
*Prevalence of Illness and Household Ill-Health Risk
Coping Strategies in Rural China
A Chinese literature review*

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Abstract

The paper aimed to review Chinese literature on the prevalence of illness and household ill-health risk coping strategies in rural China, and to determine which questions further research should answer. Investigated literature included those on prevalence of illness, two-week morbidity of common illnesses, impact of ill-health on household income, consumption expenditure, investment and human capital, household *ex ante* and *ex post* coping strategies. Existing studies provided evidence that ill-health risks had become more complex in rural China. More research on patterns of illness prevalence for both previously common illnesses and increasingly widespread illnesses (such as non-communicable chronic illnesses) is needed. There is also a need to further investigate the characteristics of households with different types of illness, to understand the socioeconomic factors determining household healthcare seeking behavior and the impact of serious illness on household livelihoods. More empirical studies on household ill-health risk coping strategies deserve high research priority. Studies using both quantitative and qualitative methods to investigate the impact of informal and institutionalized solutions to overcome the huge problems of the poor in accessing quality health care are needed. These would assist the early identification of vulnerable households and the design of appropriate policy interventions.

Introduction

The transition from acute illness prevalence to non-communicable illness prevalence and the implications for household coping strategies in rural China and other developing countries are issues increasingly attracting research interest in terms of understanding health-related poverty and suggesting policy interventions. Investigations into the dynamics of illness prevalence within a population have been moving towards a more nuanced understanding in the contexts of socioeconomic and cultural changes in recent decades, with much attention being paid to population mobility and the socioeconomic factors shaping it (see for example, Garrett 1995; Lloyd-Smith *et al* 2005; Bloom 2001; Bloom *et al* 2007). The concept of ‘coping strategies’ has been recognized as of considerable value in explaining household responses to adverse shocks. While earlier studies focused on famine and natural disaster survival strategies of rural households, and mostly on Africa (among others see: Watts 1983; Corbett 1988; De Waal 1989; Devereux 1993; Rosenzweig and Wolpin 1993; Townsend 1994; Udry 1994), literature investigating the impact of ill-health and related household coping strategies in many different parts of the world has been increasingly available (to list some: Corbett 1989; Jayawardene 1993; Seeley, *et al.* 1995; Sauerborn *et al.*, 1996; Wilkes *et al.* 1997; Lucas and Nuwagaba 1999; Rugalema 2000; Gertler and Gruber 2002; Wagstaff and Van Doorslaer 2003).

It is widely recognized that serious illness has significant adverse effects on households composition, labor supply and income generation. It affects not only household food production, cropping patterns, livestock production, labor-time allocation and access to productive assets, but also children’s education, access to consumption of goods and services essential for household maintenance and reproduction. In rural China¹, households have developed various strategies to cope with the adverse health-related

¹ Rural China is a geographical concept, referring to locations where a majority of the Chinese population live and where agriculture and farm work are the main production activities. Citizens in China are basically separated into urban and rural mainly in terms of a household registration system. Urban citizens are more protected than their rural counterparts who have limited access to public services and welfare systems. Those living in rural China currently constitute roughly 60% of the total population.

shocks. However, these strategies have not been adequately studied. Such studies are needed to identify interventions that complement households' own strategies so that they are more effective and efficient in managing health-related risks.

In the literature on understanding household coping strategies, several analytical frameworks have been proposed. Coping strategies are generally categorized into *ex ante* and *ex post*. Holzmann and Jorgensen (2000) proposed a framework highlighting a Social Risk Management (SRM) matrix, which outlined three types of strategies that households employ to cope with adverse shocks: 1) prevention strategies - to reduce the likelihood that the household will experience the shock; 2) mitigation strategies - to decrease the potential impact of a future shock, including portfolio diversification, insurance, hedging/risk exchange; 3) coping strategies - to relieve the impact once the shock has occurred. In health research, household coping strategies for reducing the likelihood of illness incidence or decreasing the damaging impact of a potential illness can be seen as *ex ante* coping strategies, while strategies designed to relieve the actual impact of an illness can be considered as *ex post* strategies.

This paper, based on existing Chinese literature, will first investigate the prevalence of illness in rural China. This will be followed by a review of the relevant literature on household coping strategies. Special attention will be paid to POVILL project research sites, the provinces of Hubei and Sichuan. Based on the reviews, future directions for research will be identified.

