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INTEGRATION OF HEALTH, NUTRITION, AND FAMILY PLANNING: THE COMPANIGANJ PROJECT IN BANGLADESH†

It is more than 50 years since John Grant and Andrija Stampar first proposed regionalization of health services around rural health centers, but it cannot be said that the widespread application of these concepts in developing countries has been very successful (3, 4, 7). The causes of this failure are complex, but it has not been due to lack of trying. There have been numerous pilot projects, but many have asked whether it is possible to draw any conclusions valid for general application from demonstrations which have available more special expertise, money, logistical support, and other kinds of attention than are likely to be available ordinarily. Certainly it is unlikely that demonstration projects will produce fully developed models which can be replicated generally throughout a country or even a district. Nevertheless, there are at least three ways in which a demonstration project should be able to contribute to design of health centers:

1. The identification of program failures and the forces contributing to failure. If a program or a program component does not work despite all the special inputs, this in itself is useful information. It becomes more useful if it provides an opportunity to identify the forces that caused the failure.

2. The analysis of program components to identify successful and cost-effective ones which might be transplanted elsewhere. A demonstration gives

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scope for experimentation with modifications of personnel mixes, training programs, and other elements, although in a protected environment. The real test must come when the new species is transplanted to the real world outside.

3. Finally, there can be no progress in development of rural health services without a nucleus of skilled professionals who have training which is relevant to the situation existing in rural areas of developing countries. Physicians, nurses, and medically trained personnel of all sorts are in short supply in Bangladesh, but physicians and nurses motivated and trained to work in rural areas are almost nonexistent. Professional development of doctors and nurses into effective leaders should be one of the primary aims of demonstration projects. In some countries, the project site is the only place where appropriate training can be carried out.

Analysis of experience at Companiganj, Bangladesh, indicates that there are some important lessons to be learned in each of these areas of concern, but that implementation of these lessons will not be easy in the face of the socioeconomic, political, and administrative realities of Bangladesh. Neither the lessons nor the problems of application are unique to Bangladesh.

THE PROJECT

In 1972, just after the establishment of Bangladesh as an independent nation, the Health Ministry proposed an extensive reorganization and expansion of the existing rural health services. The aim was to integrate all of the existing "vertical" health and family-planning programs plus the curative medical programs in rural health centers into a single administration. Ninety-two percent of the 80 million people in Bangladesh live in rural areas and in 1972 less than half of the 356 rural *thanas* (a thana is an administrative unit similar to a county—population 100,000 to 300,000) had rural health centers with a government doctor. Preventive programs existed in all areas, however: a malaria program which had been quite successful in controlling malaria, a group of "sanitary inspectors" who vaccinated for smallpox and cholera and made some efforts to improve the quality of food and water, and a family-planning program begun in 1965.

By 1972 the family-planning program had been weakened by the war and by the elimination of a group of low-paid, part-time women workers (*dais*) who had been the main source for referral of patients. Each of these three vertical and categorical preventive programs was administratively separate and reported to separate district and higher authorities. The Health Ministry proposed to integrate all three and to introduce a maternal and child care program using expanded curative staff from the rural health center. The Companiganj Project was conceived as a demonstration of how this integration might be carried out. It was conducted jointly by the Bangladesh government and outside agencies with funds provided by the West German Protestant Central Agency for Development and by Christian Aid in Britain. A small evaluation unit was funded by the Ford Foundation and the International Development Research Center of Canada. New personnel were to be hired up to the limit set in the government's proposal to join existing government personnel in the thana selected. A training program for all personnel was to be conducted in the first two years, after which expatriate involvement would be phased out so that the project could operate in its last two

years under the direction of the thana health administrator appointed by the Bangladesh government.

The team undertaking the project was required to develop a program within the pattern set in the government's proposal, which in its turn was determined in large part by the health services already existing in rural areas of Bangladesh. Two significant modifications of the government program were made in the final proposal:

1. Aside from a nucleus of physicians, nurses, and "lady health visitors," new personnel were to be recruited from the union in which they would live and work.[1] They would have no previous medical experience but would be trained by the project in the thana.

