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**OPERATIONS RESEARCH IN FAMILY PLANNING
AND PRIMARY HEALTH CARE:
REPORT ON A WORKSHOP**

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INTRODUCTION

Over the past few years, the growth of international donor assistance to developing countries has slowed considerably. At the same time, developing countries are facing severe economic constraints. As a result, it has been increasingly difficult to obtain funding from either international or local sources for the ongoing costs of family planning and health programs. At the same time, the emphasis of such programs has shifted toward extending priority services to all people in need, including rural populations and the urban poor. One way of reconciling these conflicting trends is to attempt to make programs more efficient and cost-effective. The core of operations research (OR) is the systematic gathering of information that can be used to improve service programs through the development and assessment of additional or alternative service delivery strategies. Consequently, OR is of major importance to family planning (FP) and primary health care (PHC) programs today.

On May 26, 1983, the Center for Population and Family Health (CPFH) of Columbia University held a small, informal workshop on operations research. The participants included, in addition to the staff of CPFH's International and Social Science Research units, representatives of The Johns Hopkins University, The Population Council, The Primary Health Care Operations Research Project (PRICOR), the Research Division of USAID's Office of Population, Tulane University and the Association for Voluntary Sterilization (AVS). (See Appendix A for a list of participants.)

Note: For information on publications and the projects mentioned, please write to the appropriate organization.

OPENING SESSIONS

The purpose of the workshop was to bring together people involved in OR on FP/PHC programs in order to discuss 1) what we have learned from OR; 2) OR methodology; and 3) directions OR should take in the future. It began with representatives of each organization briefly discussing its OR activities.

The Center for Population and Family Health utilizes OR as a tool for improving the delivery of family planning and basic health services. CPFH begins by identifying the problems hindering delivery in the particular program. Potential solutions are proposed and the research strategy is then built around them. The objective is to study the effect of the innovations on the program systematically, in terms of both how results are achieved (process analysis) and what the results are (product analysis).

The content and methodology of OR vary with the program being studied and the research questions being posed, as brief descriptions of the OR activities of CPFH in the Sudan, Thailand and Brazil (presented by CPFH resident advisors) demonstrate.

Research in the Sudan Community-Based Family Health Project is focused on assessing whether the duties of the nonliterate government midwives can be expanded to include such preventive services as family planning and maternal/child health (MCH) care. In the examination of this broad question, a number of smaller, more specific issues have been addressed. For example, pretraining and posttraining questionnaires were used to assess the effectiveness of training programs. Through observation and personal interviews, the important issue of the ability of the midwives and the male dispensary staff to work together

harmoniously was assessed. Finally, the overall impact and practicality of the project are being addressed by analysis of baseline and follow-up survey data and through a cost-effectiveness analysis.

Because Thailand has had a longer experience with family planning through a variety of well-developed government and private programs, its research needs are quite different from those of the Sudan. Consequently, the CPFH advisor uses data provided by different projects and programs to identify problems and their solutions. Often, research can be done using the extensive information that is already available. For example, routine mini-survey data were used to examine the effect of distributor characteristics on contraceptive prevalence. Standardized questionnaires and forms facilitate analysis across programs. Another major focus of this research effort has been on the expansion of the roles of nursing and auxiliary personnel to include such activities as provision of modern contraceptives and performance of postpartum sterilizations.

CPFH has provided technical assistance in OR to Brazil's main family planning program, which is operated by a private organization -- BEMFAM. Established in 1965, the program is relatively mature. A central issue addressed by OR activities in Brazil has been administrative efficiency. Specific attention was given to an experimental evaluation of several supervisory schedules. This experiment showed that more supervisory visits do not necessarily mean better supervision. Although this study involved substantial expense, a cost-benefit analysis showed a saving, during the first year alone, of three dollars in

supervisor salaries and expenses for every dollar spent on the research.

While PRICOR and CPFH clearly agree on the basic tenets of OR, there are some differences in both approach and emphasis. PRICOR deals with OR as a three-stage process: 1) problem analysis, which entails verifying the perceived problem and breaking it down into its basic components; 2) solution development, which is the process of systematically identifying possible alternative solutions and, in some instances, building and manipulating models in order to identify the best solution; and 3) field testing. PRICOR projects do not always include field testing of the solution, although this is sometimes carried out by local agencies.

Key to the PRICOR approach is the systematic investigation of alternative solutions. While this requires time and money, it may prove to be economical in the long run. For example, in a study of community financing of primary health care in Benin, the first stage of the project included examination of existing and specially gathered data on program components. Next, objective criteria for success were developed, and various possible schemes were then evaluated using those criteria. Thus, a comparative approach was used, although it did not entail an experimental or quasi-experimental field trial.