Materials and methods

Journal articles and documents and reports in Chinese from official and non-official sources within China were reviewed, using both digital databases and library text materials. Firstly, more than twenty top Chinese scientific journals in hard copy on public health, health economics, economics and sociology were reviewed². Secondly, several digital resources (databases)

² These journals include Social Sciences in China, Economic Research Journal, Social Security System, Sociological Research, Chinese Journal of Population Science, China Rural Survey, Chinese Rural Economy, Chinese Health Economics, Chinese Rural Health Service Administration, Health Economics Research, Chinese Health Service Management, Journal of Preventive Medicine Information, Chinese Journal of Tuberculosis and Respiratory

containing key journals in the above mentioned fields were searched using the Chinese digital library. Thirdly, several key Chinese researchers who are known as experts on relevant research areas were selected as keywords to look specifically at their publications from the digital sources. Using both library and digital library methods, over three hundred scientific articles were gathered. Over 60 articles were finally selected from these sources for in-depth review.

Many articles reviewed were using data from statistically representative samples of study areas or populations concerned, although many of them may not be considered as representative for rural China as a whole. The National Health Services Survey is, however, a nationally representative survey. It has been conducted three times in 1993, 1998 and 2003, respectively. The third survey was conducted in 2003 with multi-level stratified cluster sampling (MOH 2004), in total 57,000 households from urban and rural areas in 95 counties of 29 provinces were surveyed. Other reviewed articles using relatively large sample size survey data include Gao *et al.* (2004; 2005; 2006), Yan *et al.* (2006), Zhang (2003), Wei (2004), Hai (2004) and Zhu (2002). The sampling approaches that major reviewed articles used are described in Table 1.

Table 1. Description of sampling information of the studies in reviewed articles

	Size sample	No. of county	No. of province	Year	Sampling method
Gao <i>et al.</i> 2004; 2006; Hai 2004	1,428h	-	8	87-02	10 villages under observation of Ministry of Agriculture in each province
Gu <i>et al.</i> 1994	642,564p	20	-	1988	50 townships in 20 counties over China
Huang <i>et al.</i> 2004	10,000p	10	1	2000	Multi-level stratified clusters, Hubei
Jiang <i>et al.</i> 2003	18h	5	1	2000	Stratified samples from 5 counties, Sichuan
Jiang <i>et al.</i> 2005	300h	5	1	2001	Multi-level stratified clusters in a province

Diseases, Disease Surveillance, Modern Preventive Medicine, Maternal and Child Health Care of China, Chinese Journal of Prevention and Control of Chronic Non-Communicable Diseases, Medicine and Society, Chinese Primary Health Care and Chinese Journal of Public Health.

	Size sample	No. of county	No. of province	Year	Sampling method
Li <i>et al.</i> 2005	6,983p	1	21	2003	Multi-level stratified clusters in China
Mao 2001	2,976h	10	8	1996	10 poor counties in 8 western provinces
MOH 2004	57,000h	95	29	2003	Multi-level stratified clusters in China
NST 2002	365,097p	-	-	2000	257 stratified proportional clusters in China
Peng <i>et al.</i> , 2004,	360h	8	1	2003	Random county clusters, Hubei
Sun <i>et al.</i> 2006	1,127h	-	8	87-02	48 villages from Ministry of Agriculture
Sun 2005	612h	2	1	2003	Random samples from 2 counties, Shanxi
Wei 2004	2,560h	32	8	1993	China's economy, population and health survey
Wu <i>et al.</i> 2002	50,000p	-	-	2000	From 32 random clusters in a province
Xing <i>et al.</i> 2002	6,000h	12	1	1998	The Third Health Services Survey, Zhejiang
Yan <i>et al.</i> 2006	808h	25	5	2004	5 counties in 5 provinces
Yue <i>et al.</i> , 2003	800h	4	3	2002	50 households in 3 central provinces
Yue 2006	1,106h	-	11	2002	Random samples, 38 villages in 11 provinces
Zhang 2003	460h	6	-	1997	6 state-designed poor counties
Zhu 2002	2,008h	34	6	1999	1 villages in 2 counties in 6 provinces

Note: in the column size sample, p means persons; h means households

However, several articles reviewed were based on a rather small and highly selective number of households, and did not use samples representative of the population concerned. In addition, relevant definitions and study designs (as used in the articles) vary to some extent. These preclude combining the studies statistically.

Prevalence of illness in rural China

THE TWO-WEEK MORBIDITY

Most studies used two-week morbidity to reflect the prevalence of illness. In the National Health Services Survey, it is investigated by asking the interviewees whether members of their household have been ill in the previous two weeks, and measured either in terms of the number of those ill

or total episodes of illness in the past two weeks. According to the 2003 survey, the two-week morbidity in rural areas was 14%. Among these, 45% suffered from chronic illness. Compared with the 1998 survey, this is an increase of 31% (MOH 2004)³.

