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PROGRESS IN CLINICAL  
AND BIOLOGICAL RESEARCH  
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**OPERATIONS  
RESEARCH**

**Helping Family Planning  
Programs Work Better**

Editors: Myrna Seidman  
Marjorie C. Horn

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**OPERATIONS RESEARCH**  
Helping Family Planning Programs  
Work Better

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# OPERATIONS RESEARCH

## Helping Family Planning Programs

## Work Better

Proceedings of an International Conference and Workshop on Using  
Operations Research to Help Family Planning Programs Work Better,  
Held in Columbia, Maryland, June 11-14, 1990

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## Preface

The family planning world of the 1990s has changed from that of the 1970s. In the 1970s, much of the operations research (OR) agenda was simply to demonstrate the acceptability of quality family planning services where they had not been made available previously, and to try sweeping innovations such as community-based distribution (CBD). While the need for such pioneering activities continues in such frontiers as parts of Africa, much of the world now has family planning services available, often through more than one mechanism. Nevertheless, the potential for improvements in service delivery is immense. OR—the handmaiden of family planning service delivery—has responded and will respond further to this challenge.

A number of attributes of OR have not changed since the early days. These include the paramount importance placed on improving service delivery; the priority given to being innovative, taking risks, and being at the cutting edge; the need to serve two masters—the program manager and the social scientist interested in developing a general body of knowledge on family planning service delivery; the desire to foster a problem-solving mentality among program managers; the objective of policy impact at various levels; the attention to carefully documenting the output of family planning efforts, such as contraceptive prevalence; and a research agenda that includes various “bread-and-butter” issues, such as the demonstration of demand through quality family planning services, management structure, training, supervision, and method mix.

At the same time, a number of things about OR *have* changed. These include wishing to be more user-friendly to programs; being more flexible, timely, and “bottom-up” in the methodology; paying more attention to process as well as outcome; stressing the dissemination and application of OR results and other systemic service delivery findings, including special emphasis on pure technical assistance to family planning programs; increasing emphasis on institution strengthening, including independent OR *within* family planning programs and A.I.D. Cooperating Agencies; and pursuing a research agenda that includes current issues such as new contraceptive technology, underserved groups, quality of care and client-provider interaction, AIDS and family planning, sustainability, and a wide variety of private sector approaches.

**xiv / Preface**

While OR has already changed significantly, the purpose of the meetings for which the papers in this volume were prepared was to help provide further guidance on where OR should go and how. By interacting with our OR colleagues and our family planning service constituency, we sought to share what we know and what we believe to be the best directions for the future. The challenges of the 1990s offer many opportunities to which OR, the science and art of family planning service delivery, can respond.

**James Shelton**  
Director, Division of Research  
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Development

## Acknowledgments

The production of this volume was truly a team effort, involving a large number of people over an 18-month period. It is difficult to acknowledge completely and precisely the efforts of the many individuals who contributed their ideas and worked so hard to turn the possibility of this publication into a reality.

The title of “grand author of it all” belongs to Jerald Bailey, who served as project officer during the early planning stages for the meetings that generated the papers collected herein. He saw the need for a conference to synthesize the OR Program’s accomplishments and help chart its future directions. His extensive knowledge of the program from both a field and a headquarters perspective, his concept of what the conference needed to accomplish, and his boundless enthusiasm, confidence, and support gave our work its first impetus.

Sidney Schuler ably assumed the role of helping us translate the content of the meetings into a rich program of sessions, paper presentations, and small group discussions. Her guidance was instrumental in helping us make the best possible selection of paper authors and in ensuring that field perspectives would be well represented at the meetings.

Ann Way’s in-depth knowledge of the family planning research literature and her extensive publications experience proved invaluable in helping us organize the papers into a book of conference proceedings.

The interest and involvement of our other colleagues in the Office of Population’s Division of Research, James Shelton and Jeffrey Spieler, assured us of the support of the Agency for International Development, and underscored the importance of these meetings for the OR Program. Their active guidance helped us fine tune the conference program so that it would address the salient concerns of both researchers and family planning program managers.

Duff Gillespie, Director of the Office of Population, introduced OR into A.I.D.’s family planning program and served as the OR Program’s first director. His early foresight about the contributions OR can make to improving family planning services, and his continued dedication to strengthening the collaboration between research and services, set the stage for the theme of the meetings and the focus of the prepared papers.

## xvi / Acknowledgments

The terminal illness and untimely death of David van Tija deprived us of his insights and intellectual prowess. We thought of him often as we planned and conducted the meetings and organized the proceedings, and we think he would have been pleased with the fruits that his early efforts have borne.

Day in and day out, over an intense three-month period, the staff of the Maximizing Results of Operations Research (MORE) Project oversaw arrangements and logistics for the meetings and the production of the conference handbook, which included first drafts of the papers in this volume. Only those who have been involved in organizing an international meeting can fully appreciate the number of details that have to be carefully managed. Alison Malone, Kriss Barker, Jennifer Southard, and Jeannette Cachan, the support team members for the meetings, were consummate professionals. The success of the meetings was due in no small part to their skill, flexibility, and commitment. As a result of their behind-the-scenes work, the meetings ran well, and it all appeared effortless.

Alison Malone and Kriss Barker also managed the process of transforming draft papers into camera-ready copy. Alison and Marlene Hawkins were responsible for final manuscript preparation, a task they handled with care, precision, and patience that are greatly appreciated. Kriss provided invaluable support in readying the papers for publication. She did meticulous editorial and proofreading work, coordinated with authors to ensure that references were accurate and complete, prepared the final versions of figures for several of the papers, and in general steered the process of finalizing the manuscripts.

Rona Briere edited the papers for publication and also served as editorial advisor for the meetings. Her logical thinking, critical insights, and attention to detail contributed immeasurably to planning the meetings and preparing the proceedings. It would be difficult to imagine how we could have carried out this work without her.

Finally, there are our unsung colleagues. Although too numerous to mention, their contributions are notable. These individuals helped shape the meetings, and they served ably and enthusiastically as moderators, panelists, discussion leaders, and rapporteurs.

The many people cited here gave so generously to this effort because they believed in the difference that OR can make in helping family planning programs work better. We owe them our thanks.

