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**STRATEGIES FOR STRENGTHENING HEALTH SERVICES
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Abstract—The Danfa Comprehensive Rural Health and Family Planning Project is a long-term collaborative project between a Ghanaian medical school and an American school of public health with financial and technical support from Ghana and USAID. Project efforts have focused on training, service and research in a rural agricultural area 8–50 miles north of Accra.

Staff have been particularly concerned with strengthening the health service infrastructure in the area in order that project activities can be replicated elsewhere. Training, information transfer and cost control have been essential in this effort to institutionalize project findings.

INTRODUCTION

A major problem in implementing appropriate health care delivery systems for rural populations in developing countries has been the inadequacy of the health service infrastructure. Health services which address the needs of the rural population require a framework of adequate health manpower, financial resources, a functioning transport and communication system, a socioeconomic and political climate that permits the health care system to run smoothly and accurate information on health status and needed services.

The authors have been involved in a long-term collaborative project in Ghana—the Danfa Comprehensive Rural Health and Family Planning Project—which has been attempting to develop improved health delivery procedures and strengthen the health service infrastructure in that country. Collaborating agencies have included the University of Ghana Medical School and other university departments, Ghana's Ministry of Health, the Department of Social Welfare and Community Development and the School of Public Health at the University of California at Los Angeles (with funding support from the Government of Ghana and USAID). From the beginning, project staff were aware that when a

large-scale health project, such as the Danfa Project, is introduced in underserved areas, frequently the demand for Western-style medicine exceeds available resources. There has been a conscious effort, therefore, to keep villagers' expectations at a realistic level. Few promises have been made and project health education programmes have stressed that one of the most important contributions to improved health status is prevention of illness—an approach which requires that villagers take some responsibility for their own health maintenance. This paper briefly describes the ways in which the Danfa Project has evolved and its observed and expected contributions to the strengthening of infrastructure of the Ghanaian health services system.

HISTORY AND BACKGROUND

In Ghana, concern over the inadequate enjoyment of health services by the majority of the rural population has been expressed by successive governments since the country's pre-independence days in the early 1950s. Several commissions were set up to recommend ways to resolve this injustice, including the Brachott Committee (1961), the Easonon Committee (1966) and the Health Sector Committee (1971). These committees uniformly recommended an expansion of the rural health services and an increased use of auxiliary medical personnel. Although the current health

* Presented, in part, at the Health Panel of the Latin American Studies Association-African Studies Association Annual Meeting, Houston, Texas, November 4, 1977.

policy of the government of Ghana remains committed to these recommendations, they have not been successfully implemented. The major obstacle to their implementation has been the relatively large portion of the national health budget committed to maintaining existing hospitals and clinics. Attempts by various administrations to apportion the health budget more judiciously have not met with much success. The Ministry of Health recently established a Health Planning Unit, however, to collaborate with the National Economic Planning Unit in an attempt to rectify inequities of health service distribution. The creation of this Health Planning Unit, along with an increasing reliance on input from the district level to determine health policy and plans, may help in designing more appropriate, need-related health programs.

In response to the Ministry of Health's expressed concern for improvement in rural health services, the University of Ghana Medical School opened in 1964 with a firm commitment to relate medical education to the needs of the rural populace [1]. In 1965, the Ministry of Health and the Medical School developed a plan for a rural health demonstration centre and associated training and research programme for use in the school's teaching activities and to serve as a mechanism for gathering information about rural areas and experimenting with alternative approaches to delivering low-cost, effective rural health services.

The new medical school requested assistance to develop such a project from the United Nations Development Programme (UNDP). Although the request was approved by UNDP, the national priorities were such that funding could not be made available at that time. The Medical School, however, felt strongly that the development of the teaching and demonstration portion of the project should proceed and secured local funding. The Department of Community Health was made responsible for the organization of the project. A careful search for an appropriate rural community was carried out and a site (for a health centre) approximately 30 km (18.5 miles) from Accra was selected. Relevant government departments were brought together to consider their respective contributions. The Ministry of Health, Department of Social Welfare and Community Development, Ministry of Agriculture Extension Division and the Greater Accra Regional Administration comprised the initial collaborating agencies.

