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Health System Reform in China 1

Tackling the challenges to health equity in China

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In terms of economic development, China is widely acclaimed as a miracle economy. Over a period of rapid economic growth, however, China's reputation for health has been slipping. In the 1970s China was a shining example of health development, but no longer. Government and public concerns about health equity have grown. China's health-equity challenges are truly daunting because of a vicious cycle of three synergistic factors: the social determinants of health have become more inequitable; imbalances in the roles of the market and government have developed; and concerns among the public have grown about fairness in health. With economic boom and growing government revenues, China is unlike other countries challenged by health inequities and can afford the necessary reforms so that economic development goes hand-in-hand with improved health equity. Reforms to improve health equity will receive immense popular support, governmental commitment, and interest from the public-health community worldwide.

Lancet 2008; 372: 1493–501

Published Online October 20, 2008 DOI:10.1016/S0140-6736(08)61364-1

See Editorial page 1437

This is the first of a Series of seven papers on health system reform in China

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Introduction

Over the past half century, the health performance of China has been the subject of intense international interest. In the early decades after the founding of the People's Republic in 1949, China was able to achieve impressive health advances and was internationally recognised as a superior health performer.[1] Economic reforms over the past three decades have sparked unprecedented economic growth, including large reductions of income poverty. Although health gains have continued, concern for the equitable distribution of social benefits of economic progress has grown. China's health inequalities are increasing, gains slowing, and public dissatisfaction mounting. The Chinese government increasingly recognises these challenges and is responding to them. Reform of health care has been ongoing for several years,[2] And earlier this year, after the 17th Chinese Communist Party Congress, the Ministry of Health announced major new policy directions for achieving Healthy China by 2020:[3]

> "Health is the cornerstone of comprehensive human development…assurance of health equity is now regarded as the key parameter for the social justice and fairness in the country…Accessibility of basic medical and health care services is a basic right of the people."

We synthesise evidence underlying Chinese concerns about health equity (panel)[4,5] with a conceptual framework of health equity proposed by Amartya Sen:[5]

> "Health equity cannot be concerned only with health in isolation. Rather it must come to grips with the larger issue of fairness and justice in social arrangements, including economic allocations, paying attention to the role of health in human life and freedom. Health equity is most certainly not just about the distribution of health, not to mention the even narrower focus on the distribution of health care. Indeed, health equity has an enormously wide reach and relevance."

Evidence points to daunting equity challenges for China. The Chinese Government itself has diagnosed that economic reform has "ushered in some outstanding contradictions and problems".[6] These daunting problems constitute a vicious cycle of three reinforcing forces: imbalances in role of the market and government in health care, inequities in the social determinants of health, and growing public perceptions of unfairness of the overall health system. These forces, which are individually damaging, reinforce and aggravate each other, generating a perfect storm that ravages health care in China.

Panel: Concepts and definitions[4,5]

Social inequities in health
Systematic differences in health status between different socioeconomic groups or areas; because these differences are socially produced, they are perceived as unfair and the differences are modifiable by public action.

Health equity
Everyone could attain their full health potential and no-one should be disadvantaged from achieving this potential because of their social position or other socially determined factors.

Actions to promote health equity
These encompass the distribution of health status, the distribution of health-care services, fairness of processes in the delivery of essential public goods and services, and social justice in the way that health-related resources are allocated.

Equity in health care
One aspect of the larger concept of health equity, equity in health care implies fair arrangements that allow equal geographic, economic, and cultural access to available services for all in equal need of care.

China's disparities in health

Significant differences in health status exist between population groups in China. Among the 31 Chinese provinces, autonomous regions, and municipalities ranked by gross domestic product (GDP) per head, there

