

Cooperative Medical System in Taicang County of China: Lessons for Bangladesh and Other Developing Countries

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Abstract

Lack of funding in health sector renewed the interests of development practitioners and policy makers in community organized, managed and funded health care delivery schemes. To design a community health programme for rural areas developing countries should evaluate the appropriateness of the Cooperative Medical System (CMS) of China as an alternative model. In this research, successful CMS Units of China are examined to identify factors affecting long-term viability of community-based health insurance plans. These factors can be grouped into a number of programmatic aspects of health system organization: choosing appropriate human resource mix consistent with the economic status of community members, designing a benefit package to encourage participation of both poor and non-poor households, developing administratively simple premium setting and collection mechanism, ensuring inter-CMS collaboration and developing well-functioning referral system. Since the per-capita income in rural China in late 1970s was similar to the average income of the population in Bangladesh, Chinese health care costs can be used as a rough guide for estimating the health care resource requirements for implementing a CMS- type programme. Adjusting the Chinese data for Bangladesh income and prices, the premium level becomes Taka 10 to 15 per person per month. This premium will not allow appointment of a fully qualified physician at the village level. In fact, the premium level can pay only about Tk.1,500 to 2,500 per month for a village doctor, keeping aside 55% of total premium collected for drugs, supplies and diagnostic tests. The Chinese experience also implies that a well-functioning health system should allocate about 30 to 35% of total health care costs at the primary level. This will ensure access to basic health care services for community members at the village level and partial protection against costs incurred at secondary and tertiary levels of health care delivery infrastructure.

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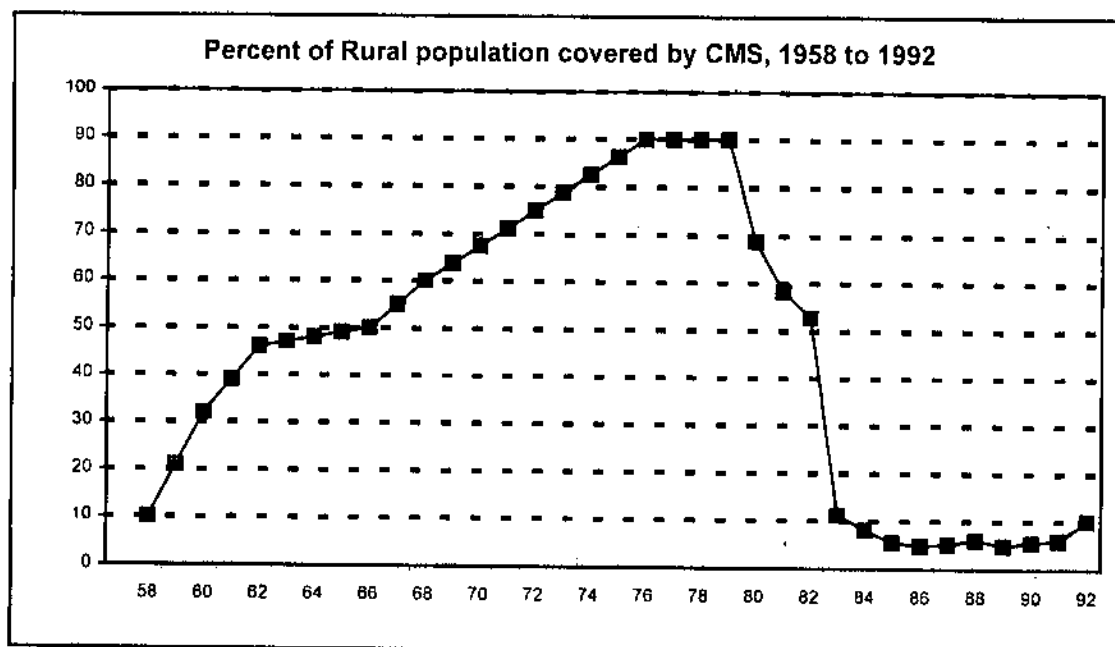
I. Introduction

