

A CASE STUDY OF THE DANFA COMPREHENSIVE RURAL HEALTH
AND FAMILY PLANNING PROJECT, GHANA

by

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The views expressed herein are those of the author only and should not be attributed to the Agency for International Development.

PREFACE

This case study was prepared specifically for and with considerable guidance from the staff of the Development Studies Program, Agency for International Development, U. S. Department of State. The opinions and evaluations expressed, however, unless quoted from other sources, are those of the writer and do not necessarily represent present or former positions of the Agency for International Development, members of the UCLA staff, or the Ghanaians.

The general model guiding the Danfa project is familiar to all acquainted with agricultural extension efforts: an integrated program consisting of research, demonstration, and teaching for the discovery and diffusion of advances in applied technology. In this instance, however, the substantive topic was not agriculture but the development of a comprehensive rural health and family planning delivery system adequate to serve the needs of a rural African population but modest enough to be adopted nationally within the constraints of a severely strained budget.

A further note on the case study is warranted. Although the Danfa Project has been described as ". . . a Ghanaian project assisted by UCLA and US/AID, not a US/AID funded UCLA project in Ghana," the writer's sojourn in Ghana was brief indeed and the amount of time available to talk with Ghanaians extremely limited (though all who were asked for interviews made time for them). Necessarily, most of the information for the case study has been winnowed from project documents. Most of these are either project papers of one sort or another that have flowed into the files of AID/W or publications out of the project that have passed through the project's editorial offices at UCLA. Hence, at times, the Ghanaian perspective indicated above may be lost and it may appear that the Danfa Project was another American activity in a cooperating country.

PART I

The Setting

Exemplary in its achievements, in many other ways the setting and the problem addressed by the Danfa (Ghana) Rural Health and Family Planning Project are typical of the non-capital projects attempted since the early seventies by AID and cooperating LDCs.

Located 5 degrees north of the equator on the Greenwich meridian, the variety presented by Ghana's geography, for example, is considerable; ranging from coastal marshes and fishing grounds through tropical rain forest to savanna where desertification is coming to be a problem. Throughout most of the country, the presence of the tsetse fly precludes the use of draft animals and drawn vehicles. Lacking fossil fuels or extensive mineral resources, the country's economy rests primarily on the products of the rain forest area: cocoa, which is the most important export crop, and the production of hardwood timber. (Though an early AID capital project has provided the country with the earth's largest man-made lake and a hydroelectric generating plant whose output is used to reduce imported ores to aluminum for multinational corporations.) Transportation networks and communications facilities are limited. Outside the urban areas, where paved roads exist, the condition of the surface makes thirty miles an hour a punishing speed for vehicles and passengers. Public transportation is largely by means of the ubiquitous "mammy lorry." Telephone systems are mainly local and instruments difficult to obtain; radio telephone linkages are primarily limited to military and police nets. Post offices are so scattered that their locations are

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marked on the national tourist map.

In the years since independence from Britain in 1957, Ghana has experienced three major changes in government. The first government, under U. S.-educated Dr. Kwame Nkrumah, launched the country on the road to socialism. Initially, attitudes toward the U. S. and developmental assistance through AID were favorable. In 1963, however, these relationships deteriorated markedly. In 1966, while Nkrumah was en route to the Peoples' Republic of China, members of the military and police staged a coup d'etat with the leaders promising an early return to civilian rule. Three years later, a parliamentary election was won decisively by the Progress Party, led by Dr. Kofi A. Busia who, as prime minister, formed a new government in the following year. Since then, relationships with the United States have been cordial. But, in January 1972, a month after a drastic devaluation of the currency, members of the military again staged a bloodless coup. The present government is headed by the leader of that coup, Colonel I. K. Acheampong, other military officers, the head of the police, and a single civilian. No plans for a return to a civilian administration have been announced.

Deteriorating economic conditions have been central to two of the governmental changes and to many of the problems of the current regime. The flow of cocoa from Ghana represents about one-third of the world production (for Ghana, cocoa produces almost two-thirds of the total exports), yet its prices are notoriously volatile and production uncertain. Falling cocoa prices and heavy investments in non-revenue producing public works projects, as well as a repressive regime, helped set the stage for

Nkrumah's removal. Inflationary pressure after devaluation precipitated the downfall of Dr. Busia. In an effort to gain adequate control over the economy, the present government has renegotiated loan repayment schedules, severely restricted imports, and embarked on a program of Ghanaianization of foreign owned enterprises. Each has contributed to a slowing of the flow of foreign development and investment funds. Meanwhile, the cost of imports, particularly fuels and products derived from petroleum, has soared.

The population, which numbered nearly 7 million at the time of the first national census in 1960, is ethnically diverse in the extreme. To classify it, the census schedule provided some 100 language or cultural categories. The official and instructional language, however, is English. But the 1960 census revealed that only a fifth of the population was currently attending or had ever gone to school. The population is also predominantly rural; a fifth of the population of the Accra district, more than three-quarters in all other districts lived in places of 5,000 or fewer inhabitants. Over 60 per cent of the labor force makes its living in agriculture, generally on small plots, or in one of the other extractive industries. Per capita incomes shade just below \$500. But, as in other LDCs, this figure represents an averaging out of the incomes of those who drive imported cars and those who carry headloads. Parenthood, particularly for men in rural areas, is a source of status in the community. For women, entry into marriage or other reproductive unions tends to occur early and is nearly universal, resulting in one of the highest observed total fertility rates (averaging between 7 and 8

children per woman). Environmental sanitation outside the capital and major towns is limited and the diseases associated with tropical Africa prevalent. High mortality rates, particularly among infants and young children and women in the childbearing ages, result in a life expectancy of 48 years.

Partly because of the level of mortality, the rate of natural increase in the population is not particularly high, being estimated at somewhere near 3 per cent per annum. But the age structure of the population, heavily loaded at the younger years, and the levels of fertility and mortality suggest that Ghana is poised on the brink of the so-called "demographic transition" in which rates of natural increase skyrocket and massive population growth occurs as progress in the control of disease and morbidity outstrips changes in behavior associated with declining rates of fertility. That prospect and the spectre of the demands rapid population growth would make on a struggling economy were sufficiently real as to result, in 1969, in the promulgation of a government white paper setting out the major outlines and objectives of an antinatalist population policy featuring widespread promotion of voluntary contraceptive practices and structural reforms in government and industry that would increase non-reproductive options from women and ". . . limit pro-natalist perquisites and enhance anti-natalist ones . . ." in government.

The timing of the white paper was appropriate, for Ghana was beginning to take measures that could have significant impact on mortality rates. In the mid-sixties, there were roughly 500 physicians in Ghana,

most of them practicing in Accra and other population centers. All had been trained outside the country; more than half were expatriates, mainly Indians. Remote areas were served by a sparse network of government health posts and health centers staffed by lower echelon health delivery personnel and by some 150 military, company, and missionary hospitals (with fewer than 10,000 beds altogether). In the entire country, there were only two maternity hospitals although other hospitals had maternity facilities. Distances and transportation difficulties in many rural areas implied travel of as much as a day to obtain any medical care. There were similar shortages in other medical personnel: the number of pharmacists was about equal to the number of doctors and, although there were nearly 10 times as many nurses as doctors, there were still fewer than 9 nurses or midwives per 10,000 inhabitants. Of course, these modern medical personnel were supplemented by a variety of folk practitioners: traditional birth attendants, herbalists, witch doctors, and drug sellers.

To correct this situation, Ghana had turned its attention to developing in-country training facilities for physicians, health center superintendents, and nurses. The first group of premedical students (57 in number) destined to receive their professional training entirely in Ghana entered the University of Ghana at Legon in 1962. At the time, it was anticipated that they would complete their education at Legon in a new medical school being planned under a cooperative arrangement with AID. However, in 1963, as relations between the countries worsened, this cooperative agreement which had provided American technical assistance

from a consortium of universities (called the "Pennsylvania group" after the prime contractor) for faculty members and for consultation and assistance in the design and construction of the proposed medical school was terminated at the request of the Ghanaian government. Hence, Ghana's first class of medical students completed their training in makeshift facilities at Korle Bu Hospital, the nation's largest and most modern, in Accra. The class, three women and thirty-seven men, graduated in June 1969.

Although the curriculum and the teaching philosophy at the Ghana Medical School emphasized responsibility to the general public through the practice of social and preventive medicine, it was clear in the mid-60's that the capacity of the health delivery system would be inadequate to achieve these goals even if the target of graduating 100 physicians a year could be attained during the 70's. In the absence of innovative approaches to the training of physicians and to the restructuring of the health delivery systems, the practice of medicine in the country would doubtless continue to be largely reactive and curative rather than preventive and promotive. Moreover, because the training of medical students occurred almost exclusively within the classrooms and wards at Korle Bu, graduating health personnel would lack training and experience with health problems and situations similar to those they would encounter in practice outside major hospitals.

PART II

Toward a Solution

The Ghanaians were well aware of this gap in the training and experience of their young physicians and other medical personnel and, given the health conditions and resources of the country, of the need for exploration and evaluation of alternative health delivery structures. In fact, in his capacity as a physician attached to the Food and Agriculture Organization of the United Nations, Dr. Fred Sai, the Deputy Director of Medical Services for the Ministry of Health, had attended a UN conference in Paris in 1962 at which an American public health doctor, Dr. Julius Prince, read a paper describing his experience in developing and evaluating an AID supported rural health delivery system staffed largely by paramedical personnel in rural Ethiopia. Fifteen years later, that same physician--who had become the senior AID official most closely linked with what ultimately became the Danfa Project--recalled vividly the enthusiasm expressed in a conversation in which the Ghanaian and he discussed the Ethiopian experience and the ideas in the paper he had read.

The termination in 1963 of the cooperative arrangement between the United States and Ghana in the health sector brought the development of a new physical plant for the medical school and hopes for a rapid expansion of its facilities and curriculum to a standstill. But the unmet health service needs persisted. Accordingly, in 1965 the Deputy Director of Medical Services, Dr. Fred Sai, prepared a development proposal and presented it for consideration to the United Nations Special Development Fund. That proposal sought assistance from the Special Fund for funds

and expert personnel to assist in the creation of a unit within the Medical School under the responsibility of the Department of Preventive and Social Medicine which would:

- (a) investigate the state of the community, both rural and urban, its social organizations, the factors that make for an effective participation in the health problems and programmes and research into the most useful and efficient ways of utilizing the service of the available manpower;
- (b) train doctors, sanitarians, midwives, community health nurses and health centre superintendents specifically for their role in rural health work;
- (c) provide both during training and after, manpower confidently oriented and equipped to handle the problems of the community.

Notice that the research objectives are mentioned first. Two factors lay behind this. First, at the time, there was little available on the epidemiology of the myriad of tropical diseases which afflict rural Ghanaians, less on how to engage the population affected in promotive or public health activities. Secondly, because of the exploratory nature of the demonstration planned, there would be need for continual and careful analysis of program operations to determine what worked with whom and what did not.

In the narrative in support of the proposal, three points were made: (1) the data and experience resulting from the project were expected to have immediate utility for the improvement of health delivery services, (2) recognition of the need to restructure relations and responsibilities among health delivery personnel to allow for a more prominent role for paraprofessionals was expressed and (3) the project was expected to develop practical delivery models that could be replicated throughout the country.

The Commissioner also noted that the country was facing two very different classes of health problems, one related to urbanization and industrialization, the other stemming from the lack of health personnel in the rural areas where the bulk of the nation's wealth was being produced. Hence, he proposed two field sites: one in the heart of the cocoa producing region, the other in the new town of Tema where the aluminum reduction plant was located. In enumerating the health areas in which action should be taken, the Commissioner said, ". . . the major needs are for better maternal, industrial, rural and child health services, for the control of communicable and infectious disease, and for improvement in nutrition." In marking up a copy of the Special Fund proposal, Dr. Julius Prince, the public health doctor who had presented the paper on the Ethiopian project, completed the enumeration of primary needs by pencilling in the words "along with the equally essential element of reduction in fertility rates." At the time, he was in Washington as AID's Special Assistant for Population Planning in the Africa Bureau of the Office of Institutional Development.

While no funding level was indicated, the proposed list of services and commodities for which funds were being sought gives an idea of the scale of the project envisaged. Among the items for which Special Fund monies were sought were funds for the services of 20 foreign professionals and technicians, training fellowships for 19 Ghanaians, four four-wheel drive vehicles, two small buses and two small cars, a wide variety of office and other project equipment ranging from typewriters and mimeograph machines to air conditioners and audio-visual equipment as well as

books to form a project library. Ghanaian contributions proposed were the necessary buildings in Accra and at the field sites, personnel from the Medical School and collaborating agencies, and unspecified office equipment as well as maintenance and operating expenses for the vehicles. Significantly, the last sentence in the proposal narrative is a request for expert assistance in "working out the details of this project."

The proposal also contains evidence of recognition that a good deal of collaboration among diverse Ghanaian agencies would be required. To facilitate that collaboration, a broadly drawn "policy coordinating committee" was proposed: That eight person committee would be composed of: the Government Statistician, the Executive Secretary of the Ministry of Economic Affairs, the Director of Social Welfare and Community Development, the principal secretary responsible for higher education, the Chief Medical Officer, the Director of the National Institute of Health and Medical Research, the Professor of Child Health and the Professor of Preventive Medicine.

In sum, the proposal to the Special Fund constitutes a Ghanaian working through, in relatively concrete terms, of the ideas advanced at the 1962 UN seminar on the application of science and technology for the benefit of less developed countries. While the project was approved in principle, due to competition with other projects, it was not funded. As it happened, the draft then became the first iteration of the design that was to guide the development of what came to be the Danfa Rural Health and Family Planning Project.

In 1967, despite the frustration of failing to receive foreign assistance, the Medical School decided to proceed on its own with development of a much more modest research, demonstration, and training center. With the funds available, only a single center was possible and the rural option was chosen. A site near the capital, but still typical of the country's rural areas, was needed. Consideration of optional sites led to the final selection of a cluster of seven villages about 20 miles from the capital. Despite their proximity to an all-weather road, they had remained relatively isolated. And they had already expressed an interest in having a health center to serve them. Negotiations with the village chiefs and elders led to the selection of Danfa as the site for the Center, and to elaboration of a list of development priorities in the health sector (for two villages, closer to the all-weather road and thus with greater access to a rural hospital, clean water was more important than a health center), contribution of land for the Center site, and the contribution of local labor to assist in its construction. On May 12, 1967, by pouring the appropriate libations on the ground and sacrificing a ram, the site was consecrated and construction begun.

After some delays, occasioned by inter-village rivalries, difficulties in obtaining local labor, and exceptionally heavy rains during the 1968 rainy season, the clinic and staff quarters were completed in December 1969 (see Figure 1 for clinic floor plan).

