Pergamon

0277-9536(94)00421-8

Soc. Sci. Med. Vol. 41, No. 8, pp. 1047–1055, 1995

0277-9536/95 $9.50 + 0.00

THE CHINESE HEALTH CARE SYSTEM: LESSONS FOR OTHER NATIONS

WILLIAM C. L. HSIAO

Department of Health Policy and Management, Harvard University School of Public Health, 1350 Massachusetts Avenue, Holyoke Center 726, Cambridge, MA 02138, U.S.A.

Abstract—This paper examines China's health care from a system perspective and draws some lessons for less developed nations. A decade ago, Chinese macro-health policy shifted its health care financing and delivery toward a free market system. It encouraged all levels of health facilities to rely on user fees to support their operations. However, China continued its administered prices and hospitals continued to be operated by the government. These financing, pricing and organizational policies were not coordinated.The author found these uncoordinated policies created serious dissonance in the system. Irrational prices distorted medical practices which resulted in overuse of drugs and high technology tests. Market-based financing created more unequal access to health care between the rich and poor. Public control of hospitals and poor management caused inefficiency, waste and poor quality of care. The disarray of the Chinese health system, however, had not caused a measurable decline in health status of the Chinese people. One explanation was that the government had maintained its level of funding (per capita) for public health and prevention. Another possible explanation was that rapid rising income in China had improved nutrition, clean water and education which offset any adverse impacts of poorer medical services to the low-income populations. Nonetheless, the Chinese experience showed that its increasing expenditure per person for health care through user fees and insurance had not produced commensurate improvement in health status.China's experience holds several lessons for less developed nations. First, there is a close linkage between financing, price and organization of health care. Uncoordinated policies could exacerbate inequity and inefficiency in health care. Second, incentives had great influence on the hospitals' and physicians' behaviors one what drugs and medical modalities were used to treat patients. Prices have to be rationalized and modern management of hospitals and health centers has to be instituted to produce better quality health services and improve efficiency. Finally, China showed that a small amount of spending (U.S.$0.21) per person spent for public health can yield large benefits for the people.

Key words—Chinese health care, health care systems, China, public health

INTRODUCTION

China achieved enviable improvement in the health status of its people between 1952 and 1982. Despite a limited number of well-trained professionals and hospital beds and an expenditure of U.S.$5 per capita for health care, within 30 years the country increased the average life expectancy from 35 to 68 years, reduced infant mortality from 250 to 40 deaths per 1000 live births, and decreased the prevalence of malaria from 5.5% to 0.3% of the population [1]. These universally acclaimed achievements have resulted, in part, from a system of central planning, emphasis on 'prevention first', community organization and cooperative financing of health care.

Recent dramatic changes in system structure, policy and financing have brought about profound transformations in China's health care delivery. This paper describes the current Chinese health care system, its achievements, its problems, and the lessons it holds for other nations.

More than ten years have elapsed since China changed its economic system. In essence, the new policy is to accept less equality in order to achieve more rapid economic growth. Private initiatives and market forces have largely supplanted government planning; concurrently, the central government has decentralized more power to the provincial governments. While China moved its economic sector toward a market economy, it did not put into place adequate rules through laws and regulations so that the market would function on a competitive basis.

Health care policy followed economic policy. China made three major policy changes in health care. First, the government had to severely limit the public funds available for health care because of the drain on its budget resulted from the large losses incurred by state enterprises [2]. Whatever the government could not finance, it left to the private market with a *laissez-faire* policy. For example, when collective farming was replaced in the early 1980s by individual household responsibility, collectively-financed and organized village health stations collapsed. The government took no remedial action. By default, the government allowed an unrestrained market to take its course. As a result, rural health services are now largely provided by fee-for-service private practitioners and patients' ability-to-pay determines supply and demand.

Second, the government altered financing of hospitals and township health centers, giving them a large degree of financial independence. Government financing was cut to cover only basic personnel wages and new capital investments, which total approx. 25–30% of hospital expenditures. Hospitals are now required to obtain the remaining revenues for operations from user fees. Moreover, bonus payments were introduced for workers to encourage greater productivity and efficiency. For health facilities, the bonus payments had to be funded from their earned profits. However, except for drugs, the government usually set prices at less than cost. Consequently, hospitals use more drugs to generate greater profits.

While public hospitals were freed from strict governmental fiscal controls, the government retained the most authority to make staffing decisions.

Finally, the government liberalized the private ownership of health facilities and private clinical practices. Private investment in new hospitals, especially from foreign joint-ventures, was promoted by allowing them to charge much higher fees—sometimes 10–20 times that which is allowed for public hospitals.