2. In addition to the rural health center and one other general clinic, five subcenters were proposed, one for each union. Funds for construction costs and personnel for these centers were obtained by reducing the number of personnel in the large rural health center and hospital and by deleting some items. The new subcenters are small, cost about U.S. $2,000 to construct and are staffed by a lady health visitor and by four locally recruited women. They deal with maternal and child health and family planning only.

In 1975 both of these modifications were incorporated into the government's plan. Another modification was added in the first month of the project: because family food supplies were low, hunger was the most important medical problem, and nutrition education alone could not be expected to help much. To meet this need, shops were established adjacent to all project clinics which provided *pushtikor*, a locally produced mixture of wheat (75 percent) and chick peas (25 percent) to be sold as a food supplement for small children. This was sold for one-half the market price for wheat. The wheat was provided free by various donor agencies so that most of the production and distribution cost plus the cost of the chick peas was recouped. Families who bring children under three years of age to a clinic are given a ration card and are allowed to purchase an amount of the supplement equivalent to about one-third of the child's caloric requirement as long as they continue to come regularly to the clinic.

The training program at Companiganj began in September 1973, and the full program has been in operation since March 1975. The project now has 145 service personnel working in two general clinics with attached maternity, child health (MCH), and family-planning centers and five subcenters with MCH only. The subcenters provide both clinic and field activities in MCH and family planning. Clinics are open two days a week and on three days a week the staff makes home visits in the area served by the clinic. The aim is to provide motivational and educational activities at home which are not possible in the crowded clinics.

In addition to the women's field program, there are 28 male "family welfare workers," former malaria workers, and sanitary inspectors who have been trained to combine malaria surveillance and treatment with smallpox surveillance, smallpox vaccination, and family-planning work.

A small hospital with 16 beds was opened on the top floor of the existing rural

[1] In 1972, a Bangladesh "lady health visitor" was a young woman with two years training, after matriculation, in maternal and child health. A "union" is the smallest government administrative unit. It usually contains 15-20 villages and population of about 20,000. Villages in Bangladesh do not have elected or appointed governing bodies or head men.

TABLE 1.—COMPANIGANJ PROJECT'S OVERALL PERFORMANCE, ALL CLINICS AND SUBCENTERS, JUNE 1976*

Service	Quantity
Total clinic visits	12,042
Houses visited (women field workers)	4,733
Smallpox vaccination	1,303
DPT immunization	186
Pushtikor sold (*tons*)[a]	5.2
Malaria slides	756
Hospital admissions	95
Family planning	
New acceptors	277
Oral pill cycles	2,265
Condom and Emko (*dozen or vials*)	29
IUD	17
Vasectomy	5
Tubectomy	13

*Data are from service records.
[a]Pushtikor is the nutrition supplement.

TABLE 2.—DEATHS PER 1,000 POPULATION BY LANDHOLDING FAMILY, 1975, 1976, AND 1977*

Acres of land per family	Crude death rate			Age 1-4 mortality rate		
	1975	1976	1977	1975	1976	1977
0	34	26	16	92	44	29
.01-1.00	27	19	13	48	53	16
1.01-3.00	17	17	17	46	9	18
3.00+	14	14	12	26	21	12
All families	24.1	19.2	14.6	54.8	35.3	18.6

*Data are from project surveys in a 10 percent sample of the population served. X^2 analysis for the differences observed in 1975 or for all years combined indicates a probability of chance occurrence less than .001.

health center. Thirty-seven women and 11 men were recruited locally and trained to work in field programs, clinics, or hospitals. Table 1 summarizes project activity in June 1976, 15 months after the training programs had been completed.

