

# Medical Expenditure and Rural Impoverishment in China

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## ABSTRACT

Thanks to continued economic growth and increasing income, the overall poverty rate has been on the decline in China. However, due to escalating medical costs and lack of insurance coverage, medical spending often causes financial hardship for many rural families. Using data from the 1998 China National Health Services Survey, the impact of medical expenditure on the poverty headcount for different rural regions was estimated. Based on the reported statistics on income alone, 7.22% of the whole rural sample was below the poverty line. Out-of-pocket medical spending raised this by more than 3 percentage points. In other words, medical spending raised the number of rural households living below the poverty line by 44.3%. Medical expenditure has become an important source of transient poverty in rural China.

**Key words:** Health expenditure; Healthcare costs; Healthcare; Rural health; Health insurance; Poverty; China

## INTRODUCTION

Poor health is a common consequence of poverty (1-3). There has been increasing interest in poverty as a consequence of poor health as reflected in the recently-published report of the Commission on Macroeconomics and Health (4). Poor health can cause poverty through several pathways, including impaired labour participation, thereby disrupting people's income-generating capabilities. One of the most devastating consequences of poor health is impoverishment caused by medical spending. Families can suffer catastrophic medical spending either because their income levels are low relative to the medical costs, or because they do not have adequate insurance coverage. This 'medical impoverishment' is very tragic because people affected often must make a dire choice: either die without treatment or save a life by sinking the family into poverty (5). The World Health Organization argues that one of

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the most important functions of health systems is fairness of healthcare financing—the extent to which risks are shared in the society (6).

This paper analyzes the role of medical expenditure in causing rural poverty in China. Rural China represents an interesting case for several reasons. About 70% of the 1.29 billion population of China live in the rural areas and are primarily engaged in agriculture. How to provide health insurance for people involved in the informal sector, such as agriculture, has puzzled the world for many years without satisfactory answers (7-8).

Thirty years ago, China was the first large nation in the world to establish a community-based insurance system for its rural population (9). However, since the inception of market reforms in the early 1980s, the rural insurance system has collapsed. Meanwhile, China has achieved remarkable agricultural and industrial growth. Since 1978, aggregate gross domestic product (GDP) has grown at an average annual rate of 10%, agricultural GDP at 5.2%, and rural industrial output at 31% (10).

The world community is also deeply impressed by the achievements of China in reducing absolute poverty. The government's estimates of the incidence of absolute poverty demonstrate a significant drop from 270 million people in 1978 to about 60 million in 1997. The number

of rural poor declined from around 1/3 of the total rural population in 1978 to roughly 1/20 at the end of 1998 (11). Many people either assumed or hoped that, with this kind of economic growth and rising income, rural people in China would be increasingly able either to pay directly for medical expenses or to purchase health insurance.

Contrary to the growth-for-all (a country can grow out of many social problems automatically) beliefs, this paper provides empirical evidence for the persistent problems of medical impoverishment in China. The structure of the paper is as follows: we first review two background issues: escalation of medical costs and lack of insurance coverage. Then we provide a comprehensive analysis on the impact of poor health on poverty generation, using national survey data. We conclude by discussing major implications from this China case study for policy and future studies.

**INCREASING MEDICAL COSTS AND LACK OF INSURANCE**

Ever since the 1980s, the annual health expenditure of China has increased at a rate consistently higher than the economic growth rate. There are multiple reasons for the escalation of medical costs, including demographic and epidemiological transition, more advanced medical technologies, and over-prescription of drugs by healthcare providers (12-14). Table 1 summarizes the levels and sources of total health spending in China from 1980 to 1998. While total health spending as a percentage of GDP increased from 3.17% in 1980 to 4.82% in 1998, the government share of the total spending, rather against the international trend, decreased from 36.4% in 1980 to 15.5% in 1998. Over the same period, the private share of the total spending increased from 23.2% to 57.8%, indicating a higher financial burden on families (15).

**Table 1.** Percentage of healthcare spending in China in 1980, 1990, and 1998 (12)

Health spending	1980	1990	1998
GDP spent on health	3.17	4.01	4.82
Total health spending by government	36.40	25.00	15.50
Total health spending by individuals (out-of-pocket)	23.20	37.10	57.80
GDP=Gross domestic product			

Despite escalating medical costs, insurance coverage in China is miniscule. According to the two national health services surveys, conducted by the Ministry of Health,

the percentage of the population with any health insurance decreased from 30.2% in 1993 to 23.6% in 1998 (16,17). The problem is particularly pronounced for the rural population. In 1993, insurance coverage for the rural residents was already low (12.8%). By 1998, only 9.5% of the rural population was insured (Table 2). This means that, currently, the majority of rural residents have to pay out-of-pocket for any health services they need. Rapid escalation of medical costs, combined with a lack of insurance coverage, has caused healthcare use in China to fall, despite the increasing supply of healthcare facilities (18). For those people needing medical services, large medical expenses can cause a financial catastrophe. Results of numerous community surveys indicate that medical expenses have become the number one poverty generator (19).