The Population Council has been engaged in OR activities in various parts of the world for many years. One such activity is its Asia OR Project. Operating out of the regional headquarters in Bangkok, Population Council staff provide technical

assistance in the development of OR projects, give financial support and assist with project implementation. In addition, staff members have produced a handbook for designing a family planning project. Written in clear, simple language, the handbook is designed to enable research staff and program managers to design their own OR projects.

Like those of the other organizations, The Population Council's OR activities are tailored to the stage of program development in the host country. In Asia, The Population Council provides training in OR design and technical assistance to specific OR projects within national programs. In Tunisia, it gives ongoing assistance in OR to the national family planning program. In Colombia, The Population Council has been involved for the past eight years in OR in community-based distribution, both for the Ministry of Health and for Profamilia, testing expansion of services, supervision systems, cost-effectiveness, and information and education strategies. At present, The Population Council has six field staff working in OR abroad.

The Johns Hopkins Population Center has in common with the other organizations a conceptual definition of OR as proceeding from problem identification. This is followed by development of an experimental or quasi-experimental project for testing possible solutions in the field and implementation of the research findings. At present, Johns Hopkins has four OR projects in Kenya, one in Egypt and one in Brazil. One of the projects, in the Diocese of Mount Kenya East, is addressing the relative efficiency of individual versus small-group supervision. Another project is examining alternative teaching schedules for "natural"

family planning. In Egypt and Brazil the impact on contraceptive prevalence of household visits, distribution of condoms and the establishment of mini-health posts in poor neighborhoods is being studied.

The Johns Hopkins OR projects have had an experimental or quasi-experimental design, with emphasis on the importance of strengthening the program infrastructure. They take into consideration the fact that low cost, simplified logistics and quality of training and supervision are key factors in determining whether the program will survive after the donor agencies leave. In addition, the Population Center has conducted conferences and produced a series of issue papers on OR.

Tulane University has concentrated most of its OR activities in the Caribbean. Tulane is currently developing seven OR projects in that area, all of which have quasi-experimental or experimental designs and are built on existing programs. In St. Vincent, for example, the objective is to improve contraceptive continuation by increasing access to family planning through an information campaign focusing on the management of side effects and on expanded use of primary health care workers. In Barbados, Tulane is working with the Ministry of Health to find ways to delay second pregnancies among adolescent mothers through counseling. Three groups of teenagers will receive different amounts of counseling and follow-up. A project in St. Kitts will focus on the impact of sex education on contraceptive use and teenage pregnancy.

The relatively new OR program of Association for Voluntary

Sterilization is focused on improving the acceptance of sterilization. In Guatemala, for example, AVS is testing the impact of various information and education plans on vasectomy rates. AVS is now incorporating OR into its grants for training and services.

The Operations Research Program of USAID's Office of Population was established in 1973. To date, over 55 projects have been developed. The first 30-40 grants awarded were aimed at testing the feasibility of community-based distribution (CBD) of contraception. These demonstration projects showed that CBD can work in Latin America, Asia and the Near East. However, the results are not yet clear in Africa. Another area of interest to USAID is management. Effective management is crucial to program success, but it is very difficult to research. Ways need to be found to demonstrate the impact of improvements in this important area. Finally, it is necessary to find methods of disseminating what has been learned in OR. As one mechanism, USAID has prepared capsule summaries of the OR projects it has funded to date.

WORK GROUP DISCUSSIONS

After this overview of OR as perceived and carried out by the organizations represented, workshop participants divided into work groups for discussion of OR accomplishments to date, methodologies and future directions. A rapporteur was assigned to each group. Their notes (from which the following summary was prepared) show that common concerns surfaced in all groups. Therefore, the work group discussions are presented together. The discussions covered specific lessons learned from OR to date,

conditions necessary for productive research and a variety of other issues.

OR Accomplishments

Operations research in FP/MCH has produced many important and useful findings. Some of these are general principles of program design and management, such as the following:

- Offering a variety of contraceptive methods increases utilization.
- Increased access to family planning supplies and information increases utilization.
- A variety of community-based approaches can be effective in extending services to underserved areas or groups.
- Integration of FP and PBC programs does not necessarily lead to increased contraception. The decision to integrate programs should be based on practical considerations.
- In integrated health and family planning programs, limiting the number of interventions to a few finely focused ones produces better results than do more diffuse efforts.
- Even when paramedical personnel and volunteers provide services, rural health programs are more expensive to run than are urban, clinic-based programs, because of supervision requirement, transportation costs and other logistical complexities.

Other OR findings are more specific. The following are just a few examples:

- Trained nurses, auxiliary nurses and midwives can safely insert IUDs.
- In the training of community health workers, for many reasons, repeated short segments of training are often preferable to one session many weeks long.
- In many settings, a phased approach to introducing several interventions has produced positive results.
- A great variety of OR questions can be answered by using such "quick and clean" methods as mini-surveys and mini-experiments.