The Project Situation

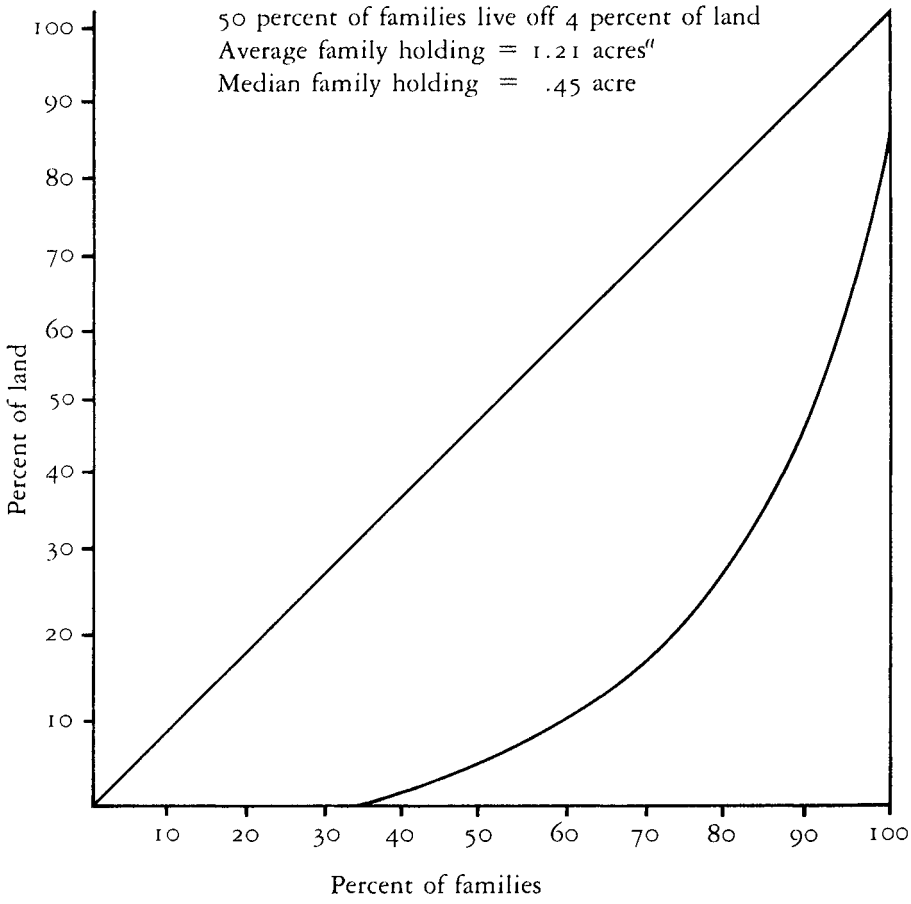
The area selected, Companiganj thana in the district of Noakhali, has a population of 120,000 and is located 100 miles southeast of Dacca on the coast of the Bay of Bengal. Since the cyclone of 1970 it has been a chronic rice deficit area, but it is generally considered to be economically average for Bangladesh. Per capita income is about $80 per year, mostly derived from agricultural production. There are not many large landholders, but nevertheless there are large inequalities in the distribution of land (Chart 1), and unfortunately most of the outside income is earned by individuals who are in families which have the larger landholdings.

The first year of the project was a year of famine in Bangladesh. The price of rice rose to levels which made it impossible for a large proportion of the population to purchase adequate supplies of food. The results are reflected in the death rates shown in Table 2. The crude death rate in 1975 was three times as high in families with no land as in those with three acres or more, and the disproportion in death rates among children of ages 1 to 4 was considerably greater. Cause of death was determined in the sample area by physician interviews with each family in which a death occurred. The increasing mortality in 1975 was due entirely to malnutrition (starvation) or to chronic diarrhea with associated malnutrition.

The project's efforts could not more than partially compensate for the shortage of food in poor families. Statistics of death rates in Companiganj are available only for 1975 and later, but they are available for earlier years in Matlab where conditions are similar (Table 3). Death rates in Matlab in 1974-75 were 37 percent greater for the entire population and 30 percent greater for infants than in 1973-74. The mortality rate for children ages 1 to 4 years was 31 percent higher in 1974-75 and 44 percent higher in 1975-76 than in 1973-74. Bangladesh appears to have passed through the first stage of a true Malthusian crisis in late 1974 and most of 1975, and it is likely that there was an absolute decrease in the population of landless laborers during this time.