**Table 2.** Medical costs and insurance coverage in China (12,13)

Cost and coverage	1990	1993	1998	% of change (1990-1998)
Medical costs (Yuan)				
Per visit	11	40	79	625
Per admission	473	1,668	2,891	511
Insurance coverage (%)				
Urban		53.70	42.10	-22
Rural		12.80	9.50	-25

**POVERTY IMPACT OF POOR HEALTH**

**Major causes of impoverishment from a national survey study**

Several surveys have been conducted in China to measure the extent of 'illness-induced impoverishment', namely addressing the question of how many poor households have become poor due to illnesses. Results of those locally-administered surveys indicate that illness is the number one poverty generator (19-26). However, results of these surveys cannot be generalized over the whole country because these are not based on representative samples of the nation. Following a multi-stage stratified sampling framework, China conducted two national health services surveys in 1993 and 1998 (16-18). For these surveys, rural regions of China were divided into four different groups, mainly based on levels of socioeconomic development, such as income per capita and infant mortality rate, with the class I region being the richest region and class IV region being the poorest region. The approximate proportion of the rural population living in the four different regions are 24%, 30%, 34%, and 12%.

The 1998 National Health Services Survey is the first national survey, which asked questions about the major reasons for impoverishment. Of 40,210 rural households surveyed, 2,036 (5.06%) were identified as households living under poverty by the local government agencies. These poor households were then asked to list the major reason for their impoverishment and were given a multiple choice of five reasons: lack of labour, poor ecological conditions, natural disaster such as drought, social reasons, and diseases or injuries. Table 3 lists the different percentages of households that cited one of the three most frequently-chosen reasons (lack of labour, poor ecological environment, diseases or injuries). Taking the rural sample as a whole, human capital factors seem to be the major perceived generator of poverty in rural China. 23.18% of the poor households identified lack of labour as the major reason for impoverishment, while 21.66% considered disease or injury to be the major poverty generator. Only 17.13% of the poor households blamed the poor natural environment for their lot.

### Medical expenditure and poverty

Different proportions of income spent on healthcare by different income groups reflect redistributive effect, i.e. indicating how income inequality is affected by out-of-pocket payments for healthcare. It does not indicate whether these payments push households into poverty. According to a survey of the rural poor of China, about 18% of rural households that used health services incurred health expenditure that exceeded their total household income (21). Of 11,353 rural households interviewed, 24.3% borrowed or became indebted because of health expenses. Another 5.5% sold their meagre assets to pay for healthcare. Forty-seven percent of the medically-indebted households suffered from hunger for an extended period of time. When households have large debts, their investment in agricultural production and subsequent living standards decline, which adversely affects the health status of the household members. This interaction between income and health sets off a vicious cycle of illness that produces poverty, which, in turn, causes more illness.

**Table 3.** Percentage of the poor rural households that cited the top three reasons for their impoverishment (of 40,210 rural households surveyed, 2,036 were officially identified as households in poverty by the local governments)

Reason for impoverishment	Whole sample (n=2,036, 5.06%)	Class I* (n=382, 3.97%)	Class II* (n=431; 3.59%)	Class III* (n=777, 5.63%)	Class IV* (n=446, 9.29%)
Lack of labour	23.18	27.75	20.19	19.82	27.80
Disease or injury	21.66	23.82	22.74	24.32	13.90
Poor natural environment	17.13	7.33	9.05	18.53	30.04

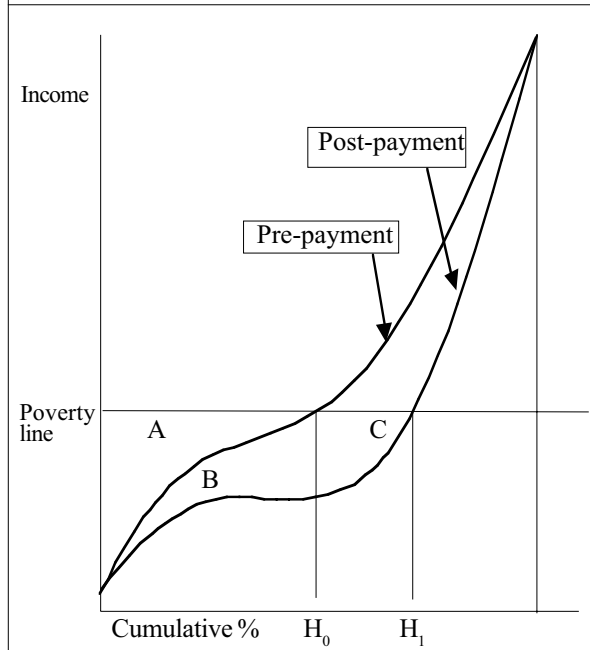
\* Mainly according to income level, rural regions are divided into 4 classes, with Class I being the richest and Class IV being the poorest