**The Editors**

## EDITORS' OVERVIEW

### INTRODUCTION

Operations research (OR) has been an integral part of the Agency for International Development (A.I.D.) family planning program since the 1970s, and has played the important role of examining and testing ways of promoting family planning and making services more acceptable, efficient, and effective. When the program was still in its infancy, OR demonstration projects in countries like Morocco, Bangladesh, and Tunisia examined issues such as the acceptance of family planning by traditional populations, the feasibility of nonphysicians' providing services, and strategies for bringing family planning services to rural populations. These studies influenced changes in governmental policies about family planning and contributed to the establishment of national family planning delivery systems. Furthermore, the partnership between service delivery and OR was strengthened by these experiences, which demonstrated how research could be used to test and build acceptance for approaches that initially were politically controversial and risky.

A.I.D.'s OR Program is now worldwide in scope, and OR has emerged as an accepted and critical tool for helping to shape the establishment and growth of family planning programs. Many of the new bilateral programs in Africa, for example, include an OR component, and an increasing number of service provider organizations are carrying out OR-like activities as an ongoing part of their programs. OR also has expanded in the breadth of issues studied, the diversity of study methodologies employed, and the numbers and variety of research and service-providing organizations collaborating in the studies.

In June 1990, an international conference and workshop were convened in Columbia, Maryland to review the contributions of OR to the design and implementation of family planning programs, and to consider how OR could be used more effectively in the future to help family planning programs work better. The meetings were organized and convened by staff of the Maximizing Results of Operations Research (MORE) Project and sponsored by the Operations Research Program of A.I.D.'s Office of Population.

The timing of these meetings was auspicious. OR had proven its value, and had established a role for itself in A.I.D.'s family planning

program with an impressive record of achievements. At the same time, OR has become an even more important program management tool and resource in light of growing pressures on the family planning program to reach and serve more users more efficiently, and to find more effective ways of providing quality services and increasing contraceptive prevalence.

The papers that form the body of this volume served as the intellectual underpinnings for the deliberations at the meetings. Together they provide a composite view of the contributions of OR to helping family planning programs work better (Part I), use of OR to address the challenges facing family planning services in the 1990s (Part II), how the conduct of OR could be strengthened and tailored to better support the needs of service providers and policy makers (Part III), how approaches to disseminating and applying OR results could be improved (Part IV), and how the capacity of collaborating institutions to conduct OR could be strengthened so that OR can become an ongoing and permanent part of the management decision-making processes of service provider organizations (Part V). A summary of the proceedings of the meetings has been prepared as a separate document.

## **REVIEWING OR'S CONTRIBUTIONS TO HELPING FAMILY PLANNING PROGRAMS WORK BETTER**

The opening session of the meetings provided a broad overview of the accomplishments of A.I.D.'s OR Program, and described the contributions of OR to the development and improvement of family planning programs throughout the developing world. The papers presented during the session and included in Part I review the results of OR studies, addressing different aspects of family planning service delivery: mechanisms for delivering services (Jane Bertrand); components of family planning programs (John Townsend); use of information, education, and communication (IEC) to promote family planning (Phyllis Piotrow and Rita Meyer); and program management (Michael Bernhart). In reviewing the lessons for family planning service delivery gained from OR studies, this group of papers raises a number of issues concerning the future role and content of OR that were among the major themes to emerge during the meetings.

### **Mechanisms for Service Delivery**

Much of the early OR focused on community-based distribution (CBD). These studies demonstrated the feasibility of CBD and had a major impact on the family planning policies of a number of countries. Although OR still has an important role to play in convincing government

officials and policy makers of the safety and feasibility of CBD programs in new settings (notably in Africa), Bertrand notes that recent OR studies on CBD have focused on increased effectiveness, the impact of CBD on contraceptive prevalence, the characteristics of successful distributors, and the appropriate mix of services and supplies.

Bertrand also reviews OR results on three other service delivery alternatives: market-based, clinic-based, and employment-based programs. Market-based distribution is a relatively new approach to service delivery, combining features of CBD (distribution by community volunteers) with those of social marketing (use of financial incentives). As discussed by Bertrand, OR on this approach has focused on the willingness of traders to sell contraceptives, public acceptability of contraceptive sales in the marketplace, and the most suitable characteristics of traders and markets. In clinic-based programs, recent OR studies in Africa suggest that a "risk reduction" concept may be an effective justification for incorporating family planning into ongoing medical services, while the issue of sustainability is the focus of attention in employment-based ventures.

### **Components of Family Planning Programs**

Although much OR has dealt with demonstrating the acceptability and feasibility of innovative approaches to service delivery, Townsend points out that once delivery systems have been established, program managers can manipulate those systems only through changes in program components, such as personnel selection, training, and supervision; IEC; method options, access, and logistics; organization and composition of services; and research and evaluation. For each component, he presents lessons drawn from the results of OR studies, along with challenges to the OR community that highlight issues requiring further study or new topics requiring attention. For example, he identifies a need for the development of techniques for competency-based training of service providers, which OR studies have demonstrated to be a cost-effective approach to improving the quality of services delivered. Similarly, with regard to method options, access, and logistics, he reviews study results that demonstrate the positive impact on continuation rates of providing a wide range of method choices, and suggests the need for technical assistance to help service agencies increase the number of contraceptive options available to their clients, either directly or through an improved referral network.

In addition, Townsend lays out the view of OR as a management tool. He notes that OR offers program managers a new approach to resolving problems and augments the available methodological tools for the modern management of service programs. Nevertheless, he also points out that

there is still insufficient theoretical understanding of how effects on the principal outcome variables--acceptance, use, and satisfaction--are produced, and thus of how to replicate changes in different settings and time periods. Consequently, there are still practical benefits to be gained from theory-based OR.

### **Use of IEC to Promote Family Planning**

Research on IEC, which is one of the components addressed by Townsend, is also the focus of the paper by Piotrow and Meyer. They stress that while early IEC activities focused on increasing public awareness and promoting favorable attitudes toward family planning, since the 1980s greater concern has been placed on changing behavior. This has been accompanied by a shift from attention to communication patterns within the community to interpersonal communication between service providers and clients, and to more sophisticated uses of communication. As in the Townsend paper, the authors present a series of propositions or lessons learned from the research findings and propose questions OR might address in the future. The latter include research on such issues as how to improve the quality of interpersonal communication with clients without increasing costs, appropriate compensation or reward systems to sustain the motivation and performance of peer promoters, strategies for recruiting new contraceptive buyers in social marketing programs, and means of persuading policy makers to permit more specific family planning information in the mass media.

Institutionalization of IEC activities in family planning programs is the subject of the paper by Margot Zimmerman and Joan Haffey in Part V, which synthesizes lessons learned from this experience that are relevant for OR. For example, they note the need to involve managers in all stages of an OR project so that skills are transferred and the OR process becomes a management tool.