It was suggested that a compendium of OR findings might be

useful, especially since many have been incorporated into programs and their OR origin forgotten. One such finding is that operations research is indeed possible.

Current Trends in OR

In addition to the specific findings that have come out of OR, it is apparent that the process and priorities of OR are changing:

- Cost-effectiveness studies are becoming more common.
- Research questions are becoming more specific, shifting from assessment of entire service delivery systems to study of specific components, such as training, supervision, community financing, education, etc.
- In Asia and, to some extent, in Latin America, emphasis is shifting away from starting and studying new service programs toward doing research on innovations within existing programs. Of necessity, in Africa, more attention is given to developing demonstration and pilot projects.
- As interest in integrated health and family planning programs has increased, researchers have begun to grapple with the complexity of studying and evaluating them.

The Importance of Flexibility

Health programs in developing countries, especially new and experimental programs, are not static or predictable. Therefore, in order for OR to produce relevant information, flexibility is needed at a number of levels, especially in regard to funding, management, staffing and design.

Many of the most useful OR studies have been relatively small and inexpensive -- for example, those which showed that trained midwives can safely insert IUDs. In the past, such studies were mounted and finished relatively quickly. Today, however, before a study is funded it must usually pass through

many levels of bureaucracy (e.g., the central and local offices of the funding agency, the host country's Ministry of Health and the agency providing technical assistance). This process can take longer than the study itself, and the relevant policy decisions may be made in the meantime. Funding agencies should allow flexibility, so that project personnel can respond to research needs as they arise. It was noted that the Research Division of USAID's Office of Population has recently been given the authority to fund projects costing up to \$75,000 without having to go through the agency's contract office. In addition, CPFH has developed with the Office of Population a format for proposing and conducting OR projects in two phases: the first devoted to problem identification and the proposal of solutions; the second devoted to field testing. This two-phased approach should facilitate the process of project development.

Flexibility in the management of OR projects was also emphasized. The length of an OR project, for example, should reflect the situation. One requiring the training of new types of health workers and the extension of services into unserved areas may well take more than the usual 2-3 years. On the other hand, a case was cited in which the research was completed by the end of the second year of a three-year OR project. The sensible thing to do would have been to terminate the project and use the rest of the money for something else. Instead, because of lack of flexibility, the project ran for another year.

It should be recognized that there will be OR projects that are clearly not being implemented in an effective manner. Mechanisms should be developed (and those that exist should be

used) for terminating such projects rather than throwing good money after bad. However, an unsuccessful service program should not be confused with an unsuccessful OR project. Even if the service program is a failure, valuable information may be obtained that can be used to prevent repetition of mistakes.

Flexibility of staffing is important as well. In some instances, it may be appropriate to have a staff member providing general assistance to a program or ministry, while in other circumstances, a resident advisor may be needed to concentrate full time on an OR project. In addition, temporary assignment of a resident advisor (for example, during the planning phase) should also be an option.

OR design, like funding and management, should be appropriate and flexible rather than follow a fixed format. Insistence on the traditional baseline study of contraceptive prevalence, for example, may be an inefficient use of time and money in some circumstances. Furthermore, such studies may not address many of the issues which now concern researchers, such as reasons for nonuse or discontinuation of contraception. Fortunately, some funders (including USAID) are now placing more emphasis on OR that looks at process, as well as supporting OR with traditional research designs.

Flexibility in OR design also means taking advantage of information as it becomes available. Data from pilot projects, pretests and qualitative studies should be used to improve program design. In some cases, this may mean altering the program midway, even if a comparative study design has to be abandoned.

The Importance of Context

One of the lessons learned from OR is that the answers to many research questions depend upon the context. The Ministry of Health in a developing country is usually more concerned with answers for their country than with global answers (should they exist). Researchers and funders, on the other hand, are seeking general principles which can be applied in many contexts as well.

Perhaps the best way to resolve this dilemma is to rephrase research questions. For example, there is no set number of tasks that community health workers (CHWs) can handle adequately; it varies with training, backup, commitment and community support, among other factors. The question, then, is not, "What is the optimal number of tasks for a CHW?" but, "What are the factors which influence the number of tasks a CHW can handle?" The answer to this question can only be found by conducting studies in a number of programs and extrapolating from their findings. An important offshoot of such research would be to reinforce awareness that giving CHWs too many tasks reduces their effectiveness on all fronts. For some questions, it may be possible to derive generalizable principles, but for others, it may not.

The need to take the context into account is more important now than ever, because so much research attention is focused on Africa. For example, it is often not possible to rely on routine service statistics in Africa. This is especially true in integrated programs utilizing CHWs, since forms which could record all the services provided would be too complicated. Similarly, the question was raised as to whether experimental and

quasi-experimental research designs (which have been receiving increased attention in the OR field) are appropriate in many African settings. The emphasis may need to be on simple demonstration or pilot projects with intensive technical assistance. These projects probably should be relatively small at first and of short duration (18-24 months), with priority given to expansion at a later phase to the state or national level. Finally, it was emphasized that regional as well as continental differences must be kept in mind.

