

! The Population Council

9320632/53

PD-AAN-715

ISN-33004

XD-AAN-715-A

Contract No.	DPE-0632-C-00-2012-00
Project No.	932-0632
Project Title:	An Integrated Program of Operations Research in Bangladesh
Period Covered:	1 May 1983 - 31 October 1983

PROGRESS REPORT OF THE INTEGRATED PROGRAM OF OPERATIONS RESEARCH
(CONTRACT NUMBER DPE-0632-C-00-2012-00)

I. INTRODUCTION

The Population Council has been engaged in a project at the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) aimed at developing an integrated program of operations research in family planning and health services. This is to be achieved by providing scientific direction of key studies and by coordinating staff training and extending technical assistance to operations research projects.

The first progress report reported on project activities by geographic area. The operations research projects of the ICDDR,B derived from the successful implementation of the MCH-FP Experiment in Matlab. The fertility impact of this project has been analyzed and the role of the service delivery interventions explained. In response to this research the Government of Bangladesh requested a joint project with the ICDDR,B to test the transferability of the Matlab service system to the Ministry of Health known as the "MCH-FP Extension Project." A series of baseline studies of rural households was launched to determine background characteristics of couples, their exposure to health and family planning services, and patterns of service utilization. The first of these studies was fielded in an area contiguous to Matlab, known as Munshigonj Subdivision. By examining the characteristics of the population, the nature and extent of health and family planning services, patterns of service utilization, health and family planning practices and other issues, the Munshigonj data permit interpretation of the socio demographic context of

the Matlab success. These studies, together with longitudinal operations and impact assessment systems are intended to address four basic questions:

1. What are the factors responsible for the relatively high contraceptive prevalence rates in Matlab achieved by ICDDR,B field experiments?
2. To what extent are those factors replicable by the national family planning program of the Government of Bangladesh?
3. What are the mechanisms that are necessary to effect replication of those factors?
4. What are the demographic consequences of replication?

Answering these questions requires an interdisciplinary team of investigators and a coordinated research strategy. The Integrated Program of Operations Research (IPOR) addresses this need.

II. AN OVERVIEW OF THE FIRST 12 MONTHS

In addition to its long-term work in Matlab thana, which has been described in detail in several published articles, the ICDDR,B has received funding from several donors for family planning and MCH activities in other areas of Bangladesh. In particular, the German Technical Assistance Agency (GTZ) provided funds for a multipurpose survey in a six-thana area contiguous to Matlab, known as the Munshigonj

Subdivision. In addition, UNFPA, USAID/Dhaka, and other donors have contributed support for family planning and MCH activities in Pabna and Jessore districts, which together are known as the "Extension Project." The Extension Project originated from the Government of Bangladesh's specific interest in testing replicability of the Matlab experience in other parts of the country. Thus there are three administratively distinct and separately funded family planning-MCH activities in which the ICDDR,B is involved with multiple donor support. These three activities are linked into a single research framework by the Council's Integrated Program of Operations Research. That is, the three separate activities are being systematically examined through a unifying conceptual framework, comparative data collection and analysis procedures, and an integrated program of operations research, interventions, and impact assessment.

The first progress report describes the project activities in each project area:

1. Matlab

In 1980 the ICDDR,B published a report on the Matlab experiment which notes the "improved management" of the project in comparison to an earlier, less successful, experiment. Authors stress the importance of establishing "a strong supervisory system" (see Bhatia et al., 1980). While supervision and management are undoubtedly important, the specific elements of that system were not well documented and systems for their broader utilization were not developed. A priority of IPOR was to document the field design of Matlab management information system (MIS), refine and simplify basic procedures, and

develop computer routines for the broader utilization of Matlab data. This Matlab MIS system was fully developed in the first year of IPOR and baseline analysis of data was begun.

2. Munshigonj

The broader relevance of published work on the impact of the Matlab study has been questioned owing to the hypothesized "contamination" of Matlab by two decades of demographic surveillance and special health service inputs. If such contamination indeed exists demographic dynamics and contraceptive knowledge attitudes and behaviour in Matlab comparison areas would differ from the prevailing patterns in Munshigonj. To provide for this comparative analysis a sample was designed, survey instruments developed, and data were collected, edited and archived in the first year of IPOR.

3. Extension

The principal achievement of the Extension Project in the first year of IPOR was the development of the Sample Registration System (SRS) in Aboinagar and Sirajgonj and contiguous areas of two neighboring thanas. This system permits simultaneous longitudinal monitoring of demographic dynamics and service operations. Also baseline socio demographic and service utilization data were compiled.

In the first project year two types of committees were established for continuous exchange of information and ideas: a "National Coordination Committee" (NCC) and Project Implementation Committees (PIC). The NCC is comprised of senior officials of the Ministry of health and Population Control (MOHPC), the Planning Commission, and the various population research and training centres in Bangladesh.

PICs are established in project areas to foster service implementation, joint interpretation of results, and reporting to the NCC.

III. ACTIVITIES OVER THE MAY 1 - OCTOBER 31, 1983 PERIOD

1. In Service Training

(a) Data management

A common barrier to the timely execution of research on large scale data sets in Bangladesh is the practice of processing large batches of data through each stage of data development without a unified system of computerized edits for each stage. Delays ensue and editing is incomplete. To avert this pitfall in OR the project has developed a team of specialists in modern data management techniques. The work of this team is linked to field operations so that field staff are receiving regular computer editing reports while data collection is in progress. Work on training this data management team continued in the reporting period.

All aspects of field training and data management for the Extension Project Sample Registration System were finalized within the reporting period. By September, 1983 it was possible to print a field manual on the computer for each SRS interviewer in which each household's demographic history is recorded together with contact between respondents and MOHPC service workers. This development required extensive training and orientation of field staff. A new module for assessing the quantity of services was developed, tested, and

fielded. This is linked to the SRS so that operational data can be incorporated in demographic research.

(b) Training in software development and utilization

Work progressed on the preparation of analytical and data management software for limited capacity computers. In the first 12 months of the project an integrated micro-computer compatible system of programs was written, tested, refined and disseminated to perform regression, correlation, multiple classification analysis, factor analysis, discriminant analysis, logistic regression, life table analysis and birth history analysis. In the reporting period the statistical staff of the ICDDR,B were given practical exercises in the use of these programs. Two reports emanated from this training programme (Chowdhury et al., 1983 and Phillips et al., 1983).

(c) A Field Team for OR

The research projects coordinated under IPOR collect information through a variety of mechanisms:

- i. Service statistics based on records.
- ii. Survey data based on interviews of villagers.
- iii. Panel data from the SRS.
- iv. Interview data based on indepth discussions with MOHPC field workers.
- v. Participant observation data.

In the first project year we concentrated on in service training for items i - iii. The training of the various operations research staff continued over the May - October 1983 period. In this period a team

of "functional analysis" workers were oriented to observation techniques for monitoring organizational change and conducting special evaluative studies. Three reports were prepared on the work of this OR team (Simmons, et al., 1983; Akbar, et al., 1983a and 1983b) all of which were addressed to baseline assessments of the functioning of service units. This team is currently evaluating training programs and other Extension Project interventions.

Project computer counterpart staff began to work independently on systems development with occasional guidance from Mr. Leon. A systems document has been prepared, in part to demonstrate documentation standards, but mainly to familiarize computer staff with the system. This has produced one report by computer staff (see Islam, et al., 1983).

2. Supervision and Monitoring of the Evaluation System

(a) Munshigonj

In the Munshigonj area the data system was evaluated and recommendations were made to the German Technical Assistance Agency to convert the annual panel interview to a quarterly round system on the Extension Project SRS model.

(b) The "Record Keeping System" in Matlab

Since 1977 the ICDDR,B has maintained an excellent household couple register for family planning service information. This system permits comprehensive management control information. It is non-computerized. The project

staff are implementing this household record book in the Extension areas to test the replicability of the Matlab MIS. In Matlab we are experimenting with microprocessor compatible sample computerization of the system to permit analysis of data on use-effectiveness. Once developed this new MIS will be transferred to the Extension areas for Government workers pilot testing. The system will be modified, as needed, for broader use in management information. This MIS replication project was launched in the reporting period.

(c) Survey data: Munshigonj and Extension

Baseline survey data editing and file building were completed in the reporting period for Munshigonj and Extension Projects. Tabulation and report writing was started (see bibliography below).

(d) The Sample Registration System - Pabna and Jessore

A data base system has been developed for monitoring demographic impact of the Extension Project. Approximately 7800 households are monitored for demographic events and rates in 90 day household visitation cycles.