Of these various collaborating government departments, the Ministry of Health had the greatest involvement in planning the project. The selection of the community and location of the clinic had to be approved by the Ministry and Greater Accra Regional Planning Committee. Many project staff were seconded from the Ministry of Health and the Ministry provided the drugs and supplies needed for clinic operation.

The initial task was to provide a clinic for the community. This was constructed with the help of communal labour provided by villagers. The cost of materials was borne by the Medical School while the technical supervision of the construction was carried out by the Department of Social Welfare and Community Development.

The Ghanaian originator (and subsequent Director)

of the proposed project (the "Danfa Project") as well as the first Dean of the Medical School, had been Deputy Director and Director of Medical Services for the Ministry of Health, respectively. They were, therefore, quite familiar with the government's health policy. In addition to the Ministry's concern for more effective rural health services, the government's interest in family planning had been quietly but steadily growing during the 1960s. This interest culminated in the official government "White Paper" published in January 1970 [2]. While family planning became a matter of national policy, the White Paper did not spell out how the policy was to be implemented. At this time, the Ghana National Family Planning Programme (GNFPP) was established within the Ministry of Economic Planning. The GNFPP soon developed an active programme for urban and peri-urban areas, but there existed relatively little experience in providing family planning services in a rural African context and almost no systematically documented experience. The University of Ghana, with Ministry of Health support, decided that it would be desirable to research, in addition to the items mentioned above, alternative ways of delivering family planning services in a rural Ghanaian context [3].

It was appreciated in Ghana that the full range of activities proposed for the project had many important, long-term implications for Ghana. In order for the applicable suggestions which emerged from the project to be adopted and to become influential in government policy-making, it was accepted that the project's activities would have to be carefully planned, documented, evaluated and shared with health planners. Project planners also recognized that an extensive training programme would be needed to provide the manpower required to implement new health care measures which might be forthcoming.

The clinic was completed in 1969 and was officially opened in January 1970 in response to urgent requests by nearby villages. In order not to interfere with baseline measurements of health status as well as other anticipated research and evaluation efforts, these early service activities were limited in scope and only reached the population of seven villages near the clinic. As the health service activities were developed, the Ghanaian Director conferred with Ministry of Health officials concerning the need for a major research component to provide needed information on health status and health service delivery and utilization. Ghana lacked the staff and equipment necessary for extensive and complex research, so it was agreed that outside assistance would be needed for such an effort. The Ghanaian Director of the project began negotiations with the University of California at Los Angeles (UCLA) School of Public Health through the offices of the United States Agency for International Development (USAID). Through USAID, the Ghanaians invited senior UCLA Public Health Faculty to conduct an eight-month feasibility study beginning in September 1969. During this time, UCLA teams made several trips to Ghana and with senior Ghanaian health staff gathered suggestions as to precisely how the field work might be carried out. More than 50 Ghanaians were involved in these discussions. There had long been an institutional policy of faculty and student exchange as well as previous

collaborative endeavors between the University of Ghana and UCLA.

A proposal requesting funding assistance was submitted by the Ghana Medical School to USAID and was subsequently approved. UCLA was awarded a contract by USAID primarily to assist with the development of the research and evaluation phase of the project. Project research activities were initiated in 1970.

The collaborative project was divided into three phases. The first phase lasted approximately one and a half years and consisted of staff recruitment and training, village mapping, baseline census and surveys, refining and testing study instruments and general preparation for the second phase, the five-year field study phase. This second phase began in 1972 and included longitudinal surveys of a large sample of the population concerning fertility, family planning, maternal and child health practices, morbidity and registration and vital events updates. The third phase, to be concluded in 1979, consists of the final data analysis and interpretation, and writing reports, articles and training/procedure manuals.