On January 19, 1969, the appropriate notables and villagers assembled to conduct opening ceremonies for the Center. They included: the village chiefs and elders, as well as the local population, the chair of the

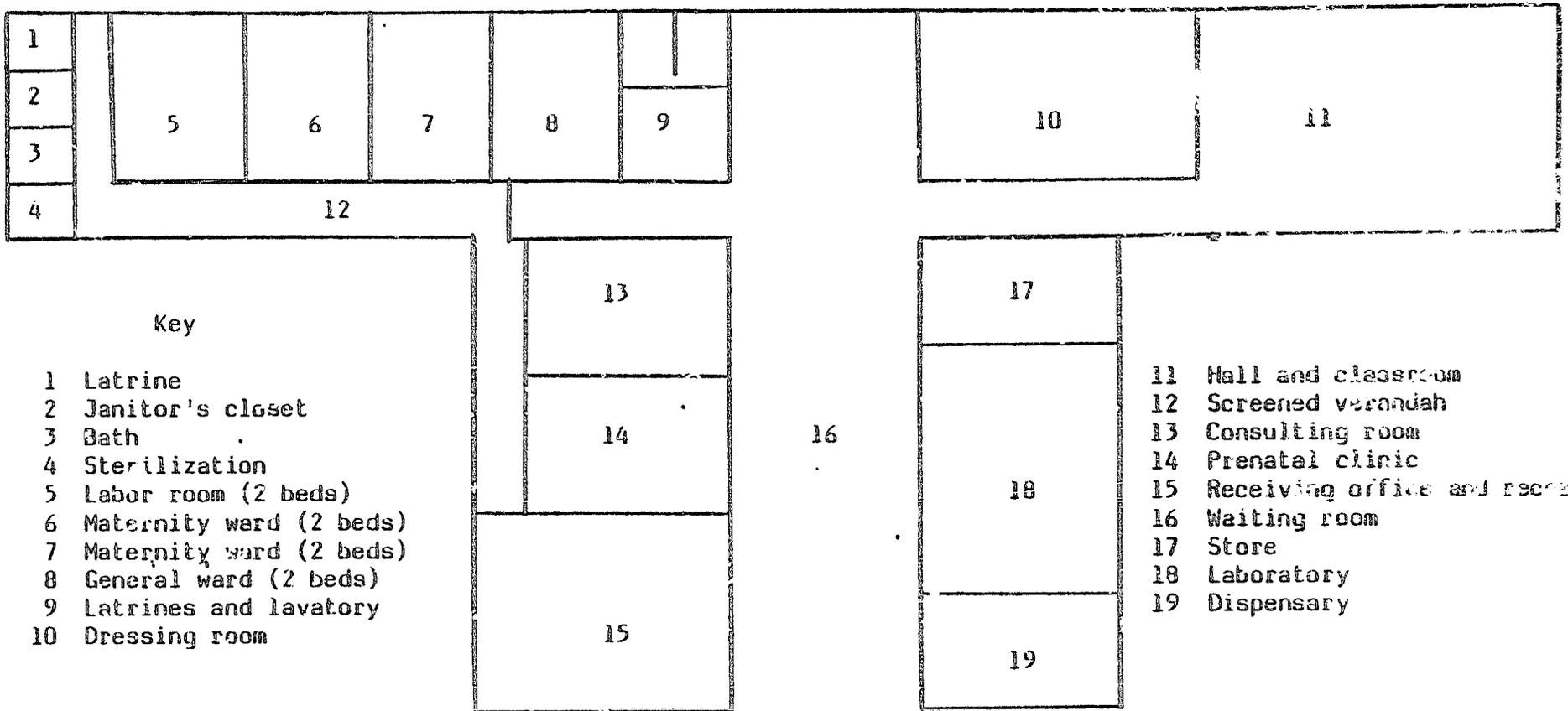


FIGURE 1
CLINIC FLOORPLAN

Department of Preventive and Social Medicine, the Vice-chancellor of the University, members of the Danfa Joint Village Development Committee that had formed to guide the project, the Minister of Health and the Prime Minister. It was an auspicious occasion.

As the construction work at the Danfa site was being brought to a close, Dr. Fred Sai, who in addition to being Commissioner of Medicine was also the chair of the Department of Preventive and Social Medicine, began discussions with the AID Mission in Ghana regarding support for the development of a comprehensive rural health demonstration program at Danfa (and, possibly, a parallel program in an urban area). These proposals were received warmly in Ghana and in Washington where they got the particular attention of Dr. Julius Prince, AID's Special Assistant for Population Planning in the Africa Bureau of the Office of Institutional Development. He had accepted that assignment after completing a nine-year stint in Ethiopia where he had been principal investigator in a rural health demonstration program sponsored by AID. From experience dating back to a rural accident prevention project in New York state and doctoral level training at Harvard in the School of Public Health and Department of Social Relations, he had long been an advocate of controlled field experiments which allow program personnel to state with confidence the effects attributable to their intervention. The Ethiopian program, designed to train middle-level health personnel--health officers, community nurses, and sanitarians--in rural settings representative of much of the country, had collected data and processed it with a punch card technology on health practices, attitudes, and knowledge from villagers living outside the

demonstration area as well as those receiving the services of the project. He saw that the nascent Danfa project offered an opportunity to search for and test ways by which family planning perspectives and technologies might be made acceptable to rural Africans. To facilitate development of a project proposal for AID, he went to Accra to discuss the main outlines of the project with members of the AID Mission and the staff of the Department of Preventive and Social Medicine. These discussion led to a draft non-capital project paper (PROP) forwarded to AID/W, together with 10 copies of the new white paper on population policy, at the end of April 1969. The interests of the Commissioner of Medicine in his dual capacities as head of the Ghanaian health system and chair of the Department of Preventive and Social Medicine and of the Special Assistant for Population Planning of the Africa Bureau had been joined. At least one of the Mission staff was satisfied with the outcome of the planning efforts. At the end of the letter accompanying the draft PROP he noted that, unless serious objections were raised, the word "draft" could be taped over and the PROP would be final.

PART III

The Project Design

The further development of the Danfa project design went on at a steady, if protracted, pace during the rest of 1969 and on into August 1970. The activities of that period were a familiar set: agreements between AID/Ghana and the University of Ghana, the search for and selection of an appropriate U. S. contractor, contracts between AID/W and the selected contractor to provide a team to finalize the project design and implement the project, design team revisions to the PROP, and second round agreements and contracts with all the principal actors.

The first agreements, between AID/Ghana and the University of Ghana were signed by the head of the mission and the Vice Chancellor of the University on the last day of fiscal 1969. These documents, the project agreement (PRO AG) and project implementation order/technical services (PIO/T), put forth the main outlines of the project design, stipulated the main budgetary and other responsibilities of both parties, and set up a tentative course of action. The wording of the first action step listed in the June PROAG indicates the magnitude of delays inherent in the contracting process. That sentence says: "During the remainder of FY 1969, AID will select a U. S. school of public health that is highly qualified and interested in undertaking the project."

The search for a ". . . highly qualified and interested. . ." U. S. school of public health was completed during July, indicating that the process had actually been under way for some time. On August 29, 1969,

a contract (effective August 1, 1969) to acquire the services specified in the PIO/T was written by AID with the Regents of the University of California on behalf of the School of Public Health of the University of California at Los Angeles (UCLA). The selection of the school lay, in part, upon fortuitous events. UCLA had a school of public health with a well-deserved reputation. UCLA also had a well-developed area studies program including a specialization in African studies and had recently instituted interdisciplinary cooperation between the social science departments and other schools and divisions in which the School of Public Health was participating. In addition, among the faculty at the School was Dr. Alfred Neumann, an associate professor who had recently completed a tour of duty as a physician with the Narangwhal Project, a major family planning and rural health demonstration project in India. His interest in maternal and child health and family planning was longstanding; his awareness of the proposed Ghana project and its fundamental goals was intimate. He and Dr. Sai, the Chair of the Department of Preventive and Social Medicine of the Ghana Medical School, had continued a friendship established while they were classmates at the Harvard School of Public Health.

By the time the first UCLA contract was signed, the conception of the activities to be undertaken by the design team had become more specific. The June PRO AG stipulated that the selected school of public health would send a two-man team to Ghana ". . .for up to six weeks in order to prepare a final project design within the general magnitude of the project as conceived so far." [Emphasis added.] The introductory narrative of the first UCLA contract stipulated that the team was to ". . .make a feasibility study and requirements analysis. . ." for the project. According to the

UCLA contract, in not more than six weeks, the team should: (1) develop a detailed project implementation plan for the first 18 months of the project, (2) identify Ghanaian agencies and groups other than the Medical School whose participation would be necessary for the successful outcome of the project and specify the contribution needed from each, (3) prepare a detailed staffing plan for Ghanaian and American personnel and a plan for training to be undertaken by Ghanaians at home and abroad, (4) prepare detailed cost estimates for project commodities and supplies, (5) prepare a ". . .scope of services. . .", (6) assist in selecting tentative control sites for evaluation of the project and, (7) "to the extent one is called for. . .prepare a suggested revision of the Non-Capital Project Paper (PROP)." The contractual stipulation that the draft and final reports of the design team were to be prepared before leaving Ghana (to be typed at the Medical school and reproduced at the Mission) indicates a desire to have Ghanaian input down to the final wire and a keen awareness of differences in the availability of support services in Ghana.

A UCLA team, consisting of Dr. Alfred Neumann, the UCLA project co-director, and Dr. Carl E. Hopkins, an operations research and design specialist, spent six weeks in Accra during August and September working on the final design of the project with their Ghanaian counterparts. They did not complete the tasks assigned to them. Accordingly, an amendment to the UCLA contract was drawn authorizing a second team visit to Ghana. Only the UCLA project co-director was carried over from the first team. Other members of the second team were: Dr. Jerome Niswonger, an obstetrician-gynecologist with maternal and child health and family

planning experience (who would later join the field party), Miss Olive Johnson, a medical records specialist, and David Sullivan, a computer programmer. They were in Ghana for two weeks, returning to the United States on Christmas Eve, 1969. They had carried a seven item agenda to the field with them. According to that outline, while in Ghana, they were to: (1) fix precisely the costs of the family planning activity, including personnel, supplies, and contraceptive materials; (2) estimate per person costs of family planning and other project services for each of the three service areas planned; (4) develop a detailed plan, including staff requirements, for processing project data; (5) finalize plans for overseas training of Ghanaians; (6) work out the details of cooperation with the Ministry of Health in planned in-country training; and (6) develop a final budget. Working with the Ghanaian team, this team produced the materials that form the basis for the revised PRUP, PRO AG, PIO/T and UCLA contract. There were still planning details to be resolved, however.

In April 1970, two members of the UCLA team, Drs. Alfred Neumann and Irvin Lourie (the co-director designate and the physician who would become the UCLA chief of party), returned to Ghana for two weeks to facilitate the transition from the planning phase to project implementation. Their agenda contained five items. One man was to ". . .assist in the (1) preparation for the base line surveys, (2) arrangements for the logistic support of the UCLA team, (3) establishment of a health records system and (4) organizing of field research aspects of the project. His companion was to: ". . .advise and assist in finalizing project plans as regards operational research and program evaluation."

The first two visits of the UCLA teams to Ghana were particularly important in shaping the project. For, as a result of these visits and conversations with Dr. Julius Prince, the Africa Bureau's Special Assistant for Population Planning, project objectives and activities were specified in increasing detail, potential trouble areas were isolated, and some solutions to them proposed. The general outlines of the project, and much of the text of the documents of agreement were carried forward from earlier materials. In that sense, the final agreements represent an evolution and sharpening of the original project design with greater specification of the responsibilities and activities of the signatories and the groups they represented. In short, the agreements constitute a work plan and an agreed upon division of labor among the parties for bringing the Danfa project into reality.

The details of the agreements negotiated fill several file folders with densely packed single-spaced pages of typing. While it is instructive to study the original agreements, the main lines of the case study can be drawn without including them all here.¹ Instead, we shall attempt a reasonably concise and appropriately specific summary of the project design as represented in the second (revised) PROP, the second PRO AG and PIO/T, and the contract with UCLA implementing their portion of the project.²

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These materials, indexed in the case study bibliography, may be found in the library.

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At this point, readers familiar with Logical Framework analysis may wish to inquire why a Log Frame Summary has not been inserted here in lieu of lengthy text. There are two reasons. The original agreements for the Danfa Project antedate the Log Frame planning process. And, some readers may wish to attempt a Log Frame analysis as an exercise to demonstrate what that process reveals that older, narrative, forms of project designs do not.

As usual, AID/W and, by delegation, the local Mission stands as the linking party of the agreements. The agreements, once again, are between AID/Ghana and the University of Ghana and between AID/W and the Board of Regents of the University of California. There was no direct agreement between UCLA and the Ghana Medical School, other than as specified in terms of the contracts and agreements with USAID. And it is also the contracting regulations governing the Agency not the practices or preferences of the other participants that determine the terms of the agreements and provide the frame for resolution of conflicts. This, of course, means that in matters of disagreement on details of substance or in situations where both parties were agreed that departures from the terms of their respective agreements were needed, AID would almost inevitably be brought in. This and the disparity of funding levels between the U. S. and Ghanaian contributions are perhaps the first factor challenging the Ghanaian proprietorship of the project.

Moreover, one should remember that the completion of formal agreements does not necessarily signal achievement of complete accord. An exchange of cables between Washington and Accra (with messages shared with Drs. Sai and Neumann) in June 1970 makes it clear that the agreements negotiated for the Danfa Project accommodated three different priorities, each related to principal statuses or roles of the major actors. The Ghana Medical School and the Department of Preventive and Social Medicine were most interested in the service program and the opportunity for training medical and paramedical personnel. The UCLA group's main interest lay in the operations research and the development of replicable rural health and family planning

delivery services. AID was most interested in determining the context in which family planning services might best be provided to rural Africans.

Comparison of the first and second round project documents reveals an interesting shift in the emphasis given to family planning activities. At the time, AID health funds were not available; if the project were to be funded at all, it would be through the justification of family planning activities proposed in the design so that Title X (Programs Relating to Population Growth, in the Foreign Assistance Act) funds could be used. This funding arrangement would also have unforeseeable consequences for the project. In 1969 and 1970, while the Danfa Project was being planned, Title X funds were administered by AID's regional bureaus. In 1972, control over these funds and, hence, the prospects for future funding of the project passed to the Office of Population.

In the second round PROP, the instrument by which AID agrees internally to commit funds, family planning activities planned for the project are mentioned in the second sentence of the opening paragraph. In the second round PRO AG, in deference to Ghanaian sensitivities, the context of project family planning activities was altered somewhat in order to emphasize the health significance of this aspect of the project's work. Here is the opening paragraph of the second PRO AG:

The purpose of this project is to assist Ghana in initiating a demonstration comprehensive rural family care program which will help improve the health and welfare of the people. The major health problems of the rural communities include ignorance in health matters, malnutrition, poor environmental sanitation, infective and parasitic diseases and high infant and child mortality.

With cooperation of the population in the project area, the vicious circle of high fertility and high mortality rates of infants and children can be broken through emphasis on the control of communicable diseases, sanitation of the environmental, maternal and child health, nutrition, health education and family planning.

It may be appropriate to reflect for a minute on the many meanings of that euphemism "family planning," a term not unlike "it" as analyzed in Alice in Wonderland that generally means just what the speaker intends it to mean. First of all, "family planning" is not synonymous with "contraception." Contraception implies anti-natalist behaviors; family planning may also imply pro-natalist behaviors (as when a couple purposely seeks conception). Secondly, two different meaning dimensions surround the use of the term "family planning." On the one hand there is the micro vs. macro differentiation in the application of the term (with the micro application referencing the behavior of reproductive pairs and the macro application referencing the behavior of larger aggregates, such as local or national populations). There is also a purposive dimension associated with the use of the term. In this instance, the purpose associated with the use generally tends to correspond rather closely to the speaker or writer's main interests. The view expressed in the Ghanaian white paper on population is primarily economic, though the humanist perspective--the welfare of parents and children--is also expressed there. In the economic use, "family planning" tends to refer to national programs of some sort with a decidedly anti-natalist bent. That is primarily the position adopted by AID's Office of Population, by AID's Office of Population, but not by the Africa Bureau or by AFR technicians who had consistently espoused the

view that the family planning part of a population program, at least in Africa, is best seen as an integrated health family planning effort in which, in turn, is part of the total development process (see C.A. 1491, July 1970). Family planning is seen as a means of avoiding the Malthusian spectre by reducing the drain on scarce resources. A very different view is that of the public health practitioner, particularly specialists in maternal and child health. With them, the humanistic consequences assume greater importance than the bald economic ones. From the public health perspective, family planning is another means, like nutrition or sanitation or inoculation against disease, for improving the health and well-being of populations. Note here that the emphasis is on the macro level, as with the economic planners; it is also consonant with public health emphases on preventive and health promotive behaviors in distinction to curative or reactive medical practice. Micro applications of family planning are the domain of persons, couples and counsellors, who adopt means-end type analyses to attain or promote goals. Other kinds of appeals, among them duty to the nation, are made in population programs to induce people to alter their reproductive behavior, but generally the selling point is on the micro level, emphasizing the benefits that will accrue to the individual being addressed, their partner in the reproductive union or the children they do produce. Now, the importance of all this is that the use of the term "family planning" in the Danfa Project would come to include all these varied meanings (and probably others not obvious to this writer). Certainly, at the outset, there was the contrast between the economic interests (as evidenced in the white paper and by the

position of AID's Office of Population) and public health interests as expressed by the position held by the chair of the GMS Department of Preventive and Social Medicine and the Special Assistant for Population Planning in the Africa Bureau.