3. Computing facilities and capabilities

With Population Council assistance the ICDDR,B evaluated alternative computer products and selected a new mainframe for installation in 1984. A computer management specialist was identified by the Council's Regional Representative in Cairo and brought to Dhaka to evaluate plans.

A statistical package for the analysis of OR data was completed and documented by David Leon in the following reports:

Leon, David; James F. Phillips

1983 "Analytical programs for multivariate operations research on limited capacity computer systems." Operations Research Project Documentation Note No. 1: International Centre for Diarrhoeal Disease Research, Bangladesh (mimeographed, October).

Islam, M.N.; D.Leon, J.F.Phillips

1983 "A computerized sample registration system for monitoring household demographic dynamics, service operations, and contraceptive use -- Part I: The Demographic Data Component." Operations Research Project Documentation Note No. 3: International Centre for Diarrhoeal Disease Research, Bangladesh (mimeographed, November).

4. Dissemination of Results

The following OR related reports were written with Population Council support:

Phillips, J.F.; W.Stinson, S.Bhatia, M.Rahman and J.Chakraborty
1982 "The demographic impact of the Family Planning Health Services Project in Matlab, Bangladesh," Studies in Family Planning 13(5):131-140.

Akbar, J.; J.Chakraborty, N.Jahan, J.F.Phillips, and A.P.Satterthwaite

1982 "Dynamics of Depot Medroxy-Projesterone Acetate (DMPA) Use-Effectiveness in the Matlab Family Planning Health Services Project," paper presented at the 7th Annual Contributors Conference of the Bangladesh Fertility Research Programme (December 8-9).

Akbar, J.; U.Rob, and J.F.Phillips

1983 "Background characteristics of the population of Munshigonj Subdivision: Population composition and household economic status," Munshigonj Project Evaluation Survey Research Note No. 1 (mimeographed, April).

- Rob, U.; J.F.Phillips, J.Akbar
1983 "Fertility levels and differentials in Munshigonj Subdivision: Estimation by the Brass Procedure," Munshigonj Project Evaluation Survey Research Note No. 2 (mimeographed, April).
- Akbar, J.; and J.F.Phillips
1983 "A Comparison of Contraceptive Knowledge and Practice in Munshigonj Subdivision with Bangladesh as a Whole," Dhaka: Munshigonj Project Evaluation Survey Research Note No. 3 (mimeographed, April).
- Rob, U.; J.Chakraborty, N.Jahan and J.F.Phillips
1983 "The use-effectiveness of the Copper T in Matlab, Bangladesh," presented at the Biannual Seminar on Family Planning Programmes of the National Institute for Population Research and Training (August).
- Chowdhury, A.I.; J.F.Phillips, M.Rahman
1983 "Predicting the adoption of contraception: A multivariate analysis of contraceptive intentions and subsequent use in Matlab thana, Bangladesh," submitted to Studies in Family Planning and presented at the National Symposium on Statistics on Medicine, Jhansi, UP, India (Nov. 10-12).
- Akbar, J.; J.F.Phillips, and U.Rob
1983 "The health and family planning field workers of Munshigonj Subdivision: Background characteristics in 1981." Munshigonj Project Evaluation Survey Research Note No. 4 (mimeographed, September).
- Phillips, J.F.; and J. Akbar
1983 "The health and family planning services provided in rural Munshigonj Subdivision: The view from the bari," Munshigonj Project Evaluation Survey Research Note No. 5 (mimeographed, September)
- Akbar, J.; M.Jahan, M.Rahman, J.F.Phillips
1983 "The family welfare centres of Munshigonj Subdivision: A review of the German Technical Assistance Agency intervention strategy," Munshigonj Project Evaluation Survey Research Note No. 6 (mimeographed, September).
- Akbar, J.; and J.F.Phillips
1983 "The German Technical Assistance Agency sponsored mother's clubs of Munshigonj Subdivision: Characteristics of users and service effects," Munshigonj Project Evaluation Survey Research Note No. 7 (mimeographed, September).

- Phillips, J.F.; and J.Akbar
1983 "A preliminary evaluation of the effect of special service interventions on changes in contraceptive prevalence in Munshigonj Subdivision, 1981-1982," Munshigonj Project Evaluation Survey Research Note No. 8 (mimeographed, September).
- Phillips, J.F.; R.Simmons, J.Chakraborty, A.I.Chowdhury
1983 "Integrating health service components into a family planning program: The contribution of MCH to family planning efficacy in the Matlab Family Planning Health Services Project," (unpublished manuscript).
- Phillips, J.F.; Mozumder, K.A., and U.Rob
1983 "The sample registration system of health and family planning project in two thanas of rural Bangladesh," Dhaka of the International Centre for Diarrhoeal Disease Research, Bangladesh.
- Simmons, R.; J.F.Phillips, Mizanur Rahman
1983 "Energizing Government Health and Family Planning Programs: Findings from an Action-Research Project in Rural Bangladesh.(unpublished manuscript).
- Phillips, J.F.; R.Simmons, G.Simmons, Md.Yunus
1983 "Researching the transfer of health and family planning service innovations: The design for an experiment in organization in organization development," (unpublished manuscript).

IV. DESCRIPTION OF DELAYS AND PROBLEMS

The implementation schedule of the Council's "Integrated Program of Operations Research" was set back significantly during 1982 as a result of several management and organizational problems within the ICDDR,B. As a result of these problems, large numbers of project staff, ranging from field workers to the Director of the Extension Project, either resigned or were dismissed. These staff disruptions prevented field work from proceeding as scheduled, necessitated the retraining of

large numbers of field workers, and required administrative changes in several senior positions. Consequently, and with the support of the USAID Mission in Dhaka, Dr. Phillips was assigned additional administrative responsibilities that were neither foreseen nor intended at the time the Council submitted its unsolicited proposal to AID. Dr. Phillips has had to assume the added responsibilities of Project Director for the Extension Project, Project Director for the Munshigonj Subdivision, and Principal Investigator for the family planning related components of the Matlab project.

In spite of these difficulties, considerable progress has been made towards achieving contract objectives and producing the papers, reports, and other documents proposed by the Council. The six-month progress report covering the period May 1, 1983 to October 31, 1983 documents these achievements. (An earlier report, covering the one-year period beginning May 1, 1982, was submitted to AID/W in July 1983. That report provides very detailed information on the scientific work that had been undertaken during the first year of the project.

V. CONCLUSION

Integrated Program in Operations Research in Bangladesh has achieved significant progress in staff development, in completing baseline studies of demographic dynamics, and in developing OR software. In a proposed contract amendment the comparative analysis originally proposed in the Council's unsolicited proposal will be rescheduled for the end of the amended contract period (June 1985). This rescheduling has the advantage of extending the period of time for systematic

observations and assessment of the impact of service delivery innovations applied in the Extension Project area as compared to the Matlab project. It will also allow more time to work closely with Government of Bangladesh family planning program officials to improve service delivery through improved staff training, supervision, data collection and utilization, and other operational interventions identified through the Integrated Program of Operations Research.

VI. Population Council Subcontract No. CI82.44A with ICDDR
Estimated Expenditure of Six Months (June 01 - November 30, 1983)

1. Demographer	US\$ 2,230.67
2. Computer Scientist	2,870.94
3. Secretary	1,249.67
4. Data Processing	2,200.00
6. Consultant (computer scientist)	<u>22,108.00</u>
	<u>30,659.28</u>

Total Budget	US\$124,136.00
(a) Expenditure incurred during May 1, 1982 to May 31, 1983	US\$62,624.00
(b) Estimated expenditure for June 01, 1983 to November 30, 1983	US\$30,659.00
(c) One months approximate expenditure (December, 1983).	<u>US\$ 5,109.88</u>
TOTAL EXPENDITURE.	<u>US\$98,392.88</u>
	Balance (approx.) <u>US\$ 25,743.12</u>

9320632/17

XD-AAN-715-A

ISN-33005

RESEARCHING THE TRANSFER OF HEALTH AND FAMILY PLANNING SERVICE INNOVATIONS:
THE DESIGN FOR AN EXPERIMENT IN ORGANIZATION DEVELOPMENT

James F. Phillips
Ruth Simmons
George Simmons
Md. Yunus

International Centre for Diarrhoeal Disease Research, Bangladesh
GPO Box 128
Dhaka

AUGUST 1983

15

ABSTRACT

The International Centre for Diarrhoeal Disease Research, Bangladesh has launched a field experiment in two rural thanas of North Bengal to test the transferability of its successful health and family planning experiment in Matlab to the Ministry of Health and Population Control service system. This paper reviews the Matlab experiment with particular attention to organizational aspects and identifies elements for transfer. The intervention strategy and operations research design of the new experiment is discussed. The proposed design follows an organization development strategy in which collaborative diagnostic research is used to foster institutional change.