The University of Ghana Medical School's budget for project activities (provided by USAID) was separate from the Danfa contract budget administered by UCLA—a precedential procedure for USAID-sponsored international health projects at that time. Such a budget separation helped promote the collaborative spirit between the two staffs and encouraged Ghanaian staff to assume direction for the project. Throughout the project, Ghana has assumed financial and administrative authority for all service activities, most of the teaching and some of the research tasks; UCLA has concentrated on research and documentation activities. While there were various service and research objectives of the project, two were felt most crucial to strengthen health services: (1) providing training and (2) providing needed information to Ghanaian health planners by developing and testing methods of extending health care to rural communities [1, 4, 5].

TRAINING

Training has been the single most important activity of the Danfa Project in terms of helping to strengthen health services infrastructure. Considerations in formulating the training programmes included the level of trainee and the location and duration of the training. New training material has been developed including special training manuals, audiovisual aids and discussion guides for village-based work.

An early project policy was to conduct as much training as possible in Ghana; and, indeed, the vast majority of Danfa trainees have received training in their own country including both in-service training and special seminars or courses. Project training activities have included all levels of personnel.

Junior-level training

At the most junior level of staff training, community-based health workers such as the village health workers and traditional birth attendants participated in Danfa-sponsored training programmes.

Traditional birth attendants in one of the project's study areas were identified and interviewed after conferences with village chiefs and elders. Information gained from the interviews helped staff to design appropriate training programmes to improve the traditional birth attendant's midwifery practices and involve them in family planning referral [6-8]. The village health worker programme is a more recent endeavor involving recruitment and training of a community-based multipurpose worker with support and cooperation of the village [9]. In-service training, supervision and evaluation of these semi-volunteers are usually the responsibility of middle-level staff such as health centre personnel. The simplicity of training and the fact that such workers are readily available in rural areas lend feasibility and practicality to the training programmes and facilitate programme replicability.

Middle-level training

Project middle-level training can be classified into two sublevels. Lower-middle-level staff training has included the health education assistant training programme [10] and health centre staff training—all of the training has been accomplished in the project area by members of the senior staff. Many of these workers have been seconded from the Ministry of Health and other organizations and given supplementary training. For example, community health nurses, nutrition officers, family planning workers and sanitation workers have comprised the core of people trained to work as health education assistants—multipurpose village-based workers involved in community development, primary health care, disease surveillance and the project's health, nutrition and family planning education efforts.

At a higher level, research assistants with university backgrounds (such as field supervisors, computer programmers and data analysts) have obtained in-country training as well as some overseas training in their specialization.

Medical student training

Training of medical students has had high priority since the project's inception. Prior to the expansion of research activities of the project, University of Ghana medical students were regularly using the facilities at the health centre and in the community for their rural health experience. Since 1971, these medical students have routinely spent several weeks during at least two of five medical school years working at Danfa-related activities. When the research component became more elaborate, the students were able to participate in some of the project's data gathering and analysis activities. Such experience has influenced a number of medical students to take electives with the project and has stimulated interest in the proposed postgraduate community medicine training programme. As the Danfa Project has developed, there has been an increase in the medical students' interest in community health. However, in many countries the choice of medical careers is often based on which specialty provides the greatest remuneration, and graduates are reluctant to serve in rural areas. These problems apply to the training of all

levels of health personnel in Ghana. Also, the study community's location is not ideal since it is only 30 km away from the urbanized capital. In spite of these cultural and psychological handicaps, the Department of Community Health, through its teaching, service and research activities, which relate considerably to the Danfa Project, has made some progress in increasing medical school graduates' awareness of the importance of community health.

Senior-level training

Of vital importance is the training of the senior-level individuals. The Danfa staff development programme has helped train more than 20 senior and upper-middle-level technical specialists—most of them were trained during the first half of the project at overseas institutions. All of the trainees have returned to Ghana. Some are filling newly created faculty positions and senior staff positions within the University of Ghana. Others are in senior positions in the Ministry of Health. It is expected that they will constitute an important part of the proposed postgraduate community health training programme in the Medical School and the Ministry of Health.