These economic realities must be taken into account in any appraisal of the utility of the project's activities. Some administrative and political realities are almost as important. The first is that outside of Companiganj thana there has never been any real acceptance in Bangladesh of the concept of integration of health services with family planning or, for that matter, of integration of curative activities in the rural health centers and hospitals with the activities of the field workers for malaria and sanitation. The family-planning program established in the 1960s has not been under the health division, and present government plans call for a network of MCH and family-planning clinics and field workers similar to what now exists at Companiganj, but administratively separate from other government health activities in a thana. The mechanism for providing medical support and guidance for the MCH and family-planning workers has not yet been

CHART 1.—INEQUALITY OF LAND DISTRIBUTION, COMPANIGANJ, BANGLADESH, 1975



[a]The average is probably low, since many of the top 10 percent of families underreported the amount of land they controlled. Lower income families seem to have reported accurately.

worked out. A second administrative problem is more fundamental: a significant portion of the government civil service system is controlled by officers who are university educated and have an urban orientation. This applies to all areas of the civil service, not just to health and family planning, but it is a particular problem there. Health and family planning require community participation and trust to be successful. Furthermore, institutions for community organization are extremely weak in Bangladesh. Union councils, one for each 20,000 population, were established before independence from Britain but they have been weakened by repeated changes of government and they tend to be controlled by certain elements of the local power structure.

It is important to recognize that this is not a black and white situation. There are sincere, interested, and courageous people working both in the government and in the community, and there is general recognition that the present social

inequity and weak community structure cannot continue. Nevertheless, the obstacles to change are strong. By the end of 1977 there was little evidence of significant improvement at the village level.

WHAT HAVE WE LEARNED?

The project's success in identifying and training people to carry out health work in rural areas was encouraging, and it should be possible to repeat it elsewhere. Noakhali is a very conservative Muslim area where purdah traditionally has required most adult women to confine their activities to the home. Most people who were consulted in Bangladesh before the establishment of the project believed that it would be impossible to recruit local women to work in clinics, let alone to get them to travel about making home visits. The initial response to recruiting efforts seemed to confirm this, but informal conversations made it clear that many women wanted to work in the project if it were socially acceptable to do so. It was four months before any women came forward, but once they started to work and brought their paychecks home, there was no further difficulty. Furthermore, since no other jobs were open to women, it has been possible to recruit some extremely talented and energetic workers.

Fortunately, it was also possible to recruit very competent physicians, nurses, and lady health visitors for supervisory positions in the program. Four out of five physicans who were selected chose to stay beyond their original contracted time, and there is every reason to believe that they could become leaders in the development of rural health services in their country. All four have been sent for advanced training outside of Bangladesh and two have now returned to take over direction of the project. Project pay scales are higher than present government pay scales for physicians, but monthly income is much lower than is possible in private practice. The main factor in acceptance of this sort of work as a career has undoubtedly been provision of a professional setting in which all members of the health team could see concrete results.

TABLE 3.—BIRTHRATES AND DEATH RATES, COMPANIGANJ AND MATLAB*
(*per 1,000 population*)

	Companiganj,	Matlab		
	1975	1973/74	1974/75	1975/76
Crude birthrate	37.6	47.8	40.1	27.6
Crude death rate	24.1	14.6	20.0	18.2
Infant mortality rate	142.0	128.8	167.2	150.4
Age 1-4 mortality rate	55.0	22.7	29.7	32.7

*Data are from project survey for Companiganj and for Matlab, A.K.M.A. Chowdhury and L. Chen, "The Interaction of Nutrition, Infection, and Mortality During Recent Food Crises in Bangladesh," *Food Research Institute Studies*, XVI, 2, 1977.

TABLE 4.—MONTHLY COST OF OPERATION OF SUBCENTER MCH CLINIC AT SHIRAJPUR, COMPANIGANJ

Category		Cost (*in takas*)
Drugs and supplies (exclusive of family-planning supplies)		1,940
Salaries[a]		
Lady health visitor	495.00	
Four clinic assistants (360 x 4)	1,440.00	
Rickshaw puller	300.00	
	2,235.00	2,235
Depreciation		
Building	25,000 / 20 x 12	105
Furniture and equipment	5,000 / 8 x 12	52
Rickshaw	3,000 / 4 x 12	63
Maintenance		200
Total		4,595 takas = U.S.$328

Cost per patient seen in clinic = $\frac{4,595}{1,407}$ = 3.27 takas = U.S.$0.23

[a] In addition to seeing 1,407 clinic patients, the same workers also made 420 house visits. Clinic assistants and rickshaw pullers work two days per week in the clinic and four days making field visits.