In Bangladesh, despite an early and relatively strong commitment on the part of the government to family planning programs, there has been little change in fertility and only modest success in increasing the level of contraceptive prevalence. While research on the national program has not produced evidence of impact, there has been a number of small-scale pilot projects outside of the public sector which have attained a measure of success in reducing fertility. The lessons that can be drawn from these small scale field experiments and applied to large public sector health and family planning programs continue to be a subject of discussion and debate. In Bangladesh this question has assumed national policy significance. Three years ago the Planning Commission requested the International Centre for Diarrhoeal Disease Research, (ICDDR,B) which has fielded such a successful family planning and MCH project in its research station in Matlab, to extend these activities to the government program in two thanas. Out of this request evolved a project, known as the MCH-FP Extension Project, whose major purposes are 1) to collaborate with government health and family planning staff in an attempt to transfer key components of the Matlab approach to the public sector, and 2) to document and analyze the process of this collaborative venture as well as its effect on contraceptive prevalence, fertility and mortality.

This paper discusses the design of the MCH-FP Extension Project as well as major characteristics of the Matlab experiment upon which it builds. We begin with a brief background discussion of the ICDDR,B, its evolving emphasis on MCH and family planning and government interest in these activities. We then outline both organizational and service delivery characteristics of the Family Planning and Health Services Project (FPHSP) in Matlab in an attempt to interpret

and understand what determined the success of this small-scale field experiment. Emphasis is given to the relevance of organizational factors.

The focus on organizational factors is continued in the second part of the paper which describes the experimental intervention and associated research strategy of the MCH-FP Extension Project. Intervention activities are based on the premise that a carefully executed "organization development" strategy might succeed in overcoming at least some of the extensive and widely documented barriers to the transfer of innovations from pilot projects to the complex bureaucratic environment of government programs. The research component of the project, which is subsequently described, consists of rigorous monitoring of the impact of the intervention, systematic study of the government health and family planning program, and careful documentation of the manner in which it responds to the intervention.

In its concluding section the paper outlines a framework which summarizes the basic conceptualization of the Extension Project. We identify characteristics 1) of public sector program organization and management, 2) of the client population, and 3) of the contraceptive and MCH services offered by the program as major classes of factors that determine contraceptive use and fertility change. Public sector programs and rural communities are viewed as dynamic elements, capable of change and adaptation in response to carefully targeted interventions.

Background: For the ICDDR,B focus on MCH and family planning is relatively recent. The Centre began its work in Matlab Thana in 1963 in the area of diarrhoeal disease research. Matlab Thana was chosen because it was a

relatively undeveloped rural area which had experienced regular cholera epidemics. The area is thus, in most respects, representative of the poor health conditions of rural Bangladesh. As a part of its research program on selected interventions relating to diarrhoeal disease, a demographic surveillance system was established which as one of its outputs produced relatively accurate estimates of fertility and mortality. This capacity to monitor demographic trends was of critical importance when the Centre began to expand its research activities to family planning.

The first family planning experiment was begun in 1975 and concentrated on the household distribution of contraceptives without much clinical support on follow up services and without any related efforts in the area of MCH. It had a notable but largely ephemeral impact on the contraceptive prevalence rate and little impact on fertility.¹ The second experiment begun in 1977, employed a wider range of contraceptive methods, integrated some aspects of MCH into the program and used a drastically different village-based delivery system. Its impact on both contraceptive prevalence and fertility was immediate and pronounced. More important, the impact has been sustained over the five years that the project has been in existence.² Currently the contraceptive prevalence rate is about 39 percent in treatment areas and fertility is approximately 25 percent lower in the treatment area than it is in the control area. There has also been a significant and desirable impact on mortality.³ Thus the second Matlab experiment is notable in providing an example of a relatively poor rural area where efforts to reduce fertility and mortality have been successful.

In 1979 when proposals were being advanced to fund a continued program in Matlab, the Government of Bangladesh made its concurrence conditional upon the development of a parallel program in two additional thanas where the ICDDR,B working through the government network, would seek to replicate the success of Matlab. It was out of this request that the MCH and Family Planning Extension Project originated. From the beginning it was clear that the new project would involve more than an effort to reproduce the original Matlab project in two new settings. The relatively high cost of the Matlab experiment could not be duplicated on a national basis, and it was thus important to make use of the existing government infrastructure. Given the very different characteristics of the government program and the Matlab experiment, this implied that a large part of the research effort would be devoted to identifying the features of the Matlab project which are suited to transfer and ways in which selected elements could be transferred to the government system. To be successful the project would have to be adaptive and would have to concentrate on organizational issues as an important part of its work.

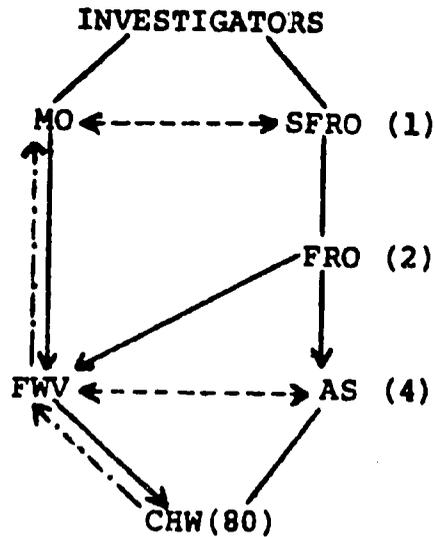
In the following pages we review the Matlab Family Planning and Health Services Project and its special features and then describe the experimental intervention that is intended to increase contraceptive usage and the associated research design that is intended to document the intervention process and its impact in two experimental areas.

Organization structure and management system of the Matlab FPMS Project: The Family Planning and Health Services Project was designed to provide a broad range of contraceptive and immunization services and oral rehydration therapy

available to the rural population of Matlab thana. Its staffing pattern is diagramed in Figure 1. The primary service providers of the FPHSP are literate, young, married women who have been recruited from the villages they serve. The formal project design specifies assignment of one female community health worker (CHW) to each village to serve as the primary service worker of the project. In the implementation of the design, primary consideration was given to standardizing CHW density. Since one worker serves 250 families and is expected to visit each family every fortnight, certain large villages have two workers and some workers serve more than one small village. This represents a density of female workers that is about three times higher than the density of female staff in the national program corresponding to one worker for 1,000 villagers. The operational aim is to maintain comparable and manageable workloads for each female village worker and to assure CHWs can efficiently provide both MCH and family planning services. Training of CHWs emphasized client-oriented approaches: solving community needs; building close rapport with the rural population; providing education rather than focusing narrowly on acceptance of family planning or MCH measures. Workers were instructed to visit all households, to ascertain felt needs, and to offer only those services that were genuinely suited to client needs.

CHW are grouped by "block" with 20 workers supervised as a reporting unit. Fortnightly meetings of supervisors and CHW are intended to facilitate supervising support. Each CHW has two back-up and supervisory systems: one focused on administration and community relations, and the other on the technical and medical aspects of service delivery. Administrative supervision is exercised by a male supervisor and two assistants; technical supervision

Figure 1: Organization structure of the Matlab MCH-FP Project.



Medical and
Technical
Supervision

Administrative
Supervision

- CHW Community Health Work
- FWV Female Welfare Visitor
- AS Assistant Supervisor
- MO Medical Officer
- SFRO Senior Field Research Officer
- FRO Field Research Officer
- _____ Line of Authority
- Line of Coordination
- .-.-.- Line of referral

by a family welfare visitor (FWV) and a female physician. One component in this dual supervisory and back-up system ensures high standards of service quality (left side of Figure 1), the other ensures that the quantity of work is maintained (right side of Figure 1). Roles are strictly delineated according to technical and administrative functions at each level, except among CHWs whose roles are both technical and administrative. There is no operational distinction between health and family planning, both sides of the dual leadership system are responsible for health and family planning services. Meetings and information systems are designed to insure appropriate linkages at all levels.

Female welfare visitors provide paramedical back-up in the village and in static health centres known as family welfare centres (FWCs). FWVs permanently reside in these health centres; each serving a population of 20,000. Thus an average of 20 village workers, each with responsibility for a population of 1000, uses a common FWC for paramedical back-up. A female physician has technical authority over the field project. She attends fortnightly meetings to provide MCH care and is available in a central clinic in Matlab for medical back up services for serious complications. The physician conducts regular training for all workers with emphasis on maintaining clinical standards in the subcentres and continuing expansion of the village service components of the MCH program over time.