In the rural sector, this *laissez-faire* policy resulted in reliance upon market exchange to dictate the organization, financing and delivery of health services, including such basic programs as vaccinations. In cities and towns, private initiatives and schemes that relied on profit motives have been encouraged for hospitals and township health centers. However, China has not established the necessary conditions for the market to work properly; it lacks a coherent approach that integrates planning and market functions.

Faced with increasing inequity and inefficiency in its provision of health care, China seeks to find an integrative way to finance and organize health care by understanding the respective roles of planning, regulation and market competition. In doing so, the country hopes to define policy and regulatory roles of the state, and design a clear integrated system of public and private financing, provision and administration of health care.

This paper is divided into four sections. The first section presents a descriptive analysis of China's health care system. While there are wide variations in financing, organization, pricing and administration within China, we describe the general conditions. The second and third sections discuss problems and achievements. The last discusses the lessons from the Chinese experience.

A DESCRIPTIVE ANALYSIS OF CHINA'S HEALTH CARE SYSTEM BACKGROUND

China is the most populous nation in the world with approx. 1.2 billion people of whom 80% live in the countryside [3]. A gross national product of U.S.$310 per person in 1990 (as compared to U.S.$18,000 in the United States) places China in the bottom third of developing nations [3]. China has an area of 9.6 million km^2—the size of the United States—yet more than four times the population. Half the country is arid or mountainous, further exacerbating population density in the plains where most people are concentrated. Administratively, the country is divided into 22 provinces, 5 autonomous regions and 3 metropolitan municipalities under the central government. The provinces, which possess a high degree of fiscal independence, are themselves divided into 2182 counties, 47,000 townships and 740,000 villages. Counties, towns and villages have averages of 400,000, 18,000 and 1000 residents, respectively [3].

Eighty percent of the population live in areas where the epidemiological transition has already occurred, shifting from infectious to chronic and degenerative diseases as the major cause of death. Nevertheless, there is still a high prevalence of infectious disease in poor rural and urban areas of China. The health status of this 15% of the total population is similar to that of the least developed nations. Their infant mortality rates still exceed 75 per 1000 live births. Table 1 presents the major causes of death for China as a crude representation of the burden of disease.

Table 1. Ten leading causes of death in China: 1957–1987

			1987					
		Urban 1957*		Urban†		Rural‡		Total§
Disease	Rank	Deaths (%)	Rank	Deaths (%)	Rank	Deaths (%)	Rank	Deaths (%)
Respiratory	1	16.86	4	15.08	1	20.83	1	19.37
Infectious¶	2	7.93	12	1.20	9	2.09	9	1.86
Pulmonary TB	3	7.51	9	1.61	7	2.94	7	2.60
Digestive	4	7.31	6	4.49	6	5.03	6	4.89
Heart	5	6.61	3	15.20	4	18.07	2	17.34
Cerebrovascular	6	5.46	2	20.61	2	14.83	3	16.29
Cancer	7	5.17	1	21.61	3	14.19	4	16.07
Nervous system	8	4.08						
Trauma	9	2.66	5	7.61	5	10.27	5	9.60
Other TB	10	1.98						

Source: Ref. [22].
*Based on sample of 13 random cities.
†Based on sample of 37 random cities.
‡Based on sample of 81 random counties.
§Based on urban/rural distribution of 25–75%.
¶Urban infectious disease 1987 estimated by author.

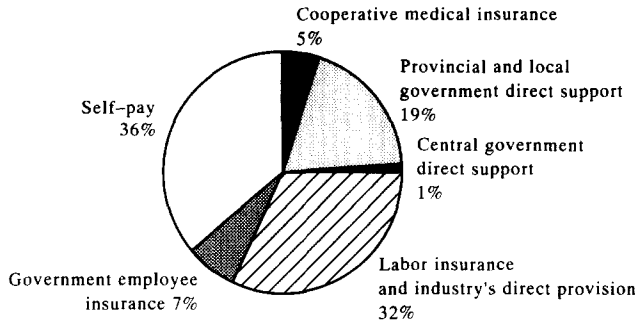

Fig. 1. Sources of Chinese health care financing: 1989. Source: Ref. [4].

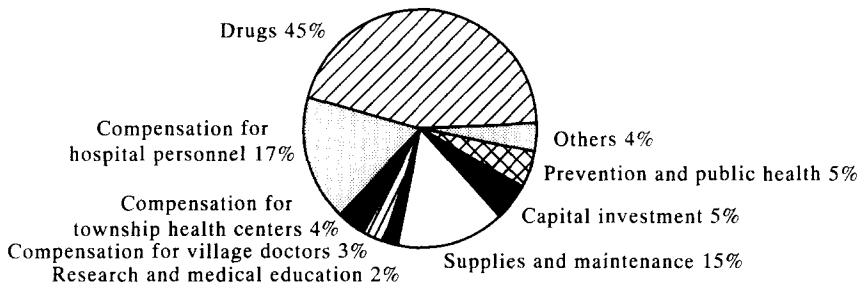

Fig. 2. Spending by expense category or program: 1989. Source: the figure was prepared with data from two studies: Refs [21] and [25].

