<i>30.4</i>	<i>0.61</i>

Table 5. Income and health expenditure in current prices by income quintile and rural/urban (NHHIS)

Year	Income quintiles	Annual per capita income			Share of income spent on health care		
		Urban	Rural	Ratio rural–urban	Urban	Rural	Ratio rural–urban
1993	First	743	205	0.28	10.9	10.9	0.99
	Second	1264	357	0.28	6.9	4.3	0.62
	Third	1677	518	0.31	5.3	3.3	0.61
	Fourth	2194	713	0.32	4.7	2.7	0.57
	Fifth	3732	1969	0.53	3.4	1.6	0.46
	<i>Overall</i>	<i>1886</i>	<i>749</i>	<i>0.40</i>	<i>5.2</i>	<i>2.8</i>	<i>0.54</i>
1998	First	1540	649	0.42	8.5	6.2	0.72
	Second	2663	1118	0.42	6.2	4.2	0.68
	Third	3692	1539	0.42	6.1	2.8	0.46
	Fourth	5229	2149	0.41	5.3	2.5	0.47
	Fifth	9773	4253	0.44	5.1	2.0	0.40
	<i>Overall</i>	<i>4413</i>	<i>1920</i>	<i>0.44</i>	<i>5.7</i>	<i>2.8</i>	<i>0.49</i>

rural and urban widened considerably for all income quintiles except for the highest (Table 3).

Health service utilization

Despite an increasing self-reported morbidity, the outpatient service utilization decreased for all urban income quintiles (Table 4). For the rural populations, the service utilization followed the changes in self-reported morbidity, meaning that for the lower four quintiles, utilization increased, while it decreased for the highest quintile. Overall, therefore, the gap which existed for outpatient service utilization in 1993 between the rural and urban populations had disappeared by 1998, i.e. the outpatient visit ratio had become close to 1 (Table 4).

For inpatient admissions, the picture was more complex. Inpatient service utilization decreased between 1993 and 1998 for the lower urban and the higher rural income quintiles, while it increased for the higher urban and the lower rural groups. Overall, there was a slight decrease in urban and a close to constant level in rural inpatient admissions, thus narrowing the gap between the two; the rural–urban ratio increased from 0.59 to 0.61. However, for the two lowest income quintiles, because the urban utilization decreased and the rural increased, the gap between rural and urban narrowed, while the opposite was the case for the highest income quintile (Table 4).

Health care financing

The results from the survey on development in the annual per capita income showed complex dynamics with three major trends. On the one hand, the income gap within the urban population widened, i.e. the ratio between the lowest and the highest income quintiles increased from 5.0 to 6.3. On the other hand, in the rural population the income gap diminished, with the ratio decreasing from 9.6 in 1993 to 6.6 in 1998. Furthermore, comparing the rural with the urban population,

it is noticeable that, albeit still considerable, the income gap for the four lowest income quintiles narrowed, with the rural–urban income ratios increasing from about 0.30 to more than 0.40. However, for the highest income quintile, the gap between the rural and urban groups widened considerably; the ratio decreased from 0.53 to 0.44 (Table 5).

In both 1993 and 1998, and in both the urban and the rural populations, the lower income-quintiles were spending large proportions of their incomes on health care. In 1993, the lowest quintiles spent more than 10% of their income on health care, with little difference between the urban and rural areas. For all the other income quintiles, there were marked differences between rural and urban areas, with the urban population spending a considerably higher share of income on health care. The difference between urban and rural increased with income, i.e. the ratio dropping from 0.62 for the second quintile to 0.46 for the fifth quintile (Table 5). In 1998, the picture changed markedly. The two lowest income quintiles in the urban areas and the four lowest in the rural areas experienced a decrease in the percentage of their incomes spent on health care, while the highest three quintiles in urban and the highest quintile in rural areas saw an increase. With the exception of the second income quintile, the urban populations faced a relative increase compared with their rural counterparts, i.e. the rural–urban ratios decreased (Table 5).