There is strong evidence that morbidity varies between and within provinces and regions. Chen *et al.* (2003) investigated the two-week morbidity and inpatient care of 1,914 rural residents in 5 counties in Hubei in 2000, and found that the two-week morbidity was 13%, similar to the national level⁴. Analyzing the Third National Health Services Survey in rural Sichuan, Li *et al.* (2005) found the two-week morbidity was 22% in 2003, much higher than that at national level. Researchers found that two-week morbidity in rural areas varied by gender, age, education level, type of illness and geographic locations.

Two-week morbidity by gender

In rural areas, the two-week morbidity of males was 13%, whereas females' morbidity was 15% (MOH 2004). By analyzing data from a survey containing 1,428 households in 8 provinces (Zhejiang and Guangdong in the east, Shanxi, Jilin, Henan and Hunan in the central region, and Sichuan and Gansu in the west), Gao *et al.* (2004) came to the conclusion that two-week morbidity rates of males and females were 5% and 6%, respectively. Li *et al.* (2005) found that two-week morbidity of males in rural Sichuan was 20%, while that of females was 24%, much higher than MOH (2004) rates⁵.

Two-week morbidity by age group

While females may suffer more from two-week morbidity, the distribution of morbidity among age groups shows that the older age groups had a higher morbidity. This can be investigated as in Table 2.

³ Further investigation is needed to explain the increase in chronic illness. Patterns of illnesses in rural areas have been investigated and chronic non-communicable illness has been found increasingly common in rural areas

⁴ The two-week morbidity here refers to the results of the Second National Health Services Survey in 1998.

⁵ This needs further investigation. If, for example, population is broken up by age group, different patterns may be observed due to the fact that more elderly women live in the Sichuan countryside than elderly men.

Table 2. Distribution of two-week morbidity and chronic illness morbidity by age group, %

Age groups	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65+
Two-week morbidity	14	8	5	9	14	20	25	30
Chronic illness morbidity	1	1	2	6	12	20	30	39

As can be seen, the age group of 15-24 had the lowest two-week morbidity. For the age groups under 15, the younger in age, the higher the two-week morbidity. For the older age groups, the older the age, the higher the two-week morbidity (MOH 2004).

Two-week morbidity by education level

The morbidity of people with lower education levels has been found to be significantly higher than that of other education levels. The two-week morbidity of illiterates and near-illiterates is the highest (24%), followed by that of people with primary school education (17%). The higher the individuals' education level, the lower the two-week morbidity (MOH 2004). Chen *et al.* (2003) report similar findings in rural Yichang in Hubei Province.

Two-week morbidity by types of illness

Illness can be classified in various ways. Patients in rural areas were most likely to suffer from respiratory system illness, digestive system illness, circulatory system illness, musculoskeletal illness and injury and poisoning. Taken together these account for an 84% of all illnesses (MOH 2004). In rural areas, the highest two-week morbidity was that of acute upper respiratory tract infection, followed by acute nasopharyngitis, acute/chronic gastroenteritis, hypertension, flu and rheumatoid arthritis. Compared with 1998, the two-week morbidity of hypertension had increased by a remarkable 131% (MOH 2004).

Zhu (2000) points out that in the past two decades, with increasing mobility, changes in life style and dieting, and environmental deterioration, common patterns of illnesses in rural areas were no longer limited to influenza, fever and diarrhea, which were previously the major types of illnesses, but had also begun to include chronic non-communicable illness.

Huang *et al.* (2004) point out that malignant neoplasm and cerebrovascular illness were the leading causes of death in rural areas in 2002, accounting for 38% of the total. Malignant neoplasm, cerebrovascular illness, respiratory system illness, heart disease and injury and poisoning together were implicated in 78% of all deaths.

MORBIDITY FROM CHRONIC ILLNESS

The Third National Health Services Survey indicates that, in terms of individuals reporting illness, the morbidity of chronic illness⁶ among rural residents was 11% (MOH 2004). By analyzing data from the Health Yearbook in China for 1993 and 2004, which were derived from the First and Third National Health Services Survey, Liu (2005) found that malignant neoplasm, cerebrovascular illness, heart disease, hypertension and diabetes were the most common chronic non-communicable illnesses in China, all with high morbidity and mortality. Using data on 808 households from 5 provinces, Yan *et al.* (2006) showed that the overall reported health status of rural population was poor, with 25% of the total sample suffering from chronic illness. Li *et al.* (2005) report that the morbidity of chronic illness in rural Sichuan was 15%, higher than that at national level.

Morbidity from chronic illness by gender

There were gender differences in chronic illness morbidity in rural China, with the rate for males being 11% and for females 14% (MOH 2004). Using data from Anhui, Qin *et al.* (2003) found that the two figures were similarly 11% and 13%. Li (2005), using data from Sichuan, found that the rate for females was also much higher than that for males.