The training programme for senior Ghanaian and upper-middle-level personnel such as computer programmers and research associates is divided into three parts. The first part, an "apprenticeship", begins with careful selection of the candidate and assignment for up to a year of work with the Danfa Project staff in the field. During this time the candidate's anticipated role after training is officially planned so that applicable coursework is undertaken.

During the second part of the training, the trainee leaves Ghana to earn usually a master's degree in public health or a training certificate. Study programmes are task oriented. Curriculum content and training goals and objectives are developed in consultation with the trainee, senior Ghanaians in Ghana, and the trainee's potential advisor and faculty at the overseas institution. Trainees draw on Ghanaians health concerns for field projects and special papers. Field experience, an integral part of each programme, has been carefully tailored to the trainee's needs and has involved visits to places with problems similar to those in Ghana. During this period of overseas training, periodic, detailed reports are sent from the participating overseas institutions to the relevant health authorities in Ghana. These communications promote institutional ties and help assure that the trainee's planned role will be enacted upon his/her return to Ghana. Such assurance seems to stimulate trainees to perform well and to apply their training experience to their anticipated role in Ghana.

The third part of the training begins on return to Ghana. The trainees maintain an association with the Danfa Project for at least one year on a part-time basis while they begin work at their future, permanent post. This year of transition involves increasing responsibility with an agency, usually the Ghana Ministry of Health or the University of Ghana, with strong ties to the Danfa operation.

Incorporation of trained personnel

New positions which utilize the newly acquired skills of the specially trained staff are a necessary

accompaniment to training. A very early priority of the Danfa Project was to train simultaneously key individuals and press for the establishment of new positions and suitable supporting budget well before the end of the project, so that the newly trained individuals could move into them and continue to work without interruption.

Under the terms of the initial agreement, all monies for hiring of staff were removed from the contractor's budget—in this case UCLA—and turned over to a Ghanaian institution. As a result, all temporary staff were hired through Ghanaian institutions at prevailing salary schedules and under full administrative control of the Ghanaians. Although many were temporary staff, it was possible for them to earn good service records from the project and thereby secure more permanent jobs in several Ghanaian institutions. This created an incentive for good performance.

By about the fifth year of the project, approximately 10 new senior-level faculty researchers and managerial-level positions were authorized and began to be filled at the Medical School and the Ministry of Health respectively. In addition, a substantial number of the most capable temporary staff employed by the project (some for several years) have been absorbed into permanent positions in various University of Ghana departments and the Ministry of Health.

INFORMATION TRANSFER

Sharing of important project findings has been a major objective since the project's inception. Initially, formal review meetings were held every six months; since the second year they have occurred once a year. These are important public meetings to which a large circle of government officials and, often, international observers are invited. At these meetings project staff present reports of activities and findings and invite comments and reactions. In addition, the project issues an annual progress report and a steady flow of published papers and monographs. Papers are also presented at international meetings. A large number of informal meetings, seminars, workshops and other gatherings serve as effective ways to disseminate project information. Progress reports have been prepared specifically for the Ministry of Health, which form the basis of meetings between Danfa Senior Staff and Ministry of Health officials. Examples of important information derived from project activities and supplied to Ministry of Health and Ghana National Family Planning Programme officials include:

1. Techniques of planning and implementing mass immunization and malaria prophylaxis programmes.
2. Methods of training and utilizing community-level health workers such as traditional birth attendants and village health workers.
3. Knowledge of health conditions among rural Ghanaians. Poliomyelitis, and guinea worm for instance, were believed to be minor problems in Ghana but project surveys revealed a higher than expected incidence of both, and the information has been made available to government officials.

4. Methods of providing "outreach" family planning and health services for rural inhabitants who have minimal access to clinic-based services.

5. Techniques for increasing efficiency of health centre operations such as the development of clear job descriptions for staff and increased use of electronic data processing of patient information at suitably selected health facilities.