In 1993, there was a marked difference in the price-pattern between the rural and urban population quintiles. There were clear gradients in the average unit prices paid by the urban population for outpatient services, ranging from 38 Yuan paid by the lowest to 75 Yuan by the highest income quintile. For inpatient admissions the average unit price ranged from 1274 to 2009 Yuan depending on the income quintile. For the rural population, there was no clear gradient in the average price paid. Outpatient visits cost about 25 Yuan for all income quintiles, while inpatient admissions varied from 450 to 600 Yuan. By 1998 the picture had changed for both population groups and for both types of

Table 6. Average payment (price) per health care service utilization for outpatient visits and inpatient admissions in percentage of average per capita income by income quintile and rural/urban (NHHIS)

Year	Income quintiles	Payment (price) in % of average per capita income			
		Per outpatient visit		Per inpatient admission	
		Urban (%)	Rural (%)	Urban (%)	Rural (%)
1993	First	5.1	13.3	171.4	296.3
	Second	4.6	5.5	121.3	125.0
	Third	3.5	4.8	88.3	88.2
	Fourth	2.8	3.4	81.4	68.4
	Fifth	2.0	1.2	53.8	33.2
	<i>Overall</i>	<i>3.0</i>	<i>3.2</i>	<i>85.2</i>	<i>72.1</i>
1998	First	5.5	5.7	176.0	179.3
	Second	3.9	3.3	126.8	121.5
	Third	4.0	2.7	104.6	81.8
	Fourth	2.9	2.3	97.0	67.1
	Fifth	2.0	1.5	68.6	49.9
	<i>Overall</i>	<i>3.1</i>	<i>2.4</i>	<i>101.0</i>	<i>77.9</i>

services there were clear gradients, with the highest income quintile paying about twice the price per service utilization compared with the lowest quintile. Overall, the price gap between rural and urban areas increased slightly for outpatient visits, with the ratio declining from 0.43 to 0.38, while for inpatient admissions the gap narrowed slightly, with the ratio increasing from 0.34 to 0.38.

In comparing the unit prices of health care with the average per capita income, it is noticeable that the relative price per service utilization was high for all income quintiles (Table 6). For the lowest income quintiles and for uninsured patients, the price could be devastatingly high. In 1993, for the lowest rural income quintile, an outpatient visit would cost, on average, 13.3% of the annual per capita income. The price for an admission was almost three times the average annual per capita income for this quintile. In 1998, the relative prices for both out- and inpatient service had decreased for the four lowest rural quintiles, while they had increased for the highest quintile. For the urban population, the relative prices of outpatient services remained more or less at the 1993 level, while the relative price of admissions increased significantly for all income quintiles.

Insurance coverage for the urban population was significantly higher compared with the rural population in both 1993 and 1998. For both the urban and the rural population, coverage decreased between 1993 and 1998. The largest decrease occurred for the urban population, where the overall coverage decreased from 75.5 to 57.4%. In the rural population, coverage decreased from 14.4 to 11.7%. The most dramatic decrease in both populations occurred for the lowest income quintiles. Only the second and third rural income quintiles saw a small increase in insurance coverage in 1998 compared with 1993, all of the others experienced a decrease (Table 7).

The new insurance schemes failed to take over the members who had previously been covered by the traditional insurance schemes such as the GIS, LIS, Semi-LIS or any of the various other schemes which were phasing out. The overall self-payment among the rural population was already high in 1993, at 85.6%, and this increased slightly to 88.3% by 1998. During the same period, the urban population experienced an almost doubling within some income quintiles of self-payment for health services. For both the urban and the rural populations, the lowest income quintiles experienced a considerable increase in the percentage that had to pay themselves for health services, with the most marked increase in the urban areas (Table 7).

Discussion

From 1990 to 1998, which was a period of rapid economic growth, a very complex picture emerged with regard to equity in health needs, health care utilization and financing.