From the outset, the activities proposed for the Danfa Project were cast in the public health mold; not too surprisingly, considering that the three principal actors (in AID/W, at the Medical School, and at UCLA) were all public health physicians. The aim of the project was to explore ways of improving the health of the population through promotive and preventive health practices as well as through the provision of curative services. Three interrelated project functions were proposed and agreed to: (1) the Project would provide services to the population, experimenting with various approaches in order to develop alternative delivery and service models that could be replicated in other parts of the country, (2) program operations as well as effects would be monitored continuously in order to derive accurate cost/benefit information and to improve program efficiency and gauge its effectiveness and (3) the program would provide an opportunity for training Ghanaian medical personnel including physicians, final year medical students, nurses, and other paramedical personnel. Further diffusion of the knowledge gained through the project was to be accomplished by means of project sponsored professional meetings and publications.

In addition, the project was seen as a means by which an important hypothesis concerning the most advantageous means of promoting acceptance of family planning technologies could be tested. That hypothesis rested on a series of assumptions, stated in the second round PROP:

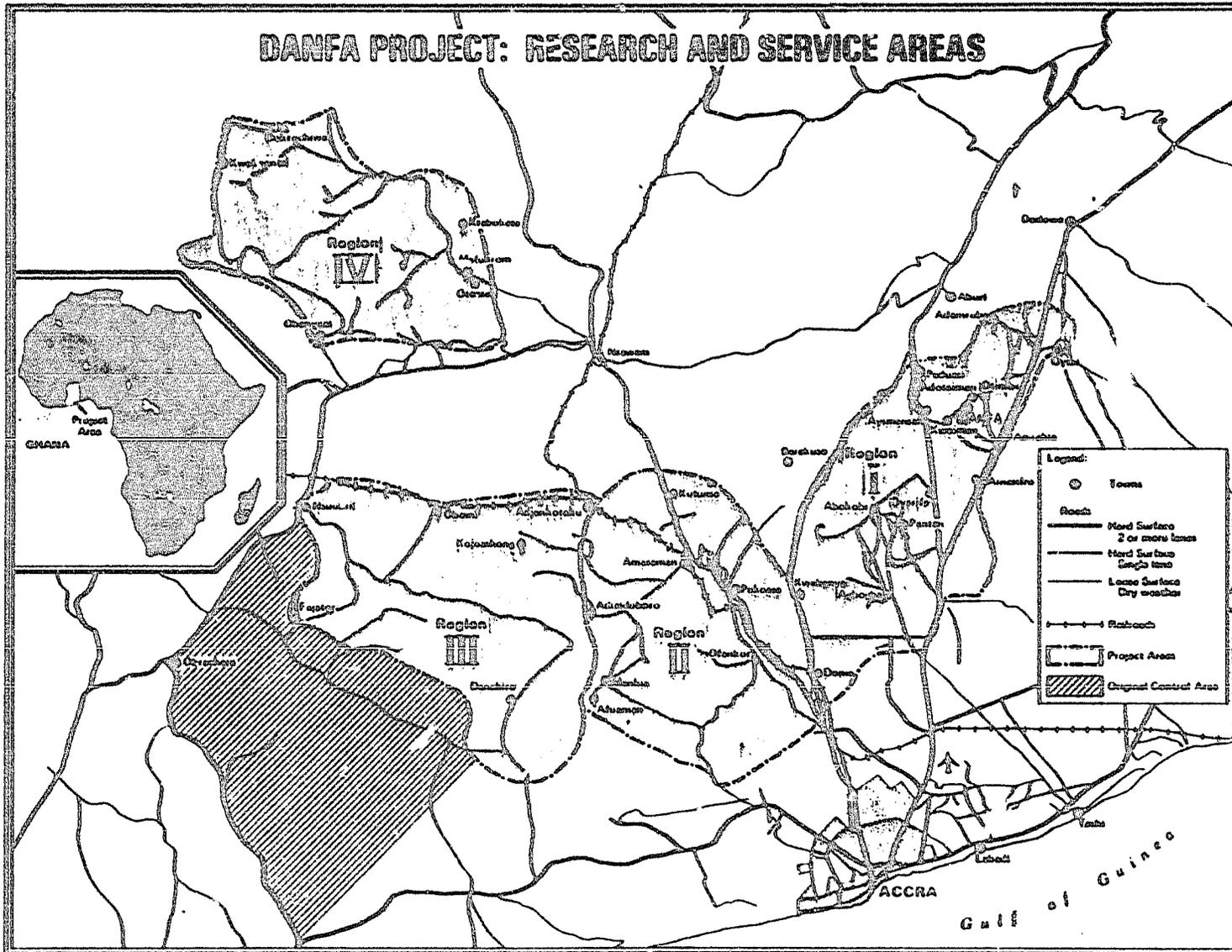
1. That rural villagers will not initiate and continue an effective family planning program unless and until they are reasonably sure that the children they have will survive.
2. That the number of children people say they want represents the net number wanted and that more must be born to compensate for the effects of early death. It is also likely that the "net number" wanted is inflated to compensate for excess morbidity. Reduction in morbidity will lead to a reduction in number of children wanted because the functional effectiveness will have been increased, other things being equal.
3. That a prerequisite of a long term, successful family planning program is a suitable infrastructure of health services which can help provide preventive and curative services which will insure acceptable morbidity and mortality levels.
4. That lowering morbidity and mortality rates will cause an increase in population and that in order to minimize the extent of this increase, it is necessary to have a family planning program very closely associated with the health program and that efforts be made to maximize the impact of the combined program.
5. That the effectiveness of the integrated health and family planning program be maximized by means of an associated health education program. The health education effort requires the efforts of a professional group of health educators and also the efforts of the health services staff.

The hypothesis, first stated in the papers prepared by the first UCLA two-man team to visit Ghana was retained and restated with minor modification of wording in the second round PROP. That hypothesis, as restated was:

. . .the optimal method in terms of long term acceptability of results, time and cost of reducing birth rates and fertility is to first lower morbidity and mortality, especially of infants and children and to accomplish this via a comprehensive approach embracing comprehensive health services which stress maternal and child health, include a nutrition program, provide general health education, family planning education and family planning services as an integral part of the health services.

This is, of course, the public health position. In its final form, the project design permitted testing three implicit variations of that hypothesis: (1) that promotive, preventive, and curative health services are superfluous to the family planning program and beyond the available resources of the country, but that rapid adoption of family planning technologies could be facilitated by providing health education information to augment the services provided by family planning teams, (2) that health education campaigns are also superfluous, rapid adoption of family planning technologies could be promoted solely through the use of mobile family planning teams, and (3) that all these efforts are superfluous, adoption of family planning technologies would occur without additional governmental intervention through private sector activities and the efforts of voluntary agencies. Testing of these hypothesis would be accomplished by providing three levels of treatment in the service area and comparing outcomes there with changes observed in a fourth area in which no services other than those normally present in the area would be provided. Thus the design for the Danfa project had evolved from a paired comparison of outcomes at single demonstration sites in an urban and a rural area to an experimental design in a rural area with three sub-areas each receiving a different level of treatment and a control area in which no services would be attempted (see Figures 2 and 3).

DANFA PROJECT: RESEARCH AND SERVICE AREAS



| AREA I | AREA II | AREA III | AREA IV |
|--------------------------------------|---------|----------|---------|
| Standard Ministry of Health Services | | | |
| Family Planning Team | | | |
| Health Education Team | | | |
| Comprehensive Health Care | | | |

FIGURE 3

ALLOCATION OF SERVICES TO DANFÁ PROJECT AREAS

Among the many observations that could be made about the final project design, there are two that seem particularly relevant. First, the final design was an amalgam of ideas, some particularly Ghanaian, but also including others brought to the project by others participating in it. For example, the "no service" or control area was added to the design at the eleventh hour on the insistence of the Africa Bureau's Special Assistant for Population Planning. At that time, plans to evaluate project impact by means of data derived from a national demographic survey (funded by AID but being phased out) or from the upcoming national census were dropped. Secondly, the services planned for Area I, in which the Danfa Health Center was located, and Area III corresponded closely to competing views within AID on how best to accelerate the acceptance of family planning in rural Africa. The public health view has been stated at length. The then

(and now) Director of the Office of Population, R. T. Ravenholt had argued that, however appealing on professional or humanitarian grounds this mix of services might be, insofar as family planning per se was concerned, the added services were unnecessary to achieve family planning targets and, moreover, utterly beyond the range of resources that might be brought to bear on a nationwide program. Since each of the variations of the Area I or Danfa area treatments involved a diminution of Area I services, it may be well to sketch the services planned for that area in some detail.

The keystone of the Area I program was the clinic at Danfa. Its physical plant was similar to that of other Ghanaian health centers but markedly superior to those of rural health posts, the next lower level of existing health services. The major part of the services planned for Area I would emanate from the center, many would be provided there (for example, obstetric deliveries). It would also serve as a base for some of the field personnel and for training purposes.

Two principles guided the service plan. The first principle guiding the search for optional models for a rural health program was that of replicability. If successful, the project should be able to demonstrate that the service models it proposed were within the budgetary and manpower resources of the country. This implied the maximum feasible use of para-professional personnel (e.g., health center superintendents, nurses, midwives and others such as health educators and sanitarians) with physicians used only in a part-time supervisory capacity. Cases beyond the capabilities of the project staff were to be referred for treatment to neighboring

hospitals or to Korle Bu in Accra and transported by project ambulances, if necessary. Secondly, if the full-blown public health model was to be attained, services would have to be comprehensive in two senses: (1) the services should be accessible to all or nearly all of the population in the service area and (2) the mix of services should be broad, including efforts to promote health (e.g. through nutrition programs), to prevent disease (e.g. through environmental health measures, health education, and mass immunization or drug therapy programs) and, of course, curative services must also be available. Though men would not be ignored in the scope of services planned, the main target would be the health of mothers and children within the designated service area. Within the limitations of the services planned for each area, all who sought project services, whether residents of the area or not, were to be provided them. An intensive family planning program consisting of education and propaganda efforts as well as delivery of contraceptive materials (mainly steroids or the Pill but also loops, condoms and foam all to be provided at no cost to the user) was to be provided in all three service areas.

Comparison of the PROP, the PRO AG, and the UCLA contracts reveals an interesting contrast in the level of specificity of the agreements. The materials relating to activities to be undertaken by the UCLA group and the related budgets are developed in considerable detail. Description of activities to be undertaken by the Ghanaians were more broadly drawn and the budgets provided only in aggregate totals. The Ghanaians were to be responsible for providing and managing the health and family planning services, for training medical and paramedical personnel through use of the service

programs and the Project's facilities, and for organizing and conducting the annual review sessions.

The "Contractor's Scope of Work" paragraphs in the UCLA contract with AID/W specify the tasks the UCLA group was expected to perform or participate in. The general assignment was for the UCLA group to do research and evaluation in order to isolate the most efficient and cost-effective means of improving the health and reducing the fertility of the concerned population and to assist in the training, in Ghana, of various categories of health personnel. Eleven sub-tasks were specified. Briefly, the UCLA group was to: (1) design and conduct research--including, but not limited to, household surveys, special community studies, operations research, and related studies, (2) assist in providing in-service training at the health center for Ministry of Health personnel, physicians, students, and others, (3) design and organize a computerized records system to process health center records, household and epidemiological survey data and the data necessary for operations research, (4) design the necessary computer programs, (5) provide consultation on the overall project design and operations and on data processing, (6) assist in the organization and operation of family planning activities in Areas I-III, (7) assist in the training of the staff for a community health education program and in its organization and operation and conduct evaluation of that program, (8) design and conduct special epidemiological studies, (9) assist in getting specialized training for Ghanaians at UCLA and other locations, (10) procure and maintain equipment--the title of which was to rest with the Medical School--and supplies as stipulated

in the contract, and (11) in consultation with the Ghanaian project staff, prepare timely reports on project findings and activities.

What was to be expected of the operations focused on the Danfa Center by the end of the project? The UCLA contract stipulates six products, all to be presented in the form of reports prepared by the UCLA group in collaboration with the Ghanaians. The topics specified were: (1) guidelines for implementing similar comprehensive health and family planning services for inclusion in a national health plan, (2) experience in the "most effective ways" for instructing professional and paraprofessional personnel and students in the operation of comprehensive health and family planning programs, (3) instructional materials in family planning for use in other curricula, (4) criteria for evaluating family planning activities for use in implementing the country's population policy, (5) operational research on the Center's training program and on the health and family planning delivery system, including cost benefit analyses, and (6) results of research on community health attitudes and practices. In addition, the training activities planned for the center were expected to have been institutionalized.

Formally, work toward accomplishment of these objectives was begun by the UCLA design and feasibility teams and their Ghanaian counterparts in the latter half of 1969. The final version of the enabling PROP provided for continuation of project activities through FY 1975 into calendar year 1976. The total amount of funds envisaged at that time (May 1970) was \$3.3 million distributed as follows: U.S. dollars \$2,174,627; PL 480,

Section 104 (h) local currency \$428,000; Ghanaian cash contributions \$689,000; funds from other sources \$30,000. This allocation of funding was based on the organizing principle for the project. The Medical School would fund and undertake activities associated with training and service functions of the project, UCLA with funds provided by the AID contract would collaborate in teaching activities in the field and undertake those activities associated with innovative, experimental aspects of the project and with the operations and evaluation research.

Through a direct grant (using PL 480 Title I--surplus agricultural commodities sales) AID would also provide for the services to the project of a senior statistician from the University's Institute for Statistical, Social and Economic Research (ISSER) and for the salaries and benefits of an administrative, data processing, and field research staff numbering 20 persons. The cost of these services, salaries and benefits for one year was estimated at NC 41,000 (or \$40,196). A separate agreement was to be drawn for the purpose of using available PL 480 funds to finance completion of the staff facilities at the Danfa Health Center. (Funding for this capital expenditure was not possible through the documents for this non-capital project.)

Ghanaian contributions to the project, through the University or through the Ministry of Health, were to be staff for the service and teaching aspects of the project and driver for the vehicles assigned to the research functions, office space for the UCLA technicians and the Ghanaian staff associated with administrative, research and evaluation

aspects of the project, fuel and maintenance of the vehicles assigned to the project's service activities, supplies and equipment for the Danfa Health Center on a standard comparable to that of other Ministry health centers, office space, logistic support and, if available, housing for short and intermediate term consultants from UCLA to the project and salaries and transportation for the project's participant trainees.

The first year budget for the project was nearly \$500,000, of which the Ghanaian portion was \$85,000. The largest share of the budget was, of course, for personnel costs: \$370,299 of which the Ghanaian portion was \$60,000 (the remainder of the Ghanaian share of the budget in the AID documents was their contribution for office space and furnishings). Associated with the personnel costs was the \$30,000 budgeted for household furnishings for the UCLA field personnel and, presumably, for their housing rental and utility costs since no separate funds for these appear in the budget. (Earlier plans were for the University to provide housing, but in the final budgets housing was provided for in the contract with UCLA. The third largest amount, \$17,000, was for vehicles.

¹ These were: four, four-wheel drive vehicles, two of them ambulances, and six motor scooters. Use of lightweight Italian motor scooters as a means of transportation in the village area had been suggested in the early proposal to the UN Special Fund. In fact, they were never purchased, largely because of unfavorable attitudes towards them amongst the Ghanaian field personnel; they are an uncommon mode of transportation in the country. But, difficulties in arranging purchase of non-American durable goods may also have been a significant factor. Bicycles were ultimately purchased for local transportation in the village area.

Aside from the \$10,000 for clinic equipment, supplies and demonstration materials and \$1,000 for two suction aspirators, all other funds in the budget were for equipment related to the research operations. Significantly, no funds were provided for tires, other parts or repairs for the vehicles or any of other equipment in either the detailed PIO/T budget or in the budget for the first three years of the UCLA contract.