### **Program Management**

In his paper on OR studies on program management, Bernhart presents some empirical support for a life-cycle approach to program evolution that offers certain lessons to program managers. Specifically, he notes that management challenges differ with the progression to each new stage of program evolution, whether these stages are linked to fertility rates or to contraceptive prevalence levels. Also, he notes that programs will not advance spontaneously from one stage to the next, and that prevalence will plateau if managers do not adopt strategies needed to continue to the succeeding stage. Related issues are raised by Dawn Liberi (in Part II),

who elaborates a typology of family planning programs by level of maturity according to contraceptive prevalence. Indeed, a recurrent theme during the meetings was the need to tailor OR studies, technical assistance, and management strategies to the stage of program maturity.

Bernhart also addresses political strategies and the use of OR for marshalling support to overcome barriers, for example, to family planning *per se*, to innovative approaches to service delivery, and to demedicalization of service delivery.

Program managers need to pursue appropriate financial strategies to ensure the viability of their programs. Shrinking donor resources for family planning programs and the increasing focus on sustainability have led to a number of OR studies reviewed by Bernhart on community financing, contraceptive pricing, fees for services, and separate charges for individual services. Another approach--employer support--is addressed by Bertrand. The broader issue of cost-effectiveness and sustainability is discussed by Bernhart, but receives more detailed consideration by Eric Jensen (Part II), while analytical approaches to cost analysis are explored in the paper by Genevieve Kenney and Maureen Lewis (Part III).

In his discussion of lessons learned, Bernhart suggests that OR projects can be divided into three categories: studies that have yielded generalizable findings; studies whose research methods are generalizable even though the specific findings are not; and studies yielding as yet unproven findings. This latter group of studies may be attractive because they have theoretical consistency, because the study results provide a better understanding of local conditions, or because the results point to general issues and program dynamics that may differ within each program. The results of the studies reviewed by Bertrand, Townsend, and Piotrow and Meyer may be similarly categorized. However, regardless of the category, Bernhart suggests that past research findings are the logical starting point for managers seeking to improve the performance of their programs.

## **ADDRESSING THE FAMILY PLANNING PROGRAM CHALLENGES OF THE 1990S THROUGH OR**

Following the overview of OR's accomplishments, the focus of the meetings shifted to how OR could help family planning program managers address the challenges, discussed in Liberi's paper, of improving the accessibility, efficiency, and quality of services. Throughout the developing world, family planning program managers are faced with finding ways of reaching more clients and providing effective, efficient, high-quality ser-

vides. The seven papers included in Part II review and synthesize OR study findings that have addressed these issues.

### **Improving Access**

Liberi notes that, at the macro level, family planning program needs and priorities differ according to stage of program maturity. The nature of the challenge of making services accessible differs between countries where prevalence is very low and those where prevalence is moderately high, and large delivery systems are already in place.

In the former case, the task is often to introduce an innovative delivery system, with the primary goals of demonstrating feasibility, influencing policy, and creating commitment to family planning program development. Sam Adjei's paper illustrates the nature of this challenge for a low-prevalence country--Ghana. The paper by Don Lauro, Regina McNamara, Maria Wawer, and Cathy Maternowska, based on Columbia University's experience in Africa, observes that OR in such a setting legitimizes innovative service delivery approaches as research, and also provides risk protection for managers: if unsuccessful, projects can be terminated; if effective and acceptable, the study provides the data managers need to support expansion.

In countries where family planning services are already available, the challenge is not to introduce services, but to expand services to new clients and make services more cost-effective. Adding more outlets is one of three strategies discussed in the paper by James Foreit on reaching more users. Several OR studies have been conducted on who can provide family planning successfully, and on where, when, and how. Strategies investigated include the use of nonphysician health professionals and community volunteers to distribute contraceptives, provision of services in the workplace, physical and temporal integration of family planning with other services, and greater reliance on retail outlets.

In addition to increasing access to services by instituting or expanding family planning programs, program managers can address this challenge by improving the mix of available methods. Foreit points out that no single contraceptive method is appropriate to all users, and adding a method to a program will reach new users for whom previous method choices were inappropriate. Choice of contraceptive methods is one of the six elements in the quality of care framework described in the paper by Judith Bruce and Andrudh Jain. They argue that providing a choice of methods increases program effectiveness for three main reasons: the needs and values of individuals and couples change as they pass through different stages in their

reproductive lives; multiple methods permit switching for those whose initial choice is unacceptable or inappropriate; and, given erratic contraceptive supplies, a choice of methods ensures that at least some methods will be available.

One way to expand choice is to introduce new methods to a program. Nancy Williamson, Shyam Thapa, and Sandor Balogh address some of the issues facing program managers in deciding whether a new method should be introduced, and note that tradeoffs are typically involved (for example high effectiveness may also mean high costs). To date, little OR has been conducted on contraceptive introduction, but their paper suggests that in the future, attention be directed toward acceptability research to determine the demand for new methods in relation to other methods, examination of whether new methods attract new users or switchers, and consideration of the impact of a new method on quality of care and the overall provision of services.

### **Increasing Effectiveness**

As demand for family planning continues to grow, program managers must grapple with the task of stretching their resources either to sustain existing services or to meet the needs of underserved populations. A new, and as yet relatively untested, strategy is building collaborative relationships among government agencies, private voluntary organizations, and for-profit agencies so that existing resources can be used more efficiently as each agency contributes what it does best. Marcia Townsend reviews some examples of such partnerships entered into by family planning program managers seeking to share resources and expand services. She notes that, although OR has rarely been used to field test such arrangements, program managers need better information about the policy and operational problems involved. Managers also require data on whether collaborative services substitute for other sources of family planning or do, in fact, attract new users.

Partnerships are just one approach managers may take to stretch scarce funds as they are increasingly challenged to make their programs more sustainable or adopt more cost-effective approaches. Sustainability refers to the ability of a program to generate revenues to cover recurrent costs, while a cost-effective program is one that delivers a given output with fewer inputs than an alternative program providing comparable outputs. Eric Jensen draws a sharp distinction between the two concepts, noting that cost concerns relate to issues of resource commitment, whereas the central concern in sustainability is the consumers' willingness to pay, either directly for family planning or indirectly for other services or com-

modities whose revenues support family planning activities. Although program managers may need to address both issues, Jensen points out that a cost-effective program need not be sustainable, nor is a sustainable program necessarily the most cost-effective approach. He also cautions that cost-effectiveness analysis can be used only to discriminate among programs with comparable outcomes, and not to compare programs that serve different client groups or that provide different mixes of services.