Health status and health care needs

The overall population mortality rates decreased both in urban and rural areas, however the gap between urban and rural populations widened as the decrease in the rural rate was less than that of the urban population. There could be many explanations for the change in mortality rates, some of them being derived from economic development. The role of health care in mortality changes has been much discussed. Economic growth might create better health care and also better living conditions in general; for example, better housing with less crowding would lead to lower mortality from communicable disease with fewer preventable deaths. General economic development is likely to affect both urban and rural areas, so even if the rural health care system has not improved or improved less than the urban system, the

Table 7. Insurance coverage in rural and urban populations by income quintile, insurance scheme and year (NHHIS)

Year	Income quintiles	GIS	LIS	Semi-LIS	Commercial	CMS	Collective	Total insurance	Other	Self-payment	Total
Rural population											
1993	First	3.2	2.8	1.3	0.2	1.7	0.1	9.3	15.4	75.4	100.0
	Second	0.3	0.2	0.1	0.2	3.0	0.0	3.9	0.5	95.6	100.0
	Third	0.5	0.4	0.2	0.2	5.1	0.0	6.4	0.1	93.4	100.0
	Fourth	1.0	0.5	0.4	0.2	8.2	0.0	10.4	3.5	86.1	100.0
	Fifth	2.6	1.1	1.1	0.2	15.9	0.2	21.0	0.2	78.8	100.0
	<i>Overall</i>	1.6	1.0	0.7	0.2	6.6	0.1	10.2	4.2	85.6	100.0
1998	First	0.2	0.1	0.0	0.6	3.9	0.0	4.7	9.4	85.9	100.0
	Second	0.2	0.0	0.0	0.8	4.8	0.0	5.9	2.0	92.1	100.0
	Third	0.3	0.1	0.0	1.2	5.6	0.0	7.3	1.2	91.5	100.0
	Fourth	0.6	0.1	0.1	1.8	6.9	0.1	9.6	1.1	89.3	100.0
	Fifth	1.7	0.3	0.2	2.5	12.3	0.1	17.1	0.6	82.3	100.0
	<i>Overall</i>	0.6	0.1	0.1	1.4	6.6	0.0	8.8	2.9	88.3	100.0
Urban population											
1993	First	5.4	18.2	9.4	0.2	6.1	0.2	39.5	21.8	38.7	100.0
	Second	12.6	38.1	16.4	0.3	0.1	0.4	68.0	4.6	27.4	100.0
	Third	20.0	39.8	16.5	0.3	0.2	0.7	77.5	2.7	19.8	100.0
	Fourth	25.6	41.0	14.3	0.2	0.1	1.2	82.4	1.3	16.3	100.0
	Fifth	35.5	34.2	9.7	0.3	0.8	1.3	81.8	1.4	16.7	100.0
	<i>Overall</i>	18.9	33.6	13.2	0.3	1.7	0.7	68.4	7.1	24.5	100.0
1998	First	6.1	14.0	4.0	1.0	0.1	0.4	25.5	7.8	66.7	100.0
	Second	11.0	23.4	6.8	2.3	0.2	0.9	44.6	4.6	50.8	100.0
	Third	16.6	26.9	7.2	3.8	0.1	1.8	56.5	2.8	40.7	100.0
	Fourth	23.0	30.3	6.8	5.3	0.0	2.2	67.7	2.4	30.0	100.0
	Fifth	31.3	28.9	6.4	5.2	0.0	2.3	74.1	2.5	23.4	100.0
	<i>Overall</i>	17.3	24.7	6.2	3.5	0.1	1.5	53.3	4.0	42.7	100.0

mortality rate could still decrease. Mortality, although a rather blunt indicator of health status, is often used.