The project organizational structure vests strong management control in the non-medical, male supervisory staff. The project supervisor has the authority to hire, fire and discipline village workers who fail to perform. Since the onset of the FPHS Project in Matlab some 50 workers have been disciplined for poor performance, and over half of the disciplined workers have been terminated. Thus, in

the interest of encouraging and maintaining high standards of performance, efforts have been made to supplement careful recruitment and training of workers with rigorous management control, the systematic review of information about individual and group performance, and the use of disciplinary procedures when necessary. FPESP decision making is decentralized. Supervisors have authority and flexibility to change the system of work or take actions when problems arise. They convene fortnightly "block" meetings which provide opportunity for review of performance records and discussion of problems. Small amounts of discretionary funds are available for supervisors to facilitate work and arrange local transport. FWV village visitation schedules are established for necessary household follow-up. If community relations problems hamper fieldwork, supervisors schedule visits to male members of the community. Management information is also decentralized, and data management is task oriented. Data are maintained in village record books in ways that help workers do their jobs. Data is collected only if it is useful to village level service providers and aggregation of data at the union level is used by supervisors to structure discussions at fortnightly staff meetings and to schedule the field work of FWVs and supervisors.

Utilization of existing community resources of the Matlab field station and of community leadership has been extensive. The Project supervisory personnel were selected from the pool of field workers who knew the Matlab area through previous research and were thus known to the village elites. Community leaders were involved in establishing the health centres, the selection of village workers, and in informing the community of project goals and purposes. There was no construction of facilities as all FWCs were community donated. There was minimal reliance on high technology, with

an exception being the utilization of speed boats originally used for vaccine trial and demographic surveillance work. This special logistics capability undoubtedly provided mobility to supervisors that facilitated rapid project implementation. Pay scales of community health workers are comparable to those of workers in the government program; but much higher scales exist for the supervisory cadre. A well paid, highly disciplined supervisory team has been a critical element of the Project's success.

Characteristics of contraceptive and MCH services provided in Matlab: The FPHS Project followed an incremental service development strategy. While the Project is integrated in the sense that female village workers provide both health and family planning services, training at any given point in time, has always emphasized a single component and its subsequent implementation. Thus during the six weeks of female village worker training which launched the program, only family planning was introduced. Much of this training period involved field demonstration. After six months of successful implementation of family planning, tetanus was added; and six months later, oral rehydration therapy. More recently measles vaccination, antenatal care, and traditional birth attendant training have been integrated into this step by step approach. Implementation of each successive component was evaluated before the next component was introduced.

Certain family planning activities of the Matlab FPHS Project improve contraceptive access: DMPA and Copper T services are offered in the home, regular pre-announced tubectomy services are available at the Matlab clinic, and other contraceptives are distributed in the villages.

25

Approximately half of all contraceptive use prevalence is attributable to DMPA. Clearly, the availability of this popular and highly effective method has contributed to the impact of the project.

The combined emphasis on family planning and MCH in the Matlab Project reflects an underlying hypothesis about the interaction effect of these two types of services. Dealing with widely prevalent conditions of minor illness, project designers posited, is a prerequisite for effective and lasting contraceptive use under the conditions of poverty and disease that characterize rural Bangladesh. Unless minor ailments are attended to, their presumed origin in contraceptive use is likely to lead to discontinuation. Research on use effectiveness in Matlab lends support to this hypothesis. Overall continuation of contraceptive practice is associated with careful paramedical follow-up and encouragement of method switching has alleviated concern about the deleterious health effects of particular contraceptive methods (Rob et al. 1983, and Akbar et al. 1983).

Lessons from the Matlab FPHS Project: The success of the Matlab family planning project depended upon both its contraceptive/MCH service and its organizational components. Previous discussions of the Project have emphasized the service dimensions of the project: The availability in the village of a wide range of contraceptive methods, the household insertion of IUDs, referrals for tubectomy, etc. However, technical interventions do not function in a vacuum. They are implemented in an organizational context which is an integral part of the experiment. The Matlab program was carried out by an organization characterized by high management effectiveness; a competent, technically trained, disciplined, and field-oriented supervisory staff, a team of village workers with a well articulated task

26

orientation, a system guided by performance rewards and sanctions. Necessary external resources were available although local resources were used and care was taken to select field staff with the appropriate social characteristics.

These organizational dimensions of the FPHSP are so tightly intertwined with the contraceptive/MCH service dimension of the project that it is impossible to sort out the extent to which its success was due to one or the other. Formally, the Matlab experiment has a two cell design, but the treatment differs from the control in a variety of technical and organizational features. Thus the experimental structure of the Matlab family planning and health services project is more complex than is frequently recognized. Treatments are not one-dimensional, therefore it is difficult to partition the contribution of services and organizational components. The Matlab experiment has nevertheless demonstrated that it is possible to intervene in a rural setting and reduce fertility and mortality. The study did not, however, demonstrate the circumstances that are necessary to produce such a result on a larger scale through the public sector.

The MCH-FP Extension Project

Public sector programmes aim to achieve results that small experimental projects have shown to be possible. In Bangladesh, both the inability of the program to effectively offer more than a narrow range of MCH and contraceptive services and the existence of an organizationally weak delivery system, however, have blocked attainment of these objectives. The public sector program has not yet used either injectables or home based IUD insertions. Training for field staff has been brief and intermittent, and health and family planning field staff have functioned independently from each other even though recent policy

decisions stipulated that work proceed on an integrated basis. Field contact between government workers and the rural population is sporadic and not necessarily perceived as beneficial. Field supervision is weak, lacking both technical competence and goal orientation. Procedures neither reward performance nor sanction incompetence and unwillingness to work. Resources and supplies in the public sector programs are scarce, autonomous decision-making is discouraged and adherence to intricate rules and regulations has primacy or setting goals and striving to achieve them.

The Extension Project addresses the question of whether it is possible to apply the lessons of Matlab to the government health and family planning program and thereby achieve at least some of the results that were possible in the context of the small experimental project. A design which satisfies this objective is necessarily complex. Three main barriers to the utilization of the experience of pilot projects have been emphasized in the literature on organizational change:⁶ 1) Pilot projects are typically fielded with special resources,⁷ 2) they are implemented through small, autonomous agencies in the private sector,⁸ and 3) the hypotheses and goals of research frequently bear no relation to the practical questions that concern policy makers and administrators.⁹

These conditions all apply to Matlab. The Family Planning and Health Services Project was organized with the help of an extraordinary array of special resources: extensive financial support for data collection and project implementation; availability of a pre-existing data system and organizational infrastructure in Matlab; the professional

competence and expertise of other ICDDR,B staff. The Matlab project largely ignored the government health and family planning program in the thana and established a small delivery system of its own. Research emphasis was on a question which continues to engage the interest of academics in the population field: can family planning programs, if implemented, be effective? Policy makers and administrators have little patience for this question. For them the issue is, and has been for some time, how can public sector delivery systems be made more effective?

While the Extension Project seeks to apply successful innovations to the public sector, it does not pretend to answer all questions associated with the issue of how to energize government health and family planning programs. It asks whether collaborative efforts between the Ministry of Health and Population Control and the ICDDR,B can lead to improvements in the service and managerial components of the government programs in two thanas. As such it remains a small-scale, experimental, pilot project. It constitutes but a beginning point to the larger issue of how the entire MOHPC system can be revitalized and whether it is possible to establish mechanisms that make such renewal independent of outside change agents.

While the Extension Project continues to have the characteristics of a pilot project, it deals explicitly with some of the conditions that have been identified as barriers to the wider utilization of research results. The project limits the use of special resources to training and other organization building and research activities of the ICDDR,B team, without adding additional inputs to routine program activities. Moreover, while the ICDDR,B change agent team operates out of an autonomous, non-profit

private organization, it collaborates with the government and attempts to achieve its aims with minimal change to the formal structure of the MOHPC program. Finally, the project seeks to determine the conditions under which public sector programs can be more effective and involves government officials at all levels to ensure that they perceive research issues addressed by the project as meaningful.

The MCH-FP Extension Project has two components: 1) an intervention strategy in which ICDDR,B staff use organization building and training to transfer elements of the Matlab project to the public sector, and 2) a research strategy which aims to assess, through a variety of instruments, the efficacy of the existing programme, the resources, structural and technical constraints on the programme, the operational changes introduced by the intervention and the impact of those operational changes on programme effectiveness.