### **Enhancing Quality of Services**

As managers increasingly turn their attention toward cost considerations, they are also being urged to improve the quality of care provided in their programs. Quality can affect program sustainability, cost-effectiveness, client satisfaction, and continuation, as well as program growth and expansion. The various components of the quality of care framework discussed by Bruce and Jain, although analyzed from the client viewpoint, also clearly are relevant for managers seeking to improve effectiveness and efficiency. As noted above, expanding method choices can be an element in attracting new clients. Efforts to encourage correct use and improve continuation as discussed by Williamson et al. cut across at least three additional elements of the quality of care framework: information given to clients, interpersonal relations, and mechanisms to encourage continuity. Bruce and Jain also suggest that OR researchers begin to develop diagnostic, feasibility, and impact studies to examine and improve quality of care directly.

## **STRENGTHENING THE CONDUCT OF OR**

One of the major purposes of the conference and workshop was to formulate strategies for improving the conduct of OR carried out under the A.I.D. OR Program. The five papers included in Part III review various aspects of conducting OR, including the selection of study topics and the design of studies.

The paper by Michael Hendricks draws on exemplary and successful OR experiences to provide a wide range of suggestions for strengthening the conduct of OR. In advocating a stronger, more visible management focus for the research, Hendricks identifies the need to develop the will of managers to request and use OR. He suggests that to accomplish this, researchers more explicitly identify managers as their clients, that they help managers develop the research agenda, and that they involve managers and local counterparts more directly in the studies. Hendricks also emphasizes several research strategies to ensure that results will be used. These

include conducting studies of short duration; using flexible emergent designs; linking research studies to specific decisions; specifying possible action up front; and providing managers with information, even if it is preliminary, as soon as possible. He also calls on researchers to view their studies as products and to "market" their findings more aggressively. The presentation of his paper at the opening session of the workshop set the stage for a more in-depth examination of the conduct, dissemination, and application of OR studies.

A first step in any OR project is selecting a problem to study, and technical considerations are critical in making this selection. Andrew Fisher and Robert Miller outline four key criteria for identifying problems that can be addressed through OR: the topic should be amenable to research, i.e., there are two or more reasonable and competing causes of the observed problem; the problem can be solved by administrative action; the problem is relevant in that the independent variables are under the control of managers, and the dependent or outcome variables are viewed as important by decision makers; and the problem is salient (important to institutional goals), and the potential solution can be replicated to a larger area. Nevertheless, the paper notes that nontechnical considerations, such as people, personalities, institutions, social customs, cultural values, and politics, also play an important role and may necessitate compromise in the selection process.

In addition to balancing technical and nontechnical criteria in selecting topics, OR researchers increasingly are being challenged to employ a wider variety of research designs and methodologies to address the needs of program managers. Historically, A.I.D.'s OR Program supported large-scale, quasi-experimental projects that demonstrated the feasibility of providing family planning services or tested innovative delivery systems that might be generalizable to other settings. These projects reflected a social science approach to OR, that is, the testing of hypotheses. More recently, there has been a gradual shift toward less rigorous quasi-experiments, nonexperiments, and even designs that are not considered experimental (e.g., diagnostic studies, evaluations, qualitative studies, process analyses, and cost-benefit analyses). One of these approaches--process analysis--is examined in detail in the paper by James Heiby, which describes the methodology employed by the Primary Health Care Operations Research Project (PRICOR) II to evaluate primary health care services.

While there is continuing interest in quasi-experimental designs, there is also increasing acceptance of the less rigorous alternative approaches. Jack Reynolds suggests that this may be due to the greater emphasis on conducting OR for family planning managers and on improving program

management. More rigorous designs tend to cost more and to require more time and technical expertise, and may even disrupt service delivery to some extent. However, managers are typically interested in quick results and are likely to accept a lower level of confidence than social scientists. Thus, Reynolds suggests that researchers must balance the issues of certainty and practicality in designing OR studies. As a general rule, when the risks of being wrong are high, a more rigorous study design should be employed, but less rigorous designs are appropriate in lower-risk circumstances.

Expanding the range of possible study designs implies the need to tap a broader range of expertise than has been the case to date. Family planning OR began in the late 1960s and early 1970s as social science-based research growing out of sociology and demography. Reynolds, along with Robert Blomberg, suggests that the OR community should begin to recruit more staff from the management sciences, and also make a more systematic effort to incorporate and use the philosophy and techniques of management science.

The need for better information on program costs is an area of management concern that received attention during the meetings. While the challenge of making programs more cost-effective is the focus of the paper by Jensen, Genevieve Kenney and Maureen Lewis address the larger area of cost analysis. They note particularly the lack of a methodological approach to costs based on the practical needs of planners and managers, and present information on some recent innovations in data collection and analysis that hold promise for new ways of defining, measuring, and analyzing program costs.

## **IMPROVING THE DISSEMINATION AND APPLICATION OF OR RESULTS**

Application of OR study findings to improve family planning delivery systems, influence policies, and replicate and expand program innovations depends on effective dissemination of research results. Although there are a number of reasons why research results may not be utilized, a lack of dissemination guarantees that use will be limited. The four papers included in Part IV review approaches to dissemination and constraints that need to be overcome for results to be more widely applied.

The paper by Antonietta Martin, Margaret McEvoy, and John Townsend reviews how A.I.D.'s OR contractors have approached dissemination in the past, and describes the target audiences addressed, as well as the

results achieved. It also outlines strategies that should be pursued in the future to facilitate dissemination, and thus to enhance the application of research findings. One strategy is targeting information to the audiences to be addressed--program managers, policy makers, donor agencies, researchers--and tailoring the content and format to the specific interests of each group. Attention to the intended audience is also the key theme of the paper by Gary Saffitz, which applies a marketing perspective to dissemination and application, and emphasizes the need to view the users of information as clients to be served.

A second strategy suggested by Martin et al. is to develop a dissemination plan as an explicit component of an OR project. Such a plan would identify objectives, target audiences, media, dissemination channels, and assistance required (for example, from local communication experts). Preferably, this plan would be a part of the research proposal, and would ensure the allocation of sufficient funds and time to carry out the plan successfully

A third way to maximize the impact on policy is to ensure that potential users of results are kept fully informed on progress and problems encountered by the study, and are provided with preliminary results of the project as they become available. Further, all reports should clearly identify the policy and programmatic implications of OR results, and tie results as closely as possible to the concerns of decision makers. This approach can help dissemination become an ongoing process that is well integrated with the research, and not simply a one-time activity carried out at the end of the project if budget and time permit.