Total health expenditures and who paid for them

China spent approx. 56.9 billion yuan (U.S.$10.1 billion) for health care in 1989, or 3.6% of gross domestic product, an average of 51 yuan (U.S.$9.00) per capita [4].

As shown in Fig. 1, health expenditures are mainly financed by direct patient payments (36%) and labor and government employee insurance (39%). Patients or insurance pay providers through fee-for-service. Thus the price structure has great influence on health care delivery. The central government finances less than one percent of total health expenditures—provincial and county local governments 19%. It follows that central and local governments have relatively little power in determining resource allocation.

In 1989, close to one-half of the central and local government funding was expended for preventive and public health programs, medical education and research. The other half was spent for medical services. China spent 1.4 billion yuan for prevention and public health programs, financed largely from provincial and county governments under guidelines set by the central government. Their budget for disease prevention and public health was about 5% of the total health expenditures, but constituted 23% of government health expenditures. This included the 740 million yuan for family planning. Yet, the minuscule investment of 1.20 yuan per capita (U.S.$0.21) yielded large improvements in health status for the Chinese.

China spent the largest portion (45%) of its health care dollars for drugs. A smaller portion (21%) was spent for physician and worker's compensation in hospitals and town health centers.

In 1989, approx. 5% of total health expenditure was invested in new capital equipment and facilities. Local and central governments financed 78% and 5% respectively; the remainder was financed by industrial enterprises (Fig. 2).

Methods of financing health care

Chinese health care expenditures in urban and rural sectors are financed very differently. The urban population is largely employed by government and industry who provide health insurance for workers. At present, most of the rural population has no organized financing but pay for services out-of-pocket. A more detailed description of the two sectors is given below.

A. The urban sector. Approximately 37% of the Chinese population live in large and medium-sized cities. Approximately 227 million persons, 50% of the urban population, was covered by one of two types of insurance in 1989. The largest program is the Labor Insurance Program, which covers close to 201 million workers and retirees of state and large collectively-owned enterprises, and their dependents. Almost 100% of their health costs are reimbursed by their employer*. Their dependents are also covered

*In recent years, China introduced some coinsurance. Some enterprises require their employees to pay a small amount of deductible or coinsurance. The government employee insurance requires employees to pay 10% coinsurance for outpatient services.

although only reimbursed at 50%. The second program is government employee insurance, which reimburses employees for close to 100% of health care expenditures but dependents have no coverage. The government employee insurance covers approx. 26 million employees and retirees [5].

While the term 'insurance' is used, there is no third party insurer insuring workers; in fact, China operates on an employer self-insured system. The cost of government employee health insurance is considered to be an operating expense. Governmental agencies include these expenses as budget items. Labor health insurance is financed by a government mandated premium equivalent to 7.0% of basic wages and this amount is maintained as a separate fund by each enterprise. It pays claims submitted by its own employees, dependents and retirees from this designated fund. The same system is used in collectively-owned factories that offered health insurance.

The 7.0% of basic wages set as a health insurance premium rate has proven to be insufficient for most enterprises. Between 1985 and 1990, health care cost per employee rose nominally by 24.4%. This is 9.5% greater than the increase in cash wages. By 1990, most enterprises found that their health insurance cost equaled 8–9% of payroll [3]. Consequently, enterprises had to use their profit to fund the shortfall in their health insurance premium. However, many enterprises earned no profit and approximately one-third of the state enterprises ran at a deficit. They often could not reimburse their workers for their health expenses. In fact, these workers were uninsured.

B. The rural sector. Since initiation of the new economic reform of the agricultural sector in 1981, the cooperative-financed medical care program—the mainstay of China's rural health care financing since the early 1960s—has collapsed [6]. At its peak effectiveness, 90% of the Chinese rural population was covered by the system. However, by 1985, it was estimated that only 5.4% of rural communities were maintaining their collectively-financed cooperative medical care system; the rest were self-pay.

More recently, some provincial governments promoted the rehabilitation of the cooperative medical care program [7]. Employees of government or small industries in the rural areas had been covered by government employee or labor insurance described above. It is currently estimated that 10% of the rural population is covered by insurance or prepayment schemes.

Organization of health services

While resources are needed to finance health care, there must also be effective organization of the delivery system. The availability, efficiency and distribution of health services depends on adequate financing and organization. There are several dimensions to health system organization: functional and referral tiers; ownership and control of hospitals; and planning and regulation. These dimensions of the Chinese health system organization are described below.