Although discussed extensively in the materials prepared by the UCLA design and feasibility study teams, there is no discussion--let alone stipulation--in the second round PRO AG or PIO/T of the computing services to be provided to the project by the University. The only reference, for example, of a contribution in this vital area is in terms of the full-time services of a junior statistician and guidance from a senior programmer and a records systems analyst. Yet, it is clear from the text of materials prepared by the first two-man UCLA design team that a relatively sophisticated file of data was being planned. In their write-up, they described a file, to be augmented periodically throughout the life of the project, containing information for each individual in the project area or served by the project. In the same document, they also indicated their intention of reading that file periodically to produce longitudinal case histories as well as static descriptions of project services and activities. In addition, heavy use of computing facilities was planned in conjunction with the analysis of various program operations and cost/effectiveness structures.

To provide the coordination needed to attain project objectives, four groups were specified in the PRO AG. At the most senior level would be the two project co-directors; each to devote part-time to the Danfa Project. Each was designated not by name, but by the position he was then holding. They were the Head of the Department of Preventive and Social Medicine (Dr. Fred Sai) and the Head of the UCLA School of Public Health International Health Program (Dr. Alfred Neumann). Their task was to provide overall project planning and direction. At the immediate administrative level, the Ghanaian group would provide a project coordinator from the faculty of the Department of Preventive and Social Medicine and, in consultation with the Ghanaians, the UCLA group would designate a chief-of-party. Two coordinating committees were stipulated in the second round PRO AG. One was composed of representatives from the project and public and private Ghanaian agencies whose cooperation would be required for successful implementation of the project. The persons named for this committee were: the Ghanaian co-director (as chair) and representatives from the Ministry of Health, the Ministry of Youth and Rural Development, and Institute of Statistical, Social and Economic Research, Demographic Unit, the Department of Preventive and Social Medicine, the UCLA group, and USAID. The composition of this group is interesting because experience in constructing the Danfa Health Center had already indicated that a much larger net of cooperating agencies was essential to develop that facility. The other, subordinate group designated in the PRO AG was an operations committee to participate in the design and evaluation of the field service program was to be drawn from relevant

departments in the School of Medicine.

To accomplish the work outlined, a staff of more than seventy people was proposed (Table 1). These were divided into two teams. The Ghanaian team consisted of the co-director, the professional medical personnel (drawn mainly from the Department of Preventive and Social Medicine but also including members from other departments of the Medical School), statisticians, programmers, and data reduction personnel (mostly from ISSER), the staff of the service program, the field interviewers and their supervisor. The UCLA contract specified a team consisting of the co-director, a four-person field party (an obstetrician/gynecologist with maternal/child health and family planning experience, and epidemiologist, a health educator, and an operations researcher--also called a functional analysis specialist) and a variety of support personnel and consultants located on the Los Angeles campus but variously available for short and intermediate term assignments (2-4 months) to assist the project in Ghana. Additional staff, specified in the second round PRO AG included drivers for each of the four research vehicles (to be provided by the Medical School) and the following personnel to be paid by the Medical School from funds provided by a direct PL 480, Title I grant: an administrator/business manager, a bookkeeper/storekeeper, a clerk typist, and two key punch operators.

Three particularly troublesome staffing areas were isolated during the visits of the design and feasibility teams to Ghana; all required access to scarce personnel and participant training early in the project.

TABLE 1

STAFFING PROPOSED FOR DANFA PROJECT, DRAFT PROP OF FEBRUARY 1970

| Activity Area and Title | Number and Source of Support | | | | Activity Area and Title | Number and Source of Support | | | |
|--|---------------------------------|----------|------|----------------|---|---------------------------------|----------|------|-------|
| | GOG | Contract | UCLA | Other | | GOG | Contract | UCLA | Other |
| <u>Danfa Health Center Staff</u> | | | | | <u>Additional Family Planning Staff</u> | | | | |
| Health Center Superintendent | 1 | | | | Nurse/Midwife, Areas II and III | 2 | | | |
| Midwife | 2 | | | | <u>Records and Evaluation</u> | | | | |
| Midwifery Assistant | 2 | | | | Senior Programmer | 1 | | | |
| Community Health Nurse | 2 | | | | Junior Programmer | | 1 | | |
| Dispenser | 1 | | | | Senior Statistician | 1 | | | |
| Records Clerk | 1 | | | | Records System Analyst | 2 | | | |
| Clerk/Typist | 1 | | | | Statistical Clerk | | 1 | | |
| Sanitarian | 1 | | | | Editor/Coder | | 1 | | |
| Laboratory Technician | 2 | | | | Senior Records Clerk | 1 | | | |
| Diesel Generator Attendant | 1 | | | | Clerk/Typist | 1 | | | |
| Watchman | 2 | | | | Records Consultant | | | 1 | |
| Driver | 2 | | | | Programming Consultant | | | | |
| <u>Health Education Program</u> | | | | | <u>Other</u> | | | | |
| Health Educator | 2 | | 1 | 6 ^a | Project Co-director | 1 | | | 1 |
| Community Health Education Aide | | | | | Systems and Operations Research Consultant | | | | 1 |
| <u>Teaching and Consultant Staff</u> | | | | | Family Planning Consultant | | | | 1 |
| Field Coordinator | 1 | | | | Social Science Consultant | | | | 1 |
| Ob/Gyn, Family Planning | 1 | | | | Maternal Child Health Consultant | | | | 1 |
| Ob/Gyn, M.C.H., Family Planning | | | 1 | | Health Education Consultant | | | | 1 |
| Epidemiologist | 1 | | 1 | | Cytology Consultant | | | | 1 |
| Nutritionist | 1 | | | | | | | | |
| Pediatrician | 1 | | | | | | | | |
| Internist | 1 | | | | | | | | |
| Nursing and Midwifery | 1 | | | | | | | | |
| <u>Functional Analysis and Operations Research</u> | | | | | | | | | |
| Functional Analysis Specialist | | | 1 | | | | | | |
| Social Scientist | 1 | | | | | | | | |
| Field Interviewer Supervisor | | 1 | | | | | | | |
| Interviewers, Areas I-IV | | 8 | | | | | | | |

^aGhana Planned Parenthood Association

Steroid contraceptives (or the Pill) had, at the time, been in general use less than a decade and the medical profession was beginning to have reservations about the side effects that might emerge from long-term use of this family planning means. The Ghanaian planners were particularly concerned about possible carcinogenic effects of the Pill and insisted on attaching a cytologist to the Project staff. Use of an intermediate term UCLA consultant who would provide in-country training for Ghanaian staff was considered but abandoned in favor of a participant training program in cytology (despite the fact that the country had no facilities for radiological treatment of uterine cancers and that the Project could not hope to provide enough work for the full-time services of a cytologist). A similar need for advanced training in epidemiology was isolated and included in the training plan. And, there was also an obvious need to increase the capabilities of the ISSER group in records management, programming, and data processing. Participant training was proposed to meet these and other staffing needs (Table 2).

One of the distinguishing features of the Danfa Project is the level at which the operations research and cost analysis was done. Yet, it is not at all clear from the project agreements that the original intention was to gather such fine grain data. For, while there is a clear expression of an intention to measure both inputs and outputs, evidenced as early as in the material prepared by the first two-man design team, the language in the agreements specifying the data collection operations is sufficiently vague to allow a more general level of analysis. For example, in the second round UCLA contract, the sentence specifying the nature of the

TABLE 2

PARTICIPANT TRAINING REQUIREMENTS FOR THE DANFA PROJECT AS PROPOSED (FEBRUARY 1970) AND APPROVED (MARCH 1971)

| Field of Specialization | Departure Date | | Duration/Months | | Funds (US\$000's) ^a | |
|---|----------------|----------|-----------------|----------|--------------------------------|----------|
| | Proposed | Approved | Proposed | Approved | Proposed | Approved |
| Programming (Supervisor) | 4/70 | 8/70 | 3 | 21 | 3.0 | 13.0 |
| Programming | 4/70 | 9/72 | 3 | 21 | 3.0 | 21.4 |
| Programming | n.s. | 9/72 | 6 | 21 | 5.0 | 21.4 |
| Health Education | 12/70 | 9/71 | 18 | 24 | 11.2 | 22.4 |
| Cytology & Microscopy | 12/70 | 7/71 | 12 | 12 | 7.8 | 12.4 |
| Maternal & Child Health/Family Planning | 12/70 | 9/71 | 12 | 24 | 7.8 | 22.1 |
| Maternal & Child Health/Family Planning | 8/71 | 9/72 | 12 | 24 | 7.8 | 22.4 |
| Maternal & Child Health/Family Planning | 8/71 | Deleted | 12 | Deleted | 7.8 | Deleted |
| Epidemiology | 8/71 | 6/70 | 12 | 5 | 7.8 | 6.0 |
| Health Education | 6/72 | Deleted | 18 | Deleted | 11.2 | Deleted |
| Health Education | 6/72 | Deleted | 18 | Deleted | 11.2 | Deleted |
| Public Health Administration | 8/72 | 9/72 | 12 | 24 | 7.8 | 22.4 |
| *Social Welfare | ---- | 9/71 | -- | 36 | --- | 32.4 |
| *Records Operations & Analysis | ---- | 4/71 | -- | 4 | --- | 6.0 |
| *Records Operations & Analysis | ---- | 4/72 | -- | 6 | --- | 6.0 |
| *Health Operations Research | ---- | 9/72 | -- | 24 | --- | 22.4 |
| *Health Operations Research | ---- | 9/72 | -- | 24 | --- | 22.4 |
| *Medical Records Supervision | ---- | 9/71 | -- | 21 | --- | 12.4 |

^aFunding amounts combine U.S. and Ghanaian contributions. Total amounts proposed: U.S. \$77,200, Ghana \$14,400. Total amounts approved: U.S. \$163,400, Ghana \$102,000. (Amounts rounded to nearest 100 dollars.)

"n.s." indicates not specified.

"*" indicates training requirements added in revision.

records system says: "The system will be such that objective, systematic evaluation of the center and associated programs will be possible." In that same document, the areas in which data were to be collected were also broadly drawn: (1) an ability to compare project data with other in-country data, such as that from the census or the AID sponsored demographic survey, was specified; (2) the project would be expected to conduct baseline and periodic censuses in each of the four project areas-- population totals for these areas had been gradually elevated from approximately 10,000 in each area to 15,000; (3) there would be "ongoing" assessment of illnesses and accidents, their treatment and economic impact, (4) ongoing or continuous studies were also to be made of "medical care attitudes and use patterns;" (5) there were to be similar investigations into family planning knowledge, attitudes, and practices (commonly called KAP studies); and (6) there would be other "special" studies in related substantive areas such as child development, nutrition, and specific diseases. To assemble these data, the feasibility study team had expressed their intention of building on previous experience by adapting existing data collection and records methods for use in the project. The health center records system to be used was one that had been implemented in Alaska; family planning questionnaires and records systems were to be modeled after those used in work done for the Population Council. The baseline and subsequent census data would provide denominators against which incidence data (such as acceptance of contraceptives, births or deaths) could be put. To provide a further check on vital events, the use of village registrars was also planned. Throughout, there was

consistent expression of an intention to link all data in computer files through unique ID numbers for every person in the project area (with numeric components for project sub-area, village, household, and individual) so that longitudinal analysis on the individual level as well as cross-sectional or synchronic analyses could be performed. In addition, of course, there would be continual operations research aimed not only at cost benefit analyses but also a functional analysis of the work being performed by the health delivery personnel so those structures could be modified on the basis of empirical evidence. The UCLA contract, signed in August but funded under letters of intent since May, stipulated that all these data collection operations would be implemented by January 1971.

PART IV

The First Two Years: 1970-1972

At times during the first two years of the project, it must have seemed to staff members that malevolent spirits were bent on using their lives as a systematic demonstration of Murphy's Law. For, despite the planning and preparations, the Project did not enter the operational stage until the end of the second year.

The range of problems encountered in implementing the Project was broad and their impact devastating. Logistical problems were encountered that severely affected transportation and communication and the rapidity with which the UCLA field party settled in at their new duty station. Deficiencies in material resources hampered transportation, imposed an awkward arrangement of office and work space, limited the amounts and kinds of computation that could be done at the computer center in Accra, and impeded the progress on the baseline censuses which were required before the service operations could be begun. Quantitative and qualitative shortfalls in human resources, at the senior as well as the junior level, were also experienced requiring recruitment and orientation of new personnel for the field party and in the Ghanaian group and adjustment of work assignments and training schedules. What appears to have been an incident of conflicting organizational goals resulted in contamination of the area designated as the study control for the experimental design. And, an act of God, in the form of a cholera epidemic, required diversion of the Project health service personnel.

The main difficulties emerged soon after the arrival of the UCLA field party in Ghana. Preparations for their departure had gone relatively smoothly. In advance of a long-term contract with AID, the members of the field party were recruited on month-to-month contracts and assembled in Los Angeles for a series of weekend seminars to familiarize all with the major aspects of the work they would be doing together. By early August, the UCLA co-director, the chief of party, and the family planner-obstetrician-gynecologist (respectively, Drs. Neumann, Lourie, and Niswonger) were in Accra. The last of these to arrive was in Ghana a day before the contract with AID/W was signed on behalf of the Regents of the University of California. They were followed by the epidemiologist (Dr. Belcher) and by the health educator-behavioral scientist (Dr. Cannon). By the middle of August, the field party was in place; by the middle of September their families were in Ghana. One important change in the composition of the field party had occurred. The operations researcher, stipulated in the PROP and the UCLA contract, was not among the members of the initial party; the duties of that position were performed by the UCLA chief of party, Dr. Lourie, by consultants on IDY assignments, and by delegation of tasks to other members of the field party.

Logistical problems affected office space, housing, and transportation and communication. By the time the UCLA contract was signed, Detroit's production lines had shut down for the model year change over and delivery of the project's ambulance and four-wheel drive field transport was delayed. Until the vehicles arrived in Ghana, over six months late, the project staff had to use their own cars and borrow heavily committed transportation from

the motor pool of the Medical School. Office space for the project at the Medical School or at the University at Legon, negotiated as part of the Ghanaian contribution, was simply unavailable. Instead of the 2,800 square feet promised, the project was able to acquire only 800 square feet and it lacked furniture. Space was so cramped that, on good days, incoming data forms were processed out-of-doors, under the building overhang. Finding housing and acquiring household furnishings for the UCLA staff also proved to be a problem. To arrange for the rental of houses, the field party finally retained a local firm of public accountants. None of the houses rented had telephones and the wiring in all was inadequate for air conditioners and other standard American household equipment. Much of the furniture to be provided through the UCLA contract was unavailable locally. All told, getting the field party settled took four months. To circumvent the office space problem, the UCLA team members each established offices in their own homes. While all were located in the same general part of Accra, they were separated from each other, from the AID mission, from their Ghanaian counterparts at the Medical School, and from the research staff at the University by driving times of up to 40 minutes.

Attempts to use existing maps of the project areas as a basis for the baseline census enumeration showed them to be clearly deficient for that purpose and for future sampling. Among other problems, house numbers had been assigned in order of construction and registration, making it difficult to locate a particular dwelling. To create new maps, a team of mappers was recruited. After a two week training course given by supervisors from the

Surveys Office, they were deployed. An initial low rate of production was ascribed to inclusion of extraneous detail in their maps and a desire to prolong their period of employment. To speed production, detail was dropped, quotas were set for each mapper, and the UCLA epidemiologist (Dr. Donald Belcher) took to the field as a working supervisor. Nine months were required to map Areas I-III, an additional seven weeks were required to map Area IV. For the benefit of future workers, the Project produced a monograph on mapping domiciles in rural areas.

After what appeared to be a promising start using a team of eight enumerators experienced in the 1970 census, close examination of the work being done on the baseline census (which had to be completed before any of the service programs could be initiated) revealed the necessity of replacing the entire group of enumerators. New enumerators were recruited and trained and supervision procedures were repeatedly revised in order to attain the data quality sought. Ultimately, there were 28 enumerators in the field. Their work was progressing so satisfactorily that it was possible to assign some to the mapping task to speed work there. By the end of 1971, the baseline census was complete, roughly 12 months beyond the time originally set.

In what was dismissed as a misunderstanding in early December 1970, workers from the Ghana National Family Planning Program mounted an intensive information and propoganda campaign in the control area, ruining it for the purposes of the project. A new control area, north of the area originally chosen, was selected. But it was clearly not as satisfactory

as a control. Located on the edge of the cocoa producing region, the farmers of the area had moderately higher incomes than farmers in the service areas.