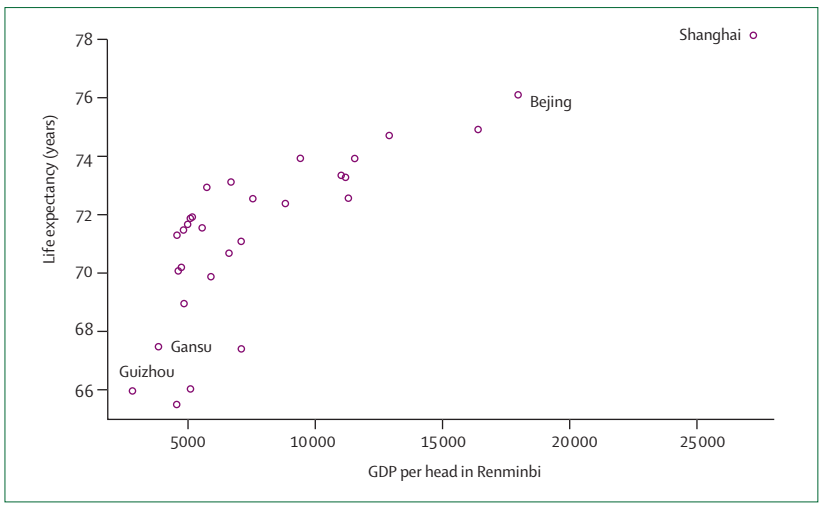

Figure 1: **Life expectancy at birth by Gross Domestic Product (GDP) per capita of 30 Chinese provinces in 2000**[7]

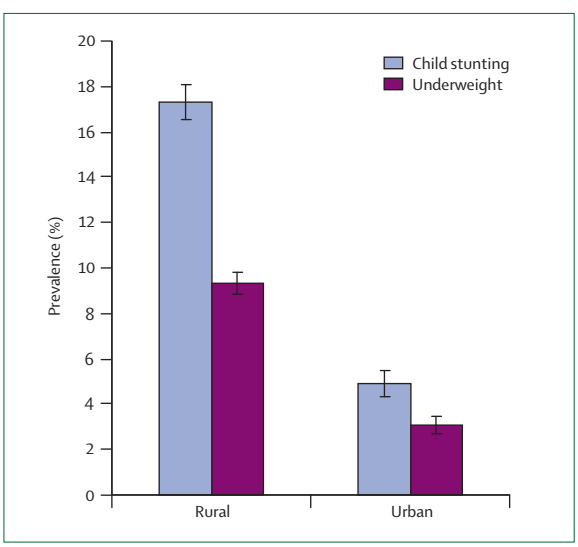

Figure 2: **Disparities in child malnutrition between urban and rural area of China 2002**[11]
Data are prevalence with 95% CI.

is a clear gradient in life expectancy, which increases with prosperity. In 2000, there was more than a ten-fold difference in average provincial GDPs between the richest and poorest provinces. In Shanghai, life expectancy was 78 years but in the poorest provinces it was 65 years—a gap of 13 years (figure 1).[7] Migrant populations are included in the urban figures. Although comparability is imperfect because of differing population unit sizes, the gaps in average life expectancy between provinces are noteworthy in comparison with the USA and the UK. In 2001–03, the gap in life expectancy between the US states with the highest (Minnesota) and lowest (District of Columbia) life expectancies was 6·5 years.[8] For the 12 regions and countries that make up the UK, the life expectancy gap in 2004–06 was 2·6 years for men and 2·7 years for women.[9]

China also has substantial disparities across a range of child-health indicators. Rural infant mortality rates are nearly five times higher in the poorest rural counties than in the wealthiest counties—123 versus 26 per 1000 livebirths, respectively.[10] There is a six-fold difference in mortality in children younger than 5 years between the highest-quintile and lowest-quintile population groups based on socioeconomic development of area of residence. In 2000–04, death rates in children younger than 5 years ranged from 10 per 1000 in the most affluent large cities to 64 per 1000 in poor rural areas. Levels of malnutrition in children aged less than 5 years show at least a three-fold difference between urban and rural areas. In 2002, the prevalence of child stunting was 17·3% in rural areas compared with 4·9% in urban areas; 9·3% of children were underweight in rural areas compared with 3·1% in urban areas (figure 2).[11]

Epidemiological transitions are shifting disease burdens that are unequally shared. The burden is shifting from infectious diseases mainly in children to chronic and degenerative diseases in adults.[12,13] Communicable and non-communicable diseases commonly have socioeconomic gradients with the burden falling most heavily on the poor.