Source: 1998 national health services survey (17)

Although we cannot conclude from the 1998 survey that diseases or injuries is the number one poverty generator from the point of view of rural population, there are two strong reasons for us to be concerned about the major poverty impact of illnesses. First, the most frequently-cited reason for poverty is lack of labour. If the bread-winners suffer from illness (especially during the planting and harvesting seasons) or the families should lose their bread-winners due to illnesses, the economic consequences are dire. Second, while for the whole rural population, diseases or injuries ranked number two for poverty generation, the number one poverty generator perceived by the poor households in middle-income regions (Class II and Class III) is diseases or injuries. The majority of the rural population in China live in Class II and Class III regions.

Figure 1, which is based on Pen (22), and has been used elsewhere (23), provides a simple framework for examining the impact of out-of-pocket payments on the two basic measures of poverty—the headcount and the poverty gap. The headcount measures the number of individuals or households living below the poverty line as a percentage of the total population/households. The poverty gap measures the total amount of income transfer that is needed to lift all the poor households out of poverty. The chart is a variant of Pen's parade, named after the Dutch economist who invented it. Pen's parade plots household income (before and after medical payments) along the y-axis against households ranked by pre-payment income along the x-axis. Reading off the parade at the poverty line gives the number of households living below poverty—the headcount. The area below the poverty line above the parade gives the poverty gap (the total shortfall from the poverty line).

**Fig. 1.** Pen's parade showing the impact of the out-of-pocket payments on the two basic measures of poverty—the headcount and the poverty gap



In the case of the pre-payment parade, the headcount is  $H_0$  and the poverty gap is equal to the area A. In the post-payment parade, assuming the poverty line is held constant, the headcount is  $H_1$ , and the poverty gap is equal to the area A+B+C. Area B represents the deepening poverty experienced by households that were poor before medical payments. Area C corresponds to the addition to the poverty gap caused by households that were not poor before payments but are poor after their out-of-pocket payments. Using data from the 1998 National Health Services Survey, we estimated the impact of medical expenditure on the headcount for different rural regions. As indicated by Table 4 and Figure 2, the headcount for the whole rural sample was 7.22%. Out-of-pocket spending on healthcare raised the headcount by more than 3 percentage points. In another word, medical spending raised the number of rural households living below the poverty line by 44.3%. Not surprisingly, the biggest percentage point increase (4.21%) of the headcount due to medical spending occurred in households living in the poorest regions, driving up the total headcount to about 30%.

Similarly, the impact of medical expenditure on the poverty gap is alarming. For the total rural average, the poverty gap increased by almost 146.6%, when poverty caused by medical impoverishment is taken into account

(Table 4). The gap increased by over 200% in rural areas I, II, and III in 1998. Although the overall poverty rate due to medical expenses decreased from 1993 to 1999, reflecting increases in income, the relative poverty impact of medical expenses increased. For example, in 1993, the number of households that were medically impoverished as a percentage of the total number of households living under poverty was 26.4%. By 1998, it had gone up to 45.1%.

**CONCLUSION**

Today, the majority of the rural population in China has no health insurance and is, thus, vulnerable to catastrophic medical expenses, in light of the escalation of medical costs. To reduce medical impoverishment, two major policy interventions are available: controlling medical costs and providing insurance coverage. There have been numerous reform initiatives in China aimed at controlling medical inflation (28). This paper focuses on rural health insurance in the context of poverty reduction for several reasons. First, a health insurance system functions as an income-protection mechanism when the need arises for medical treatment that requires large expenses. Second, insurance buys access to healthcare services for low-income people, who otherwise may not be able to afford them. Since health is an important dimension of human capital in poverty reduction and healthcare has an important role to play in saving lives and improving health, providing health insurance coverage would appear to serve the purposes of income-protection and human capital-enhancing. Third, as in many other developing countries, economic growth and poverty reduction are always among the top government policy agenda items. A better understanding of the link between poor health and poverty can help prompt development of new health policies, such as new health-insurance policies.