It has also been possible to integrate these new personnel—local residents, physicians, and other medical professional staff—into a working system with the existing government workers. This has not been accomplished without some difficulty. General expansion of this sort of system throughout the country has been slow because of weaknesses in the existing rural health center, malaria, sanitation, and family-planning programs. Resistance to the integrated system has been reduced in the central government, but it persists at lower levels. Integration of health services and family planning cannot be accomplished throughout Bangladesh unless the central administration and, in particular, the district administrations demonstrate a strong determination to correct inefficiencies and inequities in the present system. Multiplicity of independent bureaucratic units makes it very difficult to do this.

The most cost-effective element in the project, without question, is maternal child care and family planning. Within this area, the best are the family-planning

TABLE 5.—FAMILY PLANNING AT THE COMPANIGANJ PROJECT, JANUARY 1974 TO FEBRUARY 1976*"

	New acceptors of family planning					
	Pill	IUD	Tubectomy	Vasectomy	Condom and Emko	Total
1974	604	259	4	24	142	1,033
1975	2,723	396	187	100	340	3,746
January and February 1976	1,039	45	50	51	42	1,227
Total	4,366	700	241	175	524	6,006

$\frac{6,006}{22,800}$ = 26 percent of couples have accepted family planning.

*Data are from service records.

"Population of Companiganj is 120,000. There are 22,800 fertile couples (an exaggerated figure, since about 15 percent of men 15-49 live and work outside of Companiganj).

and nutrition programs. Table 4 shows the monthly cost of operation of a subcenter staffed by a lady health visitor and four women clinic assistants. The staff took care of 1,400 clinic visitors and made 420 home visits per month at a total cost of $328.

The number of new acceptors of family planning from January 1974 to February 1975 is shown in Table 5. This gives a somewhat exaggerated picture of the actual practice of contraception since pills are free in the government program, and there is a large number of casual acceptors. Service records indicate that about 15 percent of women in the fertile age group were practicing family planning at the start of 1977. The real test of the effectiveness of the family-planning program should have come in 1977. Birthrates fell sharply throughout the country in 1975, in response to serious famine. Food supplies were adequate in Companiganj throughout 1976 and a sharp rise in the birthrate would have been expected in 1977, reflecting increased conceptions in 1976. In fact, preliminary data indicate that the birthrate in 1977 will be about 44 per 1,000. Since other Bangladesh programs with more intensive inputs than Companiganj are reporting similar levels of contraceptive practice, it does not seem likely that family-planning programs, either alone or in combination with health, will have a major effect on population growth in Bangladesh until a social and economic climate is created which will increase demand significantly above present levels. Of course, once this climate is created, a 15 percent practice rate is an excellent base on which to build—certainly almost every woman of childbearing age must know someone who is using contraception. Experience in other countries with very low per capita income has shown that family planning can have an effect on growth rates (6, pp. 242-48).

At the peak of the food shortage in the summer of 1975, sales of the locally produced food supplement reached 14 tons per month—enough to provide approximately one-third of the daily caloric requirement for 25 percent of the children under age three in the thana.

Field surveys in one area showed that 40 percent of the children over 6 months had participated in the program and 20 percent participated regularly. These proportions are perhaps not bad for the first year of a voluntary program requiring both purchase and clinic attendance, but unfortunately it has not been possible to show significant nutritional benefit to the children of families who were regular participants. Both those who used the supplement and those who did not improved after the harvest of 1975, but declined in the time of greatest food shortage. The seasonal differences for the total population were statistically significant (23 percent were less than 60 percent of the Harvard standard mean weight for age in the worst season; 14 percent in the best). The proportion of severely malnourished children among supplement purchasers was much greater than among those who did not purchase—30 percent versus 18 percent at the start of the famine year. At the end of the year there was no change in the purchasing group and the non-participants had improved slightly but not significantly.