Demographic transitions are also producing new vulnerable groups at high health risk. China's population is ageing; the UN predicts that more than 453 million Chinese will be older than 60 years by 2050.[14] Huge internal migration from rural to urban areas is estimated at about 140 million in 2005, 10% of the total population. Three-quarters of this migration is within provinces,[15] and migrants do not have adequate access to education and health care.[16] China has also witnessed a resurgence of gender inequities. China has a major share of the world's "missing women". Amartya Sen coined the term missing women for severe shortages of women arising from neglect and bias against girls, which affect parts of Asia and north Africa.[17] In China, the problem has been exacerbated in recent decades by the practice of sex-specific abortions.[17] As a result, in 2000, China's sex ratio at birth had climbed to 117 boys for every 100 girls—the normal sex ratio at birth is 105–107.[17] Discrimination lasts through infancy and childhood, reflected in higher death rates for girls. In 2000, infant mortality was 33·7 per 1000 livebirths for girls compared with 23·9 per 1000 for boys.[18]

How do we assess the scale of these health inequities? One straightforward method is to compute shortfalls in life expectancy or excesses of avoidable deaths relative to some feasible standard, such as the level already achieved by the most advantaged group in the population. For example, if all Chinese provinces had the same infant mortality level achieved by the prosperous municipality of Shanghai (5·1 per 1000 livebirths), some 374 000 infant deaths in the rest of China would have been avoided in 2000. Adopting Sen's approach of comparing China's sex ratio with that achieved in countries without substantial gender bias, the number of missing women

in China was estimated as 34·6 million in 1990. This is equivalent to an astounding 6·3% of the female population in China.[19] By 2000, the number of missing women had increased to 40·9 million (6·7%).[19]

Getting better or worse?

From an international perspective, China's national health achievements seem to have shifted from positive outlier (better health than expected from the level of