Late in December 1970, Ghana was struck with a cholera epidemic. All of the Project's physicians were diverted to the control effort and mappers from the baseline census team were given a crash course on cholera control and put into Areas I and II as health educators (no Project services were put into Areas III and IV, in adherence to the design).

In contrast to the problems being encountered elsewhere, development of the program at the Danfa Health Center went like silk. A staffing pattern and job descriptions were produced and, by January 1971, para-professional and support personnel required were recruited (see Table 3).

TABLE 3
HEALTH CENTER STAFF: 1972

| Title | Number | Title | Number |
|------------------------------|--------|-------------------------------|--------|
| Health center superintendent | 1 | Laboratory assistant | 1 |
| Nurse midwife | 1 | Dispensary assistant | 1 |
| Staff midwife | 1 | Records clerk | 1 |
| Community health nurse | 2 | Generator attendant | 1 |
| Health Inspector | 1 | Assistant generator attendant | 1 |
| Midwifery assistant | 2 | Sanitary laborers | 4 |
| State enrolled nurse | 1 | Watchman | 1 |
| | | Total | 19 |

Eight health education assistants with backgrounds in community health, nutrition, family planning or sanitation were recruited (two, the sanitarians, were former mappers who had performed well during the cholera control campaign). A training program, designed to provide all with capabilities in all four fields represented in the group, was undertaken by the UCLA health education specialist with the assistance of the Ghanaian field coordinator and the UCLA chief of party. Experience in the classroom indicated a substantial revision of the curriculum. Half of the trainees had only middle school leaving certificates and only one had completed high school. What was to have been a short course required a full year. Meanwhile, the Ghanaian health education counterparts were in the United States for training and their designated replacement was fully occupied in assisting with the supervision of enumerators in the baseline census. On completion of the course, the health education assistants were assigned to a practicum outside the project area; analysis of their work there provided the basis for further revision of the curriculum. Not being able to enter their assigned service areas until the baseline census was completed, the health education assistants began a supervised field test of visual health education material being prepared for the Project. The results of that short study led to redesign of some materials and publication of their findings in a journal article.

The family planning team, of three rather than the nine persons in the original design, was recruited and trained piecemeal. The nursing sister who was to head the team was trained by the UCLA obstetrician/gynecologist/family planner in an eight week preceptorship; together they

trained the midwifery assistant and family planning records clerk. Reviewing the experience, the UCLA technician realized that as it had been given, the training was not replicable on a national basis. There was also clear recognition that the staffing pattern and training schedules of the family planning team and health education assistants provided no back-up personnel to cover absences due to registrations, sickness, annual leave, or further training.

There were also important changes among the senior personnel. The importance of having the assistance of staff from the Institute for Statistical, Social, and Economic Research (ISSER) in conducting the field studies and in processing and analyzing the data had been noted by the feasibility planning teams. But during 1971, as a result of uncomfortable relations with University administrators, seven of the eight ISSER staff members with degrees superior to baccalaureates resigned, isolating the junior personnel who had just returned from completing short courses in programming. And the computer at ISSER proved too limited in capacity for some project purposes. As a result of the lack of personnel and lack of computer capacity, a large part of the data reduction was done at UCLA. For example, the field forms for the first round census of nearly 50,000 persons in the Project area were air pouched to Washington, repackaged in the AID mailroom and sent by air parcel post to Los Angeles for processing (thus depriving the field personnel, Ghanaian and American, of the opportunity to work on data reduction and computation).

In the Department of Preventive and Social Medicine, two senior staff were added to assist with the project, a physician to serve as medical officer for the Center and a community development worker seconded from the University's Department of Social Welfare. In addition, through the cooperation of other departments of the Medical School, the Department was able to acquire the services of a variety of Ghanaian medical consultants (six at the beginning of 1972). But the Ghanaian co-director (Dr. Fred Sai), unanimously regarded as one of the sparkplugs of the project, resigned to leave for London to become Assistant Secretary for the International Planned Parenthood Foundation. Under the terms of the PRO AG, the new chair of the Department should have become the Ghanaian co-director. However, that person was a Togolese. To maintain Ghanaian control, the co-directorship was assumed in an acting capacity by the Dean of the Medical School (Dr. Silas Dodu). This slight change in organization reinforced impressions of conflicting interests among the Ghanaian staff. They had classroom obligations (in which the Americans were also participating) and it was these that were their most likely path for career development. And, even though the Project was being conducted in large part to enhance their classroom performance, its demands in time and energy were exhausting. Nonetheless, the assumption of the co-directorship by the Dean was indicative of the importance attached to the Project by the School. Meanwhile, the staff of the Department, already below the level authorized, was being depleted further by the assignment of personnel for advanced training in the United States. At the end of the Project's second year, four members of the Department

were abroad for participant training; only one of the medical personnel sent abroad had returned. He had completed a short course in records management and data processing.

Changes in the composition of the UCLA field party were of a comparable magnitude. As anticipated by the design team, two of the original four person field party resigned at the end of the first two year tour (Jo Ann Cannon, the health education specialist, and Dr. Jerome Niswonger, the obstetrician-gynecologist-family planner). "Personal reasons" were given as the basis for one resignation; public documents of the Project reveal no basis for the other. But it does appear that the individual was having difficulty in obtaining the collaboration needed from faculty outside the Department of Preventive and Social Medicine. He was replaced by a young maternal health/family planning advisor (Dr. David Nicholas) whose most recent experience had been with the Peace Corps in the Sahel. The designated replacement health educator (William Ward) was a member of the UCLA back-up team who had been working half-time on the project in data and operations analysis while completing a Master's degree in public health. His prior overseas experience included an extended community development tour on Jordan's West Bank.

The physical separation of the UCLA team members and the lack of telephones denied them the opportunity for spontaneous interaction and quick consultation with each other and with their Ghanaian counterparts. This was exacerbated by the shortage of ground transport. To manage the Project, a schedule of standing meetings emerged. At the end of the first

year, the UCLA chief of party estimated that half of his work time was given to these meetings. The details of administration consumed somewhere near two-thirds of the remaining time, leaving him with something like 15 per cent of his time for development tasks. (Similar information from the Ghanaian perspective is lacking, but the burden there must have been at least comparable. For example, it was they who had the main responsibility for establishing and maintaining the cooperation of other agencies and groups for logistic support, activities in the field, and secondment of personnel to the Project.) To ease the administrative load, the UCLA epidemiologist (Dr. Donald Belcher) was designated deputy chief of party, the chief of party's wife was added as a local hire to the field party as an administrative assistant, and a Ghanaian clerk-typist was hired.

The letter of intent from AID to UCLA specified a staff of eleven persons, including the field party. The contract, signed shortly later, stipulated a campus support group as necessary and within budgetary limitations. By January of 1972, 15 persons were working in the campus support group, contributing in aggregate the equivalent of seven person years of service (see Table 4). This was supplemented by TDY assignments to Ghana. These personnel included the co-director, the medical records consultant, a programmer, the systems analyst, and the campus coordinator who made several trips to help the field staff come to grips with UCLA and AID administrative and purchasing regulations.

TABLE 4

UCLA ON-CAMPUS SUPPORT STAFF, JANUARY 1, 1972

| Title (Name) | Duties | Percentage of Work Time Charged to Project |
|---|--|--|
| Co-director (Dr. Alfred Neumann) | Administration of project activities, responsible for research and evaluation activities | 29* |
| Administrative assistant (Alva Pryor) | Overall supervision of employees personnel matters, budget control, travel, supplies and equipment, procurement and fiscal matters | 100 |
| Research, training and editing (Sheila Banani) | Assist with academic matters and coordination of training of Ghanaian participants, annual report writing, recruiting, editing, response to requests for information, organization of 1972 review conference (held at UCLA). | 75 |
| Fiscal and expediter (Rochelle Kagan) | Ordering and expediting shipment of equipment to Ghana, follow-up control & fiscal matters | 25 |
| Statistical Clerks (4) (Boyd, Dulsky, Godby, & West) | Processing of statistical data, report typing, related duties | 100-30 Average 61% |
| Bibliographer (Eva Couvillon) | Bibliographer, book orders, journals, and library research | 10** |
| Shipping Clerk (Jordan Yu) | Duplicating, xeroxing and collating project materials, packing and shipping of project materials | 7 |
| Systems Analyst (Stewart Blumenfeld) | Systems and cost-benefit analysis | 75 |
| Medical records specialist (Olive Johnson) | Record and reporting system design and supervision | 50 |
| /No title given/ (William Ward) | Programming statistical analysis and programmatic research | 50 |
| /No title given/ (Dr. Eugene Boostrom) | Assist with academic matters and programmatic research | 25 |
| /No title given/ (Dr. Carl E. Hopkins) | Research design and methods consultant | 12 |

*Actual time spent on Danfa Project, 60 per cent of work week.

**Actual time spent on Danfa Project, 35 per cent of work week.

For all other persons, time worked and time charged are identical.

Looking back over the first two years in the field, the staff breathed a sigh of relief. In their progress report for the end of that period, they observed:

All are glad that a period of major infrastructure building is ended, that the baseline studies are completed and that in July 1972 the important field experiment phase will begin.

Nearly two full years elapsed between the signing of the UCLA contract and the point in time at which the project, in the sense implied by the design, could be described as operational; despite over six person months of planning and preparation in the field by members of the UCLA feasibility and design team and sizeable investments by their Ghanaian counterparts and AID personnel in the planning process. What happened?

PART V

The Middle Period: 1972-1975

The first two years of the Project could be fairly characterized as a period of organizational development. Recruitment and training of personnel, solution of fundamental organizational problems, and preparation for the field and research operations fully occupied the staff, Ghanaian and American. In the next three years, what we term the middle period, the Project moved into implementation of the services and activities planned; in other words, to the translation of inputs to outputs toward the realization of Project goals. Credit is seldom given for the solution of problems encountered in the implementation phase, perhaps because these are largely unanticipated frustrations to the development of project operations and, therefore, taken by some as indications of poor planning or management. On the other hand, if adequate solutions are not found, operational goals may not be attained or may be severely compromised. The activities of the middle period of the Danfa Project were of a different sort. Certainly problems, some of them as serious as those encountered in the first two years, did emerge. But, in perspective, they and their solutions were dwarfed by the progress made toward realization of Project goals and by the skillful exploitation of human resources and emergent opportunities to accomplish some ends that exceeded those envisaged by the planners. Thus the text in this part of the case study is largely descriptive of the activities of the Project, though mention is made of a couple of rather serious problems and the ways they were resolved. Activities of the Project during this middle period are

discussed under six major headings: Staff Developments, Data Collection, Data Processing, Development of Service Delivery Systems and Their Outcomes, and Other Aspects of Coping.

Staff Developments

In staff development, the middle period of the Project is characterized by modest augmentation of the UCLA field party, the development of strong on-campus support capabilities, and the gradual accumulation of Ghanaian professional staff as the latter completed participant training and returned to the Project.

In January of 1973, the replacement UCLA health educator (William Ward) and his family arrived in Accra. He, too, was familiar with the Project through work in the campus support group. An experienced community development worker, he nonetheless encountered slight difficulties in arriving at an amicable agreement on research needs and priorities with his principal counterpart. It is as easy to overdraw these as it is difficult to accurately assign causes. He had the experience and the degree; but so did his counterpart. And her experience was on the Project and her degree was a few months senior and from Berkeley, a rival school in the California university system. After completing a two-year tour of duty, Ward made a scheduled withdrawal from the field party to resume doctoral studies in anthropology at UCLA. Of the field party, he was the only member who acquired any fluency in the village languages.

The UCLA field party was augmented by the arrival of the operations researcher (Stewart Blumenfeld) and his family in March 1973. He was not, in any sense, a newcomer to the Project. He had visited Ghana on several occasions and demonstrated a capacity there to effectively organize data collection and complete analyses of Project costs and operations. As a member of the campus support group, he had worked on these tasks part-time while completing requirements for a doctorate.

In addition to the departures, mentioned above, of the operations researcher and the health educator, the main changes in the UCLA on-campus support group were the appointment in July 1972, of a part-time doctoral level deputy co-director. Understandably, the UCLA co-director had found that he had too little time to provide adequate management for both the Danfa Project and the School's International Health Program. In 1975, the UCLA co-director's wife, Dr. Charlotte Neumann, assumed the position of deputy co-director on a part-time basis. As a physician, her field of specialization was maternal child health and nutrition. She also had prior professional experience in Ghana. At the Harvard School of Public Health, she had been a classmate of the two co-directors. During the middle period, the on-campus support group were also providing substantial assistance in computer programming, bibliographic research, and editorial services. Other services were paid for out of overhead funds or (as in the case of the Health Sciences Computing Facility) billed as a direct charge. There was also considerable use of TDY consultants. Between July 1972 and December 1975, members of the UCLA support group and other consultants spent roughly 86 person weeks in Ghana.

Changes in the composition of the Ghanaian staff occurred throughout the middle period. Participant trainees, led by the records management and computing personnel and followed by health services personnel continued to be recruited to the Project, rotated overseas for training--mainly at UCLA--and assigned to active Project roles (see Table 5).

Though not entirely pleased by the lack in variety in training schools, the Ghanaian staff attributed this to delays in processing papers through the Ministry which frequently resulted in the UCLA co-director being asked to obtain exceptional admissions at his school.

Over most of the middle period, the Ghanaian co-directorship remained with the Acting Dean of the Medical School. However, in 1975 the Department (renamed the Department of Community Medicine) gained a new chairman, Dr. Samuel Ofosu-Amaah. At that time, he became Ghanaian co-director and has remained in that post since then. Since 1972, he had been co-chair of the Project's maternal and child health planning committee and an active participant in Project activities. The Project also experienced changes in Medical Officers for the Danfa Center, but the field coordinator and the recently returned health educator remained with the Project.

Insofar as possible, to increase project loyalties and reduce turnover, other Ghanaian staff were hired through the Medical School on permanent appointments. In addition to roughly 30 service personnel in the field, at the end of 1972, there were 51 persons in the Medical School support group (see Table 6). Despite increases in staff, Ghanaian personnel were never available in abundant supply. For example, as late as the

TABLE 5

DANFA PROJECT SPONSORED A.I.D. PARTICIPANT TRAINEES: JULY 1972 THROUGH JULY 1975

| Starting Date | Termination Date | Subject, Training Site, Level | Immediate Post-training Status |
|----------------|------------------------|--|--|
| Fall 1971 | Extension to June 1974 | Program modification to extend training in health education/behavioral science to include Community Organization, U Missouri, MS | - - - |
| Fall 1972 | January 1973 | Data processing and records, - - -, - - - | Research analyst/assistant statistician |
| January 1973 | April 1973 | Data processing and records, - - -, Non-degree | Research analyst |
| September 1973 | November 1974 | MCH/Nutrition, UCLA, MPH | Ministry of Health Advisor in MCH/FP/Nutrition |
| September 1974 | November 1975 | MCH/FP/Nutrition, UCLA, MPH | Medical Officer, Danfa Project, Area I |
| September 1974 | November 1975 | Epidemiology, UCLA, MPH | Medical Officer, Danfa Project, Areas II and III |
| March 1975 | August 1975 | Health Records/Biostatistics Data Management, UCLA, - - - | Assistant Research Analyst |
| July 1975 | October 1976 | MCH/Nutrition, UCLA, MPH | In training |
| July 1975 | October 1976 | MCH/Nutrition, UCLA, MPH | In training |

"- - -" = data not in records seen

Spring of 1977, the Department of Community Health still had filled only four of ten authorized full-time appointments. While the chair of the department hoped to hire project personnel to fill some of these positions, he also noted that staff with urban and industrial specializations were also needed.