Improving dissemination of OR findings is certainly an aid to their utilization, but a number of factors constrain whether and how widely results are used, including rapid turnover of senior program managers, lack of technical expertise to interpret OR findings and design program changes, the cost of implementing tested interventions, bureaucratic resistance to change, and questions about the applicability/replicability of findings from pilot projects or other settings. Michael Koenig and Maxine Whittaker provide specific suggestions for facilitating the application of study results in large public sector family planning programs. Drawing on their experiences with the family planning program in Bangladesh, they note that the gap in translating OR findings into improved policies and programs is greatest in the weakest and technically least sophisticated programs. They observe that application in such settings is enhanced by providing program managers with results from similar settings; presenting convincing demonstrations of the positive impact of specific OR interventions, including opportunities for on-site visual observation; and focusing recommendations

on issues that are directly manipulable by policy makers. They suggest briefing papers that address specific operational components of family planning service delivery and provide specific recommendations for solving problems. They also underscore the need to recognize that effective application in such settings requires continual interaction and a long-term perspective, as well as technical assistance to follow up on study results and stimulate and assist with application.

## STRENGTHENING THE CAPACITY OF COLLABORATING INSTITUTIONS

Institutionalization of OR is the transfer of OR principles and methodologies so that managers internalize a problem-solving mentality; it implies the capacity to both conduct OR and use its results. This process takes time, and family planning organizations differ in their readiness for institutionalization. Several factors are involved, including the maturity of the program, the current staffing and skill levels of the target agency, the diversity of family planning providers in the country, and the current status of social science research.

The approach to institutionalization presented by James Phillips, Ruth Simmons, and George Simmons emphasizes that research must be both utilitarian and scientifically sound in order for OR to become a sustained component of family planning program decision making. However, the authors caution that without accumulating experience beyond specific case studies, OR can result in endless repetition, without producing general principles and insights, and without fostering institutionalization of the research process itself.

Phillips et al. note that institutionalization is enhanced if organizational issues are addressed in the OR regimen. Like Fisher, they emphasize that if the focus of research is something over which administrators have no direct control, OR will be peripheral to operations and slow to be institutionalized. They recommend that rather than focusing only on family planning dependent variables (e.g., acceptors, prevalence), OR also address management issues, such as organizational efficiency, worker motivation, job knowledge, and service quality.

Another strategy suggested by Phillips et al. for enhancing the prospects for institutionalization involves establishing the research as a continuous process, and developing clear lines of communication to administrators and policy makers for the systematic and regular transmission of progress and findings. Such mechanisms can enable researchers and decision makers

to interpret research jointly, to link research results to the management process, and to focus strategic attention on the application of successful findings.

Although institutionalization per se has not received major attention within A.I.D.'s OR Program, the process of institutionalization can be facilitated by technical assistance (TA). Blomberg describes the nature of TA in the OR Program in terms of a continuum. At one end of this continuum, TA emphasizes building and transferring skills, and developing self-sufficiency in conducting and utilizing research within the collaborating agency. OR subprojects are primarily vehicles for providing TA, and high priority is given to nurturing self-sufficiency and long-term institution building. The contributions of study findings to either the program or the body of knowledge about effective family planning service delivery are considered less important. At the other end of the continuum, the major focus of TA is on developing findings by carrying out OR subprojects. Although some transfer of skills to the collaborating agency may occur, it is not emphasized.

Blomberg suggests that, as the purpose of TA moves beyond the ability to undertake a reasonable quality of research to improvement of the service delivery program, managers should be the end-clients of OR, and TA should focus on helping make them better consumers of data, better detectors of programmatic problem areas, and better conceptualizers of the implications of research findings. This implies a continuing expansion of A.I.D.'s OR Program to include both TA to help generate study findings and TA oriented toward integrating OR applications for management decision making. The latter type of TA can be used to diagnose problems and suggest solutions; help apply relevant study findings from elsewhere; and generally help managers "tinker" with their programs by making small, incremental changes and observing their effects.

There are differing views about where the capacity for OR should be located. Phillips et al. envision a critical role for academic institutions, where social research can flourish and aspiring OR scientists can be trained. Nevertheless, they also place primary importance on collaboration between managers and research and evaluation units within provider agencies; links between academics and social science researchers and policy makers; and partnerships between researchers and action agencies outside the public sector. Such mechanisms for coordinating research with the decision-making process are critical to ensure that research becomes a routine function of management. Blomberg outlines several other models for institutionalization, including developing a capability within the family planning service provider's evaluation unit; creating the organizational

expertise to contract for research as needed; fostering in-country research groups knowledgeable about family planning and capable of undertaking studies; and enabling managers of service-providing agencies to identify problems and/or assess the merits and cost-effectiveness of new delivery strategies through the use of improved management information systems.

Blomberg asserts that the success of TA should be measured as a progression, beginning with the transfer of basic knowledge and skill, and moving toward ever-increasing levels of self-sufficiency in undertaking every aspect of OR activity. However, he notes that helping counterparts achieve the ability to conduct OR independently is not equivalent to institutionalization, which implies that the capacity for undertaking OR has become an integral component of the provider's process of using management tools and analyses for decision making.

## SUMMARY AND CONCLUSIONS

The papers collected in this volume offer a synthesis of what OR has accomplished during the 15 years that have elapsed since the first demonstration studies were conducted. They provided the substantive background for the deliberations at the meetings on how the OR Program should build on these accomplishments to support more effectively the ability of family planning programs to meet the challenges of improving the accessibility, availability, quality, and efficiency of family planning services in the developing world.

During the meetings, participants concluded that the need for OR is as great as ever. Where family planning programs are first getting started and contraceptive prevalence is low, OR is needed to help change restrictive policies, apply to the local setting what has worked elsewhere, and introduce the concept of quality services. Where programs are more mature, OR is needed to improve the program; help extend services to hard-to-reach populations; test new service delivery and contraceptive modalities; and emphasize such management concerns as sustainability, efficiency, and quality.

In the meeting deliberations, it became clear that OR is viewed as a flexible process that can adapt to changing program needs in both the topics studied and the methodologies employed. It is also viewed as a user-oriented process that must be responsive to its clients. These clients include policy makers and program managers who often need timely

answers to program management and service delivery problems, as well as donors and researchers who need access to a body of knowledge to understand better what works in family planning and why.