The Importance of Planning

Planning a study or project without adequate background information wastes funds and effort. One reason is that the intended research question may not be appropriate. It may become clear, after a "Phase 1" assessment of the situation, that a planned study of several CBD approaches should be abandoned and a contraceptive retail sales project tried instead. The more common situation occurs when careful scrutiny reveals that before any meaningful research can begin, a weak administrative or logistical system must be strengthened. There is no point in testing two training schedules, for example, if the trainees will not have adequate supervision or supplies.

Background information (whether existing or specially gathered) is essential to the articulation and evaluation of possible alternative solutions to the problem under investigation. Several participants stated that the process of considering alternatives (rather than proceeding along a predetermined course) is the key to OR. This weighing of

alternatives can be done through an experimental research design or through building and studying models.

Methodological Issues

A number of general principles of OR were discussed:

- **Simplicity.** Keeping research designs as simple as possible makes it more likely that the research design will be followed and the results easy to interpret and apply.
- **Replicability.** Replicability is one of the factors that should be considered in choosing among the possible alternative interventions to be tested. This includes both replicability at the regional or national level and replicability in quite different contexts.
- **Criteria__for__Success.** In order to continue to develop OR as a science, it is important to establish criteria for success at the outset of any research project. This does not mean that all research has to be quantitative, only that it must be systematic.
- **Experimental_Design.** The consensus at the workshop was that OR need not be experimental or quasi-experimental in design. The important issue is the relevance of the study design to the question of interest. Furthermore, some researchers have become disenchanted with large experimental studies because these are very expensive and have proved less informative than was hoped.
- **Process__Analysis.** The difference between a successful and an unsuccessful program often lies not in the overall design or fixed characteristics (such as length of training or level of worker) but in some fluid aspect. However, the analysis of processes has been so neglected that we are not even sure how to collect and communicate relevant information. It was suggested that recording of processes should be made routine in program development. One participant mentioned a program in which the trainers kept formal diaries. Since it is not possible to record information on all processes involved in a program, priorities need to be established.
- **Case_Studies.** One way to convey information on process would be to compile case studies of a number of programs that illustrate a variety of successful approaches to common problems. Issues that need to be addressed in such an effort include how to get the "real story", how to decide what material to record, and how much detail to include.
- **Qualitative__Methods.** Qualitative methods are needed to provide answers to many important questions. For example,

surveys are not designed for gathering in-depth information on reasons for nonuse of a given service or on traditional health practices and beliefs. However, there is a wide range of qualitative techniques for obtaining such information. Trained observers can be helpful in gathering data on processes. A number of participants reported that they have used focus groups (a technique borrowed from marketing research) and have been pleased with the results.

- **Modeling.** Model building is another borrowed technique which is now being used in OR. Models need not be esoteric, time-consuming or expensive, and they can incorporate diverse kinds of information (e.g., survey data, interviews, marketing data, etc.). For example, a diagram which illustrates the relationships among variables both within and outside the health system can facilitate thinking about direct and indirect influences on program effectiveness. However, if models are to be useful to program managers they need to be kept realistic and free from jargon. It is crucial to strike a balance between models so simplistic that they are not useful and those so complex that they are not used.

Communications Needs

For OR findings to be fully utilized, they need to be documented and communicated to people in other programs. Unless this is done, valuable experience will be lost and costly duplication of effort will occur. Even if the contexts of programs differ, either the findings themselves or the research processes may still be useful. Sharing of research instruments (questionnaires, record forms, etc.) is also valuable.

Better ways of keeping researchers and program managers informed of OR findings are needed. The POPLINE computerized data base is one way of addressing this problem, and it should be kept attuned to the needs of people doing OR.

In addition to publication in international and regional journals, a number of other channels can be used for the communication of OR findings. These include formal and informal presentations at meetings and seminars, working papers and case

studies. As another vehicle for disseminating information about OR, CPFH described the role of its FP/PBC training program in communicating OR experience and results.

Finally, it is important to study and document the utilization of OR findings by the host country: How are the results incorporated into institutional memory? Are they communicated to people in other programs and countries?

CONCLUSION

This one-day workshop provided an opportunity for people involved in operations research on FP/PBC programs to discuss what has been learned and what needs to be done. While individual researchers and institutions varied in their emphasis, a surprising degree of agreement was evident. A number of ways to pursue the discussions begun at this workshop are under consideration. Bringing together representatives of a number of organizations involved in OR on FP/PBC programs was a first step in establishing links and communication between the different research groups. All agreed that such informal exchange is truly important and needs to be continued.

Appendix A
PARTICIPANTS

Group 1

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Group 2

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