The decline in IMR for both populations could also be explained by economic development. Unfortunately, it was not possible to break down the infant mortality by income quintiles to analyze if the reduction was evenly distributed across income groups. The narrowing gap between the two populations might seem contradictory to the widening gap in overall mortality. However, urban IMR was at a very low level when compared with the 1990 international figures, so the efforts needed to cut it further would be substantial. Although the rural IMR decreased substantially, it was still at a much higher level and a considerable difference between rural and urban IMR remained. Liu et al. (1999) reported lower rural IMR during the 1980s than is suggested by the present data; their reported level was 30 rather than 50. The urban IMR for 1990 and 1993 matched reasonably. According to that study, the rural/urban ratio increased from 1.67 in 1981 to 1.75 in 1990 and reached 2.93 in 1993. The last number tallies better with the present data; however, Liu et al. used different data sources, and death reporting and registration is shown to be problematic in many countries, including China.

Between 1993 and 1998, the self-reported morbidity rates increased generally for the two populations, with the rural morbidity rates for all income quintiles remaining considerably lower than those of their urban counterparts.

Self-reported morbidity reflects the personal perceptions and might have limited value as an indicator of health status (Evans and Whitehead 2001); similar results were found by the WHO Global Health Service Survey in some regions (personal communication). However, it is often used in studies of health equity and has been extensively validated in Europe by research such as Manderbacka (1998). In this study, the only conclusion that can be made is that self-reported morbidity increased by about the same amount in both the urban and the rural populations. Liu et al. (1999) reported increasing inequity from 1980 to 1993 using self-reported morbidity; however, they defined the indicator differently.

The bed-days (per 1000 population) because of illness is a quantitative measure of the chronic or temporary disability in a population. The measure goes beyond a mere perception of discomfort in that the interviewee reports having taken a decision to abstain from other activities due to the illness. However, such decisions may, in addition to severity of illness, also depend on the economic and other employment consequences of a 'sick-day'. Also, this indicator is commonly used in studies of health status and need and could, given the options available, be the best indicator of health care need to use in this paper. The overall difference in bed-days between the urban and the rural population increased from 1993 to 1998 due to a considerable decrease in urban areas for all income quintiles, while in rural areas there was a smaller decrease for the four highest income quintiles and for the lowest quintile the number of bed-days increased.

Table 8. Health care utilization according to need, using self-reported bed-days during preceding 12 months as a proxy for health care need by income quintile and rural/urban

Year	Income quintiles	Outpatient visits per bed-day			Inpatient admissions per bed-day		
		Urban	Rural	Ratio rural-urban	Urban	Rural	Ratio rural-urban
1993	First	2.01	1.23	0.61	0.41	0.23	0.56
	Second	1.27	1.08	0.85	0.41	0.20	0.50
	Third	1.41	1.20	0.85	0.40	0.23	0.59
	Fourth	1.48	1.29	0.87	0.39	0.26	0.66
	Fifth	1.58	1.58	1.00	0.44	0.33	0.75
	<i>Overall</i>	<i>1.56</i>	<i>1.27</i>	<i>0.82</i>	<i>0.41</i>	<i>0.25</i>	<i>0.61</i>
1998	First	1.38	1.02	0.74	0.39	0.17	0.44
	Second	1.63	1.26	0.77	0.45	0.23	0.52
	Third	1.57	1.46	0.93	0.59	0.27	0.45
	Fourth	1.83	1.53	0.84	0.57	0.29	0.52
	Fifth	1.78	1.69	0.95	0.62	0.38	0.62
	<i>Overall</i>	<i>1.63</i>	<i>1.35</i>	<i>0.82</i>	<i>0.52</i>	<i>0.26</i>	<i>0.49</i>

If the bed-day rate is accepted as a proxy for health care need, then the gap in health care need between the rural and the urban population widened between 1993 and 1998 for all income quintiles except for the highest, with the rural populations' lowest quintiles having the greatest need.