In recent years, the government of Bangladesh (GOB) and various Non-government Organizations (NGOs) of the country have started experimenting with alternative mechanisms of resource mobilization in the health sector. For example, the Bangladesh Rural Advancement Committee (BRAC) has introduced a cadre of health workers at the village level to help improve the delivery of primary care services from BRAC health centers (BRAC 1996). Grameen Trust has also started a community based health insurance programme (Grameen Trust 1996). Lack of funding in social sectors and failure of the public sector in the provision of very basic health care services renewed the interests of development practitioners in issues related to community organized, managed and funded health service delivery schemes. The Cooperative Medical System (CMS) of China, due to its reliance on the local community for funding, is clearly one attractive option to consider when trying to generate more resources for health and reduce reliance on publicly organized delivery system. In addition, the CMS appears more appropriate mechanism of delivering health care for poor rural regions due to its emphasis on preventive health activities and use of low-cost health auxiliaries. The cost of providing health services through the CMS are usually very low allowing even the poorest to participate in the insurance scheme.

The first CMS appeared in the Union Commune, Henan Province, in 1955. After the cultural revolution, the system became a national model. During mid-70s, the coverage of the CMS reached 90% of total rural population in China. However, after the introduction of economic reforms in 1978, the CMS started a quick disintegration. Figure 1 clearly shows the rise and fall of CMS over the period 1958 to 1992. The rapid decline of CMS since 1979 is well documented and widely analyzed in the literature (Zhu et al. 1989; Chen et al. 1993; Prescott & Jamison 1984, Liu & Wang 1991; Liu & Cao 1992).

In recent years, however, the CMS has regained some ground, although quite small. By 1986, the coverage of CMS declined to 5% of rural population but in 1992 it rebounded to about 10% level. Although the increase from 5 to 10% is in no sense as spectacular as the free fall observed after 1978, it represents a reversal in trend, which deserves careful analysis. Also, for China, an increase in population coverage by 5% is not insignificant in absolute terms: it implies that additional 50 million people obtained health insurance over the period 1986 to 1992 (Liu & Cao 1992; Khan et al. 1996).

This paper investigates the operation of CMS in one county of China before and after the economic reforms. The county we have chosen showed strong preference for CMS even after the economic liberalization. The analysis of the county's experience will indicate how to adapt the system in the new economic environment and methods of making it more desirable and affordable to the rural population. The continued strength of Taicang CMS in post-reform China may also indicate how to develop a low cost community health insurance program fully compatible with the market-oriented health system and based on individuals' voluntary participation.



The paper is organized as follows. To define the context of economic and administrative changes that occurred since 1978, section II briefly describes the CMS of China. Section III presents an overview of CMS in Taicang county and the next section discusses the reform measures adopted over the last few years. Section V reports the utilization pattern of health services and financing of new CMS units in Taicang. Given the experiences of Taicang, section VI discusses the future role of CMS-type insurance programme in Chinese country side. Lessons learned for developing countries like Bangladesh are summarized in the last section of the paper.

II. The Cooperative Medical System

In China, rural health delivery is organized on a three-tier system. The village health stations (former brigade health stations) are located at the lowest level, run by village doctors. Many of the former barefoot doctors, much romanticized during the cultural revolution, have been upgraded or renamed to become village doctors after the economic reforms. The formal licensing requirements for a village doctor varies among provinces but, in most cases, it includes at least 10 years of education and one year of medical training at the county health school. An excellent analysis of the three-tier health care system of China can be found in Liu and Wang (1991).

Immediately after the launching of cultural revolution in 1965, the Cooperative Medical System was organized at the brigade or village level with funds generated by the brigades themselves. A small number of CMS units were formed by both commune and brigade funding. Typically, a CMS generated its funds from annual premium paid by individuals and annual appropriations from village and township collective funds. The premiums were based on community rating so that all members, irrespective of their age, sex, education level or current health status, paid a fixed level of premium. However, individuals could participate in the CMS as a member of a household and selective enrollment of members was not allowed. The level of premium in a year was determined by the community's health expenditures in the previous year, availability of village fund and enrollment.