Morbidity from chronic illness by age group

Morbidity from chronic illness in rural areas varied among age groups. The distribution of morbidity among different age groups is listed in Table 2. As can be seen, the morbidity rate of chronic illness increased with age (MOH 2004). Li (2005) found the same pattern in rural Sichuan.

⁶ In the National Health Services Survey, patients with chronic illness were defined as those: who in the past half year had been diagnosed definitely by health workers with various chronic illnesses including chronic infectious illness (e.g. TB) and chronic non-communicable illness (e.g. coronary heart disease and hypertension); or half a year before the investigation had been diagnosed with a chronic disease, and in the past half year, the disease had attacked several times and corresponding treatment, such as medicine and physical therapy, was taken.

Morbidity of chronic illness by geographic location

In the study cited above, Yan *et al.* (2006) found that there were significant differences in health status among sampled rural residents by region in 2004. The morbidity of chronic illness of the poor sample villages was much higher than that of the rich ones, 29% in the poorest 20 sample villages, as compared to 19% in the richest counterparts.

Morbidity of chronic illness by types of illness

Common chronic illnesses in rural areas included those of the circulatory, digestive, locomotive, respiratory, genitourinary and nervous systems. All together these accounted for 84% of the total chronic illness cases. At the national level, morbidity from non-communicable chronic illness in rural areas in 2004 had increased substantially compared with 1998, while that from infectious chronic illness declined (MOH 2004). Classified by type of illness, the most common chronic illness in rural areas was hypertension, followed by chronic gastroenteritis, rheumatoid arthritis and chronic obstructive pulmonary illness. Compared with 1998, the largest increases in morbidity from chronic illness related to hypertension (by 134%), cholelithiasis and cholecystitis and cerebrovascular illness (MOH 2004).

THE PREVALENCE OF SELECTED SERIOUS ILLNESSES

With the increasing mobility of the labor force, changes of lifestyle and increased environmental pollution, health-related risks have become more complex. Some infectious illnesses once under control (such as sexually transmitted illnesses, TB and schistosomiasis) have re-emerged with high morbidity. In recent years HIV/AIDS has also started to spread with remarkable speed.

Tuberculosis (TB)

Using data from the Fourth National Epidemiological Sampling Survey on Tuberculosis in 2000, the National Epidemiological Sampling Survey Technical Instruction Group on Tuberculosis (NST 2002) found that the prevalence of active pulmonary tuberculosis in rural areas was 393/100,000, smear positive TB prevalence was 116/100,000 and bacterium-positive TB prevalence was 169/100,000.

Using data from Sichuan in 2000, Wu *et al.* (2002) found that the prevalence of pulmonary tuberculosis in rural areas was 126/100,000, and the death rates of TB and pulmonary TB for whole Sichuan were

24/100,000 and 22/100,000, respectively in 1999. By analyzing data on the Fourth National Epidemiological Sampling Survey of Tuberculosis in 2000 from a county in Hubei, Chen *et al.* (2005) came to the conclusion that TB prevalence was 455/100,000 and smear positive prevalence was 152/100,000. TB prevalence increased with age and was higher among males than females. Most patients with active pulmonary tuberculosis were middle-aged or elderly.

HIV/AIDS

HIV/AIDS prevalence rates appeared to be closely related to poverty status. Reported HIV/AIDS cases were predominantly in poor areas. Sufferers were mainly rural residents and the unemployed. 62,159 HIV-positive cases had been reported by 2003, and 80% of the victims came from poor rural areas and southern minority regions. If these cases were representative, it could be estimated that out of China's 840,000 recorded HIV-positive cases, about 670,000 are rural residents (Li *et al.* 2005).

Weng (2003) reviewed the literature and conducted fieldwork in three locations in Yunnan, and came to the conclusion that the five provinces with the highest prevalence of HIV-positives were Yunnan, Xinjiang, Guangxi, Guangdong and Sichuan. The affected individuals were mainly rural residents, especially those who had migrated in pursuit of employment. From 1998 to 2000, more than 70% of the HIV-positive cases in Yunnan were rural residents and the unemployed. In Sichuan, the corresponding figure was more than 76%.