The meeting deliberations explored the implications of a more user-friendly approach to OR. They identified criteria for ensuring the relevance of studies, as well as procedures for engaging OR users in all stages of study conduct. They also explored how TA could be effectively tailored for building an institutional capability to conduct OR, and also for incorporating OR into ongoing management processes. They examined approaches to dissemination to increase the probability that study results will be applied in strengthening family planning programs.

Both the papers and the meeting deliberations were forward-looking, emphasizing the opportunities for OR that arise from the changing needs of family planning programs as they approach the twenty-first century. Researchers, service providers, and managers are challenged to work together to apply their unique expertise in using OR to strengthen the management and delivery of family planning programs.

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**PART I**

**REVIEWING OR's CONTRIBUTIONS TO HELPING  
FAMILY PLANNING PROGRAMS WORK BETTER**

## 1. RECENT LESSONS FROM OPERATIONS RESEARCH ON SERVICE DELIVERY MECHANISMS<sup>1</sup>

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### INTRODUCTION

Over the past 30 years, governments around the world have shown increasing interest in providing their populations with family planning services, either for maternal and child health (MCH) reasons or for demographic motives. As a result, family planning services are now available in the vast majority of countries in the developing world, and millions of couples currently use a contraceptive method.

The main mechanism for the delivery of family planning services since the 1950s has been the clinic-based approach. Traditionally, family planning has been viewed as a medical intervention to be delivered by clinically trained personnel within a medical setting. Based on the Western model for medical services, the logical choice of facility was a hospital or clinic. And indeed, millions of couples in the major urban areas of the developing world today obtain family planning services from such clinics.

However, during the 1960s and 1970s, it became increasingly evident that the clinic-based approach was not adequate to reach all segments of the population. Those in rural areas often lived at considerable distance from the nearest health facility. Those who made the effort to reach one were often made to wait while the overworked clinic staff gave preference to the "more pressing" problems requiring curative treatment. There were other opportunity costs related to clinic visits, including the cost of transportation or of child care during the mother's absence. In addition, there were psychological costs of being treated with indifference or even disrespect by clinic personnel, especially those who were personally opposed to family planning. Women in marginal urban areas generally had better access to a clinical facility than their rural counterparts, but they faced the same opportunity and psychological costs in seeking services (Foreit et al., 1978).

In response to these drawbacks of the clinic-based approach, there was some initial experimentation with approaches that attempted to bring the clinic to the people by means of mobile units, outreach workers, and community resupply depots. However, these approaches did not yield the expected results, and ultimately gave way to the more radical approaches of service delivery by nonclinic personnel in a nonmedical setting. These new alternatives were not meant to replace the clinic-based systems. For one thing, some methods can be offered only in a clinical setting, such as male and female sterilization, IUDs, injectables, and the new subcutaneous implants. Moreover, clinics serve an important role as a point of referral for the small number of users from nonclinical programs that require medical attention. Rather, the alternatives were designed to make contraceptives more readily accessible to a larger segment of the population, who could or would not use clinics.

The two family planning service delivery mechanisms that have developed as the main alternatives to clinic-based distribution are social marketing (commercial distribution) and community-based distribution (CBD). Social marketing has been tested in many countries around the world, and much has been written about it. In this volume, it is covered by Piotrow and Meyer.

In addition to the general approach of CBD, two specific strategies have sufficiently unique characteristics to warrant separate treatment: market-based programs and employment-based programs.

Much of the early research financed under the Agency for International Development's (A.I.D.'s) Operations Research (OR) Program focused on the issue of alternative service delivery mechanisms, and more specifically, on CBD. The OR approach proved extremely valuable in providing administrators with a low-risk means of testing the acceptability of this new (and potentially controversial) approach on a small scale before making a major commitment of staff or resources. Moreover, in those cases where CBD did prove acceptable, the OR study results gave administrators concrete data that could be used to convince others of the merit of the approach (Gallen and Reinhart, 1986).

The principal findings from OR projects through 1985 are summarized in a 1986 issue of *Population Reports* (Gallen and Reinhart, 1986). The present paper cites these findings, yet focuses on what has been learned

since that time in the projects conducted under A.I.D.'s OR Program regarding the following service delivery approaches:

- Clinic-based programs
- CBD
- Market-based programs
- Employment-based programs

While the focus of OR has broadened considerably during the last ten years to address other aspects of service delivery, studies of the above approaches have provided us with considerable insight into their merits and limitations.

## THE CLINIC-BASED APPROACH

### Characteristics

The clinic-based approach in fact encompasses a wide range of facilities, from a hospital-based facility in a major urban area to a health post staffed by a single nurse in a remote rural area. What clinic-based facilities have in common is that the personnel serving the public have received clinical training as physicians, nurses, and in some cases midwives; that they are capable of doing a clinical examination in the course of prescribing contraceptives (if they so choose); that they generally have basic gynecological equipment; and that in urban areas, they usually have access to laboratory facilities (either on the premises or nearby).

Clinic-based programs can offer a wider range of contraceptive methods than any of the other service delivery mechanisms because they provide methods that can be administered only by clinical personnel (male and female sterilization, IUDs, implants, and injectables), as well as the so-called nonclinical methods (the pill, condoms, and spermicides). However, not all clinic-based programs offer all methods; rather, the available methods depend on local laws, availability of stock, and provider preferences.

While most users of modern contraceptives worldwide obtain them from a clinic-based service, this approach has received relatively less attention in OR than the later, more innovative approaches, possibly because the controversial nature of the latter approaches has prompted greater study of their impact and acceptability.

## Research Issues and Main Findings

Two key issues addressed in the OR projects prior to 1986 regarding clinic-based services were (1) whether specially trained nurses and paramedical personnel could insert IUDs as safely as physicians, and (2) whether nurse-midwives and medical students could safely perform voluntary sterilization (Gallen and Reinhart, 1986). The bulk of the evidence suggested affirmative answers to both questions. The more recent studies have covered some of the same ground, but most have extended to new areas of interest.

**Reproductive Risk.** Evidence continues to mount on the impact of family planning on reducing maternal mortality and morbidity (National Research Council, 1989). While family planning has traditionally been offered as part of MCH services in many developing countries, programs can use risk reduction as an integral part of promoting family planning services.