At the village clinic, patients were usually required to pay a small fee for consultations but drugs and preventive services were provided free of charge. For the services received at the township, the patients usually paid the charges out-of-pocket at the delivery point but later they were reimbursed about 70 to 80 percent of total medical costs from the township CMS office.

The barefoot doctors are the most important health personnel in the CMS. During early 70s, each barefoot doctor usually served about 500 to 1000 persons and devoted at least 80% of their time on preventive services. In the CMS system, the barefoot doctors could earn an additional 20% income if the infectious disease rate in the community was less than a predefined target rate.

Many reasons are offered for the rapid decline of CMS after the introduction of economic reform. These can be grouped into three categories: economic, political and managerial (Zhu et al. 1989; Young 1986; Chen et al. 1993; Liu and Cao 1992).

Among the economic reasons, the transformation of the collective economy into an individualized market system is considered the crucial one. Individual productivity based reward system made it difficult to organize community financing of projects. Moreover, the need for capital in rural industries reduced availability of funds in social programs. Rapid economic growth in rural China is considered another contributing factor. Higher income of the population increased the demand for more specialized medical services affecting the utilization of health auxiliaries adversely. Lack of political support played an important role in the rapid decline of CMS (Zhu et al. 1989). The system was labeled as a product of cultural revolution, and after 1980 the official policy was to eliminate all the vestiges of that era. Towards the end of the decade, county administrators realized the importance of CMS-type system for rural China and started to encourage the formation of health insurance schemes (Liu and Cao 1992).

The managerial deficiencies of CMS were quite high as well. The management and administrative team of CMS were weak and the training of the barefoot doctors was inadequate to improve the quality of services delivered with the increased demand for quality. The funding level of CMS was so low that the health auxiliaries had little or no incentive to pay for additional medical training to upgrade their skills. Although the premium remained at a very low level, the benefit package of the insurance was defined broadly to include all types of health services within the village. Exclusion of certain high-cost hospital care services was another deficiency of the system, which discouraged participation of higher income groups in the health insurance programme.

III. The CMS in Taicang County

Taicang county is a densely populated region located in the east coast of China, about 40 miles from Shanghai. After the economic reforms of 1978, the county experienced a high rate of economic growth and, at present, it is considered one of the better-developed regions of China (see Wang 1990 for a discussion of CMS in Taicang).

The CMS in this county started in 1958 and by 1970 all villages and 99% of rural population participated in the program. Political support for the system did play a very important role in its expansion. Unlike most other counties in China, all villages in Taicang continued with the CMS even after the de-collectivization of the rural economy.

To understand the relative stability of CMS in Taicang, the paper will examine two dimensions of the issue: first, the political support for cooperative financing system which defines the necessary condition for its continuation and existence and second, the financing and management approach followed to understand the actual implementation of the new CMS.

The CMS or an insurance scheme covering basic health services is clearly highly desirable for the rural population. Although the economic progress may have increased the demand for quality services, availability of a health worker within the village provides easy access to basic medical care at a low opportunity cost. Moreover, the system protects rural households from large financial loss due to serious and costly illnesses. Protection from uncertain financial liability has become more important in recent years due to rapid cost escalation of hospital services. Over the period 1978 to 1993, hospital sector cost per capita increased at a real annual rate of over 10% (Khan and Zhu 1994).

Another important player in the CMS system is the village doctor. The continuation of the system generates patients for the village doctors. This increased demand creates the financial incentives for upgrading the knowledge and skills of the local physician through continuing education. In some cases in the past, the village itself provided the financial support for additional training of the doctor.

The township health centre also benefits from the community health insurance schemes, which ensure a stable patient flow for the centre through the referral system of the programme. Patient flow in a systematic manner implies regular and stable revenue for the township. Similarly, the county hospital also gains through increased referral from the CMS units and township centres.

The political leadership in the county was always in favor of a community-based program despite rapid decline of the system elsewhere. Most rural residents and the village doctors appear to be strongly in favor of the community insurance schemes and, therefore, advocating the continuation of such activities is a good political strategy. For regional political leadership another attractive aspect of CMS is its ability to survive without any subsidy from the county government.