Health care need and health service utilization

While the health care needs, as expressed by the bed-day indicator, decreased for all population income-quintiles except the lowest rural quintile, health care utilization displayed a more complex pattern. For all the urban and the highest rural income-quintiles, the outpatient service utilization declined. For the four lowest rural income-quintiles, the utilization increased. One explanation could be that utilization is not only determined by need but is also affected by access to service, including availability and price. Overall, the gap in utilization that existed between rural and urban populations in 1993 had disappeared by 1998. With regard to inpatient service, there were sizeable changes in the utilization levels for the lowest and the highest income quintiles during the period. However, there remained for all quintiles a considerable relative difference in utilization levels between the urban and rural populations.

If the number of bed-days per 1000 population is accepted as a proxy-indicator for health care need, then a table can be constructed to illustrate the utilization of health care relative to the need for each income quintile for urban and rural populations, respectively (Table 8). For outpatient use, the overall gap between urban and rural populations, as expressed by the rural-urban ratio, remained constant from 1993 to 1998. However, this disguises considerable changes within and between the population groups. The lowest income quintiles within both urban and rural populations reduced their utilization relative to the need indicator, while all of the other quintiles increased – with the highest quintiles and the urban population generally having the largest

relative utilization. The gap between rural and urban increased for the second, fourth and fifth income quintiles and narrowed for the first and third (Table 8).

For inpatient utilization relative to the defined need, a similar pattern can be recognized. The lowest income quintiles in both populations decreased their relative utilization, while the rest increased. Here, the gap between rural and urban increased for all income quintiles, except for the second, which decreased slightly (Table 8).

Other studies have found that the poor rural population do not use health care services when experiencing minor illness, instead they resort to self-treatment, buying drugs with or without prescription and only seeking medical services in more severe cases (Liu and Gao 2002). The results propose that although there has been some increase in rural use of both in- and outpatient health services, this was not commensurate with the need. The use of inpatient services by the rural population was still, and increasingly so, falling behind that of the urban population, indicating that even in the more severe cases, the rural population was not receiving the care needed.

Liu et al. (1999) compared the mid-1980s utilization with 1993 and found that outpatient utilization rates increased both in urban and in rural areas. However, without relating to a needs measure, they found that the difference remained about the same. Inpatient utilization was found to be much lower in rural areas and decreased about 10%, whereas it increased by 12% in urban areas.

Health care utilization and ability to pay

Ability to pay depends on a series of inter-linked factors, such as the price of service, consumption, level of income and the degree to which insurance or employers will pay in full or in part. Central to the concept of ability to pay is the

extent to which a person or population group will have to forego covering essential needs such as food, shelter, education or clothing to meet health care expenses. This is likely to be the case for a person below the poverty line, which, for China, was Yuan 625 in 2000. For those interviewed in this survey, most of the first rural income quintile and a considerable part of the first urban quintile were in this situation. The higher the income, the larger the proportion of the income that can be spent on health care without foregoing other essential needs.

Not unexpectedly, the results show that the larger the income, the smaller the share of this income was spent on health care in both the 1993 and 1998 studies, giving the impression that there are great inequities between income quintiles. For most quintiles, the urban population spent a much larger share of income on health care than their rural counterparts. As they also had much larger incomes, this could be justified from an equity perspective. However, the amount spent on health care is a function of both consumption and price. It was found that the lower income quintiles were consuming less than the higher quintiles and the rural populations less than the urban relative to their needs – so, using solely the share of income spent on health care to judge equity in health care financing may underestimate the true level of inequity. Looking at the average payment for outpatient and, in particular, inpatient health care relative to income (Table 6) gave an indication that more people in the lower income rural area quintiles could likely abstain from seeking health care for their needs due to cost considerations than would be the case for the higher income quintiles.

Further amplifying these trends is the considerable increase in the proportion of the two populations that had to pay out-of-pocket for health services. Again, the largest increases were recorded for the lowest income quintiles. By 1998 the rural populations had reached a level of about 90% paying out-of-pocket; in the urban areas the percentage almost doubled to more than 40% during the 5-year period. Given the price level for health care compared with income for most of the population, and without government subsidy or cross financing between income groups, insurance policies would, for most income levels, be prohibitively expensive.