Table 2. Supply of beds and health manpower: 1990

Items	Number per 1000 population		
	Total	Urban	Rural
Beds			
Hospital beds	1,901,209	6.56	1.35
Township health center	722,877		0.79
Manpower			
Physicians	1,302,977	3.80	0.54
Assistant physicians	422,352	0.78	0.28
Nurses	974,541	3.00	0.37
Village doctors	1,231,510		1.34
Midwives	58,397	0.12	0.04

Sources: Refs [3, 23].

A. The three-tier organization. China organized parallel three-tier organizations for the delivery of health services to its rural and urban populations. In the rural sector, the tiers are village stations, township health centers, and county hospitals. In the urban sector, they are street health stations, community health centers, and district hospitals. The most serious illnesses are referred by county hospitals to city or regional hospitals.

Village stations are staffed by village doctors whose training consists of three to six months after junior middle school, and an average of two to three weeks of continuing education per year [8]. Township health centers are usually led by a physician who received a three-year medical school education after high school, aided by assistant physicians with two years of medical training beyond junior middle school, and several village doctors. County hospitals are staffed by physicians who graduated with four to five years of medical school training, nurses and technicians. The government decides the number of beds and personnel for each class of hospitals and township health centers and personnel are assigned to their positions by the government. It also provides the funds for capital investment. The supply of beds and manpower are presented in Table 2.

There is overcrowding in city and regional hospitals with an occupancy rate of 90% or more while county hospitals and township health centers have occupancy rates of 80% and 45%, respectively [9].

This three-tier system worked reasonably well in the rural sector when farmers' incomes were low and the transportation system was not well developed. People largely sought health services within their own community. Now, however, the situation has changed. Many farmers have become wealthier and roads and transportation are better. Income elasticity for quality medical services appears quite high in China. Many outpatients and inpatients are willing to pay more to go directly to county and regional hospitals. County hospitals also encourage patients to do so because they often need the patient flow to maintain financial solvency. Table 3 shows the shift in patient demand for services from village health stations to higher tiers between 1985 and 1988.

In urban areas, the three-tier organization never really worked as intended. Most large enterprises ran their own hospitals and clinics. These hospitals often had a highly trained staff and superior equipment. Those enterprises or government agencies that did not own hospitals and outpatient clinics usually contracted directly with the city hospitals for outpatient and inpatient services for their employees. Thus, a majority of the urban population had direct access to higher-level hospitals for routine clinical services and hospitalization.

B. Ownership and financing of hospitals. The Chinese hospital system can best be characterized as pluralistic. Hospital beds are not owned solely by the government; many are owned by large state enterprises. Among the 1.9 million beds in county or regional hospitals, close to 68% are owned by central and local governments, while the rest are mostly owned by various state enterprises [10]. The Health Ministry and Provincial Health Bureaus have no regulatory jurisdiction over enterprise-owned hospitals. These multiple sources of ownership and control have resulted in duplication of equipment and crowding in some hospitals while beds are empty in others.

Government-owned hospitals receive approx. 25% of their revenues from the government to finance personnel basic wages. Hospitals must generate their remaining revenues from user fees. Since the Price Commission sets prices below the average cost, except for drugs and new technology, hospitals depend upon these profitable services to break even and to pay bonuses to health workers. Hospital administrators have only limited authority over personnel matters, such as deciding the number and patterns of staff, and their hiring and firing.

C. Ownership and management of township health centers and village health stations. Township health centers are owned and managed by local town governments with supervision by the county. These centers provide primary care and low-technology secondary services. Each center has 10–30 beds and may have X-ray machines. Usually 60% of personnel's basic wages are financed by local government, amounting to about 20% of its total budget [11]. Health centers must obtain the remainder of their revenues from user fees, which mostly come from prescribing and dispensing drugs.

Village health stations are usually staffed by one male and one female village doctor who are also part-time farmers. They may receive a lump sum payment from the government for carrying out public health work, but most of their income is derived from user fees for dispensing drugs [9]. The average capital investment for the village station consists of one room, with a total capital value ranging from 600 to 2000 yuan (U.S.$110–350), which includes the building, equipment and furniture [11]. They usually have a stock of 100–200 commonly used drugs [9]. In many poor villages, there are no health stations; in 1989, it was estimated that 12% of the villages had none [9].

D. Public health and disease prevention. Local governments are responsible for organizing and financing public health services. The government has used its administrative authority as well as financial incentives to mobilize village doctors and health workers to achieve targets of clean water, better sanitation, higher immunization rates and better maternal and child health, etc. Between 1978 and 1988, financing for preventive programs by the government increased nominally from 0.47 yuan to 1.20 yuan per capita (U.S.$0.21). In real terms, expenditure per capita remained unchanged [12].