The fact that the major players in the system can potentially gain from the continuation of the insurance programme does not necessarily imply its viability. In the new economic environment, a number of factors became significant threats to the continuation of community based health insurance. The cost of health care services started a steep rise after the economic reforms, depleting the funds of many CMS units in the process. The key to

success in Taicang was its ability to adapt the system quickly in a changing environment. The following section discusses the changes carried out by the CMS units in Taicang since 1979-80.

IV. Reforming CMS in Taicang

The CMS in Taicang went through a number of significant reforms, which protected the insurance programme from disintegration through strengthening its financial viability and political support. Important reform measures are summarized below:

(a) Eligibility criteria for health insurance

In Taicang county, the health insurance plan expanded its population coverage by allowing the employees of rural industries to enroll. Before the 1978 reforms, only the agricultural households were allowed to enroll in the CMS. In early 1980s, it became clear that rural industries will play a crucial role in the development of rural China (see Islam & Hehui 1994). Since an increasing proportion of labor force became involved with rural industries, the CMS units had to relax the restrictions imposed on enrollment and offered the insurance to industrial workers to maintain the population coverage. Without this flexibility, the CMS enrollment would have declined threatening the financial viability of the insurance scheme.

The rural industries also helped the system through direct financial contributions. The employees of rural industries, in general, are relatively healthy and young and enrolling them in the system does not increase the utilization of health care services in proportion to the increase in number of individuals covered. In Taicang, the CMS was also expanded geographically to incorporate the residents of the villages and the township. This allowed the risk-pool to be larger with a lower chance of bankruptcy. Combining township with the villages in the new CMS gave patients a wider choice of providers by granting them direct access not only to village doctors but also to township health facilities and personnel. Since the CMS reimbursed the patients a part of the costs incurred at the township health centre, demand for its services also increased. Higher utilization of township centres reduced its average overhead costs and improved its economic sustainability.

(b) Changes in the benefit package and coinsurance rates

All services provided by the village doctors are covered in the reformed system but rather than providing the services free of charge, a copayment of about 30% or more has been introduced in most villages and townships. Higher copayments allow higher cost-recovery at the local level and increased income of village doctors. The increased income of the village doctors, in turn, encouraged them to invest in formal training to upgrade their knowledge and skills.

The most recent policy change adopted by the CMS of the county is the inclusion of tertiary level in-patient care services in the benefit package. At the upper levels of health care delivery (in township health centres and county hospitals), however, the copayment rates were set at a higher level, usually at about 60 percent. A number of townships adopted a graduated scale for reimbursement of costs incurred at secondary and tertiary health centers. For example, one township CMS (in Xingtang) decided to pay 40% of health care expenses if the total expense remains less than 300 yuan but paid 50% if the expenditure was in between 300 to 1,000 yuan per case. The reimbursement from the CMS was set at 70% level when the expenditure exceeded 3,000 yuan. This policy made the insurance plan highly attractive to risk-averse population. Since the insurance pays 70% of total charges for high cost medical services, richer households can also expect to benefit by participating in the programme. If the coverage is limited to only low cost health interventions, higher income groups in the community may not find the plan attractive enough making the risk pool too narrow for long-term financial sustainability.

(c) Premium levels for the insurance program

The health insurance premium in a CMS is set by the management team, which consists of the village leaders, village doctors and representatives of the population. During 1970s, individual contributions to the CMS fund remained constant in per-capita terms to generate approximately 50% of total expenditures. The village administration used to allocate money from the community funds to pay for the other half of the CMS budget. After the economic reform, health care price indices started to increase so rapidly that it became essential to refix premium on a regular basis to cope with the inflation. Adjusting the premium every month is an administrative nightmare, if not totally infeasible.