TABLE 6
PROJECT STAFF HIRED THROUGH THE MEDICAL SCHOOL:
DECEMBER 1972

| Number | Title |
|--------|---|
| 26 | Enumerators-interviewers |
| 2 | Mappers |
| 3 | Research analysts |
| 2 | Senior statistical assistants |
| 3 | Editors-coders |
| 1 | Messenger |
| 1 | Motor pool supervisor-driver-mechanic |
| 10 | Drivers |
| 2 | Clerk-typists |
| 1 | Project historian, public information specialist, conference arranger |

Finally, in 1973, Dr. Julius Prince, the public health physician who had been Special Assistant for Population in the Africa Bureau of AID/W's Office of Institutional Development, was posted to Accra as Health, Population and Nutrition Officer where he remained until the Spring of 1977. During virtually all of that same period, the directorship of the Mission was unchanged and the Project received the full support of the Director, W. Haven North.

Data Collection

Project data collected by the survey group included the annual census of population in all four areas, annual sample surveys, and surveys on special topics. Six annual surveys on a sample of 2,000 households were scheduled: (morbidity, child health--knowledge, attitudes, and practices, pre and post-natal maternal health practices, fertility, and male and female family planning--knowledge, attitudes, and practices; the morbidity survey was dropped when comparison of the interview results with data generated during the village health survey showed the latter to be of higher quality). Topics for special surveys included socio-economic conditions, housing, sanitation, etc. Together, these studies required a staff of 40 interviewers over the middle period of the project. Maintaining stability in the survey group proved difficult, partly because the positions could not be made permanent Medical School appointments. Resignations occurred at a higher rate among the upper level survey staff than among the entry level interviewers reportedly, because the former had greater employment opportunities in other organizations). Nonetheless, just over half of the interviewers who resigned had worked for the Project at least two years. About half said they were resigning to continue their educations. Replacements were recruited through newspaper advertisements, which produced an abundance of candidates even though the pay rate at the start was C47 per month (plus C1.00 per night overnight allowance, with which the field personnel were supposed to compensate their village hosts). After the initial six fires, there were no additional terminations for cause in the survey group through 1975. To guide others interested in

conducting sample surveys in rural Africa, the Project staff produced a number of technical monographs.

Another important source of data on health conditions in the project area was the village health survey mentioned above. The village health survey was actually a mass screening of sample villages containing about 900 adults and children in each of the four project areas. Each villager receives a complete physical examination performed by a physician (to perform the physicals, a cadre of more than 25 physicians was recruited from the Medical School and the Ministry of Health). To assist the physicians, survey interviewers were trained to take blood pressures, to measure and weigh the villagers, and perform clerical tasks. In addition to the physical examination of the villagers, the dwellings were visited in order to rate crowding, sanitation, and the presence of animals. Over 95 per cent of the sampled villagers were examined in the first village health survey in the first survey (in 1972-73); completion rates were slightly lower in the second survey in 1975 when only one day was allowed to complete the survey in selected villages as a test to see whether the survey could be successfully done with a lower staff loading. Data from the survey was used to define major health problems, inform decisions on the structure of services in the maternal and child health and family planning services, to plan work for the health education assistants, to evaluate the impact of the health and family planning delivery services, and to develop a model for procedures to survey the health of local populations that could be applied elsewhere in Ghana and Africa. Details on survey procedures are described in a Project monograph prepared in 1975.

In the middle of 1974, the project staff reviewed the data they had been acquiring on births and deaths, two sets of information that were necessary to appraise the impact of project activities on population change in the area. Information on vital events had been collected through two independent systems (partly so that each could be used to appraise the accuracy of the other). In the annual censuses, the enumerators got information on births and deaths within the household during the past year. In addition, the Project had recruited "volunteer" registrars, mainly teachers and village headmen, who were paid a modest honorarium to record births and deaths in their villages.

Using a standard statistical technique for estimating the number of vital events missed by both systems, the Project staff were able to compare the performance of the enumerators with that of the village registrars (and get a reasonably good notion of how good their vital events data were). The results were not particularly encouraging. Of over 9,000 estimated births between March of 1971 and February of 1974, the census enumerators had recorded 60 per cent while the village registrars had recorded only 47 per cent. The performance of both groups on deaths was even worse. Over the same time period, just over three thousand deaths were estimated to have occurred; 48 per cent were disclosed by the census data, only 31 per cent by the vital events registrars. Analysis of the vital events data for single years reveals that the census enumerators appeared to be improving substantially in recording deaths and that their performance on recording births was mixed for the last two years but still markedly better than for the first year.

The single year performance data for the volunteer village vital events registrars was less encouraging. Registration of births over the three year period improved (by 11 per centage points to 57 per cent), but the estimated completeness of death registration actually declined (from 33 per cent in the first year to 29 per cent in the third). Clearly a change was in order. (Parenthetically, one should note that by combining the two sets of data a new set of data of higher quality can be obtained. Using data from the census as well as the registration system results in third year estimates of missed events of 16 per cent for births but 30 per cent for deaths. But this level of magnitude of missing data would make correlational or other analyses of factors affecting vital events extremely tenuous, since there was no way of allocating the missed events to the appropriate individuals in the data file.)

The performance of census interviewers can be improved (sometimes) by changes in selection, training, and supervision procedures. But the staff were agreed they had gone about as far in that direction as they could. So, they revised the vital events registration system by shifting from "volunteer" registrars to a staff of 18 full-time salaried registrars. In the 1975 annual report, the staff noted that there had been a 48 per cent increase in the number of recorded births and an 82 per cent increase in the number of recorded deaths. This change reversed the relative performance position of the enumerators and the registrars. It also improved the quality of the pooled data to the point that only 2 per cent of the births and 10 per cent of the deaths were estimated to have gone unrecorded.

They concluded: ". . .the quality of vital events data produced by the Danfa Project is among the highest that is available for a rural population sample in a developing country." Nonetheless, the quality of the vital events data for the early years would impair concise appraisal of the Project's effects.

Data were also being acquired from the Health Center operations and from the activities of the health education and family planning teams. From the Health Center came information on conditions presented and treatment received. Self-completed work records showed the activities performed by each in increments of tenths of an hour to permit costing human services. From the family planning team came information on acceptors and continuers. To facilitate data processing, key punch codes were assigned to precoded categories insofar as possible on records forms; patient encounter records from the Health Center and purpose of visit cards for the family planning team were printed on specially designed punch cards (see Figure 4). All data on individuals included their project identification numbers so that newly acquired information could be associated unambiguously with other data in the file to develop longitudinal record files.

Data Processing

The volume of data being produced by the Project exceeded the data processing capabilities of the computing facilities at Legon. The problem was threefold: the capacity of the existing computer was not adequate for the tasks posed by the Project, special programs for computation of the Project's data did not exist and, at varying times, there was a dire shortage of personnel. As a result, massive amounts of data from the baseline census and the first round of the six substantive longitudinal surveys were sent to UCLA for processing. The nightmare of having data producers and users located over 8,000 miles from their programmers and computing facility can hardly be overdrawn.

The hardware problem was partially resolved when the University acquired an IBM 1130 in 1973. Although of greater capacity than the predecessor computer, like the 1620 it had also been designed for physical science applications and utilized disks for off-line storage of data. Two large tape drive IBM 360's, compatible with the UCLA installation, were available in Accra at rates between C110 and C150 per hour. Both lacked time sharing capabilities; logging on at either installation tied up the computer for the duration of the job. Runs from the Project's big files could take as long as four hours. To increase the capacity of the University's new 1130, acquisition of a tape drive was recommended. Sharing the cost among prospective users proved impractical (largely because the University had strained its budget to acquire the new computer). Since the purchase/maintenance costs were only \$7,000 greater than rental over the life of the Project, AID agreed to purchase the tape drive and

arranged to present it to the University as a contribution toward enhancing their computational capabilities. The tape drive was delivered in February 1974, only a month beyond schedule. Behind its arrival lay the volume of correspondence required to obtain the AID agreement to purchase the tape drive and the necessary releases to enable purchase of the only unit available, one manufactured in Belgium by a subsidiary of the IBM World Trade Corporation, whose headquarters are in New York. Upon installation, the tape drive was discovered to be operating about 20 per cent below rated capacity. Months of effort and correspondence by the computing staff and local IBM representatives were required to locate the problem and convince regional representatives in the United Kingdom that the unit did, indeed, have a manufacturing defect. That defect was corrected and, in September 1974, the new 1130 with its new tape drive were operating at full capacity. The capacity was sufficient to process the routine requests of the staff. Larger or more complex runs required the use of the larger computer at UCLA.

In the computing world, new equipment often requires new programs or at least substantial modification of existing ones and programmers were sometimes in short supply in Accra. The staffing shortage was created in part by the resignation of senior members of the ISSER group. It was exacerbated by the resignation of the Project's only full-time programmer in late 1973 or April 1974 (depending upon the source consulted). After completing the period of obligated service created by his participant training, he accepted a post with a local organization. Using his accumulated leave in lieu of notice, he left immediately for further training

in England. For four months, the Project was without a full-time programmer until it managed to acquire the services of a Peace Corps volunteer who was extending his period of service in Ghana. It then was assigned a national service volunteer who had completed a diploma course in programming. During the summer of 1974, they were joined by a UCLA programmer who developed a set of programs for the 1130 computer. They called the set the Ghana Applied Statistical Package, or GHASP. Things were, so to speak, off and running.

This discussion of the broader dimensions of the data processing problems encountered by the Project glosses over major accomplishments. Data from the first village health survey and from the study of health related behaviors were ". . .processed and analysed entirely in Ghana, with no back-up, neither hardware, software, nor personnel required from California sources." In addition, by 1973, the Ghanaian programmers had progressed far enough with a program for updating the population register file so that when the back-up program arrived from UCLA the decision was made to debug and test the Ghanaian version; confirming the ability of the Ghanaian programmers. Nonetheless, in 1974 and 1975, UCLA processed roughly a thousand tables a year. Moreover, as tabulations requests grew more complex, toward the end of the project, the staff foresaw increasing rather than decreasing need for the greater computer capacity and programming skills available at the UCLA facility.

Development of Service Delivery Strategies

The middle period also saw fundamental changes in the organization of the health services delivery system emanating from the Health Center. Analysis of user data showed that roughly 70 per cent of the Center's patients lived within three miles (or roughly an hour's walk). This was far short of the comprehensive geographical coverage originally planned. To broaden the service network, three outlying villages were asked to provide sound, roofed buildings with sheltered waiting areas for use as satellite clinics (on non-clinic days the buildings were available for other uses). To staff the satellites, the Center staff was divided into two teams who alternated in serving the remote clinics. Service at the first satellite clinic (in Abokobi) was started in July 1972; the third clinic (in Berkuso) opened in April of the following year. Analysis of patient records for 1974 showed that the volume of patients being served had doubled and that just over half had visited one of the satellite clinics. Coverage of the target population was also greatly improved; eighty-five per cent of the Area I population lived within four miles of a clinic.

Fundamental changes were also made in the structure of the services provided at the Center. During the first 18 months of the Center's operation, maternal and child health clinics were offered on separate days no oftener than twice a week. When the records disclosed a predominance of women and children among the Center's patients, these clinics were combined and offered daily.

Analysis of the operational data for the Danfa Center also showed that waiting times for various services were excessive and that, in extreme instances, patients were being dosed with as many as five medicines simultaneously. Reorganization of the service structure and the Center's pharmacopea were undertaken on the basis of the data in hand.

Three other activities, the malaria prophylaxis campaign, the polio study, and the mass immunization program, are also particularly noteworthy since they constituted an effort to make a quantum change in the practice of preventive medicine in Area I.

Analysis of cause of death for children under six indicated that malaria ranked third nationally. Separate analysis of death certificates for the Danfa area showed similar effects of malaria. The prevalence of malaria as a problem for young children was confirmed by spleen rates obtained in the first round Village Health Survey. After weighing the options available to them and reviewing the success of similar programs in other African countries, the staff decided to attempt prophylaxis among school age and preschool children, whose lowered immunity to malaria makes them an important reservoir for transmission of the disease. The specific drugs used were chosen on the basis of their effectiveness and acceptability to the target population and distributed through the clinics, at school, and by a network of volunteer pill passers under the supervision of the Health Center sanitarian. A survey of mothers of small children indicated that mothers in areas served by the network of volunteers were substantially more likely to know about the program than mothers in the areas

served by the clinics. Examination of records for the first two years of the campaign showed that coverage of the preschool population had dropped markedly in the second year. This was attributed to the temporary absence of the sanitarian and the consequent inability to adequately monitor and motivate the volunteers. Cost analyses showed the cost per child to be well within the range of a national program. Significantly, these same analyses showed petrol to be the major supply item, amounting to almost 60 per cent of salaries.

Though polio was not then held to be a particularly important health problem in the tropics, the medical staff were coming to have their doubts. To confirm their suspicions, they asked school teachers in schools in all four Project areas to list the names of all the students in their classes who limped. This was followed by a "walk-by" examination in the schools, which disclosed a substantially larger number of limping children than enumerated by the teachers. Neurological examination and reports from parents led to diagnosis of poliomyelitis as the likely causes of lameness of just under two-thirds of the limping children. On the basis of returns from a national sample of schools, in which the results were weighted by the underenumeration ratio discovered in the schools in the Project area, the staff concluded that polio was endemic in Ghana at about the same level as had been termed epidemic in the United States prior to use of the Salk vaccine. When asked why polio had not been recognized as a problem earlier, one of the principals cited the predominance of curative medical practices and the fact that, since the disease often occurred among toddlers, the onset of lameness commonly went unnoticed. Results

of the polio study led to the decision to include polio vaccine among the antigens planned for the projected mass immunization campaign in Area I; they were also published in two articles in the British Medical Journal.

Armed with the results of the polio study, data from the patient records from the clinics, and the results of their own epidemiological examinations, the staff laid plans for a mass immunization campaign for Area I to be modeled after a description in the literature of a similar program in 1970 in Latin America. The trial had indicated that antigens could be safely administered in combined dosages in order to eliminate the need to recover the same subjects for subsequent inoculations. Protection of as many as ten diseases, differentiated by age of subject, was sought. After a pretest held outside the Project area to smooth procedures, the campaign was launched in Area I. Using 14 assembly points, spaced so that no person would have to walk more than a mile and a half to be immunized, teams from the Ministry of Health under the supervision of the Project's physicians were able to immunize 10,000 persons in three and a half days. Results of the campaign were described at a seminar for health practitioners in the English speaking countries of Africa and an expanded pilot program for Ghana was taken under consideration by representatives of the World Health Organization and the Ghanaian Ministry of Health.

The health education assistants were deployed to their service areas in July 1972 to provide educational services in maternal and child health, family planning, nutrition, and sanitation (with referrals to higher level

service programs as needed). Aside from the area served by the Danfa Center, each of the sub-areas containing from 5 to 18 villages was served by a single health education assistant under the guidance of a roving supervisor. Assignment to base villages was for the period of one year (relieved by two town visits a month). At the end of each year, in order to maintain a balanced input, the health education assistants were to be rotated to another sub-area on the basis of a Latin square design.¹

As you will recall, the health education assistants were comprised of four pairs of workers; two each specializing in maternal and child health, family planning, nutrition, and sanitation. Their training program had been designed to equip each with knowledge in all four substantive areas. In the field, their task would be to convey health information to the local population, motivate them to adopt promotive and preventive health practices and to participate in the family planning programs in their area, to simulate cooperative action in public health

1

A Latin square is a statistical technique for experimental designs employing a symmetrical matrix (equal numbers of rows and columns) so arranged that each treatment appears once and only once in every row and column. A three row-column example is:

| | | |
|---|---|---|
| A | B | C |
| B | C | A |
| C | A | B |

Under the modified design proposed for the rotation of the Health Education Assistants, the two teams of four persons each would have been rotated among four sub-areas each in Project Areas I and II over a four year period. Theoretically, subject to substitution effects and changes in individual performance such as might be observed with greater amounts of field experience, this would have equalized the inputs from the Health Education Assistants among sub-areas over time.

activities, and to strengthen the net of health and family planning services by making individual referrals to the appropriate service programs. To assist them in their work, the health education assistants were provided with a health profile, derived from data collected in a sample survey, for each of the villages in their sub-area.

At the end of the first year, the Ghanaian health education supervisors faulted the assistants for making inadequate use of the village profiles at their disposal and noted that their performance had been impaired by lack of specific objectives and inadequate supervision. Analysis of the work records for individual assistants revealed a tendency for each to spend disproportionate amounts of time in activities related to the area of their own greatest competence and a failure to balance their visits evenly among the villages assigned to them.