Intervention Strategy of the Extension Project

The intervention strategy is informed by a literature on planned organizational change which shows that successful change is typically produced by a series of steps beginning with building of trust and collaboration between change agents and counterparts,¹⁰ the diagnosis of problems,¹¹ and clarification of responsibilities for implementing mutually agreed upon changes.¹² Given a clearly defined, jointly developed plan for implementation the prospects for transfer of innovation are enhanced.

The intervention paradigm for the project is derived from the literature on "organization development" (OD) which French and Bell (1970) define as "a long-range effort to improve an organization's problem-solving and renewal processes... with the assistance of a change agent, or

catalyst, and the use of the theory and technology of applied behavioral science".¹³ OD typically entails the following:

- a. External OD consultants are invited to assist an organization in improving organizational functioning.
- b. Social science research techniques are used to identify problems. Research results are fed back to program managers.
- c. Joint action teams involving managers and consultants are formed at various levels to take action, and feed relevant information to superiors who initiate the consultancy. In this way joint "ownership" of research and decision-making is cultivated in order to foster utilization of results.
- d. OD "change agents" are assigned the task of facilitating early utilization of results. Change agents are affiliated with the OD consultant organization and have no formal authority in the host agency. They facilitate change through counterpart support and close liaison with implementation committees.

In the course of OD, the intervention is typically designed to upgrade both technical skills and the management system. In the Extension Project organization building and technical interventions occur at several levels: the thana, the field and the national level.

The critical, initial point of collaboration in the project takes place at the thana level through the establishment of joint planning and decision making meetings between project staff and managers of the thana health complex (THC). The THC is a rural government health facility which provides curative services and also functions as the major administrative level for rural health, MCH and family planning field activities. A physician from the Health Division of the Ministry of Health and Population Control (MOHPC), the Thana Health Administrator (THA), is the chief

administrative officer at the THC. He is supported by a staff of medical officers for clinical services, and one medical officer for providing technical supervision of rural family planning and MCH services (Thana Medical Officer, FP/MCH) and two administrators for the supervision of family planning, MCH, and other health activities.

The Thana Health Administrator, the Thana Medical Officer FP/MCH, the Thana Family Planning Officer, and the Health Inspector are the key thana level collaborators in the project. The task to be accomplished through the intervention is to strengthen field orientation, technical competence and planning capabilities at this mid-management level to ensure greater control and support capabilities for program implementation in the villages.

Field activities in health and family planning are conducted by a range of government workers affiliated with the health or the population control wing of the Ministry. Male workers from the health division (health inspectors) have traditionally been responsible for health education and the control of communicable disease, while female field and paramedical staff supervised by a male family planning worker have been in charge of MCH and family planning work. Current government policy stipulates that the field staff from both health and family planning work as an integrated, multipurpose team.

Key objectives of the Extension Project intervention strategy at this level are to remedy deficiencies in technical knowledge, improve field methods with emphasis on client-oriented approaches and to introduce a more effective management control and support system. A series of four

week training courses is fielded for groups of 20 workers which covers the three key components of the Matlab training programme: family planning, oral rehydration therapy and tetanus immunization, as well as other health subjects assigned to these workers by government policy. Priority will be given to practical demonstration of field methods: household visiting patterns, motivational techniques, community relations, referral and record keeping.

Following a month of formal training emphasis will be placed on establishing the rudiments of the Matlab system in the field: predefined work routines in doorstep family planning and MCH services, systematic follow-up, regular meetings for problem solving, supervision and support. A simple household record book is introduced which permits workers to keep track of their clientele and monitor their own performance. Major change agents for this activity are Matlab CHW and supervisors who have five years of experience in the Matlab system. They provide "counterpart support" to government field staff and their immediate supervisors as agents of planned change. The technical and operational components of transfer are listed in table 1 and 2.

At the national level a formally constituted coordinating committee, consisting of senior officials from the MOHPC are relevant research organizations, reviews findings from the thana and field level. This committee receives reports from the thana committees, reviews progress, and assists with solving operational barriers to project implementation. By involving the senior officials in this way the project aims to communicate operational problems and means of solving them to key decision makers who can subsequently utilize their project experience for large scale policy planning.

Table 1: Service Components of the Matlab System and Mode of Transfer.

Elements of the Matlab Service System:	Activity to be transferred to the MOHPC in two thanas:
1. Comprehensive family planning services at the doorstep: pills, DepoProvera, Copper T, condoms.	1. Assist MOHPC implement integrated teams with FWA FWW going door to door first with pills condoms and injectables.
2. Subcentre Copper T services with comprehensive MCH, contraceptive backup, and referral services.	2. Assist in implementing FWC's. Retrain FWV's in MCH care and insertion. Develop the referral information system.
3. Follow-up for both MCH and FP services.	3. Devise a plan and implement follow-up of all women and visitation methods.
4. Central clinic facilities for tubectomy. Referral services to trained physicians.	4. Assist in developing a TCH referral system. Assist in regularizing services at the THC.
5. Comprehensive immunization services, village based ORT, antenatal care, nutrition advice.	5. Assist in developing cold chain procedures. Train staff in MCH care, ORT, and EPI.

Table 2: Operational Components of the Matlab System and Mode of Transfer.

Matlab Operational Activity	Activity to be transferred to the MOHPC
1. Primary care by village women posted at a ratio of 1:1000 population. High proportion of female workers.	1. Foster better utilization of female workers. Explore means of stimulating community development. Develop terms of male and female workers.
2. Decentralization to the union level: a) 1 male supervisor with all administrative authority. b) Simple to use management information system with no computer necessary. c) Fortnightly meetings of all union level workers. d) Task goal setting, activities planning.	2. Foster FWC development to include: a) Clear lines of supervision. b) Train workers in a simple adaptation of the Matlab MIS. c) Foster monthly meetings of union level workers in the FWC. d) Demonstrate goal setting.
3. Special Logistics: speed boats for supervisors, country boats for village workers.	3. No special logistics.
4. Continuous training: Component by component introduction of new MCH activities. Continuous refresher training.	4. Short courses with "counterpart support". Continuous counterpart training.
5. Government pay scales for village staff, higher salaries for supervisory staff.	5. No change in salary structure.
6. Clear delineation of roles: a) Technical (medical supervision) by physician over FWV and FWV over female village worker. b) Administrative (task supervision) by paramedic supervisor over male assistant supervisor (union level).	6. Attempt to clarify roles in the course of meetings. (No change in administrative structure)

The Research Design of the Extension Project

The research design of the MCH-FP Extension Project includes the following elements. First, the project is conducted within the framework of an experimental design. This approach is undertaken both because a comparison of outcomes in the various cells in the experiment is of research interest in itself and because the use of specific treatment areas provides a high measure of variation on some important variables that are used in other parts of the research. Second, we collect prospective data from a representative sample of the population that can be used as empirical basis for a wide range of studies related to the adoption of health and contraceptive practices. Third, the project incorporates the systematic study of the government program and the manner in which it changes during the experimental interventions. Finally, a set of special studies will be undertaken to examine issues of importance on either the organizational or the client side which do not fall into one of the other research categories. While each of these four research approaches has importance in its own right, they form a unified research design and each part of the design complements or improves other parts of the system.

The Experimental Framework: In the formal experiment two thanas in different geographical divisions have been chosen by the Government of Bangladesh. Within each of the study thanas four treatment unions were chosen and two unions each from other thanas neighboring the two study areas were selected as comparison areas. Comparison unions are in contiguous areas but are outside the study districts. An objective of this design is to identify the minimum conditions necessary for the transfer of innovations. To address the question of whether change can be achieved through technical training and field demonstration only, or whether a sustained counter-part presence is necessary, unions of the study area have been divided into two groups: one in which ICDDR,B assists

actively in the implementation of the technical components of training courses with "change agents" assigned to MOHFC counterparts, another where training alone is provided. Additional unions have been sampled from contiguous areas outside of the study districts to serve as comparison areas. This configuration of treatments is summarized in Table 3.

As shown in Table 3, 8 randomly selected unions in the two study thanas (denoted A and B) receive treatment interventions and are the subject of ongoing demographic surveillance. Each study thana has two research unions which receive training along and two which receive the combined package of training and counterpart support. Each thana also has one demonstration union (D1 and D2) that is outside of routine research areas. Comparison unions (denoted C) have been purposely selected from contiguous thanas of the neighboring districts (denoted K and T). In some areas (denoted N1 - N7) of the two study thanas no research is conducted but thana workers are provided the same training available in the experimental unions T1 - T4.