In the new system, the premium has become subject to change annually depending upon the changes in costs and utilization at various levels. To establish some degree of stability, the county CMS units redefined premium as a percent of per-capita disposable income. Over the last few years premium paid remained within 1.5 to 2% of household income. Since the premium is set as a percentage of income rather than at a fixed monetary value, total premium collected in real terms increased every year in proportion to economic growth. This system of premium collection also ensured that the premium increases at least at the rate of general inflation in the community.

The county also set two levels of premium rates, replacing the old policy of one rate for all participants. The rates were applied to two occupational groups: one for the farmers and the other for the industrial workers. Since the farmers were poorer than the industrial

workers, the premium was set at a lower level for them. Rural farmers are more likely to use lower-cost medical services than the industrial workers justifying the lower premium charged.

The redesigned health insurance scheme derived a small part of its funding from financial contributions of rural industries. In recent years, industrial sector played an important role in re-introducing the village welfare fund. A well-developed village organization with strong political support base is required to generate funds from non-traditional sources. In China, well-functional local institutions were already in place by late 70s and in Taicang the leadership was able to attract some additional funding for the adapted CMS.

(d) Political and administrative support

The Taicang county-government created a CMS management office at the township health center. A former barefoot doctor is usually appointed as the manager, who is paid a fixed salary by the township government. The chief of the township health center acts as the deputy manager of the office. The major objective of the department has been to help the villages to organize and manage their CMS units. The manager's job is so much dependent on the continuation of CMS, he/she monitored all the units very closely to ensure its financial viability. To demonstrate the political support for the scheme, the governor of the township became the director of the CMS management office.

V. The restructured CMS in Taicang: utilization and financing

The restructured CMS units in the county varied quite significantly from one town to another in terms of their co-payment rates and premium levels. Table 1 shows the co-payment rates for different CMS schemes in the county in 1990 by service providers. Note from the table that a third of all CMS units required no out-of-pocket payments from the patients for the services provided at the village clinic. On the other hand, six CMS units out of 21 required a co-payment of 50% at the village clinic. The co-payment rates at the township health centers were higher, usually more than 50%. About 75% of all CMS units imposed a co-payment of 50% or higher for using the services provided by the county hospitals or other specialized tertiary facilities.

Table 1. Co-payment rates for the CMS units of Taicang country by type of service providers, 1990.

co-payment (%)	Number of towns with the co-payment rate at the		
	<u>village clinic</u> Number (%)	<u>township health centre</u> Number (%)	<u>county hospital</u> Number (%)
0	7 (33.3)		
20	3 (14.3)	4 (19.1)	
30	3 (14.3)	4 (19.1)	3 (14.2)
40	2 (9.5)	4 (19.1)	2 (9.5)
50	6 (28.6)	7 (33.3)	12 (57.1)
60		1 (4.8)	3 (14.2)
70		1 (4.8)	1 (4.8)

Note: Total number of towns in the county was 21 in 1990.

Table 2 reports the utilization of health services at all the three tiers of the system. More than three-quarters of all visits took place at the village level. Only about a fifth of total contacts occurred at the town health center and less than five percent were due to visits to the county hospital. However, since the visits at the county hospitals are expensive the CMS had to spend 21% of its total funds on county hospital services. Similarly, about 40% of total CMS funds were spent at the town health center. Using the co-payment schedules from Table 2 and assuming that the price elasticity of demand is zero, a rough calculation indicates that

Table 2: Service utilization and expenditure by CMS participants by the level of health facilities in Taicang county in 1990

<u>Health care providers</u>	<u>Number of visits (in thousands)</u>	<u>Expenditure by CMS in 1,000 Yuan</u>
Village clinic	1612.5 (78.1%)	618 (35.4%)
Town health center	385.0 (18.7%)	763 (43.7%)
County hospital	65.5 (3.2%)	365 (20.9%)
Total	2063.0 (100.0%)	1746 (100.0%)

the total cost of CMS would have been about 3.4 million yuan rather than 1.7 million if the schemes had zero copayments. In other words, the co-payments reduced the total financial requirement of the system by at least 50%.