Despite the fact that the nutritional status of users was worse than non-users there was only one death among 115 children over age 6 months who took the supplement regularly, while there were 7 deaths among 229 children who did not. These mortality differentials are also not statistically significant ($p = 0.18$), but others have observed that nutritional supplement programs have a greater effect on mortality than on the nutritional status of the recipients (*1*, pp. 439-45; *2*, pp. 707-15; *5*); and it seems likely that the program had some beneficial effect during the famine. Nevertheless, peak participation for any month was only 25 percent, and the amount of food provided per family was small, so that a serious rise in mortality among small children was not averted. Again, program effects were marginal when applied during an economic crisis. More study is needed to see if greater beneficial effects can be obtained over time and in the absence of famine. The progressive decline in mortality of small children for each year since 1972 (Table 2) suggests that the combined health and nutrition program probably is having an effect, particularly among the poorest economic groups.

These program components have had some degree of success, but analysis of the failures is also important. The male field workers have been effective at controlling malaria and smallpox but mostly ineffective at promoting family planning or educating families to the importance of nutritional supplements and immunizations available at the clinics. This ought not to be surprising since motivating and educating are very different sorts of activities from those in which they had been trained for the malaria and smallpox programs. It would be reasonable to let them resume their previous tasks and use newly trained workers for motivation and education activities. Unfortunately the salaries of male field workers make up a considerable portion of the budget (13 percent), and the malaria and immunization work could undoubtedly be done by half this number, as in the old malaria program when the same number of houses was covered by half as many men. Similar problems of excessive cost for results produced exist throughout the Companiganj program.

The general clinics see large numbers of men with conditions which cannot be treated by the procedures available in the clinic, and provision of ineffective services to these individuals drains resources from preventive programs. It is difficult for government health services to eliminate general clinics, but it should be possible to restrict their growth and to make the clinics self-supporting through charges imposed for curative treatments.

Clinics for females also carry a heavy load of older women patients who cannot be benefitted significantly by the treatments that are available. The result is very crowded clinics which are not good places for motivation and education activities. The project has tried to compensate for this by providing education through home visits, but unfortunately there are only five workers available to cover a population of 20,000. With this ratio it is difficult to provide effective follow-up even for family planning, to say nothing of effectively treating such common conditions as diarrhea, pneumonia, and skin disease, and consulting during pregnancy. In the present system, female workers cannot make more than two or three home visits per house per year. More workers are necessary for effective family-planning coverage and for the development of strong programs to convince women of the need for proper nutrition in pregnancy and early childhood, to treat diarrhea properly with oral fluid therapy, to seek early treatment for life-threatening respiratory infections, and to take the necessary measures to control scabies. (Scabies is a major cause of death from overwhelming infection and from nephritis subsequent to less serious infections with streptococcal organisms.) One worker per 1,000 population is probably the minimum needed. There is no possibility that funds could be provided from the government to pay this many workers at the present government scale for a full-time field worker, but there is every reason to believe that part-time workers with lower educational qualifications could be found who would work for much lower salaries. Experience with a small group of illiterate women hired in the same capacity as the other female clinic assistants has shown these women to be better motivated than their literate counterparts and more effective in establishing contact with other village women, almost all of whom are also illiterate. These advantages, together with their natural intelligence, make them extremely effective workers. Since they are happy to work part-time at much lower pay, it is possible to conceive of a system wherein one or two literate women supervise a much larger group of illiterate part-time workers at the same total salary cost. Experimentation with such a program has begun in one union within the project. Unfortunately, the government has already begun to recruit 14,000 literate full-time women field and clinic workers. If they are successful in this recruitment effort, the opportunity may have been lost to experiment with alternative patterns of personnel which could be much more cost-effective.

The importance of this sort of analysis of successes and failures is best illustrated by examination of program costs broken down by areas within the project. A projection of the cost to the Bangladesh government of the project in Companiganj thana if the government had taken it over at the end of 1975 is given in Table 6. It assumes: (1) that the same staff pattern and salaries are continued; (2) that the use of drugs and supplies is unchanged and family-planning supplies continue to be free; (3) that free wheat is available for the nutrition program—the cost of this program rises to 14,600 *takas* if wheat is purchased at December 1975

TABLE 6.—PROJECTED SERVICE COSTS, COMPANIGANJ, 1975*

Service	Cost per month (*in takas*)
Central administration	14,000
MCH—family-planning program (includes clinics and field work)	33,000
General clinics	19,000
Male field workers (malaria, smallpox, and family planning)	12,500
Hospital	11,500
Nutrition	5,200
Total	95,200
Annual cost, 1,142,000 takas	
Annual per capita cost, 9.50 takas or U.S.$0.68	

*Author's estimate.