Table 3. Health facilities visited by rural residents: 1985 and 1988 (in percentages)

Description	1985		1988	
	Outpatient	Inpatient	Outpatient	Inpatient
Village health station	37.8	2.5	28.2	0.7
Township health center	38.2	49.6	33.8	37.1
County hospital	11.7	34.2	23.7	47.1
Regional hospital	2.2	13.6	5.3	15.1
Total*	89.9	99.9	91.0	100.0

Source: Ref. [2].
*The columns are not all-inclusive.

Table 4. Comparison of prices set by the government with average cost: 1984

Description	Principal hospitals	County hospitals	Town health clinics
Outpatient visits			
Price	0.14	0.12	0.10
Cost	1.08	0.83	0.79
Inpatient—room, board and routine services			
Price	1.68	1.25	1.01
Cost	7.61	4.49	4.28
Surgery—appendectomy			
Price	13.00	12.60	
Cost	41.54	29.61	

Source: report of a study of 37 hospitals in five provinces conducted jointly by MOPH and the Price Commission in 1985.

Pricing

The Central Pricing Commission sets the general guidelines for pricing policy for providers. Political rather than economic considerations largely determine pricing policy. China aimed to promote social equality by making health services financially affordable. Prices of most health services have been kept low, based on historical fees set in the 1950s. Prices are not established in relation to cost except for new high-technology services. Prices for office visits, surgical operations and hospital daily rates are set far below actual costs (see Table 4). Prices for drugs and new high-technology and therapeutic treatment, meanwhile, are set higher than cost to allow for a profit margin. Hospitals, township health centers and village doctors are allowed to mark up their drugs by 13–15% over the wholesale price for Western drugs, and 25% for Chinese herbal drugs. The prices of services provided by new equipment, such as CT, MRI and multi-channel blood analyzers, are set according to the average cost. Since low volume was used to calculate

average cost, hospitals can make profits by increasing the use of new equipment.

Public management

The power to regulate and plan for health services has been decentralized to the provincial level and, in many instances, further decentralized to the county level. The Ministry of Public Health (MOPH) is supposed to provide general policy guidelines, but has only modest power to implement its policies. MOPH has to rely on moral persuasion with the provincial and county health bureaus since the Ministry does not directly finance health care, appoint personnel or enforce regulations. The influence of the MOPH is largely based on central government prestige and discipline enforced by the Communist party apparatus at each level of government.

A plethora of ministries in the central government are involved in establishing health policy; the power is widely diffused and often policies of different ministries conflict with each other. Administrative and structural complexities plague the Chinese health care system. For instance, there are 11 independent or semi-autonomous commissions involved in the policy formulation for the delivery of preventive and primary care services. Family planning is controlled and managed by the powerful Family Planning Commission, while health education and promotion and control of pesticide use are managed by the Commission on Patriotism, and maternal and child health (MCH) care is managed by the MOPH. In many towns, there are separate clinics for family planning and MCH. Each clinic fights for better equipment and personnel while neither is fully utilized. Meanwhile, mothers and newborns do not have continuity of care since the prenatal care is given at the family planning clinic where they do not give post-natal care. The Ministry of Finance decides on the central government's budget for health and sets budget allocation guidelines for provinces and countries. The Ministry of Finance also decides on the financing of government employee insurance. The Ministry of Labor and Personnel sets the policy for labor insurance. The payments of health services, however, are determined by prices set by the Central Price Commission. The Ministry of Labor and Personnel sets occupational safety and health standards within factories, while the Ministry of Environmental Protection regulates air and water pollution and toxic waste disposal. The Planning Commission, advised by MOPH, determines the number of hospital beds, personnel staffing ratios and the number of health agencies. The Ministry of Labor and Personnel sets the policy for labor insurance. The pharmaceutical industry is controlled and managed by the National Administration of Drugs and Medical Equipment, an independent agency.

PROBLEMS

The organization and financing of health care in China is in disarray due to economic and political reform. The government has no coherent macro-policy for the major interlocking components of their health care system: financing, organization, pricing, planning and regulation. As a result, the distribution of and access to health services is becoming increasingly unequal. Moreover, the Chinese health care system has twin problems: significant waste and inefficiency as well as a serious shortage of funds.

Equity

The major problem facing China is unequal health status of its people among urban and rural areas, rich and poor, and among different geographic regions and communities. Table 5 shows that the infant mortality rate for the poorest rural communities and cities averaged 96.2 and 20.0 per 1000 live births respectively. Health status also varies by average income of the community.

Health resources are largely allocated by patient ability to pay because the health care system of China today is driven by patients' demand-operated in a *laissez-faire* environment. We can predict its outcome: the provision of health services shifts to those communities where there is greater organized financing such as insurance (e.g. urban areas), or where patients have the greater ability to pay (e.g. more prosperous agricultural communities). Table 2 shows the uneven distribution of facilities and personnel.