Tables 3 and 4 summarize the sources of CMS funding in the county during 1990. In most cases, CMS schemes were jointly funded by individual members and the village or township community. About 90% of all CMS units were funded through this mechanism. Only about four percent were funded by the village or township welfare funds alone and

Table 3: Frequency Distribution of Villages by Source of CMS Funding in Taicang County, 1990

Contributor	Number of villages	Percentage of villages
Individuals only	22	6.8
Individuals and villages	275	85.2
Individuals, villages and towns	12	3.7
Village only	18	4.0
Village and town	1	0.3
Total number of villages	328	100.0

another seven percent by individual contributions. In terms of total CMS expenditures, more than 50% were derived from individual contributions and another 45% came from the village welfare fund. Village industries donated about one percent of total CMS costs.

Note from Table 4 that the direct contribution of village industries was very low in 1990. The village welfare fund, one of the most important source of support for the CMS, collected the resources by taxing village collective activities and industrial enterprises rather than the agricultural sector. With the rapid expansion of rural industries, the welfare fund collection from the industrial sector also increased. This allowed an increase in funding for CMS by the village administration. By 1990, 18 village welfare funds became so affluent that

they stopped collecting premium from individual participants. Therefore, indirect contribution of rural industries to the CMS became relatively more important over the years.

Table 4: Sources of CMS funds by Contributors in Taicang County, 1990 (in 1000 Chinese Yuan)

Contributor category	Total Yuan Contributed	Percent of share of total fund
Individual	1433	54.2
Village welfare fund	1181	44.7
Village industry donation	22	0.8
Town government subsidy	9	0.3
Total amount of money	2645	100.0

VI. The Future of CMS in China

The success of CMS in this county implies that a reformed rural health insurance programme not only can survive in an emerging market-oriented health system, but also can prosper and enjoy wide social and political support. Another study, based on a village survey in Fujian province, also argued that a community based insurance may survive the economic reforms if appropriate adjustments are made in a timely manner (Huang 1988). In fact, Taicang's CMS may represent a model for providing health care services in China in the future.

The demise of collective agriculture in China reduced the availability of funds for community development. However, in recent years, rural industries became an important source of fund for the village administration. A part of this village fund could be used to support the development of CMS. In 1985, about 18% of total industrial output were produced by rural industries and the proportion increased to 26% in 1989. It also generated employment to more than 95 million workers in 1989. In Taicang county, about 37% of labor force were employed by the rural industries in 1990. A health insurance program is likely to remain financially stable if it can successfully incorporate the high growth sectors.

The rapid escalation of health care costs provided another strong inducement to develop health insurance schemes to protect households from financial loss associated with illness and health conditions. High rate of cost escalation in medical care increases the demand for health insurance. Since the opportunity cost of utilizing health services also increased over the years (due to higher labor productivity), rural households actually preferred the presence of a primary care provider within the village. The reformed CMS in Taicang strengthened the village primary care system encouraging the rural households to get enrolled.

The success of CMS in Taicang is due to its adherence to a number of basic principles in re-designing the system. The county considered CMS as a model of community participation, which ensures cooperation among different health professionals and a model for matching health personnel and services with available financial resources. Four factors appear crucial in the continued strength of CMS in the county. First, the CMS was made attractive to rural population by setting premium at a low level and designing an appropriate benefit package. Second, to control health care cost escalation, it incorporated a number of economic incentives to promote the use of low cost health services at the community level and third, the structure was made flexible enough to adjust quickly to changing market conditions. Finally, political support was required to consolidate the popular demand for the program and to allow inter-CMS collaboration. The experiences of one health insurance scheme in India also identified very similar factors as preconditions for the successful continuation of health insurance schemes (Jajoo 1992).

A number of researchers have argued that the success of rural health insurance depends upon the level of economic development of the community (Sevagram Medico Friend Circle 1983; Jajoo 1985). For Taicang, economic growth was important but it may not be a critical factor. In the counties of Wenzhou, economic growth was as impressive as in Taicang but the CMS went through rapid disintegration in the former after the economic reforms.