The treatment design has two overall aims: First, information about fertility and mortality or morbidity and contraceptive practice can be calculated for each of the three cells in the design. Calculation of effects by treatment should measure the impact of the alternative patterns of intervention. The difference between the S - quadrant in the design and the C - quadrant, indicates how much additional impact can be generated when training and counterpart support are provided compared with no intervention. Second, the experimental intervention increases the variation on key variables and permits a more effective test of hypotheses about both household behavior and program performance.

Table 3: Treatments by Union and Thana in the MCH-FP Extension Project.

ICDDR,B Demographic and Organization Research Area?				
Yes			No	
Is Training Provided?			Is Training Provided?	
Yes	No		Yes	No.
Yes	S1 (A) S2 (A) S3 (B) S4 (B)	(No Unions)	D1 (A) D2 (B)	(No Unions)
Is ICDDR,B Counter-part support provided?	No	T1 (A) T2 (A) T3 (B) T4 (B)	C1 (K) C2 (K) C3 (T) C4 (T)	N1 (A) N2 (A) N3 (A) N4 (B) N5 (B) N6 (B) N7 (B)
				(No Unions)

The Study of Household Variation: Two approaches to the analysis of treatment will be pursued: 1) multivariate statistical analysis of program outputs or effects through routine collection of household data, and 2) process analysis of the organizational system across treatments and over time, through participant observation of the MOHPC work force, and through the use of survey methods.

The analysis of effects is achieved through the longitudinal observation of households with a Sample Registration System (SRS). A random two stage cluster sample of study area households is visited by ICDDR,B interviewers in a 90 day work cycle. Although the primary purpose of the system is to develop a demographic data base, interviewers also collect information on the social, economic, and health status characteristics of members. Rounds also record information on client MOHPC worker exchanges and indicators of the quantity of health services contacts. Thus the SRS is a multipurpose monitoring system that compiles continuously cross referenced data on demographic dynamics, morbidity, cause of death, household characteristics, contraceptive attitudes and behavior, and programme operations.

The statistical analysis is informed by recent methodological work on "multilevel analysis " (Mason and Palan, 1978) The health and family planning behavior of individuals and household demographic dynamics represent the fundamental unit of analysis (see Table 4) with background characteristics of households serving as controls and treatment indicators as covariates. Characteristics of villages and thanas that may contaminate results in some way are introduced into the analysis as control variables. In this way modeling affords a test of whether treatments have an effect and, if so, the net magnitude of effects adjusting for background

Table 4: Categories of SRS Dependent Variables and Specific Indicators Measured.

Variable Category	Specific Indicators
A. <u>Impact Variables:</u>	
1. Fertility	Crude birth rates Age specific rates Total Fertility rates General Fertility rates
2. Mortality	Infant mortality rates Neonatal mortality rates Age specific rates "Cause of death"
B. <u>Intermediate Variables:</u>	
1. Morbidity	Diarrhoeal episodes, measles
2. Contraception	Current use by method
C. <u>Operational Outputs:</u>	
1. Quantity of work	Frequency client contact with MOHPC staff by type of worker
2. Quality of work	Type of exchange Content of exchange

characteristics of villagers served by the project.¹⁴

Interim SRS Analyses: Multivariate methods, while they are appropriate for the final analysis of the project, will be of little use in the research feedback process. Simple to use and quick to implement evaluation studies are planned which will provide continuous data on programme functioning. Continuous research is part of the intervention, in that feedback of output information to project MOHPC colleagues is intended to stimulate change in the system.¹⁵ Similarly diagnostic research findings (to be discussed below) are to be shared with MOHPC staff. Thus a continuous flow of interim output information is reported to project participants through quarterly hand tabulation of routine SRS reports of operational research findings and birth and death rates by treatment areas. Thus the project data system permits routine areal analysis of time series data and rapid feedback to decision makers.

Organizational Analysis: The theory embraced by the analysis of statistical data of operations is predicated on the partitioning of sources of variation in individual behavior according to client characteristics and characteristics of exchanges between workers and clients. This partitioning process is not possible when operational problems are invariant in all areas. For example, resource constraints, formal rules, and structures that characterize the institutional environment cannot be analyzed in a statistical framework, unless some change is introduced that is variable across study areas that can be posited as contributing to variation in health behavior. As a result of training and counterpart support there may be some changes in the informal characteristics of the organization or in the human resources of the project, but we have chosen not to try to change the overall government system. Thus

analysis of this institutional environment must emphasize non-statistical techniques of organizational research and analysis. This entails diagnosing critical barriers to implementation through participant observation of the elements of the MOHPC system and monitoring diagnostic indicators over time.

The organizational analysis of program functioning, barriers to implementation, and change in response to the intervention requires an "open system" approach in which the structure and functioning of the MOHPC programme is the focus of investigation. This approach starts with the understanding that the family planning, MCH, and other preventive health programs organized by the MOHPC do not function in a vacuum. They are shaped by the larger social, economic, political, cultural, and bureaucratic forces in society. The systems concept, furthermore, alerts the researcher to the fact that what happens at one program level is not isolated from policies, decisions, and patterns of behavior at other levels. It ~~emphasizes~~ emphasizes the interconnectiveness and mutual causality of complement elements and the larger context within which the program functions.

The organizational analysis is guided by the following set of questions which derive from the open system approach:

1. What is the nature, quantity and quality of the organization's output? Some of these issues, as we have noted above, are monitored by the sample registration schemes: number of contraceptors, prevalence rates; methods used, method shifts, immunizations given, and diarrhoeal disease therapy. Other issues are best researched through participant

observation: the quality of medical services, the quality and quantity of motivational and educational efforts, the quality of follow-up services, and the quality of immunization services.

2. How are clients recruited? This requires observation of motivational strategies, the role of client and worker sterilization allowances, the nature of relationships with villagers (extent of rapport, trust, hostility, conflict) and the degree of worker responsiveness to client needs.

3. How does the organization procure its resources, physical and human, and how does it create legitimacy and support for its activities in the larger environment? This requires an inventory of financial resources available in study thanas and assessment of critical shortages; a review of logistics systems for medical supplies and contraceptives; and analysis of personnel recruitment. Also needed are observations of efforts to solicit community support and to exert political influence.

4. How are decisions made, conflicts resolved; activities at different level within the organization coordinated; supervision control leadership within the local organization exercised? Is there meaningful interaction among staff about work issues? What is the quantity and quality of supervisory support? How are decisions made and what are the patterns of communication? Do the lines of communication conform to lines of authority? Do subordinates communicate to superiors task related issues? How is information compiled and shared? Does information flow contribute to management control? This, in turn, involves analyzing the MOHPC system so that the exercise of authority can be understood.

5. How does the organization mobilize the energies of the staff toward productive purposes? How are new members introduced and trained? How are non-productive needs of the members of the organization provided for? What are rewards and sanctions? Relevant issues to be explored in participant observation are the extent of job motivation, the existence of rewards and sanctions for performance, the quantity and quality of training, and the interpersonal relationships at various levels.

6. How does the organization adapt to changes in its environment? Research addressed to this issue requires analyzing responses to changes in the availability of resources (if any) and responses to changes in client needs and demands.

The organizational diagnostic activities summarized above are guiding the development of our intervention strategy. These research activities conducted prospectively enable us to assess the nature and extent of change in the MOHPC system and to interpret the statistical analysis that we conduct at the conclusion of the project.

More important, however, is the role of operations research in our implementation strategy: Lessons learned regarding the structure and functioning of the MOHPC system and feed back to project participants is used to stimulate change and organization development.

Conclusion: The Determinants of Program Success

Previous sections of this paper have described the intervention strategy and associated research plans which comprise the FP/MCH Extension Project. Implicit in this discussion is a theory of the determinants of the success

or failure for programs designed to facilitate contraceptive acceptance and fertility and mortality decline.

Three sets of factors are hypothesized to determine the impact of a family planning and MCH project. First there are the characteristics of the client population and its physical and social environment. Second there is the interface between the client population and the organization seeking to provide it with services. This interface can be described either in terms of the specific health interventions or contraceptive services offered (e.g., IUD insertions, tetanus toxoid inoculations or follow-up visits) or in terms of the contacts between the target population and the organizational staff. Third, the nature of the interface is determined by a complex set of factors relating to the nature of the organization (e.g., the staffing pattern, the management system or in the level of available resources which is providing the health and contraceptive services). These organizational characteristics work through the interface but they are a major indirect element in the overall set of forces determining whether a program will succeed.