COST CONTROL

The cost of the Danfa Project has been a common concern of observers. Some have wondered if, indeed, the project is replicable. It should be stressed that the service and training activities intended for replication were under strict cost control. Much of the special Danfa research was never intended to be replicated and its relatively high cost was a "one-time" item subsidized with external funding and staff. Historically, Ghana has devoted considerable attention and resources to the health sector. As mentioned, in the case of the Danfa Project, the government of Ghana has provided and paid for all the ongoing service staff, training personnel, part of the special research and support personnel, all of the routine drugs and supplies used in the health services and some of the equipment and transport. Ghanaians have carried out all routine service activities, as well as a considerable portion of the research and teaching. At all times project planners have observed the twin constraints of using personnel available in Ghana and keeping Danfa per capita service costs within the range of current government of Ghana expenditures.

The special training and research costs were also minimized because steps were taken to ensure that staff were multipurpose. For example, the same field personnel were trained to conduct interviews, take periodic censuses and assist with longitudinal epidemiologic surveys, special studies and editing and coding. One central information system and data processing centre has served all components of the project. Similarly, transportation, clerical services and writing/editing/bibliographic search services have been consolidated, optimizing the time of senior researchers and greatly expediting the reporting and sharing of information.

EXAMPLES OF INFRASTRUCTURE STRENGTHENING

Although the project has not yet ended, findings are being tested and implemented in other parts of Ghana. Several Danfa staff have been appointed to senior positions within the Ministry of Health and systematic information transfer between project staff and government health officials has been enacted.

Staff in the Ministry of Health's Planning Unit study suggestions that emerge from the Danfa Project and determine the feasibility of initiating them in other parts of the country; however, greater use of information from Danfa and other projects could be achieved and Danfa senior staff are currently working toward that objective. The project has helped stimulate governmental policy decisions and a reappraisal of how health services should be provided. A few

examples are listed below to illustrate ways in which selected preliminary project findings are being applied elsewhere in the country.

1. Organization of traditional birth attendant programmes are similar to those initiated by the project. Three of Ghana's nine regions have organized traditional birth attendant training programmes during the past four years. The regional staff of the Ministry of Health has been responsible for these activities, while project staff have participated in a consultant and teaching capacity. Project questionnaire instruments, training manual and the project's scheme for supervision and evaluation of traditional birth attendant performance have been adopted by the Ministry of Health [6-8, 11]. The Danfa Project's special efforts to gain the support and cooperation of village chiefs and elders before beginning programmes such as traditional birth attendant training has set a precedent for similar efforts by the Ministry of Health.

2. Expansion and modification of low-cost village-based rural health services, such as the commissioning of the village health worker programme in the Brong Ahafo Region of Ghana exemplify the Ministry of Health's involvement in this area and their attempt to extend the experience of Danfa [9]. Danfa Project staff served as consultants to the Ministry of Health in designing their programme and provided a training manual [12].

3. Through ongoing joint seminars involving project and Ministry of Health staff, functional analysis procedures have been jointly studied and, at least at the urban health centres, are being applied to the management of the health services [13, 14].

4. The project's approaches to gathering and analysing accurate demographic data are being used as the basis for the Central Bureau of Statistics' new programme of civil registration schemes in the country. Previous census coverage had been somewhat incomplete and insufficient and public cooperation was a major obstacle to efficient collecting of information. Danfa Project staff have worked with the Central Bureau's Working Committee in designing the new system of registration based on the Danfa Project's recommendations [15-18].

5. New low-cost mass immunization procedures used by the project are already being tried in three regions in the country. The Ministry of Health has been adopting the Danfa Project's recommendations on planning immunization campaigns, selecting sites accessible to large numbers of villagers and organizing and educating villagers [19-21].

6. The importance of interdisciplinary and interdepartmental coordination of activities in community development as exemplified in the Danfa Project has received new support in several community development projects in the country, e.g. in the outreach programmes in the Adidome and Bawku districts. In these programmes many of the Danfa Project's cost analysis techniques have been adopted. The Danfa Project's record system was modified for use at the Obom Government Health Post.