TABLE 7.—MODIFIED SERVICE COST PROJECTION, COMPANIGANJ, 1975[a]

Service	Cost per month (*in takas*)
Central administration	10,500
MCH—family-planning program (includes clinics and field work)	33,000
General clinics (self-supporting at 5.00 takas [U.S.$0.36] per visit)	0
Field program (malaria and family-planning support)	6,500
Nutrition	5,200
Total	55,200
Annual cost, 662,000 takas	
Annual per capita cost, 5.50 takas or U.S.$0.39	

[a]Reduction in cost is accomplished by:
1. making general clinics self-supporting;
2. eliminating hospital;
3. reducing male field staff by 50 percent; and
4. employing two physicians instead of four.

market prices; (4) that the transport available will be one UNICEF jeep and seven rickshaws; and (5) that prices are unchanged.

Annual per capita cost comes to $0.68, or about 1 percent of per capita income. This might not seem much, but it is too high for Bangladesh today. The government now spends something like $0.50 per capita for all government health services, both urban and rural. Furthermore, the personnel required to extend the program nationally are not available and cannot be made available in the near future. The central administrative costs include the salaries of four doctors in each thana, and there is no possibility that enough doctors would leave urban practices to take government jobs in the 356 rural thanas. Similarly, there are not enough lady health visitors today to provide the seven or eight who would be needed for the MCH—family-planning program, and there is nowhere near enough personnel to staff hospitals for each thana. The logical choice would be first to train personnel for MCH and family planning and move gradually to expansion of the numbers of physicians backing up the lady health visitors. Ultimately, perhaps in 10 or 15 years, a small hospital could be staffed in each thana. Table 7 presents a cost projection for a modified project which takes into account these financial and manpower resource realities as well as some of the inefficiencies in the existing program which have already been mentioned. The central administrative cost is reduced 3,500 takas by eliminating two of the four doctors and some of the administrative personnel who will be in excess if there is no hospital and if the field program is reduced. The MCH—family-planning program is continued at the same level. The general clinics are costed at zero on the assumption that they could be self-supporting if a charge of 5 takas ($0.36) per visit was charged all patients who were not in the MCH—family-planning clinics. Service would continue in the MCH—family-planning program at the existing low charges of $0.02 per clinic visit and $0.04 per prescription. The cost of the field program for malaria has been reduced from 12,500 to 6,500 takas per month on the assumption that smallpox is eradicated and the malaria control and tuberculosis control (with BCG) and family-planning support work could be done with half the staff. The nutrition program continues at the present cost, but it is assumed that wheat for the nutrition program, amounting to $5.5 million annually for all Bangladesh, would be provided by foreign aid.

The hospital has been eliminated from the modified program, not because of cost inefficiency but because of the manpower considerations already mentioned. In fact, a small hospital of this sort can be quite cost-effective. It provides important backup facilities for the MCH and family-planning programs and makes it much easier to provide a professional setting into which urban trained physicians and nurses can transfer easily.

Annual cost of the modified program is $0.39 per capita, a cost that the Bangladesh government could afford if it could be shown that results are produced in terms of human welfare and reduced birthrate. There are problems, most notably those related to the kind of female field worker who should be employed and the population she should serve, but these could be worked out by gradual expansion of services. Training centers for these new personnel should be in selected rural areas in which somewhat more elaborate facilities could be provided. Five or six training thanas in the country might be designated which

would have small hospitals and additional staff for training. Ultimately, in perhaps 20 years, every thana in Bangladesh might have a small hospital and enough staff to provide reasonably complete services to the whole population.