Endemic illness

Endemic illnesses were important concerns in China during the 1960s and 1970s, but most have been under control in recent decades. Attention has focused on eight illnesses: plague, schistosomiasis, iodine deficiency disorders, Kashin-Beck disease, Keshan disease, endemic fluorosis, Brucellosis and endemic arsenic poisoning. They were widespread, especially in remote poor areas (Qian 1999). Chu (2003) investigated schistosomiasis in Lushan County, Sichuan. The county, located at the west edge of Sichuan Basin on the upstream of Qingyi River, was a severely schistosomiasis-stricken area. The overall infection rate was 42% in 1964, but declined to 12% in 2000. It was still prevalent in 10 towns with *oncomelania hupensis* thriving in an area of 1,470,000 square meters with a population of 80,000. More than 60% of the total population was at risk. Using data from Songzi

County in Hubei, Chen *et al.* (1998) found that the infection rate was 17% and that 222,300 square meters were affected by oncomelania hupensis in 1994. These dropped to 2% and 14,000 square meters by 1997.

Gynecological illness

Perinatal and post-natal health care have received considerable research attention. The use of hospitalized delivery in rural China has increased but reproductive health care after birth has not been given due attention (Hai *et al.* 2004). After having structured interviews with 1,500 rural women in reproductive age from Xindu County, Sichuan, and making routine gynaecological check-ups and relevant laboratory examinations, Gao *et al.* (2003) found that the prevalence of reproductive tract infection was 61%. The four leading types of illness with high morbidity were erosion of cervix, hypertrophy of uterus, bacterial vaginosis and candidal vaginitis. Wu *et al.* (2003) surveyed 1,192 rural married women in Panzihua, Sichuan, and also undertook B-Ultrasound, breast screening, and gynaecological check-ups. They found that the most common illnesses were reproductive tract infection, menstrual disorder, cramp pain, pelvic mass, breast illness and prolapse of the uterus. The prevalence of reproductive tract infection, most commonly chronic cervicitis, was 59%, much higher than in other parts of China.

Geriatric Illness

Using data on mortality from China's Health Yearbook in 2004 and on chronic illness in the Third National Health Services Survey, Wang *et al.* (2005) found that common chronic illnesses among the elderly were respectively (in decreasing order): hypertension, heart disease, respiratory system illness, cerebrovascular illness, diabetes and malignant neoplasm. In 2003, the leading illnesses causing death among the rural elderly were respiratory system illness, cerebrovascular illness, heart illness, malignant neoplasm, hypertension and diabetes. Wang *et al.* (1999) investigated the quality of life and prevalence of chronic illness among 2,452 elderly people in Chengdu, Sichuan. The results indicated that on a patient basis the prevalence of chronic illness among the rural elderly was 61%. Of those affected, 25% suffered from two types of illness and 5% from three types of illness. Illness of the respiratory, digestive, circulatory, and musculoskeletal systems and ENT were the top five chronic illnesses, contributing to 76% of

total morbidity. Zhang *et al.* (2006) investigated 463 elderly people in four rural communities in Hubei in 2004 and found that 70% suffered from at least one type of chronic illness.

Economic risks of ill-health and household coping strategies

According to the Third National Health Services Survey, the proportion of households which became poor⁷ due to ill-health increased from 22% in 1998 to 33% in 2003, respectively (MOH 2004). Severe ill-health risks can impair households' capabilities, which have significant and far-reaching impacts on household livelihoods. The direct impact can be short-term, which is mainly due to the loss of laboring ability of patients in a certain period of time or loss of working hours for the household members taking care of the patients. The indirect impact is a long term one, as the large sum of resources originally meant for productive activities and children's education will be spent on health care. In this way, serious illness may lead rural households to chronic poverty.

IMPACT OF ILL-HEALTH ON HOUSEHOLD LIVELIHOODS

Ill-health affects household livelihoods in various ways. Gao *et al.* (2005) found that there were two main processes by which serious illness shocks had a great impact on household income: the patients would lose their capacity to work for a period of time and other household members would also reduce their working hours to care for them; household financial assets intended for productive asset purchase and/or children's education may be used to pay for medical expenses.

Ill-health often accompanies poverty. Malnutrition, poor sanitation, lack of medical knowledge, stress and excessive physical labor all make the poor more predisposed to illness. Once they develop an illness, they not only lose the capacity to work, resulting in a decline in income, but also face increasing medical expenses. If they cannot afford this expense they may choose not to seek medical assistance in time. The minor illness may become a serious illness with higher medical expenses, which pushes the household

⁷ The survey asked whether the household is a local government-designated poor household, and then asked the reason for being poor. 4.5% of the households were poor by the definition.

into poverty. This leads to the vicious cycle of 'illness leading to poverty, and poverty leading to illness' (Qiu 2003).