Limitations of the study

The strength of the study reported on in this paper is its large sample size, with more than 200 000 people interviewed in 1993 and in 1998 using the same methodology. Furthermore, the data are household-based with the possibility of linking health status indicators with health service utilization and socioeconomic factors.

The limitations are primarily related to difficulties in defining health status and health care need, which had to rely on self-reporting (subjective criteria). Furthermore, health status and care need, utilization and economic variables are not completely independent and, while manipulation with numbers can give valuable indication of overall trends, a deeper understanding of the mechanisms behind these trends would require complementary qualitative studies.

Three databases were used for the study, hence the analysis was done on secondary data. We have reason to believe that the data quality is good in all three of them. More than 10 years of experience of the NDNS and the Maternal and Child Health systems show that these systems give a reasonable representation of the overall population and infant mortality for both urban and rural populations. Of course, in large scope surveillance systems, most data are reported in different layers, which could result in some data being lost or other quality issues. In the NHHIS surveys, 5% of the sample households are re-interviewed to estimate the consistency rate, which is the percentage of interviews with similar results in the two interviews. The overall consistency rates of the NHHIS in 1993 and 1998 were over 97% (Ministry of Health 1994; Ministry of Health 1999). However, the three data sources covered different geographic regions, although the geographic coverage in each of them was similar over the years. It was, therefore, not possible to merge the data sets formally to combine the information on mortality with other indicators collected from household interview survey.

It should be kept in mind that health care utilization is not only a matter of prices, but the mechanisms for outpatient and inpatient services differ. Some major factors are the seriousness of disease and the availability of services, which could not be addressed in this study design. Especially for inpatient care, the number of beds available is a directly limiting factor. Another limitation in this study is that it only addresses curative services. Preventive services are important complements and there is not always a clear distinction between cure and prevention. Furthermore, traditions and local beliefs are influential and are likely to be different between urban and rural areas.

Conclusion

Despite improvement in the health status of the Chinese population from 1993 to 1998, as expressed by the declining overall and infant mortality rates and possible decline in health care needs, there is reason for concern. There is a general trend to reduced equity with respect to receiving health care according to need within and between the urban and rural populations. Furthermore, there is evidence that the higher income earners do not shoulder a burden of financing health care service commensurate with their ability to pay. The lower income groups are clearly stretched, paying a much larger proportion of their incomes than those in the higher income brackets, and are less likely to have insurance cover. While there are some trends of improvements for the rural population, with respect to equity in health care financing in terms of relative prices and share of income spent on health care, the levels are still prohibitively high, surely affecting utilization and a possible underestimation of the equity gap. Over the 5-year period, it was only the higher urban income quintiles that were able to maintain health insurance of any significance; for the rural populations, health insurance was practically non-existent by 1998. With the government relying more on market mechanisms for financing health care, the drop in insurance coverage may provide the most serious threat to equity between the different population groups and eventually to the stability of the society.

Our study also gives some indications that prices for health care services are not set on a cost basis but could have been set with the aim of maximizing the revenue with a given capacity. This could have led to the lowering of relative prices for the rural populations and increasing those for the urban. While this may have contributed to containment of the growth of inequity in health care financing, it is far from certain that this was the lead motive. However, drawing any conclusion in this respect is beyond the scope and possibilities of the current study.

The government is aware that there is a problem of access to health care; however, knowledge about the complexity and magnitude of the problem, as well as the most appropriate remedy, is limited. It is our hope that our research may contribute to encouraging policy-makers to focus more attention on the forces released during economic reforms as well as their side-effects so that appropriate action may be directed towards resolving the problems of the poor, whether in the urban or the rural areas. A combination of cost containment through, for example, improving the allocative efficiency of the health system, stricter price control for public health care providers and government subsidized health insurance schemes for low income earners, may be a way forward.

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