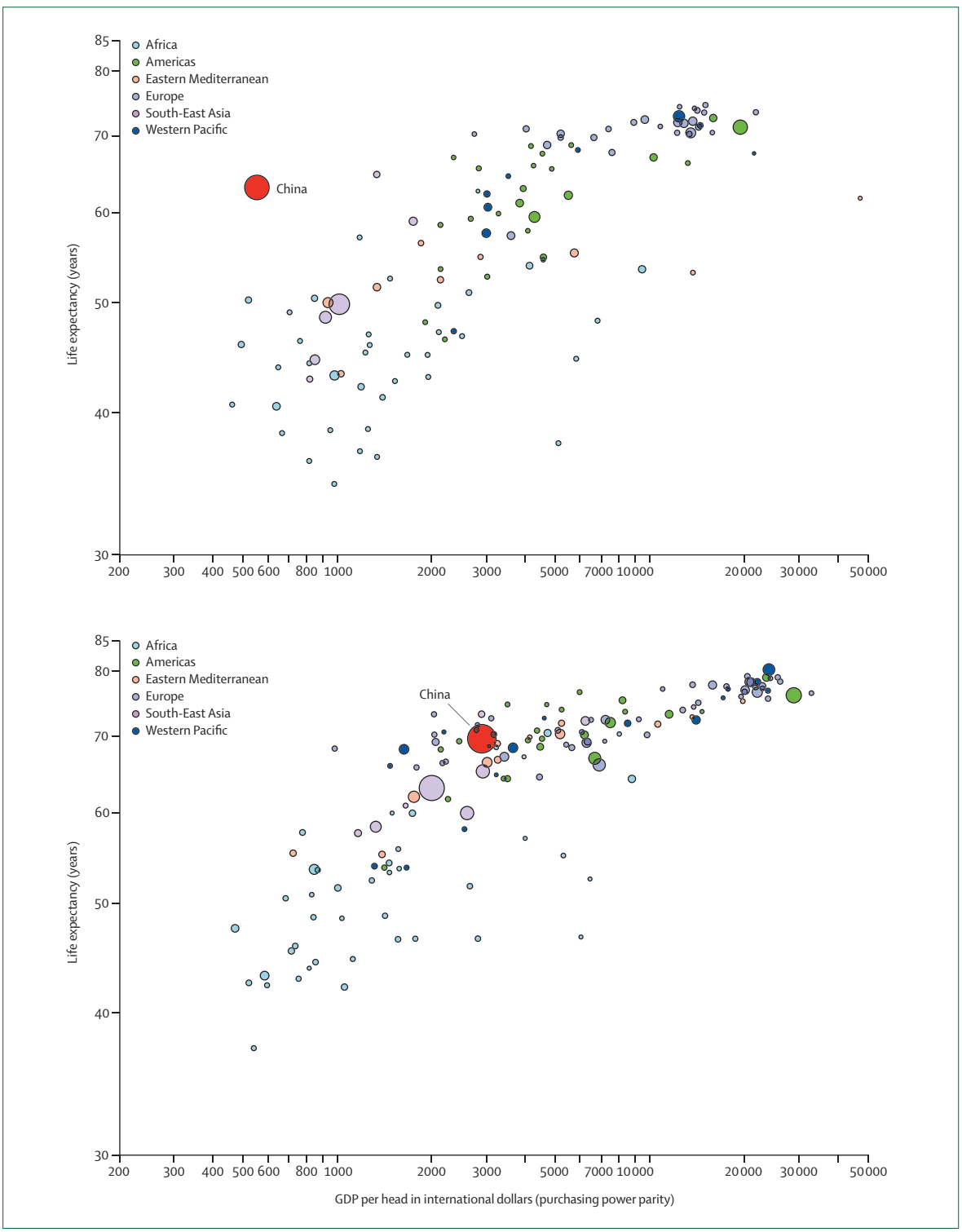

Figure 3: **Trends in national life expectancy by gross domestic product (GDP) per head for selected countries in 1970–74 (top) and 1995–99 (bottom)[20]**

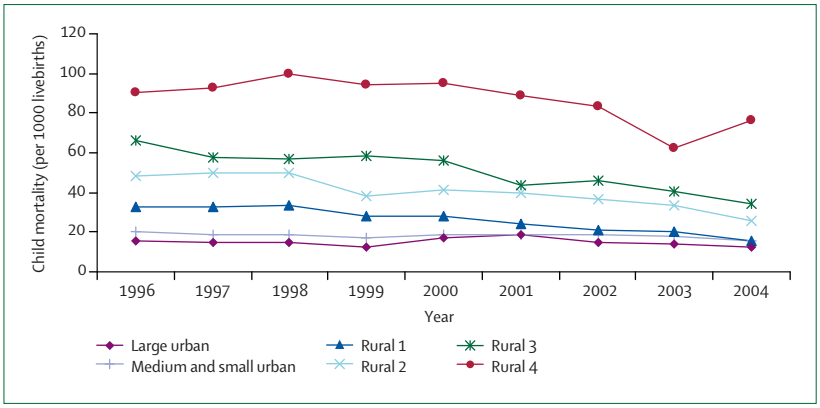

Figure 4: **Trends in mortality in children age less than 5 years by socioeconomic conditions of areas of residence, 1996–2004[10]**

Rural 1=most affluent rural. Rural 2=better-off rural. Rural 3=poor rural. Rural 4=poorest rural. Rating based on a deprivation index combining socioeconomic indicators of the areas.

economic development) in the 1970s to unexceptional performance by the 1990s (figure 3).[20] For the first 30 years from the establishment of the People's Republic, China achieved rapid increase of life expectancy, from 40 years to nearly 70 years. This increase was all the more remarkable because the nation was relatively poor, and average life expectancy for countries at similar levels of economic development was about 10 years lower than China's. The health success, despite limited economic resources, has been attributed to government commitment and implementation of public-delivery systems for food, preventive and primary health care, and other necessities for health.[1,21]

Since economic reforms in 1978, China's health performance has not fared as well. Indeed, Amartya Sen has argued that for the 1980s "rather than material prosperity pushing down the death rate, what has happened is some increase in mortality rates along with the policy package that has characterised the economic reforms".[22,23]

Possible increases in health disparities and slow-down of health gains cannot be extrapolated to the entire country or across all dimensions of health. Three lines of evidence, however, support these growing concerns in China. First, within China, improvement in life expectancy has been much slower in poor provinces than in rich ones. According to census estimates, the rich cities Beijing and Shanghai experienced gains in life expectancy of 4–5 years from 1981 to 2000—rising from 71·9 years to 76·1 years and 72·9 years to 78·1 years, respectively. By contrast, there was a much smaller improvement in life expectancy in Gansu, one of China's poorest provinces, gaining only 1·4 years over the same time period—from 66·1 to 67·5 years.[24] The differences in health achievements between rich and poor provinces have thus undoubtedly widened over recent decades.

Second, although there has been a great decline in mortality in children younger than 5 years between 1996 and 2004, child mortality rates still remain much higher in rural than in urban areas, and the gap in mortality between wealthy and poor rural areas has widened. A joint review of maternal and child survival strategy in China reported that during the period, mortality in children younger than 5 years dropped by nearly 23% in urban and 47% in rural areas. However, when the rural areas were disaggregated by socioeconomic circumstances, large declines in child mortality of about 50% occurred in wealthy rural areas, whereas poorer rural areas had declines of about 16% (figure 4).[10] These results again indicate that child mortality is closely related to the level of economic and social development, and reflect, in turn, limited access to health services due to mounting financial barriers.