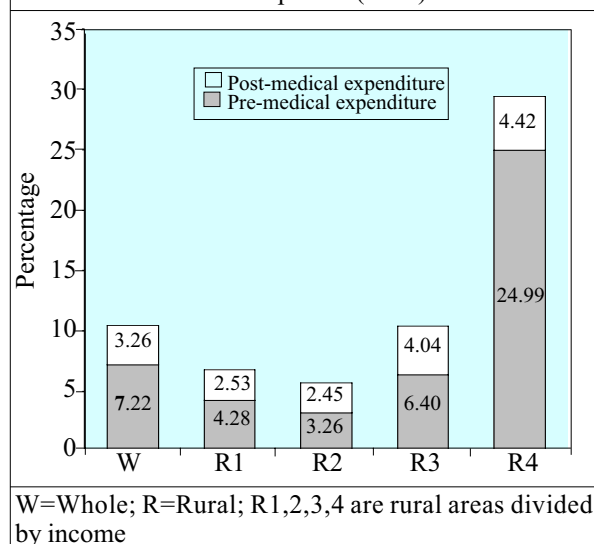
Some of the poverty observed on a given date is temporary due to a short-lived drop in the individual levels of living and, thus, termed 'transient poverty'. For other poor households, poverty arises from low long-term welfare ('chronic poverty'). Therefore, different policies may well be called for dealing with these two types of poverty. Longer-term investment in the poor, such as increasing their physical and human capital, is likely to be more appropriate for reducing chronic poverty. On the other hand, insurance and income-stabilizing schemes, which protect households against idiosyncratic economic shocks, may be needed to address the transient poverty problems (24). Using panel data

**Table 4.** Poverty impact of medial expenditure

Poverty indicator	Rural average		Class I		Class II		Class III		Class IV	
	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
Poverty rate	23.26	7.22	14.01	4.28	17.59	3.26	26.26	6.40	49.01	24.99
Poverty headcount due to medical expenditure	6.14	3.26	4.92	2.53	6.14	2.45	7.66	4.04	4.53	4.42
Medical impoverishment as % of poverty rate	26.40	45.15	35.12	59.11	34.91	75.15	29.17	63.13	9.24	17.69
Poverty gap caused by medical expenditure (million Yuan)	3.6	3.3	0.7	0.6	1.1	0.7	0.1	1.2	0.4	0.4
% increase in poverty gap due to medical expenditure	83.83	146.61	117.24	244.25	118.41	236.97	87.83	224.68	30.86	36.94

Source: National health services survey, 1993, 1998 (16,17)

**Fig. 2.** Poverty headcount of households before and after medical expenses (1998)



from four provinces, Jalan and Ravalion estimated that about half of the average severity of poverty was directly attributed to inter-temporal variability in consumption, and the exposure to income risk in this setting is also significant (24). So, transient poverty would appear to be a serious concern in China. However, China's anti-poverty strategy has placed more emphasis on fighting chronic poverty than transient poverty. For example, most of the poverty-reduction programmes focus on reducing poverty by promoting income-generating investments in local agriculture and rural development, rather than providing short-term insurance or state-contingent transfers. Our study indicates that medical expenditure has accounted for a significant portion of the transient poverty in rural China.

According to the 1998 National Health Services Survey, out-of-pocket spending on healthcare has raised the number of rural households living below the poverty line by 44.3% (17). Comparing the results from the 1993 and 1998 national survey data, the problem of medical impoverishment appears to have become more pronounced over time in the rural areas of China. Therefore, providing rural health-insurance coverage would seem to be not only an important health-protection measure, but also an important poverty-reduction strategy. Our findings on the poverty impact of medical expenditure have already helped move the central government to take action in developing new rural health policies in China (25-27).

However, several caveats regarding the interpretation of our findings are in order. First, although a significant portion of the poor households surveyed by the 1998 National Health Services Survey cited ill health as the major cause for their impoverishment, the results should be interpreted with some caution. This survey was conducted by the Chinese Ministry of Health. Responses of the households may be influenced by their interactions with the interviewers, who are health professionals. In addition, these subjective assessments, though indicative of the important role of ill health in generating poverty, are not very informative on the pathways taken for poor health to cause poverty. Second, our main results on medical impoverishment relied on self-reported income and expenditure data. There might be under-reporting of income, whereas there might be over-reporting of expenditure. Due to this reason, our estimate of medical impoverishment in rural China might be biased upwards. On the other hand, our 'medical expenditure' only includes direct expenses for healthcare services and drugs. It does not include indirect costs, such as transportation

and lodging costs for the patients and their families, which are substantial in rural China (16-17). Therefore, our estimate of medical impoverishment could have been higher, had we accounted for indirect medical costs. The net effects of these two factors on our results are unclear. More comprehensive studies on poor health and poverty should look for more reliable sources of income data and, wherever possible, try to integrate analysis of the self-perceived causes of impoverishment with a vigorous econometric analysis of health and income on cohort data.

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