Table 5. Changes in selected health status indicators* (1982 and 1987)

Description	1982	1987	Percent change
Infant mortality rate (per 1000 live births)			
Nation	34.7	—	—
Cities	21.5	20.0	7.0
Rural	50.1	46.5	7.2
I	36.1	29.9	17.2
II	41.0	38.8	5.4
III	55.7	52.1	6.5
IV	124.9	96.2	23.0
Life expectancy at birth (years)			
Nation	67.9	—	—
Cities	70.4	71.5	1.6
Rural	65.9	66.6	1.1
I	68.1	69.4	1.9
II	67.4	68.2	1.2
III	64.0	65.0	1.6
IV	57.9	59.0	1.9
Morbidity specific to tuberculosis (per 100,000 population)			
Cities	533.8	419.1	21.5
Rural	789.3	693.7	12.1
I	559.2	485.5	13.2
II	632.6	539.7	14.7
III	968.3	825.4	14.8
V	1093.2	1082.7	1.0

Source: Ref. [24].

*Rural areas have been classified into four groups according to the level of development of the economy and social services in 1987.
I—more well-off areas; about 21.9% of all rural counties.
II—Slightly less well-off areas; about 31.9% of all counties.
III—More well-off poor areas; about 36.3% of all counties.
IV—Very poor areas; about 9.9% of all counties.

Table 6. The distribution of government expenditure for curative care (in rounded percentages 1980, 1985 and 1989)

Description	1980	1985	1989
Rural (township health centers)	32.3	27.2	26.8
County hospitals	26.3	22.8	21.3
City health centers	2.9	3.4	3.7
City hospitals	38.5	46.6	48.2
Total	100.0	100.0	100.0

Source: Ref. [22].

Studies have found that the per capita expenditure for health care in the cities averaged 100 yuan per person in 1986. Meanwhile, the average cost per person in the rural sector is about 20 yuan. The ratio of expenditure per capita between urban and rural areas in 1981 was 3:1; today it is 5:1 [2].

At the same time, in an effort to modernize tertiary care, government shifted more of its resources from primary care services to the city and regional hospitals, thus further exacerbating the already increasing disparity among primary and tertiary care. Table 6 shows that the distribution of government expenditures for rural township health centers decreased from 32% to 27% while city hospitals increased their share from 38.5% to 48.2% between 1980 and 1989.

Inefficiency

While a stringent budget causes many facilities and personnel to be underfunded, there is also significant waste and inefficiency in the production of health care. For example, city hospital beds are filled to capacity, which accrues not to efficiency but to rampant inefficiency. The average length of stay in China is about three times that of the U.S. according to Diagnostic Related Grouping. There is little discharge planning and often surgical patients are admitted several days before the operation. A stark example of inefficiency was shown by a study which found that several Chinese hospitals admit their average surgical patient seven to eight days before the operation is performed. This practice of lengthy pre-operative stay has evolved to avoid scheduling problems because laboratory personnel refuse to schedule a patient for tests in more than one laboratory per day. There is also little sharing of equipment between inpatient and outpatient departments, such as X-ray or laboratory services [13].

These inefficiencies have resulted from the organizational and incentive structures placed on the hospitals in China. A hospital director only needs to account for the number of hospital days and outpatient visits provided. His revenues should meet expenses, although the government will make up deficits as a last resort. Staffing is fixed, based on the number of beds; the director cannot fire any worker nor offer real promotions. As a result, the director lacks incentive and power to operate efficiently in using equipment and scheduling patients.

In addition to inefficiency of hospital use, there is a tremendous amount of waste. A study in Shanghai showed that in the same hospital, the average cost of drugs for appendectomy patients with insurance coverage was twice as much as for uninsured patients. The study showed no difference in the outcome of procedure, yet drug costs for the insured were twice as much as for the uninsured [14, 15]. This over-use of expensive drugs is due to government pricing policy. Hospitals generate profits from the higher volume of drugs prescribed and the use of more expensive drugs. Hospital directors have to finance deficits resulting from inadequately priced hospital services with profits from drugs. In primary care, inadequate earnings of village doctors motivate them to dispense more drugs to stay in business. A defective pricing policy has created demand by hospitals for new sophisticated equipment because of its profit potential. Once installed, they are used as much as possible. The lucrativeness of this new technology is evident in the number of commercial leasing companies that have formed to purchase and lease equipment to hospitals. These leasing companies take a modest percent of the gross revenue as payment and can usually recapture their investment in two to three years [16].

There is also inefficiency in primary care service delivery. The average occupancy rates for township health center beds is between 40–50%. Most health personnel at the township and village levels work at only half of their capacity [17]. The rigid government policy of setting quotas on supply per 1000 population, regardless of patients' demand, and its *laissez-faire* policy toward private practitioners cause overstaffing and overbuilding of government-owned township health centers. Often the primitiveness and low quality of services at these centers excludes them from competition with private practitioners and county hospitals.