Third, the pace of life expectancy gains in the 1990s has been slower in China than in other Asian countries at similar levels of income and life expectancy, such as Indonesia and Malaysia.[25]

Tackling the challenges to health equity

Evidence of China's current uneven progress in health and widening disparities are of concern to the government and the public. That is why the recently announced government initiative, Healthy China by 2020,[3] is so important. China must tackle three inter-related processes that create a perfect storm for health care: market failures and insufficient government stewardship, inequities in the social determinants of health, and erosion of public perceptions of fairness and trust of the health-care system.

Market failures and insufficient government stewardship

At the beginning of 2008, the government stated that "a wrong concept in the socialist market economy is that the medical and health care system should be market-oriented depending on market forces to meet the medical care needs of the people".[3] In recent years the government has also noted "contradictions and problems"[3] of the market economy. The combination of rapid economic growth and unprecedented rate of commercialisation has brought about notable market failures, none more spectacular than those in the health-care sector. Market failures occur when public goods, such as public health, are not produced sufficiently and in proportion to need. These failures have been compounded by information asymmetry, in which health providers have much greater information than patients on prices and quality of treatments and drugs. Under such conditions, providers can use their knowledge to persuade patients to spend more on services that will not necessarily lead to the best health gains, as has been happening in China.[26] Providers, for example, have been prescribing tests, drugs, and procedures that will make them the most profit—causing cost escalation, unnecessary or even dangerous practices, and poorer quality care. Furthermore, government

financing as a proportion of total health expenditure decreased from almost 40% in the early 1980s to 18% in 2005, while out-of-pocket payments rose from 20% to more than 50% in the same period.[27]

Before the economic reform launched in 1978, over 90% of the rural population in China was covered by the Cooperative Medical Scheme,[28] while the Government Insurance Scheme and Labour Insurance Scheme provided almost free health care to the employees of the government agencies and public institutions in Chinese cities.[29] Both schemes also partly covered the cost of health care for dependants of employees. According to a national survey in nine provinces in 1986, less than 14% of the urban population was not covered by any health insurance or plan.[30] As a whole, the Chinese population was able to access basic health care at a low and affordable cost before the mid-1980s.

Economic reform in China has brought profound changes to every part of society. The Cooperative Medical Scheme collapsed in most rural areas, due largely to the weakening of collective economies emanating from de facto privatisation of agricultural production.[31] Less than 10% of the rural population was covered by insurance schemes from the late 1980s to 2000. This decline hit the most disadvantaged in the rural areas hardest. In urban areas, a new Urban Employee Basic Health Insurance Scheme has been developed to replace the Government Insurance Scheme and Labour Insurance Scheme, which led to a rapid escalation in health-care costs in the 1980s and early 1990s. Overall coverage of government-run schemes decreased from 44% to 39% over the period 1998 to 2003, while there was an increase from 11% to 16% in coverage by non-mainstream insurance, including commercial schemes. The proportion of the urban population without any form of health insurance was static at around 44% over these 5 years.[32] Coverage increased with age and was highest for men and high-income groups, and Xu and colleagues[32] concluded that inequities in the urban insurance system were increasing. In addition, between 1993 and 1998, the proportion of the population who had to pay out-of-pocket for health care increased from 28% to 44%.[33] In poor rural areas, the proportion having to pay out-of-pocket was estimated as being as high as 90%.[34]

Data from the Chinese National Health Service survey in 1998 shows that 7% of the whole rural population was below the government-set poverty line, but when out-of-pocket medical spending was taken into account, the proportion living in poverty increased by 3 percentage points, which is an increase of over 44%.[35] Medical expenditure has clearly become an important cause of transient poverty, and, indeed, one of the major poverty generators in rural China.[26,35] Recent studies of tuberculosis and poverty in China reveal that, although drugs to treat the disease are free in China, patients still had to pay for other related medicines and diagnostic tests during the course of their treatment.[36] Such a heavy financial burden is one of the main reasons why many patients do not complete the appropriate treatment.[37]

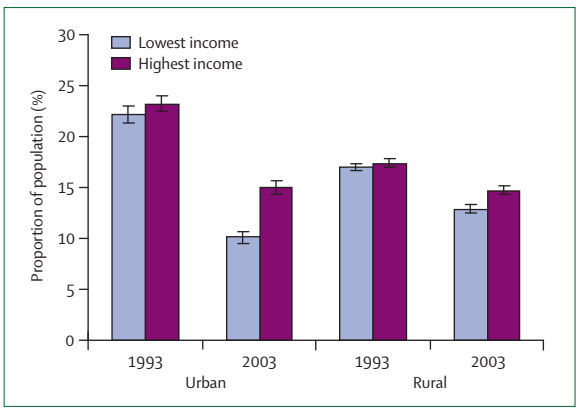

Figure 5: **Use of health services outside hospital in last 2 weeks in China by lowest and highest income quintiles in urban and rural area[38]**
Error bars indicate 95% CI.