7. Writing, production and use of a new series of training manuals is a joint effort between the Ministry of Health and the project staff. Three have been developed to date: for family planning workers [22], traditional birth attendants [23] and village health

workers [24]. Project procedure manuals have been developed describing mapping and household identification methods, recommendations for selection, training and supervision of field interviewers and techniques for conducting rural health surveys [25-27]. These documents have been made available to the Ministry of Health and other interested agencies.

8. Information emerging from the project's field demonstration and research has also influenced the curriculum design of some of the country's health manpower training institutions other than the Medical School, including the School of Nursing and the School of Hygiene. In collaboration with Danfa Project senior staff the curricula of the Schools of Nursing, Public Health Nursing and Hygiene were revised to include family planning, health education and community development. The School of Hygiene also has adopted the Project's concept of utilizing village manpower for community projects (such as latrine construction) and training sanitation workers to recognize diseases in the village, a task formerly accomplished by more senior level health workers.

9. The cost control methods which have emerged from the Danfa Project, as described under "Cost Control", have already been replicated in a number of institutions. Danfa derived techniques are being applied in their cost evaluation and budget projection measures. A reduction in health centre and health post pharmacoeconomics developed at Danfa is another of the cost control methods which have been replicated. The Danfa Project has shared cost records and accounting techniques with the Ministry of Health and Ghana National Family Planning Programme. Both of these are linked to administrative controls to ensure tight cost constraints on the service and training aspects of the project so that they are financially replicable [28-30].

10. The Project initiated several schemes of testing and supervising drivers of field vehicles. These procedures, in part, have been incorporated by the Ghana Medical School in employing their drivers. These include the administration of physical examinations for drivers, particularly eye examinations.

11. The Ministry of Health has adopted the project's idea of training health centre staff in family planning, thereby having them assume similar responsibilities to that of the nurse from the Ghana National Family Planning Programme. The Danfa Project staff, in cooperation with the Ministry of Health, have organized and participated in courses to train family planning nurses, field workers and trainers.

12. The Morley Road to Health Card used by the Danfa Project influenced the Ministry of Health to use the card widely in its health centres, especially in the Greater Accra Region. Village child-weighting sessions, adapted to village conditions, were also introduced by the project, and the Ministry has begun to use this approach in its own maternal and child health programmes.

CONCLUSION

From the inception of the project, policies and procedures have been instituted to ensure that the working relationship between the UCLA and Ghanaian staffs was a true partnership (not a "donor/recipient"

relationship) and that the project be considered primarily a Ghanaian effort. Budgeting and personnel policies have already been discussed. Publications and decision-making policies have also been designed to enhance Ghanaian responsibility for the project. The government of Ghana has supported the Danfa Project from the beginning and has continued its support (in increasing measure) through several changes in national administrations and despite certain economic problems. Project staff loyalty has remained high, especially in Ghanaian senior staff for whom Danfa responsibilities are often additions to a normally heavy workload.

The Danfa Project is primarily a testing and training ground. The Ghana Ministry of Health Planning Unit has been using the Danfa experience for modification and testing of new procedures prior to implementing them on a broad basis. Similarly, inquiries have come from other countries requesting information on project activities. Some are using the Danfa experience to help initiate or strengthen research, service and training. For example, Sierra Leone has adopted the traditional birth attendant training programme and Kenya has used Danfa recommendations in a projected series of rural teaching and health research centres.

Relatively few developing countries have Ministries of Health with both strong planning units and health service research/demonstration areas to provide the means to test new ideas. The Danfa Project, together with its links to the Ministry of Health and the National Family Planning Programme, provides such a model whose advantages are appreciated and are being adapted in other parts of Ghana as well as outside Ghana.

It must be stressed that a project such as Danfa does not strengthen infrastructure alone. Its success is dependent on a broad base of support including the inputs from many individuals and a unified, collaborative team effort. Moreover, a national government must be committed to improving health care for rural inhabitants if the information provided by such a project is to prove useful. With such support, a project such as Danfa can play a useful catalytic role in mobilizing existing resources and helping build institutional infrastructure; and with suitable modifications appropriate to local circumstances, some of the components and lessons gained from the project can be used in other settings.

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