Quality

The health of patients can be adversely affected by over-prescription of drugs. Many drugs have side effects. Overuse of antibiotics produces drug-resistant mutant bacterial strains [9]. China also lacks a system to monitor quality of services or improve services according to changes in patient preferences. Thus, as incomes rise rapidly in many communities, quality of services cannot keep abreast of patient demand. Instead, patients go directly to higher level facilities for services.

Financing

The lack of a well-organized approach to health care financing is most pronounced in rural populations where 85% of health care is paid for on a self-pay basis. Studies found that 30% of the people who live below the poverty line became poor because of the financial losses incurred during serious illness [18].

Health care in the rural sector can be characterized as non-systematic. Under the *laissez-faire* policy that has existed since 1981, there are at least 15 different varieties of organization and financing that have

emerged in the rural sector [19], ranging from total fee-for-service practice to well-organized cooperative medical care plans. In some communities, vaccination and disease prevention programs are totally separated from primary care, while others are integrated. In most villages, preventive services are carried out by county governments through township health centers, while primary care services are being provided by village doctors with minimum regulation or monitoring. Village doctors often form group practices. They contract with the village administration for village stations and operate on a fee-for-service basis, providing health care to the local residents.

The facilities and equipment in the rural sector vary widely. In a 1985 national survey, China found that 22% of its village health stations do not have a blood pressure cuff and 28% do not have a sterilizing machine. Stations in high-income communities are better equipped [20].

In the urban sector, the financing problem pertains to risk pooling because of employment-based health insurance plans. Old industries have been unable to finance health costs of their employees and retirees; yet the government cannot let these inefficient industries go bankrupt because of the social burden this would impose on the whole society. In addition roughly one half of urban residents are not covered by any insurance. The uninsured population is increasing rapidly with a large migration of rural people to cities who become employed in low wage jobs without insurance coverage.

ACHIEVEMENTS

In spite of non-system in rural health care, defective pricing policy and other problems enumerated above, it seems paradoxical that the measurable health status of the Chinese people has not declined since 1981. Actually life expectancy in China has risen slightly while infant mortality has declined somewhat. Although certain infectious diseases have risen, others have declined [2]. These results can be accounted for somewhat by the rising living standards, better education in China that contribute to good health. But myriad variables of economic, social and cultural change impede full understanding of the immediate or long-term impacts of changing health systems on health status.

The economic living standards in China have risen rapidly, especially in a majority of the rural communities. This has brought about better diet, housing and cleaner water. The Chinese government (central and local) has maintained its policy of 'prevention first' and preventive services are mostly free to the people. The amount spent per capita for prevention has remained constant in real terms. As a percent of total public expenditures, the spending for prevention also increased slightly (from 20 to 23%) between 1978 to 1989 [12]. China also manufactures most of its own drugs at low cost and has a well developed system of distribution. Thus drugs are readily available to patients. At the same time, hospital beds and health personnel per capita have increased. Also, training of health and medical personnel has improved. From 1980 to 1985, health expenditures per capita increased $< 50\%$, after adjustment for inflation [21]. On the other hand, air and water pollution and pesticide poisoning have risen while sanitation conditions (especially treatment of human waste) have deteriorated. Organized prevention and primary health care has declined in many communities. As a result, the incidence of certain communicable diseases has risen.

LESSONS FROM CHINESE EXPERIENCES

The Chinese experience showed the simple idea of using free market to finance and organize health care may not be simple in practice. The market only worked well with appropriate regulations and planning. Relying on free market to finance health care inevitably resulted in unequal access to health services between the rich and poor, between the insured and uninsured. The government must establish a rational subsidy program to reduce the inequity.

Incentives had a great influence on Chinese hospitals and practitioners. They altered medical treatments in response to administered prices and thus demonstrated their dominating position in medical decisions. For example, Chinese practitioners increased drug prescription, shifted to expensive drugs and rapidly adopted expensive high-technology tests in order to earn profits. In response to organizational incentives, hospitals increased patients' length of stay in hospitals to compensate for their administrative inefficiencies. These behavior patterns showed the important role of price played in health care and the ability of providers to induce demand. The government must recognize these market failures and regulate the power of the providers.

Chinese experience illustrated the close linkage between financing, price and organization of health services. A nation needs to have an integrated macro-policy for health care. The *ad hoc* changes made in China had created greater inequity and inefficiency in its health care.

Finally, China's experience demonstrated that people's health status is determined by a myriad of factors: economic well-being, education, diet, lifestyle and health care. In the health care domain, the contribution to better health status came principally from public health measures, prevention, basic primary care services and availability of essential drugs. China showed that a nation does not need sophisticated educated health personnel to deliver basic health care. Chinese experience illustrated that health workers with six months to two years of training after junior middle school could competently perform preventive and basic services. Essential drugs have to

be available at a low cost and cold chains have to be maintained for vaccines.