Use of and access to health-care services have declined, especially for the poor.[38] Outpatient service use declined for all income groups in urban and rural areas over the decade from 1993 to 2003, with the largest percentage declines in use in the lowest income group (figure 5). This decline was related to unaffordable costs and poor-quality facilities and equipment.[38]

Government financing of health care over the past two decades or so has clearly been insufficient, as discussed by Hu and co-workers in this Series.[26] Investment in prevention and health protection before the severe acute respiratory syndrome epidemic was also seriously inadequate. Such problems of low health investment were coupled with rapid rise of medical costs and low efficiency of service delivery, resulting in an underperforming health system.[39] Local governments in China are commonly asked to take many responsibilities for education, health and social services, but lack sufficient finance to do so. Such unfunded mandates have brought about increased disparities in social services in the regions with different economic development levels. Government recognises that it has to do more but the difficulty of gaining a stronger appropriate role should not be underestimated.

Inequitable distribution of social determinants of health

China has been acclaimed as a miracle economy, achieving 9% annual growth per head for more than 25 years, and is poised to overtake Germany as the third largest economy after the USA and Japan.[40] The benefits of growth, however, are not distributed equitably. Disparities in income and wealth between the urban and rural areas, between the eastern and western regions, and between households have widened substantially. In 1990, the richest province had a GDP per person more

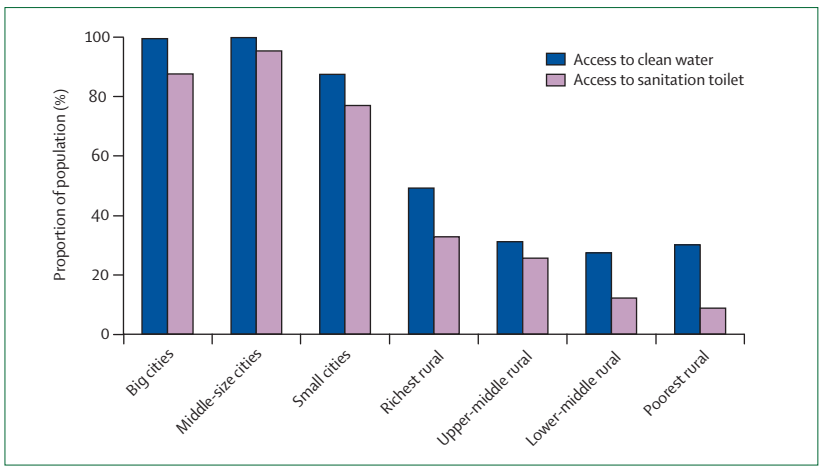

Figure 6: **Percentage of population with access to clean water and sanitation in different areas in 2003**[47]

than seven times larger than the poorest province, but by 2002, the same ratio had grown to 13 times greater.[41] The Gini coefficient, a measure of income inequality,[42] increased for China as a whole from 0·31 in 1978–79 to 0·45 in 2004. The level of income inequality in China is now similar to that in the USA, roughly comparable to that in the most inequitable Asian countries—Philippines and Thailand—and approaching the notoriously inequitable levels in Brazil and Mexico.[43]

From a public-health perspective, there is concern about the growth in income inequality, because inequality in society itself can have damaging health effects. Marmot,[44] for example, contends that societies with large income inequalities generate more damaging psychosocial stress levels throughout the population, but especially in those lower down the social scale.[44] Lynch and colleagues[45] highlight health damage as a result of more limited investments in such public programmes as health and education, which are of particular importance to the health of low-income groups.[45] Certainly in China, the disparity in wealth has created disparities in spending power, exacerbated by decentralisation. In 2003, public spending was 48 times higher in the richest than the poorest counties. China's richest province spent over eight times more per head on public services than the poorest.[41]