IMPACT OF ILL-HEALTH ON HOUSEHOLD INCOME GENERATION AND CONSUMPTION EXPENDITURE

The impact of illness on rural household income generation can be investigated in terms of income sources, namely household-based agricultural enterprises and non-agricultural activities. An interesting study by Zhang (2003) analyzed data from a survey on 'credit and poverty in China' containing 460 randomly selected households from 6 state-designated poor counties in western China in 1997 and found that the working time lost due to illness had significant negative effects on household income generation. He pointed out that one month working time lost would decrease household income from crop production by 2,300 RMB Yuan⁸. Using data from 'China's economy, population, nutrition and health survey' in 1993, which contained 2,500 households in 96 villages of 36 counties in 8 provinces (Liaoning, Jiangsu, Shandong, Henan, Hubei, Hunan, Guangxi and Guizhou), Wei (2004) found that health condition is positively correlated with wage income for rural labor force working at non-farm sector. He pointed out that human capital has an important role in obtaining non-farm employment, and that those who are healthy (and male, young, educated and urban registered) are more able to participate in non-farm activities in the city than those with health problems.

Ill-health shock has both short-term and long-term impacts. Gao *et al.* (2005; 2006) analyzed the prevalence and treatment of serious illness⁹ for 1,193 households in eight provinces (Zhejiang, Guangdong, Hunan, Sichuan, Henan, Shanxi, Gansu and Jilin) over the period of 1987-2002 and found that the annual per capita income of affected households decreased by 5-6%, with the negative effect sometimes continuing for 15 years or longer. Using the same data source, Hai (2004) found that serious illness affected household savings and consumption expenditure in the short term, and capacity for income generation in the long term through the decline in

⁸ Health variables included not only health-related variables such as self-evaluation of health status, routine life ability, having a chronic illness or not and working days lost, but also nutrition-related variables such as height, BMI, calories and primal dieting score.

⁹ Serious illness was defined as receiving inpatient care for one day and above, or medical expense for the illness exceeded 5,000 RMB Yuan.

human capital investment. Serious illness had no significant effects on income in the same year, but was associated with reductions over the following years. It generally took five years for households to recover from a serious illness. However, poor households needed a longer time to recover.

IMPACT OF ILL-HEALTH ON HOUSEHOLD INVESTMENT ON HUMAN CAPITAL

Illness affects household human capital in two ways. Firstly, the ability to work or working time may be seriously reduced. Yu *et al.* (1998) found that many individuals receiving inpatient care were often unable to work normally for several months. During their inpatient stay they also needed considerable personal care that was provided mainly by other household members. Using data from 1,193 households in eight provinces (Zhejiang, Guangdong, Hunan, Sichuan, Henan, Shanxi, Gansu and Jilin) over the period of 1987-2002, Hai (2004) estimated that the average time loss of a household member with serious illness in a sample of households was 17.9 months. According to the Third National Health Services Survey, the 'lying-in-bed-for-illness' rate and day-off rate of rural residents based on a two-week recall period were both 3.8%, respectively (MOH 2004). Secondly, household human capital investment was reduced. Sun *et al.* (2006) found that the primary educational achievement of children in households with a member suffering serious illness was negatively affected.

IMPACT OF SPECIFIC TYPES OF ILLNESS ON HOUSEHOLD LIVELIHOODS

A study based on interviews with households with HIV/AIDS patients in central and southwest China (Li *et al.* 2005) found that households were affected in the following ways. Firstly, productive activities were affected. Crops yields decreased and the labor burden on women increased. The households had less income and fewer opportunities for non-farm work. Secondly, household income and consumption expenditure declined, and income from agricultural activities became the most important component of the total. Children sometimes became the main income earners. Medical expenses (instead of education expenses) became the largest item in household expenditure. Thirdly, the quality of life decreased. Some households were not able to secure their food supply, and other consumption items were also reduced. Fourthly, social capital was affected. Households with HIV patients had less social communication and were more frowned upon by others.

HOUSEHOLD ILL-HEALTH RISK COPING STRATEGIES

Yu *et al.* (1998) and Jiang (2005) summarized household strategies in coping with ill-health risk: (1) using cash and savings; (2) selling livestock; (3) selling other assets; (4) changing productive activities; (5) borrowing from friends and relatives; (6) borrowing from moneylenders; (7) receiving in-kind help from friends and relatives; (8) delaying payment to private health care providers; (9) being exempted from medical fees; (10) receiving support from children; (11) receiving reimbursement from medical schemes; and (12) receiving social relief. Ding *et al.* (2001) and Chen *et al.* (2005) found that rural households generally followed the following sequence in coping with economic hardship: reducing consumption expenditure, using savings, borrowing from friends and relatives, borrowing from moneylenders, working longer, selling durables and productive assets, leaving home to work outside, begging for food, breaking up the household and finally committing crimes.