Figure 2 posits relationships between project activities and the achievement of program goals. The relationships in Figure 2 are drawn from our reading of the experience in Matlab and the literatures on organizational change and the determinants of demographic behavior.¹⁶ On the right hand side of the figure, a chain of variables represents interrelated outcomes of the project. While the immediate goal of the project is to influence the health and contraceptive status of individual client families, the ultimate goal is to improve the well-being of the population by reducing fertility and mortality. This diagram thus

represents a simplification of the full set of determinants of these outcomes variables. The mortality and fertility experience of the population are, for example, influenced by many factors in addition to the use of contraceptive practice or the use of the specific health interventions offered by the project. Thus the diagram represents only a partial set of the determinants of the outcomes indicated in the last three boxes on the right. The determinants of contraceptive behavior and the specific health practices promoted by the project are specified more completely. Their direct determinants are the characteristics of the client families and the communities in which they reside and the nature of the interface between the program and the client population. The client/program interface has three elements: the nature of the services offered by the program, the quantity of work done by the program staff and the quality of the work. Each of these elements will influence client acceptance of contraception or health services.

The interface characteristics are, in turn, determined by the nature of the organization which provides the services. The most direct of these organizational characteristics is the technical support and management system which controls or influences the work environment of the program staff. In the discussion of Matlab, for example, we have argued that the existence of effective supervision and the provision of a technical backup and referral service were important elements of program success. At one stage further removed the organization is characterized by a set of conditions labelled "government inputs". These conditions are largely fixed from the perspective of an individual administrative unit like the thana, but they greatly influence its work.

For example, the central government defines the goals of the program, the basic strategies to be used in achieving that set of goals, the resources that will be used to implement the strategies and the bureaucratic rules under which the program is governed. All of these factors, in turn, are influenced by the larger political and institutional system of Bangladesh. For example, the general poverty of the country limits the resources available for a health and family planning program, thereby affecting all aspects of program operations and impact.

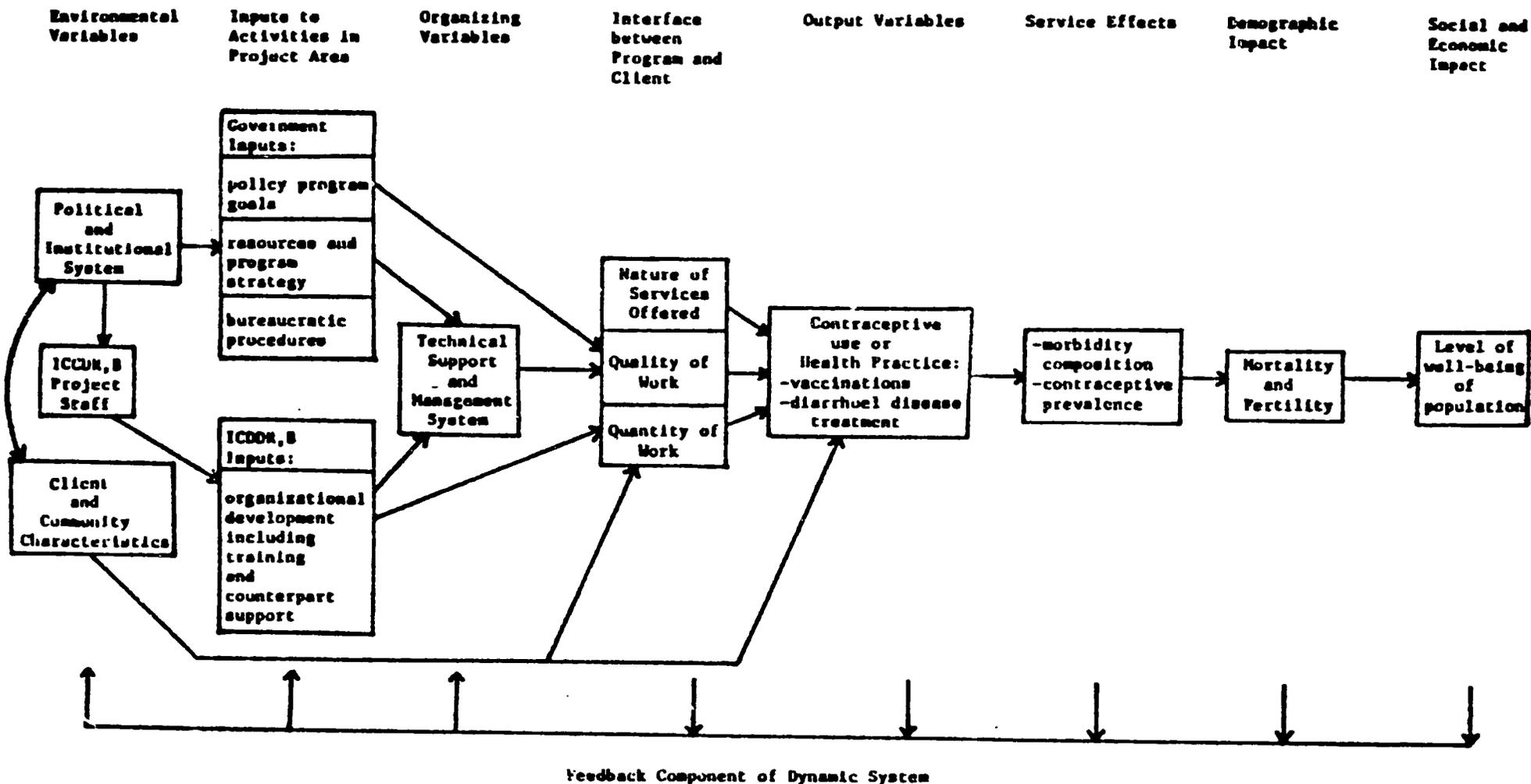
The role of the ICDDR,B in this process is also shown in Figure 2. With the encouragement of the senior government officials, it is using organization development techniques to influence both the working of the local management and technical support system and the nature of the interface between the program and its clients. Rather than arguing program resources the intervention aims to influence the way that the resources already available to the government program are utilized. The Extension Project is nevertheless constrained by the fact that ICDDR,B staff, unlike Matlab researchers, have only limited control of the inputs that go into the program in the project area.

The original Matlab experiment posited that a significant proportion of clients desire to limit or space child bearing, but lack contraceptive technology for doing so. The experiment demonstrated that there is some set of conditions under which a significant proportion of a rural Bangladeshi population will use contraception thereby reducing fertility. The Matlab experiment does not, however, address the question of how that set of conditions can be produced by a large scale public sector program. The basic goal of the Extension Project

is to assess the extent to which the Matlab experience can be replicated through the structure and resources of the existing government program. Whatever the outcome of the experiment, it will contribute to our understanding of the conditions under which health and family planning programs can improve the well-being of the rural poor.

64

Figure 2: The Determinants of Project Impact



FOOTNOTES

- ¹The design of this project, the Contraceptive Distribution Project (CDP) and the lessons learned from it are discussed by Rahman, et al. (1980) and CDP impact is analyzed in a paper by Stinson et al., 1982.
- ²This second project, the Family Planning Health Services Project (FPHSP) is described in the paper by Bhatia et al., (1980). The demographic impact of this project is discussed in Phillips et al., (1982), an analysis which shows that prevalence rose from 10 percent to 32 percent in the first year of the project and remained constant at 32 percent for 3 years. In the fourth and fifth project years, prevalence gradually increased from 32 percent to nearly 40 percent (Phillips et al., 1983).
- ³See Rahman and D'Souza (19
- ⁴Research has shown that the addition of MCH components which have direct and obvious health benefits to women, such as tetanus immunization, are associated with concomitant increases in contraceptive prevalence. Addition of general health service components such as oral rehydration has had a negative effect or null effect on family planning use. See James F. Phillips, R. Simmons, and A.I. Chowdhury, (1983).
- ⁵See Bhatia, et al., 1980, and Phillips et al., (1982).
- ⁶See, for example, the report of the Human Interaction Research Institute (1976) (HIRI) entitled "Putting Knowledge to Use: A distillation of the Literature Regarding Knowledge Transfer and Change," the report reviews several medical, agricultural, and industrial innovations in the United States and notes that the mean duration between the time of development to the time of public utilization was 19 years. Since this gap is not fully explained by technological problems the report formally reviews factors that explain delay in the adoption of research findings.
- ⁷Havelock (1969) has reviewed several projects and concluded that this incompatibility of costing is a critical problem - costs to the researcher cannot be compared, in detail with the potential costs of the innovation to the utilizer. Several reviews of research and its utilization cite this problem as a barrier to transfer of innovation (Davis, 1973 and 1971; Havelock, 1969; Glaser, 1973; HIRI, 1976).