On the positive side, the boom in the economy has been accompanied in China by dramatic advances against extreme poverty (a major determinant of ill-health), although progress is now faltering. From 1981 to 2001, the proportion living in extreme poverty, as defined by the Chinese Government, declined from 53% to 8%, with half of the decline occurring in the first half of the 1980s.[46] The bulk of this early reduction in poverty came from rural areas and was helped by one-off agricultural reforms in the early 1980s and lower taxes on farmers. The pace of reduction then stalled in the late 1980s and early 1990s, recovered again in the mid-1990s, before stalling again in the late 1990s.[46] Poverty reduction has been uneven across provinces and has become inversely related with economic inequality—provinces that had a more rapid rise in economic inequality within the province made less progress against poverty. In addition, Ravillion and Chen[46] found that poverty in China has become more responsive to rising inequality. One disturbing consequence of this, they contend, is that provinces with the greatest inequality will face a double handicap in their attempts to reduce poverty in future: "they will have lower growth and poverty will respond less to that growth".

Living conditions differ greatly between areas of different affluence. Safe drinking water is available to 96% of the population of large cities but to less than 30% in poor rural areas. Differences in access to effective sanitation are even larger, 90% of residents in large cities have adequate sanitation, compared with less than 10% in poor rural areas (figure 6).[47]

The plight of the growing numbers of rural migrants is causing mounting concern, although incomplete records prevent a robust assessment of the true extent of their problems. A survey in 2000 found that about 14% of rural migrants, about 20 million people, were living in poverty. About a third of rural migrants earned fewer than 500 Renminbi a month (about £35 in July, 2008), less than 3% were covered by health insurance schemes—and even those would have very limited access to health services due to the low level of financial protection that these schemes provide.[48] Furthermore, rural residents are likely to be living in worse conditions than are urban residents.

Greater poverty, poorer living conditions, and inadequate or no access to essential antenatal and postnatal care for migrant women are probably major contributing factors to the very high maternal mortality rates in some cities for rural-to-urban migrant women: 48 deaths per 100 000 in Shanghai compared with 1·6 per 100 000 among resident women in 2005;[49] 42 compared with 18 per 100 000 for resident women in Beijing in 2004.[50]

In Beijing, less than 50% of migrant children under 7 years old had annual growth monitoring, compared with more than 90% of the children registered as permanent residents.[51]

We have no data on differences in working conditions and exposure to environmental pollution, but we can make educated guesses that for both of these key determinants of health, conditions are likely to be worst for poor groups in the population and that the situation over the past decade has worsened. Inequities in the social determinants of health, including poorer access to schools and pollution at home, have exacerbated health-system inequities, thus contributing to the perfect storm.

Public perceptions of fairness and trust

Public dissatisfaction with the fairness and trustworthiness of China's health system is the third component of the perfect storm. The challenge to health

equity for China is not only maldistribution. The entire population—even the rich—is unhappy with the current system, which has not elicited trust in quality, reliability, honesty, and client-orientation.

Evidence of a perceived lack of fairness has been identified from national household surveys. In a survey of 12 provinces in 2002, more than 80% of the 7000 individuals surveyed considered that the income distribution was unfair, and only 1% said it was fair.[52] Public perceptions of quality, responsiveness, and trustworthiness of the health-care system are also low. From the national household health survey of 2003, we estimated that about 55% of the correspondents from both the lowest income and highest quintile group were not satisfied with inpatient services, and 40% and 45%, respectively, were not satisfied with outpatient services. The most important reason for this dissatisfaction was the cost of health care, followed by low quality of care and unnecessarily complicated procedures involved in obtaining service. In an analysis of the national household health surveys in 1998 and 2003, Xu[53] found that out-of-pocket payment for hospital care increased for all income groups in the 5 years between surveys. People in the lowest income group paid the highest proportion of their hospital costs out of pocket (>60%), and even the highest group paid nearly half (48%) of their hospital expenditure out-of-pocket. Although the lower the income group the more likely people are to be ill and in need of health care, expenditure on hospital care declines with income, so expenditure is not relative to need (table).[53]

The relation between patients and doctors has been worsened in the past decades. Patients are frustrated by lack of health information, rapid rise of medical costs, and poor attitude of health professionals, according to former vice minister Wang Longde.[54] Over two-thirds of surveyed doctors believed that patients' satisfaction with health services had decreased in recent years. Doctors and hospitals have conflicts of interests in China's market-oriented health sector. Anecdotal evidence reported by Chinese media points to ridiculously high expenditures on hospital care, poor quality of services, and use of fake or low-quality medicines.[55,56] These examples suggest that the public perception of fairness and trust in the health sector in general and doctors in particular is in crisis.