In assessing the effectiveness of household strategies in coping with health-related risks, Jiang *et al.* (2003) proposed three criteria: 1) risk transfer (whether the risk has been transferred or not); 2) risk reduction (whether the negative impact on household production was reduced or not); and 3) risk protection (whether household well-being/assets were protected or not). Yu *et al.* (1998) believed that short-term strategies can lead to a loss of production opportunities, and decrease the ability to fight against future risk. Most households that borrowed could maintain normal production activities, and the majority of households who sold residual assets¹⁰ did not lose more assets. However, those who sold core (or productive) assets could hardly make a living. Households with short-term or intermittent labor loss could manage farm work with help from friends and relatives, while those with long-term or continuous labor loss could not.

Household ex ante coping strategies

Increasing health awareness and securing safe drinking water were commonly used preventive strategies. Using data from 2,008 households in Jiangsu, Guangdong, Jilin, Hebei, Sichuan and Gangsu, Zhu (2002) found that more than 80% households had joined in a children's immunity project

¹⁰ According to the author, assets were divided into core assets (cow, horse ...) and residual assets (crops, domestic livestock and poultry).

and used clean drinking water facilities, 40% received health-related education and improved sanitary facilities. According to the Third National Health Services Survey in 2003, 87% of rural children had Planning Immunity Inoculation Cards (MOH 2004). Zhu (2000) pointed out that although chronic illness has been increasingly prevalent, government primary focus in health preventive strategies remained on infectious illness.

One preventive strategy is to join the cooperative medical system scheme. Two types of scheme have been implemented over the past decades. Previously the Cooperative Medical System (CMS), which started in the 1960s¹¹, was in place (see for example Xu *et al.* in this issue). In the 1970s, the majority of the Chinese rural people were covered through this system. By the end of the 80s, however, evidence on rural residents' perception and understanding of the scheme had become less optimistic. Ye *et al.* (2000) investigated the CMS scheme and found that only 6% of the 2,117 study villages had joined, and that a higher proportion of low income households did not perceive CMS as worthwhile. Mao (2001) found that in poor areas the majority of the population did not recognize the role of CMS in ill-health risk-pooling. Recently the New Cooperative Medical System (NCMS) scheme has been implemented (since 2003) in rural China. Using data from 808 households in 25 counties in provinces of Jiangsu, Sichuan, Shaanxi, Hubei and Jilin in 2005, Yan *et al.* (2006) found that in villages with NCMS, 80% of households had joined in the scheme. An official report stated that by 2005, 76% of total 236 million rural residents in 678 counties, where NCMS had been implemented, had participated in the scheme (Ministry of Health 2006) (for more detail on NCMS, including the perception of rural residents on this system, see Wang in this issue).

Diverse healthcare-seeking strategies were frequently used by rural households to reduce ill-health risk. Liu (2005) found that farmers with minor illnesses usually did not see doctors but only went to hospital when apparently small problems became more serious. MOH (2004) data showed that for those sick over a two-week period, the reported rates for seeing doctors, self-care and no-action were 54%, 31% and 14%, respectively. Jiang *et al.* (2003) summarized *ex ante* strategies that rural households adopt in

¹¹ The Cooperative Medical System scheme (CMS) that was implemented since the 1960s has to be distinguished from the New Cooperative Medical System scheme (NCMS) that has been implemented since 2003.

coping with ill health risk, including preventive strategies (healthy lifestyle, clean and healthy food, regular physical exercises and not doing high-risk work), strategies for reducing loss (early treatment, visiting herbalist doctors and private clinics, buying medicine/herbal medicine), and non-insurance transfer strategies (working as wage labor to transfer risk by joining in employees' insurance scheme).

Household ex post coping strategies

Several studies have investigated household *ex post* strategies in coping with health risks. Yu (1998) looked at studies on households *ex post* strategies and summarized them as follows. 1) consumption adjustment strategies: (a) maintaining the same consumption level by: selling food grains; selling livestock and poultry; private borrowing; borrowing from financial institutions; postponing repayment; (b) reducing consumption level by: reducing food/other necessities; migration; delaying seeking for health services; shortening inpatient stay; seeking for cheaper services; not seeking medical services; delaying the payment of medical expense. 2) production adjustment strategies: (a) maintaining the same production level by: other members working longer; help from family network; labor exchange; (b) reducing the production level by: diversifying income; working in activities requiring less labor.

Jiang (2005) looked into households *ex post* strategies in coping with ill health risk and summarized them in this way: 1) financial adjustment strategies, including from the nuclear family (paying cash; drawing savings; selling assets; engaging in wage labor; selling durables; removing children from school); from the extended family (food/goods transferring; labor exchanging; borrowing; cheaper medical services); beyond the extended family (medical services on credit; free services; goods and cash transferring; government relief; borrowing); and from formal insurance (health insurance scheme; new cooperative medical system). 2) time adjustment strategies, including substituting machines for labor within the family; hiring labor or manual help within the extended family; and wage labor and exchanging labor beyond the extended family.