- 8 Structural differences between special projects and larger systems can represent an important barrier to utilization of project findings (see Lippitt et al., 1958; Miles, 1964; Rubin et al., 1974). This is particularly problematic if the target organization defines the role of workers by emphasizing formally defined job descriptions (Aiken and Hage, 1968) as opposed to formally prescribed goals and clearly developed mechanisms for achieving them (Glaser et al., 1967).
- 9 Scientist testing hypotheses and theories, however, often have little to say that is directly relevant to administrative operations (Van de Wall and Bolas, 1980). Thus the greater the scientific rigor (i.e. reliance upon theory) the less likely that social research will affect social policy (Boalt, 1969; McTavish et al. 1977).
- 10 Research on research utilization consistently shows that joint work fosters identification of research questions that reflect the needs of potential users of results (Fairweather, 1967; Mackie, 1974).
- 11 Organizational research has shown that objective assessment of problems can facilitate organizational change. This assessment is termed "organizational diagnosis," (see, for example, Chin and Benne, 1969; Bowers and Franklin, 1976 and Neff, 1965).
- 12 Collaborative research can be hampered by conflicting goals of researchers and practitioners. It is therefore important to minimize the risk of conflict through careful identification of reciprocal responsibilities, (see Poser, et al. 1964 and Mackie, 1974).
- 13 See French and Bell (1978) and Margulies and Adams (1982).
- 14 Consider the following model for a given cross-section wherein some output indicator, such as contraceptive prevalence, is being monitored. Let P_i denote the probability of use for individual i such that

$$P_i = 1 + e^{-[(X\lambda)]}^{-1} \quad (1)$$

where X is a vector of variables for the individual, her household, and the community and λ is a vector of unknown coefficients representing the net contribution of each indicator to program impact P_i . More specifically, (1)

can be re-expressed as:

$$\Omega_i = \ln \left(\frac{P_i}{1-P_i} \right) = \chi \lambda \quad (1)$$

where Ω_i is the log of the odds of using contraception for individual i and χ can be decomposed into posited individual treatment and village determinants:

$$\Omega_i = \alpha + \sum_{j=1}^J \beta_j C_{ij} + \sum_{k=1}^K \delta_j V_{ik} + \delta \delta + \sum_{l=1}^L \zeta T_i \quad (2)$$

background characteristics
treatment variables

where

- C_{ij} = The j th characteristic of individual i ,
- V_{ik} = The k th characteristic of the village in which individual i resides,
- S_i = A continuous variable for the quantity or service outreach to individual i ,
- T_{il} = Project input indicator representing whether or not counterpart support or training was provided in the area where individual i resides.

Note that the equation 2 can be expanded to include interactions between program inputs and other variables, thereby testing whether the net effect of the quantity and testing whether the net effect of the quantity and quality of work variables is conditional on treatment.

With careful development of data on client worker exchanges (2) can be expanded to include quality of work indicators and their interactions with treatment conditions.

15. Aggregate areal contraceptive prevalence statistics are therefore being shared with thana authorities. Baseline results suggest that program performance is low. This, in turn, has generated much discussion and planning in Project Implementation Committee sessions at the thana level. MCH service indicators are not yet published, but this information will also be shared with programme managers.

¹⁶Note that the Figure 2 framework informs our specification of statistical models in equations (1) and (2).

REFERENCES

- Aiken, M.; and J. Hage
1968 The Relationship Between Organizational Factors and the Acceptance of New Rehabilitation Programmes in Mental Retardation, Washington, D.C.: Social and Rehabilitation Service Report Project RD 1556-6.
- Bhatia, S.; W.H. Mosley, A.G.S. Faruque, and J. Chakraborty
1980 "The Matlab Family Planning Health Service Project," Studies in Family Planning, 11(6): 202-212
- Boalt, Gunnar
1969 The Sociology of Research, Carbondale, Illinois: Southern Illinois University Press.
- Bowers, D.G.; and J.L. Franklin
1976 Survey Guided Development: Data Based Organizational Change, Ann Arbor, Michigan: Center for Research on Utilization of Scientific Knowledge, Institute for Social Research, University of Michigan.
- Chin, R.; and K.D. Benne
1969 "General strategies for effecting change in human systems," in W.G.Bennis, K.D.Benne, and R.Chin (eds.): The Planning of Change, New York: Holt, Rinehart, and Winston.
- Davis, H.R.
1971 "A checklist for change," In National Institute of Mental Health: A Manual for Research utilization, Washington, D.C.: Government Printing Office.
- Davis, H.R.
1973 "Change and Innovation," in S.Feldman (ed.) Administration and Mental Health, Springfield Illinois: Charles C. Thomas Inc.
- Fairweather, G.W.
1967 Methods for Experimental Social Innovation, New York, Wiley and Sons.
- French, Wendell L.; and Cecil H. Bell
1978 Organization Development - Behavioral Science Interventions for Organization Improvement Prentice-Hall International Second Edition.
- Glaser, E.M.
1973 "Knowledge transfer and institutional change," Professional Psychology, 4: 434-444.
- Glaser, E.M.; H.S. Coffey, J.B. Marks, I. Sarason
1967 Utilization of Applicable Research and Demonstration Results, Los Angeles: Human Interaction Research Institute.

54

- Havelock, R.G.
1969 Planning for Innovation through Dissemination and Utilization of Knowledge, Ann Arbor, Michigan: Center for Research on Utilization of Scientific Knowledge, Institute for Social Research, University of Michigan.
- Human Interaction Research Institute (HIRI)
1976 Putting Knowledge to Use: A Distillation of the Literature Regarding Knowledge Transfer and Change, Los Angeles: Human Interaction Research Institute.
- Lippitt, R.O.; J. Watson, and B. Westley
1958 The Dynamics of Planned Change, New York: Harcourt Brace, and Company.
- Mackie, R.R.
1974 "Chuckholes in the bumpy road from research to application," Paper presented at the meeting of the American Psychological Association, New Orleans, Louisiana (August).
- Mason, W.M.; and V.T. Palan
1978 "Community level variables and their effects on reproductive behaviour in Malaysai," paper presented at the Conference on Comparative Fertility Transition in Asia, Tokyo (March).
- McTavish, D.G.; D. Clearly, E.E. Brent, L. Perman & K.R. Knudsen
1977 "Assessing research methodology: The structure of professional assessments of methodology," Sociological Methods and Research, 6:3-44.
- Margulies, N.; John D. Adams
1982 Organizational Development in Health Care Organizations, Addison-Westley Publishing Company, Inc.
- Miles, M.B.
1964 "Planned change and organizational health: Figure and ground," in R.O. Carlson, (eds.) Change Processes in the Public Schools, Eugene, Oregon: Center for the Advanced Study of Educational Administration of the University of Oregon.
- Neff, F.W.
1965 "Survey research: A tool for problem diagnosis and improvement in organizations," in A.W. Gouldner and S.M. Miller (eds.): Applied Sociology, New York: Free Press.

- Phillips, J.F.; R. Simmons, A.I. Chowdhury
1983 "Integrating health service components into a family planning program: The contribution of MCH to family planning efficacy," (unpublished manuscript).
- Phillips, J.F.; W. Stinson, S. Bhatia, M. Rahman, and J. Chakraborty
1982 "The demographic impact of the Family Planning Health Services Project in Matlab, Bangladesh," Studies in Family Planning 13(5): 131-140.
- Rahman, M.; and S. D'Souza
1981 "A review of findings on the impact of health intervention programmes in two rural areas of Bangladesh," (unpublished manuscript).
- Rahman, M.; W.H. Mosley, A.R. Khan, A.I. Chowdhury, and J. Chakraborty
1980 "Contraceptive Distribution in Bangladesh: Some lessons learned," Studies in Family Planning, 11: 191-201.
- Rubin, I.; M. Plovnick and R. Fry
1974 "Initiating planned change in health care systems," Journal of Applied Behavioral Science, 10: 107-124.
- Stinson, W.S.; J.F. Phillips, M. Rahman, J. Chakraborty
1982 "The Demographic Impact of the Contraceptive Distribution Project in Matlab, Bangladesh," Studies in Family Planning, 13(5): 141-148, May.
- Van de Vall, Mark and Cheryl Belas
1980 "Applied social discipline research on social policy research: The emergence of a professional paradigm in sociological research," The American Sociologist, 15: 128-137.
- Zaltman, G.; R. Duncan, and J. Holbek
1973 Innovations and Organizations, New York: Wiley and Sons.