Taking Amartya Sen's assertion that any consideration of health equity needs to pay attention to the fairness of processes and broader issues of social justice,[5] day-to-day arrangements for ensuring that essential goods and services reach everyone could be seen as unfair. The extensive market reforms in China, for example, could not be expected to lead to distribution of essential goods and services to meet the needs of the most vulnerable in the population. Under such market conditions resources follow purchasing power, rather than need, and this scenario has played out in China over the past two decades for health care, education, food supplies, water supplies, and other important determinants of health.

Another round of Chinese innovations?

Chinese ingenuity and enterprise could generate another round of health-system innovations, just as it has before. China's path is neither the socialism of equitable distribution of both social determinants and health-care services as in the past, nor the western European and Japanese pattern of market economies with universal public health-care provisioning and financial protection.

Health-equity concerns usually become more pronounced when countries experience worsening economic trends—when standards of living decline, recessions threaten, and social turmoil erupts—this has been the case in African countries when debt has deepened, in eastern Europe after the break-up of the Soviet Union, and in western Europe after the recessions of the 1980s and early 1990s. Unlike other countries challenged by health inequities, China is in a very different position: with economic boom and rising government revenues, but with accompanying rise in socioeconomic disparities and challenges to health equity on many fronts. How this came about and whether the situation can be reversed, so that economic development

	1998*		2003†	
	Income per head (Renminbi)‡	Out-of-pocket expenditure/total expenditure on hospital admission	Income per head (Renminbi)‡	Out-of-pocket expenditure/total expenditure on hospital admission
Lowest	<2040	1890/3214 (58·8%)	<2640	4082/6616 (61·7%)
Lower	2040–2999	1457/4104 (35·5%)	2640–4011	2690/6827 (39·4%)
Middle	3000–4169	1549/4198 (36·9%)	4012–6059	3008/5992 (50·2%)
Higher	4170–5999	1444/4878 (29·6%)	6060–9035	2679/6274 (42·7%)
Highest	≥6000	1427/6177 (23·1)	≥9036	3864/8135 (47·5%)

*£1=13·5 Renminbi. †£1=13·7 Renminbi. ‡Income is based on total household income divided by number of people in household to give average income per head for individuals in the household.

Table: **Trends in average out-of-pocket payments as percentage of total hospitalisation expenditure, by income group (Renminbi) in urban China, 1998 and 2003[53]**

goes hand-in-hand with improved health equity, is of immense interest to the public-health community worldwide.

China has embarked on reform shaped by the country's unique history and culture. The challenges, however, will be truly daunting. But, there is strong popular support for and governmental commitment to reform. The problems, contradictions, and complexities are well understood. Most important, China's economic capacity is growing rapidly so that it should be able to afford major reforms.

After the outbreak of severe acute respiratory syndrome, China recognises market failures in the health sector. More specifically, China now recognises that the market will not meet needs for the good of society. The Government is thus now accelerating its public investment in modernising its public-health system including disease prevention and health promotion, and establishing three health-insurance schemes: a rural cooperative medical scheme, urban employee basic health-insurance scheme, and urban resident health-insurance scheme in recent years and a medical financial-assistance scheme for poor people. These reforms aim to ensure better access of the Chinese population to essential health care, but there is much more to do (on raising the level of reimbursement and helping people living in poverty, for example) to move towards universal access.

The Chinese government has pledged a stronger government role in health. For example, public financing, which is at a very low level, is being fortified. Universal coverage of essential health care is being promoted. Public facilities have to be deincentivised from profit-seeking to remain economically viable. Policy and regulations are being developed to change incentives. Drug and pharmaceutical policies and regulations are being revamped. More robust and rigorous academic studies, done jointly by Chinese and international academics, have been encouraged to guide China's health-system reform. Effective correction of market failure, improvement in the government role in health care, and introduction of fairer processes are largely dependent on whether these government commitments and activities can be effectively implemented in the provinces, districts, and counties in the near future.

Conflict of interest statement

We declare that we have no conflict of interest.

Acknowledgments

We thank many people who have supported the writing of the paper: Gonghuani Yang, Xuan Che, Hui Li, Ling Xu, Chunmai Wen, Jing He, Guanisheng Ma, and Sue Povall for data collection and analysis; and Yan Guo, Wenhua Zhao, and Zhuochun Wu for advice and comments.

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