Hai *et al.* (2004) found that 42% of the sample households having members with serious illness borrowed money, mainly from relatives, credit cooperatives and friends. In addition, 6% had joined commercial medical insurance schemes. Liu (2005) found that it was common for rural patients

to receive medical services from village clinics on credit; they also often prayed to Buddha for relieving illness.

Coping strategies in terms of household economic status

Based on household survey data, Zhu (2002) found that the availability of public health services¹² for the poor was much lower than that for the non-poor. The percentage of hospitalized childbirth for women of poor households was much less than the national average, and the availability of health knowledge was also lower among the poor households. According to MOH (2004), the poorer the area was, the higher the percentage of households with unsafe drinking water was.

Yu *et al.* (1998) found that the poor have difficulty in borrowing from friends, relatives and credit cooperatives. Many people in poor households suffered from illness for quite a long time, but could not afford treatment. When illness hit them, they could only seek low quality medical service either from less qualified private doctors or from the local unregulated drug market. Hu (2006) reported that a common strategy for poor households in coping with medical costs was to pay treatment costs themselves for minor illness but to seek outside help for serious illness. The strategy for the poorest was often simply 'let it be' as they could not afford treatment. Liang *et al.* (2001) investigated the poor in Shanghai and found that 19% of the poor did not seek treatment at all or only bought drugs from the local market. Hai *et al.* (2004) reported that borrowing was of greater importance for low income households than for medium and high income households. Gu *et al.* (1994) found that the percentage of patients needing inpatient care but not being able to afford it was much higher in poor counties than in non-poor counties. Zhao *et al.* (2000) pointed out that 65% of the poor households studied became poor because of serious illness in the Ministry of Health's Health 8 Project regions.

Households may take different actions in handling illness of different family members. Liu *et al.* (2002) found that children and the elderly may receive timely medical services while adults may delay. Hai *et al.* (2004) found that household income earners and children may tend to visit hospitals at county or higher level while the elderly may visit local clinics or may choose

¹² The public health services consist of health education, safe drinking water, alteration of sanitary equipment, hospitalization childbirth and children immune vaccination.

not to seek care. Li *et al.* (2002) came to the same conclusion: more resources went to income earners and children than to the elderly.

Conclusions and further research directions

The studies reviewed provide evidence that health-related risks have become more complex in rural China. There have been tremendous socioeconomic changes including increasing mobility, changes in life styles and a deteriorating environment. Given these changes, common illnesses in rural areas now include not only those that were previously dominant but also chronic non-communicable illness. While morbidity from infectious chronic diseases has declined, morbidity from non-communicable chronic illness has been increasing. Research identifying the most serious illnesses in rural areas in recent decades has made it clear that chronic illness has become the leading cause of death. More researches on the pattern of illness prevalence in rural China, with a particular focus on non-communicable chronic illness, are needed.

Researches have provided evidence that serious illness has a great impact on household income generation, consumption expenditure, human capital accumulation, and livelihood strategies and outcomes. Households with low-income are more exposed to ill-health risk. In the design of interventions for alleviating the burden of serious illness on rural households, it is important to focus on earlier identification of vulnerable households. This would help in planning treatment procedures, secondary prevention and the rehabilitation of people with serious illness. This would require further investigation of the varied characteristics of households with different types of illness, and better understanding of the wide range of socioeconomic factors determining household healthcare seeking behavior. Such studies should include detailed investigation of the impact of ill-health on: household and individual well-being; healthcare seeking behaviour; healthcare related costs; and the extent and effectiveness of the support provided by formal assistance schemes (such as the New Cooperative Medical System and Medical Financial Assistance) or from other sources.

Poverty and illness are closely interrelated in rural China. As many studies stated, there exists a 'vicious cycle' in which poverty and ill-health are mutually reinforced. To design appropriate and effective public interventions to break down the 'vicious cycle', the determinants of this 'vicious cycle'

need to be studied empirically. The poor households are generally seen as marginalized in terms of access to quality health care. Studies should investigate the impact of informal and institutionalized solutions to the access problem of the poor to quality health care, using both quantitative and qualitative methods.

Researchers have generally found that households in rural areas adopt various strategies in response to health risk, including prevention strategies, mitigating strategies and coping strategies. They have found that the effectiveness of coping strategies is very dependent on household composition and economic status. However, existing studies were mainly descriptive, and the empirical evidence available in the Chinese literature on how rural households cope with different types of illness and the effectiveness of such coping strategies was limited. More empirical studies in this area deserve high priority so that policymakers have the information they need to design appropriate interventions to improve the health status of the rural population.

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