In countries where family planning services are very limited, the risk reduction concept may be effective justification for incorporating family planning into ongoing medical services. Such was the case in an OR project conducted from 1987-89 in Côte d'Ivoire. The intervention, aimed at women at high risk of maternal mortality, marked the first time in Côte d'Ivoire that family planning services had been made available as a routine part of services provided at government MCH and maternity centers (Center for Population and Family Health [CPFH], 1989a). Another demonstration project that has integrated family planning into maternities and/or ongoing MCH services was conducted in Ouagadougou, Burkina Faso, 1986-90 (CPFH, 1989b).

Programs focusing on the concept of reproductive risk have also been developed in collaboration with the Social Security Institutes of Mexico and Honduras.

In Mexico (1986-88), the program was designed to improve management procedures for the prevention, detection, and treatment of reproductive risk. In the experimental group, more than 95 percent of the personnel (doctors, nurses, social workers, and medical assistants) received training in the risk concept as it applies to reproduction and family planning. Detection and referral of high-risk women became a routine practice; materials on the topic to inform the public were made available. The intervention had a significant impact on increasing contraceptive prevalence in general and among women at high risk (Population Council Operations Research in Family Planning and Maternal and Child Health for Latin America and the Caribbean [INOPAL] Project, 1989a).

In Honduras (1988-89), the intervention consisted of a systematic evaluation of reproductive risk among the female population in the Social Security Institute system; in addition, health personnel gave talks on reproductive risk to those attending the hospital and outpatient clinics. The program had a significant impact on knowledge of reproductive risk among the target population. Contraceptive prevalence remained unchanged among users of outpatient clinics and among hospital patients at high risk; it did increase among hospital patients at normal risk. Of note, the program also increased promotion of contraception among physicians (Population Council INOPAL Project, 1989b).

**Postpartum Programs.** Desire for and acceptance of contraception differ substantially between women who have recently given birth and those who have not (Ross et al., 1989). Postpartum programs are targeted to women at a point when they are already in contact with health professionals and when their motivation for pregnancy avoidance is theoretically high. (On the other hand, it should be noted that the efficacy of such programs has been questioned, given that women may be protected by the anovulatory effects of breastfeeding for a number of months postpartum).

An OR project in Lima, Peru compared 40-day and 6-month contraceptive prevalence rates for an experimental group consisting of women receiving immediate postpartum family planning services and a control group not receiving those services. Preliminary findings showed a higher level of prevalence 40 days postpartum among the experimental group than among a comparison group (Population Council INOPAL Project, 1989c).

An OR project in Ghana demonstrated the feasibility of integrating family planning services into private maternity homes run by trained, qualified midwives. The clients of such homes are the main target group for family planning services. Yet such services had not been offered previously, largely because the midwife-proprietors had never been encouraged or trained to do so. Service statistics from the early months of the program showed a ratio of one family planning client for every 1.4 delivery clients. Moreover, the midwives were successful in reaching a previously unreached group (CPFH, 1989c).

**Alternative Strategies for Offering Vasectomy Services.** This subject is particularly appropriate to Latin America, where vasectomy services are available through a small number of existing clinics, but acceptance of this method has been limited. In Colombia, the two strategies tested were (1) offering a variety of services for men (including vasectomy) at the traditional female-oriented clinics through a special promotional program, and (2) offering male-oriented services either at traditional female-oriented

clinics during special male-only hours or at male clinics. The third group of clinics served as a comparison. Under both strategies, the clinics hired specialized personnel, offered a variety of male-oriented services, and conducted promotional information, education, and communication (IEC) campaigns. The results showed that the second strategy, using male-only hours, yielded a higher monthly average of vasectomies performed (11.7) than the first (9.1), though the difference was not statistically significant. Contrary to expectations, the male-only hours strategy did not result in higher levels of client satisfaction or in the staff's placing greater importance on vasectomy as a method. Thus, the results suggest that vasectomy use in Colombia may be increased by adopting the first, female context, strategy; hiring specialized personnel to provide male-oriented services in the traditional female clinics; and conducting a strong IEC campaign to generate demand for the clinics' vasectomy and general male services (Vernon et al., 1989).

Three OR projects in Mexico have focused on strategies for increasing male services, including vasectomy. Collectively, the results suggest that mass media can be cost-effective in increasing awareness and use of vasectomy; providing talks to men on the subject in factories and offices proved to be ineffective in stimulating demand for vasectomy (Population Council INOPAL Project, 1989d-f).

**Quality of Care.** With the increasing emphasis on quality of care in family planning service delivery, OR projects also have addressed this issue. One of the main elements in quality of care is the counseling clients receive. One study of counseling for provider-dependent contraceptive methods in the Dominican Republic (1988-89) tested the relative effectiveness of different counseling approaches. The results indicated that giving information alone (showing a video and asking whether there were any questions) was the least effective approach (and least expensive). Method-specific counseling was most effective for clients desiring to use the implant, while multimethod counseling that provided information on all methods available at the clinic proved more useful for users of orals and the IUD (Population Council INOPAL Project, 1989g).

A diagnostic study on the use of IUDs in Nepal (1988-90) focused on reasons for nonuse of this method, factors that facilitate or impede acceptance and continued use, technical competence of clinical personnel, service provision procedures, and client satisfaction. The study revealed that a negative image of the IUD prevailed, pre-insertion counseling was incomplete, medical check-ups were insufficient, and education on side effects was inadequate. These findings provide guidelines for improving

quality of care with regard to IUDs (University Research Corporation [URC], 1989a).

Contraceptive continuation is a key issue related to quality of care. This was the focus of a study in Lesotho, which attempted to evaluate the existing situation. It identified the major causes of discontinuation to be as follows: unanticipated side effects, fear that the husband will discover the contraceptives, and periodic nonavailability of the methods (or specific brands), in addition to desire for another pregnancy (CPFH, 1989d).

**The Use of Paramedicals for IUD Insertion.** The earlier studies on this topic were primarily from Asia, Latin America, and the Near East. Data are now available from a sub-Saharan African country as well, the Sudan. In the Sudan, the training of nurses ("health visitors") consisted of the successful performance of at least 40 pelvic exams and 10 IUD insertions under medical supervision. In a subsequent analysis of performance, the health visitors did as well as if not better than the comparison group of physicians in terms of correct insertion and absence of side effects requiring removal of the device. However, IUD insertion has not yet been approved for nurses. Before this can take place, training programs will have to be designed, as well as systems for reliable supply of IUDs (CPFH, 1989e).