As in other realms of Project activities, this information on the service process was used to adjust schedules, supervision, and activities for subsequent years. But little could be done to make the physical and social conditions of the detached assignments more attractive. Because of the lack of substitute personnel and the time required for training replacements, the staff were particularly concerned about alienation and withdrawal among the health education assistants. While both were problems, they were not as serious as might have been anticipated. For the first 11 months, sick leave absences averaged out at about one per month per worker. At the end of two and a half years, half of the original team of health education assistants were still in

the field (and two, who had left because of pregnancy, had indicated their desire to return to the Project). A year later, three of the original eight were still in the field.

While the activities assigned to the Health Education Assistants appear elementary, it is fairer to remember that their assignment was a formidable one. Their task, put in other terms, was to encourage substantial numbers of people to abandon traditional and customary modes of behavior and adopt new patterns of life, on the advice of an outsider. Some areas of behavior required only the motivation of individuals; in other areas, group cooperation and sometimes the commitment of relatively scarce physical or monetary resources was required. For example, a survey of villages in Area I at the time the health education assistants went to the field revealed that only 12 of 53 villages had any pit privies in usable condition and that all but one village located on a stream drew their water from standing ponds. Only 7 villages had ponds with improved accesses (permitting water to be withdrawn without polluting the pond). Results in improving these basic sanitation conditions were a bit disappointing. By the end of 1973, 18 months after the field work had begun, 15 Area I villages had dug no new pit privies and the construction of 67 new privies in other villages represented only 59 per cent of the goal. Piped water had been brought to 13 villages by the Ga Local Council and the Water and Sewerage Corporation (in pipes laid in trenches dug by the villagers) and thirteen of the villages had developed improved accesses to their ponds. But that still left 19 villages drawing water from unimproved ponds. Looking back over their progress, the staff noted that

death during the cholera outbreak had impelled some villages to improve their environments but that similar developments in other villages had been impaired by material shortages and in others by the belief that these activities were the proper responsibility of the municipal council, not the villagers themselves.

The importance of the health education assistants as first-line deliverers of health care and information is illustrated by the Project's experience with guinea worm, an endoparasite in man that is acquired by ingesting water containing an infected minute freshwater crustacean called cyclops. About 12 months after ingesting the intermediate host, painful ulcers containing one or more small worms appear on the lower legs. The cycle is perpetuated when persons with guinea worm ulcers wade in ponds whereupon larvae are released to infect other cyclops. Since the outbreak of greatest debilitation occurs during the peak period of work in the fields and lasts over a month, the loss of manpower can have extremely adverse effects on the livelihood of an afflicted household.

Though guinea worm is endemic in West Africa, the Project's first encounter with large numbers of cases occurred in 1973, when a health education assistant reported several cases in one of his villages. The first cases in the area had apparently occurred only in the prior year. Among the reasons given for the emergence of guinea worm as a problem was the in-migration of people from Togo and the Volta Region where the worm is much more widespread. As it was, the magnitude of the problem might have escaped health personnel without the presence of the health education

assistants in the area. Due to the distance of most health facilities and the fact that movement exacerbates the pain of the patient, few present themselves for treatment. Korle Bu and the Danfa Center had each treated fewer than 5 cases in the prior year. Yet, in a study of 159 villages, the staff found 32 villages with active cases of guinea worm infection (affecting nearly 400 persons). Unfortunately, the outcome of the Project's encounter with guinea worm were not as happy as other experiences. Two publications on their guinea worm activities ensued: one describing its prevalence in the Project area and its personal and economic effects; the other describing the inefficacy of two promising regimens of drug therapy. While other treatments were being reviewed, including some traditional ones, and assistance from the Institute of Aquatic Biology was obtained, the best course of action seemed to lie in prevention of the infection: through health education among the villagers, by improving water sources, and by treating drinking water by passing it through a filter made of calico stretched over a homemade wooden hoop.

Empirical investigation of the impact of informal talks and discussions about family planning among women attending a non-Project health post indicated that there were about four times as many family planning acceptors on days when the talks were given as on days when they were not. Using a simple survey questionnaire, the staff were able to demonstrate that the talks led to marked reduction in belief that IUD's are harmful to the health of women and increases in knowledge about where family planning materials could be acquired (correct answer, every other Monday in a Project family planning clinic held in a court house about 50 yards

from the health post where the talks were given).

In another area, the staff realized that the activities of the Project could be materially advanced with the support and cooperation of indigenous midwives. An enumeration of them in Areas I-III was carried out over eight months under the direction of the Project's consultant in obstetrics and gynecology from the Medical School. Even to "well-informed" Ghanaians, the results were startling. In the three Project areas, there were 263 persons practicing as birth attendants. Their average age was 62, most had learned their craft from a parent and most were illiterate; but nearly half were male. In view of the sex distribution, the more inclusive designation, "traditional birth attendants," was adopted. The survey also revealed that, at best, their practice could be considered an avocation. For though most received a gift or monetary gratuity for their service, on the average they had delivered only 7 infants in the preceding year.

On the basis of information they had gathered during the survey, the staff developed a curriculum for enhancing the skill of the TBA's. The outline was a familiar one, find out what the TBA's actually did through group discussion and then demonstrate, describe, and discuss modern approaches to obstetrics that could be applied by the TBA's and attempt to induce their adoption. In the main, the staff sought to improve the ability of the TBA's to spot difficult presentation in advance of labor and to get those difficult cases referred to the Danfa Clinic and to improve antiseptic practices during delivery and in severing the umbilical.

The Area I TBA's were trained in four cohorts over the period from 1973 through early 1975 (in view of the research design, similar training of birth attendants in other areas was not planned). Meetings were held fortnightly with each meeting devoted to a single obstetrical topic. On the whole, attendance was high but retention of the materials presented was low. And the logistics were difficult. High attendance was achieved by having a public health nurse visit each TBA a couple of days in advance of the meeting to remind them of the next session; and by having a driver go to the village areas to pick-up the TBA's and make another trip to take them back home. On completion of their training, the TBA's were presented with the village equivalent of an obstetrician's bag: a locally made white painted wooden box containing the essentials for effecting a relatively hygienic delivery (e.g., a packet of blades for cutting the cord, ligatures for tying it off, sterile dressing materials and solutions as well as a bottle of saline solution for cleansing the eyes of the newborn). In addition, the kits also contained samples of vaginal foam, an IUD, and condoms. Though it was virtually impossible to monitor the performance of the TBA's in actual deliveries, the staff were impressed by the fact that the TBA's were requesting replacement sterile gauze umbilical dressings in almost exact ratio to the number of deliveries performed. One informant asserted that the mere adoption of sterile treatment of the umbilical would have been sufficient pay-off of the costs and efforts involved in running the TBA seminars. But part of the success achieved was a result of the close supervision given the TBA's; and, in that vein, the staff were not sanguine about the possibility of transferring this responsibility to the health education assistants.

The family planning team began field operations in Area I during July 1972 and expended its operations into Areas II and III; initiating service in the latter in September of the same year. Clinics were established in three villages in each area. Altogether, some 70 per cent of the target population lived within a three mile radius of a clinic site (which had been chosen for their accessibility). But once again, the operations research showed the effective radius of the clinics to be much more circumscribed than anticipated. In each area, a disproportionate share of the acceptors came from the village containing the static clinic, even though the majority of the population lived in other villages.

In order to reach larger numbers of potential clients, the family planning team adopted a schedule for extended service based on a stop-off in one of a series of selected villages each day enroute from Korle Bu to the static clinic scheduled for that day. Together with the population living in the villages containing the static clinics, the villages visited enroute would contain just over 70 per cent of the population in each of the three areas, slightly below the 80 per cent coverage sought as a target for the project.

Like the satellite health clinics, increasing the mobility of the family planning team proved effective. In slightly over a year and a half after initiation of the extended family planning service concept, over three-fifths of the family planning acceptors were drawn from one of

the villages served enroute to a static clinic. Acceptor rates through the end of 1975 partially supported the rankings expected under the initial hypotheses (see Table 7).

TABLE 7
 PERCENTAGE OF FERTILE FEMALES AND COUPLES ACCEPTING
 FAMILY PLANNING: JULY 1972 THROUGH DECEMBER 1975

| | Females (15-44) | Couples |
|-------------------|--------------------|---------|
| Area I | 18 | 26 |
| Area II | 14 | 27 |
| Area III | 5 | 12 |
| All Project Areas | 12 | 20 |

On the basis of a sample survey, the staff concluded that continuation rates for women were on a par with the experience of successful programs in other developing countries, but that men in the sample (N=100) were continuing to use contraceptives at a higher rate than the women. Couples with male acceptors also seemed to practicing contraception more effectively. The 12 month pregnancy rate for women acceptors was 34 per 100; only 20 per 100 wives of male acceptors became pregnant in the same interval.

Looking back, it appears that two common misconceptions about promoting use of contraceptives had been dispelled. Rural women would attend

public discussions about birth control and receive contraceptive materials in public; indeed, some of those affiliated with the Project were initially concerned because they even brought their children with them. Secondly, contrary to conventional wisdom regarding the interest of rural Ghanaian males in fathering large families, their actual interest in contraception appears to have been initially underestimated.

To some extent, staff turnover on the family planning team was less of a problem than in other units of the Project. The original team leader had remained continuously. In fact, during her annual leave in 1973, she was replaced by nurses from the Ghana National Family Planning Program who were seconded to the Project in order to gain first-hand experience about providing service in rural areas.

An analysis of 1974 operating costs of the Health Center and the satellite clinics (Table 8) and for the various health services being provided in Area I (Table 9), presented at the 1975 annual review meeting, concluded that "the health care system in Area I is operating at a cost well within the range of present national costs, most probably on the low side of the range."

TABLE 8
COSTS OF OPERATING THE HEALTH CENTER AND SATELLITES: 1974

| | |
|--|-----------------------|
| Staff | 32,503 |
| Drugs/Medical Supplies | 32,676 |
| Non-Medical Supplies and Maintenance | 4,592 |
| Transport | 4,669 |
| | <u>C74,440</u> |
| <u>Cost Per Patient Visit:</u> | 74,440/36,955 = C2.01 |
| <u>Cost Per Person in Area I:</u> | 74,440/15,931 = C4.67 |
| <u>Cost Per Accessible Person In Area I (85%):</u> | C5.50 |
| <u>Cost Per Accessible Person in Area I (Augmented):</u> | C3.97 |

TABLE 9
PER CAPITA COST OF COMPREHENSIVE HEALTH SERVICE IN AREA I: 1975

| | <u>Total Population</u> | <u>Accessible Population</u> |
|------------------------------|-------------------------|------------------------------|
| Health Center and Satellites | C 4.67 | C 5.50 |
| Family Planning | 0.46 | 0.66 |
| Health Education | 0.62 | 0.94 |
| Antimalaria Campaign | 0.10 | 0.11 |
| Immunization Campaign | 0.21 | 0.23 |
| Miscellaneous (estimated) | 0.10 | 0.12 |
| | <u>C 6.16</u> | <u>C 7.56</u> |

Other Aspects of Coping

In closing this section, it might be well to consider briefly four aspects of coping behavior undertaken by the project: the purchase and transportation of commodities, the conduct of annual review meetings, allocation of authorship among the Project's publications, and the progress experienced in trying to overcome one aspect of the space problem. Consideration of the latter two topics includes information on events that occurred through 1977. Nonetheless, their impact on the unfolding of the Project make them relevant here.

There is no evidence in the planning documents that the feasibility and design teams were even remotely aware of the volume and kinds of commodity traffic the Project would engender. Between 1972 and 1975 there were 21 air freight shipments and 13 shipments by sea; in addition, there were 504 air and 137 surface pouch shipments. Exclusive of vehicles and other large commodities, the total weight of these shipments was in excess of 14 tons. The itemized list of the goods shipped hints at the difficulties being encountered in adapting the Project to the local setting (Table 10). Perhaps to forestall criticism, the drafter of the 1974 revision of the PROP included a page-long justification of use of vehicles by the Project.

TABLE 10

COMMODITIES PURCHASED UNDER UCLA CONTRACT:
 JANUARY 1972 THROUGH DECEMBER 1975

1972

| | |
|-----------------------|---------------------|
| 7 vehicles | 12 air conditioners |
| 8 automobile tires | 4 transformers |
| 6 bicycles | 1 gas range |
| 1 electric typewriter | 1 refrigerator |
| 1 electric calculator | 1 freezer |
| 1 manual calculator | 1 washing machine |

1973

| | |
|--------------------------|---------------------------|
| 4 vehicles | 1 otoscope-ophthalmoscope |
| 5 electronic calculators | 1 cassette tape recorder |
| 1 electric typewriter | 7 air conditioners |
| 3 manual typewriters | 3 washing machines |

1974

| | |
|-----------------------|--------------------------|
| 7 vehicles | 1 slide projector |
| 1 electric typewriter | 1 cassette tape recorder |
| 1 manual typewriter | 1 refrigerator |
| 1 movie camera | 1 freezer |

1975

| | |
|----------------------------|--|
| 6 vehicles | 100 reams mimeograph paper |
| 11 batteries | 15 boxes legal file folders |
| 4 tires | 2 electric stoves |
| 25 condensers | 1 ice chest |
| 3 compressors | automobile parts |
| 100 Pregnosticon tests | air conditioner parts |
| 33 computer tapes | refrigerator parts |
| 50 cartons print-out paper | burglar alarm system |
| 1 Sun Gun case | miscellaneous office supplies & equipment |

Starting in 1970, review meetings were held annually. All except the third, which was held at UCLA, were held in Accra under the auspices of the Medical School. The fifth and, to a lesser extent, the sixth meetings were marked departures from the others in that they were convened as small-scale scientific meetings to present early results of the medical and operational research being undertaken. Following custom, the proceedings of both meetings were polished and published for broader distribution. The format of the fifth and sixth annual review meetings provided the staff with an opportunity to prepare concise summaries of their current work and share that information with interested parties either directly or through the published proceedings. At the fifth meeting, there were 148 registered participants including 6 from Washington and 12 from other international agencies. Significantly, though published in what was thought to be an abundant supply, the 300 page volume of proceedings from that meeting was soon out of print. On the other hand, the public nature of the meetings also meant that less prominence was given to discussion of emergent or persistent problems than had been the case in earlier meetings and annual reports.

While the publications and papers emanating from the Project provided a channel for the staff to share their experiences and findings with colleagues in Ghana and abroad, they could also have been a vehicle for academic imperialism, particularly because, in the long run, publications are likely to be of greater moment in the careers of the UCLA staff than for the Ghanaians (whose careers would be more greatly influenced by local events and their reputations within Ghana). Through the end of 1976,

the staff had published 33 papers or monographs (not counting those published in the proceedings of the fifth and sixth annual review meetings). In the early years, a parochial reputation was established by publishing in regional or national journals. In later years, publication was more often in forms that would have broader audiences, thus helping to establish an international reputation.

For the charge of academic imperialism to be made to stick, there should be some evidence that one group was monopolizing and exploiting the data and information being produced by the Project. However, a review of the authorship of over 80 papers (published or in preparation) reveals a pattern of sharing rather than monopolization. The Ghanaians held a slight numerical edge in sole authorships, the UCLA team had the advantage in senior authorships. But, in jointly authored papers, second or junior authorship was almost invariably shared with one or more members of the other nationality group. Closer analysis of the authorship data is also informative. Of the 81 publications underway through 1976, seven staff members were associated with more than 10. Three were Ghanaians, four Americans. Within authorship ranks (senior, second, or junior), deviation from equal shares is greatest among the senior authors, where the UCLA group held a 5 percentage point advantage. Since work assignments also tend to carry with them unequal access to group resources and opportunities to utilize them, one might expect the co-directors to have been the leading authors. But the authorship data show the UCLA epidemiologist to have been the senior author of 50 per cent more publications than either of the co-directors (who were tied for second place in senior authorship). Overall, given the range of work assignments on the Project

and individual differences in the inclination to publish, it would have been difficult to have achieved a closer balance in authorship between the two groups.