For the continuation of CMS in Taicang, the presence of rural industries was not also the essential factor. One paper argues that the success of CMS in the future will depend on the development and dynamism of rural industrial sector (Hillicr & Zheng 1990). In this research, we observed that more than 50% of total CMS funds were derived from the participants directly. In 22 villages, participants alone, without any financial support from the village, town or county funded the CMS units. Clearly, the CMS units can survive without any subsidy from village welfare fund. In Taicang, absence of rural industries in certain villages did not affect the operation of the village CMS units.

One important reason for the success of CMS in Taicang appears to be the administrative and political support provided by the township government. In Taicang, the township officials are elected directly by the population since 1984. This probably exerted political pressure on the officials to respond to the needs of the majority. In the county, voters did raise the issue of health insurance in pre-election meetings. Moreover, in 1990, the subsidy from the township government for CMS was less than one percent of total CMS expenditures making it a highly desirable program from the political point of view.

VII. Lessons for Bangladesh and Other Developing Countries of the World

The cooperative medical system, as developed in Taicang County of China, appears to be an appropriate insurance model for financing rural health care services in the developing world. During the next few decades, a large proportion of developing country population will continue to live in rural areas where market mechanism may not be able to attract fully "qualified" modern physicians. In this environment, the CMS should be examined carefully as an alternative method of delivering basic health care services. Although the success of Chinese CMS in pre-reform years required strong political support at the national level, market forces and democratic institutions rather than political direction drive its recent popularity. Therefore, the idea that CMS needs a very specific socialistic political structure for replicability is not valid. The CMS in Taicang remained strong over the last 30 years, a period covering at least three major political changes in China, including the emergence of free market structure for health services.

For Bangladesh, a decentralized system like CMS should be able to improve the provision of primary care services at the village level. The community insurance in China was based on the assumption that human resource mix of a health facility should be consistent with the financial resources available. The medical training of barefoot doctors varied from three months to more than two years, depending upon the community's economic status. Even with such wide variations in the training of the village doctors, the health status of population in China improved significantly after the introduction of CMS. In fact, one recent study observed that the access to medical care and health status of the population have been affected adversely due to the disintegration of the CMS (Shi 1996). Therefore, emphasizing the creation of a village based health practitioner or paramedical staff should improve the health status of the population.

Using the expenditure data of CMS units in Taicang (Table 2) and the median co-payment rates mentioned in Table 1, we can estimate the total health care expenditures (both out-of-pocket and CMS payments) at different levels of the health system. The estimates suggest that about 28% of total expenditures were incurred at the village level and another

26% were used at the tertiary level. This expenditure pattern should be a good guide for poor developing countries to determine the relative allocation of health care funds at the primary level for the provision of basic curative and preventive services. If we use this allocation rule, developing countries should spend about 30% of total health care expenditures on primary care.

The Chinese experience on premium setting can also be used as a rough guide after correcting the premium paid for income level of the population in Bangladesh. In China, premium was set at about 1.5 to 2 percent of average household income. If these proportions are used, the premium per person per month in Bangladesh should be about Tk.10 to 15. If a CMS unit covers 1,000 individuals, a 30 to 35% allocation at the village level implies that the monthly income of a village doctor should be in the range Tk.1,500 to Tk. 2,500 (allowing 55% for drugs and other services). Therefore, it is unlikely that the village CMS units will be able to recruit fully trained physicians to provide basic health services without significant subsidy from other sources. Need for subsidy on a continuous basis makes the system unsustainable.

Choosing the appropriate premium level and human resource-mix for primary care will not automatically ensure long-term sustainability of the programme. The experiences of Taicang indicate that four factors are crucial in ensuring the success. First, since the market-oriented system tends to increase the utilization of health care services, the CMS should design the benefit package carefully with restrictions on over-utilization of expensive services. A reasonable co-payment requirement should be instituted to keep the premium at a relatively low level. Second, the premium for the insurance programme should be carefully set to take into account the changes in medical care prices and utilization. In Bangladesh, setting the premium as a percent of income will not be feasible but the premium can be adjusted from time to time.