China found these costs of basic health care were not prohibitively high. The costs to the government for prevention, public health, family planning and basic women and child health services only amounted to U.S.$0.21 per person in 1989. Expenditures by either public or private sources for all basic health care, including primary care services and drugs, totaled U.S.$2–3 per person. Thus, Chinese experience demonstrated that the economic costs and manpower requirements for basic health care are within the reach of most of the less developed nations. What was required was the political will to allocate resources, social organization, knowledge and management to implement effective programs.

Acknowledgements—This paper was prepared with the able assistance of Maria Herrera, Xingzhu Liu and Minghui Ren. Their invaluable help is gratefully acknowledged.

REFERENCES

1. Ministry of Public Health. *Health Statistics Information in China*, 1949–88. Ministry of Public Health, Beijing, 1989.
2. Yu Dezhi. *Changes in Health Care Financing and Health Status: The Case of China in the 1980s*. Innocenti Occasional Papers. Economic Policy Series, No. 34. Florence, UNICEF International Child Development Center, Italy, 1992.
3. National Statistics Bureau. *The Yearbook of Chinese Population Statistics*. Chinese Statistics Press, Beijing, 1991.
4. Wei Ying. China's current health care financing, utilization, and future policy direction. Proceeding of the *Senior Policy Seminar on Health Care Financing and Resource Uses* (jointly sponsored and organized by EDI of the World Bank and MOPH). Ministry of Public Health, Beijing, 1991.
5. Song Lianzhong. Approach to the reform of the medical care system in China. Paper presented at the EDI Senior Policy Seminar *Issues and Options on Health Financing in China*. 27 May–1 June 1991 (mimeograph).
6. Hsiao W. C. Transformation of health care in China. *N. Engl. J. Med.* **310,** 932, 1984.
7. Liu X. Z. and Cao H. J. China's cooperative medical system: its historical transformation and the trend of development. *J. Hlth Pol.* **13,** (4) 501, 1992.
8. DeGeyndt W., Zhao Xiyan and Liu Shunli. *From Barefoot Doctor to Village Doctor in Rural China*. World Bank Technical Paper No. 187. Asia Technical Dept. Series. The World Bank, Washington, DC, 1993.
9. Ministry of Public Health. *Chinese Yearbook of Health, 1989*. People's Health Press, Beijing, 1990.
10. Ministry of Public Health. *Annual Statistical Report*. Ministry of Public Health, Beijing, 1990.
11. Shen J. The analysis of current medical services resources in China's rural three-tier medical system. *Chin. Soc. Med.* **6,** 5, 1990.
12. Kuang Shih-Gui. An analysis of China's financing and resource allocation for prevention programs. In *Proceedings of the Senior Policy Seminar on Financing and Resource Utilization in Health Care*. Ministry of Public Health, Beijing, 1991.
13. Wei Ying. The study of the possibility of shortening the length-of-stay in city hospitals. *Chin. Hlth Econ.* special issue, 1993.
14. Xiang Z. The analysis of the cost of surgery for 574 cases of gastric ulcers. *Chin. Rural Hlth Admin.* **10,** 45, 1988.
15. Xung Y. Comparison of the medical expenditures between the insured and uninsured. *Chin. Hlth Econ.* **5,** 16, 1990.
16. Zhang Hai Ying. Financing capital equipment. *Chin. Hospital Mangmt* **12,** (3) 1992.
17. Ministry of Public Health. *Chinese Yearbook of Health*, p. 469. People's Health Press, Beijing, 1990.
18. Chinese Rural Health Care system Research Group (Eds). *Research on the Rural Health Care System in China*. Chinese language publication. Shanghai Science and Technology Press, Shanghai, 1991.
19. Ding Z. Q. and Zhu R. G. The models of rural health care financing. *Chin. Rural Hlth Serv. Admin.* **7,** 17, 1991.
20. Shen Jai. *Costs and Benefits of Rural Area's Three-Tiered Health Care Delivery System*. Shanghai Medical University, Shanghai, 1992 (mimeograph.)
21. Du Lexun. *A Macro-Analysis of the Health Care Financing and Resource Allocation in China*. Monograph. Ministry of Public Health, Beijing, 1992.
22. Ministry of Public Health. *Health Statistics Information in China*. Ministry of Public Health, Beijing, 1991.
23. Ministry of Public Health. *Yearbook of Chinese Health Statistics*. People's Health Press, Beijing, 1991.
24. Keqin Rao. *Changes and trends in disease pattern in China*, Monograph, Ministry of Public Health, Beijing, 1989.
25. Hsiao W. C. *Chinese Health Care System: Present and Future*. 10 January 1988 (mimeograph).