Finally, for those who tend to think that limitations in physical resources are easily worked around, it may be well to reflect briefly on the space problem. Throughout the project, the UCLA team continued to work out of offices in their homes. Adequate space for the research group became available at ISSER only in the last years of the project when the building program at ISSER had been restarted and completed. For most of the duration of the project, lacking a safe storage area for Project material, the UCLA chief of party used portions of his house for storage of Project materials. In fact, motor vehicle parts and supplies were arranged around the perimeter of his living room. One of the moments of levity in the 1977 annual review meeting was an announcement by the new Acting Dean of the Medical School (Dr. H. H. Phillips) that a safe storage area with a watchman and a door secured by crossed steel bars and five padlocks had been obtained and Project supplies moved to it. Earlier, the chief of party had vowed to withhold dinner invitations to the Dean until the Medical School provided the promised storage.

PART VI

The External Evaluation: March 1975

An external evaluation team met in Accra in mid-March, 1975. All six members had personal familiarity with health and family planning delivery systems in developing countries through previous experience or current assignment. Formally, the team was assembled by the American Public Health Association under a basic ordering agreement it held with USAID/W. Of the four men recruited in the United States, three were physicians with experience in epidemiology, maternal and child health, and family planning. One of these physicians had been chief of the evaluation branch of AID's Office of Population. Another was currently epidemiologist in the Office of Population's research division. The fourth member of the team recruited in the United States was an economist with interests in costing health care delivery services. The remaining two members were a Ghanaian doctoral member of the ISSER staff and a member of the AID mission in Nigeria. None of the six was among those nominated for the team by the UCLA co-director.

Members of the team originating in the United States assembled at AID/W for briefing on March 7, 1975. They arrived in Accra on the 14th and were joined by the ISSER member the next day for briefing at the Mission in Accra. The member from the Nigerian Mission had been briefed earlier in the month; he joined the team on the 18th. The first four days in Accra were taken up by briefings, orientation, and the Project's two-day annual review meeting. Their 76 page draft evaluation report was

completed on the 27th. Aside from time spent in preparation (reading progress reports and other project documents) four members of the team were together for exactly 21 days, five for 13 days, and all six for only 10 days. Their expression of gratitude to the Project staff for guiding and assisting them in making their evaluation was candidly expressed as was their appreciation for the candor of the staff in discussing the project's problems.

Despite some suspicion that the composition of the team would preclude an objective appraisal, the team's overall evaluation was quite favorable:

Although time was not sufficient for the examination and thoughtful analysis of many data in detail, the Team believes that it has been able to arrive at valid impressions and conclusions about the significant components of the Danfa Project. We believe that the Project has served Ghana well, that the dedication and skill of its personnel are of a very high order, and that it should continue to be supported. We believe, however, that certain of its more "academic" research interests and activities should be reduced and replaced by operational research of a more immediately practical nature. We have not been able to recommend specific details of this changeover, but do recommend that Project staff and USAID personnel devote the time and effort that are required to make the project even more responsive to Ghana's needs in the improvement and extension of health and family planning services to its rural people.

With one exception, centering on the Project's "'academic' research interests and activities," the recommendations of the evaluation team were cast in the safe and familiar mold of "do more." But, as the following full quotation from the fifth section of their final report

makes clear, that exception had sweeping implications for the future
structure of the Project.¹

¹ There was, however, substantial disagreement between the Project's operations researcher and the team economist over the issue of how to allocate capital and training costs. The team economist argued that these costs were properly part of the Project's operating costs. The Project's operations researcher held that, since the "life" of these investments could not readily be estimated, a realistic amortization schedule for these costs would be virtually impossible to construct. His preference was to treat training and capital investment costs (such as those related to constructing and equipping the Center) as "opportunity" costs and show them separately from the costs of providing family planning and health services.

OVERALL ASSESSMENT AND RECOMMENDATIONS

1. The Danfa Project has produced, and should continue to produce, and substantial short-term and long-term benefits to Ghana for the development of more effective health and family planning services to its rural population. The Evaluation Team strongly recommends continuation of the project to its proposed termination in March 1979, but with modification in its objectives and activities.
2. The objectives of the project and their order of priority should be changed to the following, and project activities should clearly reflect these objectives:
 - a. Training
 - b. Operational Research in Health and Family Planning
 - c. Epidemiological Investigations

The omission of "Test of Basic Hypotheses" as a Project objective reflects Evaluation Team judgement that, as a result of a deliberate experiment, it is unlikely that fertility changes can be demonstrated to result from the four service modalities assigned to the four Project Areas. Furthermore, the constraints imposed by the experimental design interfere with and inhibit the full implementation of training, operations research and epidemiological investigations, and the efforts expended in extensive and expensive surveys and analyses can be better spent in more immediately productive activities. Finally, all of the urgent studies in family planning services delivery can be subsumed under "Operational Research".

3. Project activities which can best achieve the objectives given above are broadly believed as follows:
 - a. De-emphasize the new collection of demographic, vital records, and survey data and emphasize the thoughtful evaluation and analysis of already available data.
 - b. Continue the assessment of clinical, preventive, health education, and family planning service trials, including study of their relative costs, and vigorously explore and assess additional service innovations.

- c. Disseminate the findings of operational and epidemiological investigations much more rapidly to interested persons and organizations, perhaps by such means as a monthly or quarterly bulletin.
 - d. Explore ways in which the various survey instruments in use, and the experience gained with them, can be adapted for the use of health and family planning services in other parts of Ghana.
 - e. Expand the study of the epidemiological characteristics of significant health problems in Ghana, and the investigation of the effectiveness of disease preventive materials and procedures.
 - f. Expand the use of the Danfa Project as a training field site for medical students, nursing students, and paramedical personnel of all types.
 - g. Produce a new schedule of projected activities and expected products.
4. Current project support by AID, Government of Ghana, UCLA, and GMS should continue, with the following changes:
- a. There should be increased involvement of senior Ghanaian staff in the initiation and direction of project activities. This can occur only if additional senior Ghanaian staff can be made available to the project.
 - b. Consider the feasibility of increasing the number of Ghanaians to be sent to the United States for appropriate types of training.
 - c. Explore reductions in U. S.-based personnel and activities.
5. In light of all the above, UCLA, GMS and USAID/A should reconsider the overall balance of field activities in Ghana and terminal analyses in Ghana and at UCLA. With a shift to more rapidly productive operational research, the present plan to conduct terminal analyses during all of the FY 1978 and FY 1979 could be reduced to perhaps one year, and the year saved replaced by equivalent extension of field projects.

The recommendation to abandon the experimental design and the test of the family planning delivery hypotheses was based on several factors. First, the value of the test as a guide for the Ghana National Family Planning Program had been lost. In advance of the final data, the decision had been made to proceed with an integrated program, merging family planning and health delivery services. But, the evaluators also had reservations about the broader value of the test. They noted, for example, that changes in fertility among the test areas were unlikely to be observed during the life of the Project (this possibility had not escaped the design and feasibility teams, who suggested that data on the acceptance and continued use of contraceptive materials would be adequate proxy measures). They also argued that the four areas were not comparable with regard to many factors that would be likely to have effects on fertility behavior (among those they enumerated were: number of additional children desired, occupation, religion, inheritance patterns, distance from Accra and proximity to roadways and other avenues of communication, and levels of infant mortality. Further, they noted that the vital events data, especially those collected through the use of "volunteer" registrars during the early years of the project ". . .lack the accuracy needed for comparisons, either among areas at one point in time or for the same area over several points in time." In addition, they noted that the mobility of the population in the Project areas, in particular the high rates of in-migration, resulted in a constantly shifting target population, making it difficult to attribute changes in behavior to Project activities. Further, they felt that the population bases in the Project areas (and,

a fortiori, in the surveys based on samples of the total population) were too small to detect changes in behavior beyond those that could be attributed to sampling errors.¹ They also questioned the ability of advanced analytic techniques to provide satisfactory tests of the hypotheses given the lack of some baseline data (e.g., on infant mortality) and the difficulty in quantifying other characteristics (e.g., patterns of inheritance). Finally, they felt that the data necessary to estimate contraceptive acceptance and continuation models for the entire population in each area could not be derived from the sample surveys, thus depriving the Project of an output measure to be used in cost-benefit analysis. They also foresaw future analytical problems and expressed a doubt as to whether sufficient analytic expertise, Ghanaian or foreign, could be found to adequately mine the data that had been gathered.² And, as a capstone, the evaluators pointed out that, while the Project had gone to great lengths to maintain the equivalence of family planning inputs in Areas I and II, that the Project had inadvertantly destroyed that balance and vitiated the experimental design when the Area I traditional birth attendants were, in effect, converted to family planning outreach workers by the inclusion of sample contraceptive materials in their graduation kits.

1

The planned strategy of restricting analyses to persons who had been present in a given area for the lifetime of the Project would, of course, further constrict the size of the data base.

2

Unlike other points made by the evaluation team, this last point is a prediction about the future and is, therefore, problematical. Nonetheless, it was one that was still of concern to the staff during the present writer's visit to Ghana in early 1977.

In sum, the evaluation team had strongly recommended continuation of the Project, but only after drastic surgery to eliminate the experimental design and the test of the basic hypotheses.¹

¹ The argument could certainly be made that experiences similar to those encountered by the Danfa Project may partially account for the paucity of experimental designs in social science research.

PART VII

A New PROP: December 31, 1975

Following the 1975 external evaluation, a new program proposal, responsive to many of the evaluation team's recommendations, was prepared during the last half of 1975 by a joint planning and design team consisting of members of the UCLA team, staff from the Department of Community Health and the Medical School, and members of the AID Mission. Significantly, the signature date for the final draft version of the document that was to guide the project in its closing months was December 31, 1975, New Year's Eve.

The new PROP details major revisions in project funding and activities in Log Frame terms. Funding in prior years had been entirely through Title X, population, monies controlled by the Office of Population. Because of the increased emphasis in the Project on health activities, AID's Africa Bureau was persuaded to share in the funding for the final years of the project. Half of the funds for fiscal year 1976 and the transitional quarter were to come from Title X monies, half from the health funds of the Africa Bureau. Africa Bureau commitments were 75 per cent for FY 77 and 85 per cent for FY 78. Life of project obligations were raised to \$5.9 million (in addition to \$467,000 of PL 480 Title I local funds). And the tight experimental design was abandoned in favor of field activities providing a broader mix of health and family planning services and greater exploration in the use of locally recruited paraprofessionals as first-line providers of health care (Figure 4).

| | AREA I Danfa | AREA II Amesesan | AREA III Obon |
|------------------------------------|---|----------------------------------|-------------------------------------|
| Primary Health Care Sources | Health Center | Health Post (Local Authority) | Health Post (Ministry of Health) |
| Sources of Secondary Health Care | Satellite Clinics (Berakusa, Obokobi, Oyibi) | | |
| | | Health Education Assistants | |
| | | Traditional Birth Attendants | |
| | Community Health Aides | | Community Health Aides |
| Sources of Contraceptive Materials | | Staff at Primary Care Unit | |
| | Staff at Satellite Clinics | | |
| | | Health Education Assistants | |
| | | Traditional Birth Attendants | |
| | | Commercial Outlets | |
| | Community Health Aides | | Community Health Aides |
| | | Village Volunteer | |

FIGURE 4

PHASE II SERVICE COMPONENTS

DANFA RURAL HEALTH AND FAMILY PLANNING PROJECT

The "new directions" proposed, other than opening the door to broader explorations of alternative delivery structures, were not many but they were substantial. Perhaps the most important was the movement toward the development of indigenous first line health service personnel represented by the decision to recruit and train village health workers (titled "community health aides" in the revised PROP). This development, echoing those occurring in other LDCs, required a major departure from the recruitment and training standards common in the medical profession. Here are the criteria for the selection of village health workers, taken from a later Project publication:

1. He should be a volunteer.
2. He should have a stable occupation in the village.
3. He should live in that village.
4. He could be of any sex.
5. His age should preferably be between 25-45 years. Age should, however, be no barrier to a willing and well motivated volunteer.
6. He should preferably be literate, though literacy and age should not be any handicap to a volunteer who is well qualified in all other respects.
7. The volunteer should be acceptable to the majority of the community.

Another major departure from the original design was the decision to explore ways of incorporating traditional birth attendants into the health delivery system through training programs for the TBA's in Areas II and III. The health education assistants were also reassigned to include Area III in their service net. And, finally, options for the broader distribution of contraceptive materials were opened through a decision to develop networks of commercial outlets for condoms and

vaginal foam through petty traders and through the use of village volunteers as distribution agents.

Abandonment of the experimental design raises the question of what had been learned through that design that could not have been learned in other ways, such as sequential cross-sectional surveys or through observation. Certainly, the precision of the experimental design was lost (out, according to the evaluation team, that had been destroyed by defective implementation of the design). Perhaps the largest lesson was in the difficulties of managing an experimental design over any protracted period with human populations. Then, there was the recurring lesson in the difficulties inherent in managing and analyzing even relatively modest longitudinal data files. But, in their success in handling these files, the staff had been able to isolate the principal components of the population changes that were being disclosed in the annual censuses. These could not have been spotted in a cross-sectional design. The outcome of the end-of-project data analyses may reveal other important benefits of the 4-cell experimental design. But the costs had been considerable, not only in the strict sense of cleaving to the design and maintaining the appropriate variations in the experimental treatments, but also in countering appeals and personal inclinations to transgress that design (as when the Project's intervention in the cholera epidemic was confined to Area I or in the realization that a great many people in Area IV had been put to considerable inconvenience through repeated measurement without realizing any direct benefit). Moving away from the

requirements of the design also permitted a wider range of innovation in the structuring of service programs. But, as a consequence, the staff might have difficulty isolating the relative effectiveness of the modifications they were making in delivery of services. Without a first order answer to the fundamental question posed by the basic hypotheses, those interested in the relative merits of various structures of family planning delivery systems would be thrown back on their own preferences and the information provided by less rigorous designs. And, there were also costs in the form of personal frustrations involved in seeing the results of a long-term dedication to the use of one of the most rigorous research designs overridden.

EPILOGUE

To continue the discussion of the further evolution of the Danfa Project would draw us further into the night (and further deplete the world's supply of trees, from which the pulp for such as this is made). When we left Accra, the Project staff was well into implementation of the design changes of the latest PROP.

Among Americans with whom we talked, the problems of a "gradual transfer of responsibility" seemed a critical mission; for some at times overshadowing the generally expressed sense of mutual cooperation. And, too, there was the nagging problem of the production of the operations manuals that would codify the "Danfa experience" for the benefit of the rest of the health service of Ghana and similar services in other countries. On the Ghanaian side, one sensed a perennial optimism. Staffers were pursuing their assignments energetically and thoughtfully. The Ministry of Health had budgeted C60,000 for expansion of the hostel accommodations at the Health Center. Danfa had done well, much had been learned from the Project (despite the difficulties encountered), and some lifetime professional relationships had been kindled. Yet, there was an expression of sadness. Danfa, after all, was not the only task before the Department of Community Medicine, even less so for the Medical School. The Ministry of Health, with the assistance of a group sponsored by the U. S. Agency for International Development, was engaged in a health manpower resources planning exercise. But it too, had other problems on its agenda.

In this light, the remarks of the two closing speakers at the 1976 annual review meeting may have been prophetic. Dr. M. A. Badoo, the Director of Medical Services at the Ministry of Health, observed:

The Ministry of Health has emphasized time and again the policy of bringing health services to the people especially the 70 percent of the population who now live in rural areas. In pursuance of this policy, priority has been given to the development of basic health services, using as infrastructure the building of health centers and health posts so that primary health care can be given to the people at minimum cost.

Service, however, cannot be given without, at the same time, undertaking research activities and training so that the triad of research, service and training form component parts of a major whole.

Research enables us to determine the available resources - manpower, financial and physical - and also the operation which will make it possible to give optimum service at minimum cost.

Training enables us to develop our manpower resources to meet the needs of the health services and with trained manpower, backed by finances and physical resources in the form of buildings, equipment and drugs, we are able to provide the services for the nation.

From a less lofty position, the preceding speaker, the Chair of the Department of Community Health had noted:

As one looks at the health scene in Ghana and other developing countries, the gap between resources and the health problems especially in the rural sector seems unsurmountable at the present state of economic and social development.

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