Like the CMS in Taicang, health insurance schemes in Bangladesh should try to enroll as many rural households as possible to spread out the risk. In fact, health insurance plans are unlikely to become financially sustainable if only the poor households are targeted. Finally, the CMS type health insurance requires political support at the village, union and thana levels. In Bangladesh, thana-based physicians should be brought into the programme to complement the basic services provided through the village doctors. In the CMS approach, the village based and physicians practicing at the secondary and tertiary levels develop mutually beneficial referral mechanism. The CMS units actually become the direct purchasers of medical services at the higher tiers making them (upper tiers) more willing to develop a collaborative relationship.

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The Computer Information Services (CIS) offers a Centre-wide backbone that allows office staff to connect to an array of computer information systems. CIS also offers a Web Server that hosts ICDDR,B web page (<http://www.icddrb.org>) and provides an on-line e-mail system that allows users to send/receive e-mails and browse web pages from their desktops.

Dissemination and Information Services Centre (DISC) provides easy access to literature on diarrhoeal diseases, nutrition, population studies, environmental and behavioural studies in general by means of Current Contents (Life Sciences and Clinical Medicine), MEDLINE, NUTRITION, POPLINE, and AHEAD databases, 30,600 books and bound journals, 12,750 reprints of articles and documents, 352 current periodicals, etc. DISC maintains several in-house databases for its users and publishes the quarterly *Journal of Diarrhoeal Diseases Research* (and bibliography on diarrhoeal diseases within the *Journal*), two quarterly newsletters *Glimpse* (in English) and *Shasthya Sanglap* (in Bangla), a staff news bulletin *ICDDR,B News*, the DISC bulletin (current awareness service), working papers, scientific reports, monographs, and special publications.

Staff: The Centre currently has over 200 researchers and medical staff from more than ten countries doing research and providing expertise in many disciplines relating to the Centre's areas of research. Over 1,200 personnel are working in the Centre.

What is the Centre's Plan for the Future?

In the 38 years of its existence, ICDDR,B has evolved into a research centre whose scientists have wide-ranging expertise. Future research will be directed toward finding cost-effective and sustainable solutions to the health and population problems of the most disadvantaged people in the world. The Centre's Strategic Plan: "To The Year 2000" outlines work in the following key areas:

Child Survival: Priority areas for research in child survival include: improvement of the case management of diarrhoea; acute respiratory infections; risk factors for low birth rate and potential interventions; nutritional deficiency states (including micronutrients); immunization-preventable infectious diseases; and strategies for prevention, including modifications in personal and domestic hygiene behaviours, provision of appropriate water supply to and sanitation for the households, and the development of effective vaccines.

Population and Reproductive Health: The Centre played a key role in conducting pioneering research in the areas of population and family planning and raising the contraceptive use rate among women of reproductive age in Bangladesh to almost 45% through its technical assistance and operations research. The 1994 Cairo Conference hailed Bangladesh as a family planning success story, using Matlab as the model for MCH-FP programmes throughout the world. The Centre continues its research in maternal health and safe motherhood and has initiated community-based research on reproductive health and STD/RTI/HIV infections.

Application and Policy: The Centre recognizes, and has given a high priority to, the need to transform research findings into actions by replicating the successful interventions piloted in its projects and through its research and training activities. The Centre will increase its communication, dissemination and training in its efforts to influence international and national health policies in the areas of its expertise.

Centres of Excellence: As a means of addressing these new initiatives in child survival and population and health research and structuring our existing programmes into Centre-wide initiatives, five Centres of Excellence are proposed as the scientific research, investigative and training arms for key areas of activities. These Centres of Excellence are in the following areas: Nutrition; Emerging and Re-emerging Infectious Diseases; Integrated Management of Childhood Illnesses; Vaccine Trials; and Reproductive Health. The Centres of Excellence will be interdisciplinary with scientists from each of the four scientific divisions engaged in the dialogue of formulating policy, developing research protocols, and conducting clinical, hospital-based and community-based trials. Outputs will include research findings, policy development and training capacity that will be used locally and nationally and that can be applied regionally and globally.



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