Unfortunately, it does not seem likely that this kind of logical development will take place. The government already has decided to establish MCH and family-planning clinic and field programs with essentially the same personnel pattern established at Companiganj. This in itself would not be a problem if the expansion were phased over two or three years, allowing enough time to experiment with modifications and come up with an appropriate personnel mix plus appropriate training programs and supervision patterns. But it is not happening that way. Fourteen thousand people have already been hired and are at work with inadequate training and inadequate supervision. The reasons are complex. Some of them, arising from existing inefficiencies and inequities in the Bangladesh social and governmental structure, are internal problems which will have to be worked out within Bangladesh and are not appropriate subjects for this discussion. Other obvious sources of future difficulty arise directly from past and present foreign aid policies, however, and these certainly are appropriate to a discussion of the role of demonstration projects in shaping policy.

For more than ten years there has been tremendous pressure from multiple foreign aid sources to "do something" about population control. This pressure is exerted on a system of multiple, competing health and family-planning bureaucracies which makes it extremely difficult to establish a workable system or to administer it, once it is established. The competing bureaucracies are indigenous, not foreign, but almost all of them take their origin from Western sources. The process started with a Western-trained medical profession and continued with sanitary inspectors originating in the British Empire, a malaria program established by the World Health Organization (with help from other donors), rural health centers devised by Western public health experts, and, most recently, the family-planning programs. Each organization has become a firmly established bureaucracy which is locally directed, but dependent for funds upon foreign sources. This dependency saps local initiative, but, worse than this, it creates a situation in which the foreign aid agencies themselves are competing with each other to influence local policy.

Each of these new systems must have had some sort of pilot project in its early days, and one cannot help but wonder what sort of lessons were learned then. There must have been indications that the malaria program would be hard to absorb into more general programs, that sanitary workers did not produce much sanitation, and that rural health centers might become ineffective structures.

We know the history of the family-planning program of the 1960s, which successfully covered up its deficiencies until it had become a full-scale program operating in every thana in Bangladesh. In this case, certainly, pressure from foreign agencies was an important factor leading to expansion of a system before effective evaluation and administrative control was established. It could be that this same pattern of external pressure to adopt untested institutional structures is behind much of the ineffectiveness and inefficiency seen in the present health system. In any event it is certain that lessons learned from early evaluation efforts were not applied and that it is very difficult to change the structures today.

This is the real problem faced by demonstration projects. Important lessons can be learned from them, but the lessons have rarely been put to any use in the development of expanded programs. It is not likely that this situation will be changed easily. If it is to be changed, two basic requirements are prerequisites to any kind of success. First, the demonstration project administrators themselves must be candid and realistic in their estimates of what works and what is likely to work when transplanted outside the special environment of a pilot project. Second, the aid-giving organizations and government health services must change their policy so as to insist on reasonable evidence that a program will work before it is implemented nationally. If these two things are done there is some hope that effective programs can be developed.

CITATIONS

1 W. Ascoli, M. A. Guzman, N. S. Scrimshaw, and J. E. Gordon, "Nutrition and Infection Field Study in Guatemalan Villages, IV, Deaths of Infants and Preschool Children," *Archives of Environmental Health*, 15, 1967.

2 J. M. Baertl, E. Morales, G. Verastegui, and G. G. Graham, "Growth of Mortality of Infants and Children," *American Journal of Clinical Nutrition*, 23, 1970.

3 A. K. M. A. Chowdhury and L. Chen, "The Interaction of Nutrition, Infection, and Mortality during the Recent Food Crisis in Bangladesh," *Food Research Institute Studies*, *XVI*, 2, 1977.

4 John Grant, "Health Care for the Community," in Conrad Seipp, editor, *Selected Papers*, Johns Hopkins Press, Baltimore, 1963.

5 A. Kielmann, R. Parker, and C. Taylor, "The Narangwal Nutrition Study: A Summary Review," *American Journal of Clinical Nutrition*, forthcoming.

6 W. P. Mauldin, "Fertility Trends: 1950-1975," *Studies in Family Planning*, 7, 1976.

7 Andrija Stampar, "Serving the Cause of Public Health," in M. D. Grmek, editor, *Selected Papers*, Monograph Series No. 3, University of Zagreb, 1966.