**Combining Elements of Clinic Delivery with a Community Approach.** Several clinic-based projects have attempted to increase their effectiveness through outreach activities at the field level. In a project in Sri Lanka, "satisfied users as contraceptive motivators" (SAMs) were recruited to work in conjunction with public health midwives (PHMs) in rural areas to stimulate greater use of family planning. The PHMs trained the SAMs to make home visits on their own, though under the PHM's supervision. During a 13-month study, PHMs working with the SAMs had a higher IUD acceptance rate than did PHMs who worked alone (Family Health Bureau of the Ministry of Health and the Family Planning Association of Sri Lanka, 1985). In numerous cases, the SAMs have created a unique role for themselves, promoting methods other than the IUD and speaking on family planning in public places (URC, 1989b).

In Paraguay, there is only one organization that provides modern contraceptive methods. A strategy was tested which combined elements of clinics, community health posts with medical backup, and CBD workers who resupplied themselves at the posts. After nine months of service delivery, the CBD program had increased the number of couple years of protection (CYP) sold by 36 percent over the same period of the previous year, and the introduction of posts had allowed the clinics to increase the

number of IUDs inserted by 27 percent. This strategy also yielded very cost-effective results (The Population Council INOPAL Project, 1989h).

## **CBD**

### **Characteristics**

CBD programs attempt to take the methods to the people, rather than waiting for the people to come to clinics for the methods. While there are variations on the CBD model, the approach generally involves identifying, recruiting, and training members of the community to become family planning workers. In most cases, these community workers have not had previous clinical training or experience with health programs. The exception to this rule is programs that recruit persons from within the community specifically for their health-related experience; examples include traditional birth attendants (TBAs) and members of existing health committees.

Training programs for CBD workers last from several days to two to three weeks. Common elements in CBD training programs include the benefits of family planning; the correct use of the specific methods; side effects and complications of the methods; mechanisms for referral to a higher level; and procedures for recording such data as the number of acceptors and the quantity of each contraceptive sold.

At the end of the training, the CBD workers are given a supply of contraceptives (generally pills, condoms, and/or spermicides), a weather-proof container in which to store them, and the data collection forms used for recording transactions. They then proceed with the sale of contraceptives within their communities. Some programs use the community depot approach, where users must take the initiative to visit the post (either the distributor's house or a small shop) to purchase their contraceptives. A more aggressive approach is household distribution, where workers systematically canvas the neighborhoods, using maps of their assigned areas; under this system, the CBD worker not only educates the population on the benefits of family planning, but also sells contraceptives during the home visits to those who are interested (and in the case of the pill, who are free of contraindications). Some programs combine these two approaches: they encourage distributors to make home visits, but they do not require it (since many of these workers are volunteers).

In general, CBD workers do not receive a fixed salary, though in many programs they are allowed to retain a percentage of their earnings as a motivation to remain active in the program. Other programs depend on

nonmonetary incentives, such as encouragement through frequent supervision, community recognition, newsletters, awards, and so forth.

The CBD approach began to develop in the 1960s. During the 1970s, a number of CBD programs came into existence in certain Asian, Latin American, and North African countries. By contrast, CBD is relatively new in sub-Saharan Africa, where few countries have active CBD programs, and those that exist are less than 10 years old. It is estimated that CBD now operates in over 70 locations in 40 countries (Ross et al., 1987).

The CBD approach offers the following advantages:

- The population has greater access to contraceptives through an increased number of service points.
- The financial and psychological costs associated with a clinic visit are largely eliminated.
- The distributor is generally a respected member of the neighborhood who enjoys the trust of the community.

The main disadvantages of the CBD approach are as follows:

- The service providers have less training than clinic personnel in screening clients, identifying contraindications, and managing side effects.
- Some potential clients are reluctant to have a fellow member of the community know that they use family planning.
- The initial costs of setting up CBD programs are high.
- Turnover among trained CBD workers is high, given that they do not receive a salary for their efforts.

### **Research Issues and Main Findings**

Because CBD relies on nonclinical personnel for the delivery of services, it has met with opposition from the medical community in many countries where it has been established. Thus, much of the early OR on CBD was designed to convince government officials and other high-level decision makers that CBD is a safe, useful, and acceptable means of delivering family planning services. OR still serves this purpose in countries (largely in Africa) where CBD is being introduced for the first time.

In recent years, however, the bulk of the OR on CBD has focused on issues of increased effectiveness, including the following: (1) demonstrating the impact of CBD on contraceptive prevalence, (2) assessing the impact of household distribution and/or home visiting, (3) identifying the characteristics of successful distributors, (4) assessing the mix of services and supplies, and (5) testing alternative methods of training and supervision. It has now become standard practice in many CBD programs with an OR component to determine the cost per CYP. Because cross-national comparisons of cost per CYP can be misleading, these results are not presented herein.

**Impact of CBD on Contraceptive Prevalence.** Research conducted prior to 1986 in Egypt, Morocco, Tunisia, Bangladesh, and Mexico documented that CBD can increase contraceptive use, especially in rural areas (Gallen and Reinhart, 1986). Recently, similar findings have become available from three sub-Saharan countries: the Sudan, Rwanda, and Zaire. This is particularly noteworthy given that contraceptive use from any source has been very limited to date in the majority of African countries, and that CBD has come into use in sub-Saharan Africa only during the past 10 years.

In the Sudan, a pilot project covering a population of 100,000 was initiated in 1980 in 90 villages north of Khartoum. Contraceptive prevalence prior to the intervention was 10.6 percent among married, nonpregnant women. A year after the intervention, it had increased to 13.7 percent; by 1986, it was at 20.1 percent; and in 1987, it had reached 27.6 percent. In 1984, the project was replicated in an additional 60 villages with the same dramatic results. Prevalence increased from 10.9 percent in 1984 to 27.1 percent in 1987 (CPFH, 1989f).

In Rwanda, government officials are highly committed to family planning, but only 4 percent of married women of reproductive age (MWRA) used modern contraceptive methods as of 1988. An OR study was designed to test two interventions: (1) education/motivation with referral to existing health centers, and (2) education/motivation with actual distribution of pills, condoms, and spermicides. Prevalence increased from approximately 4-5 percent (estimated from service statistics) to 36 percent in the area receiving education with referrals, and to 12 percent in the area with education/distribution. In the comparison group, prevalence increased from 7 to 10 percent in the same period. The success in the first experimental area is attributed to (1) a higher level of education among MWRA in this area; (2) superior performance on the part of the workers; and (3) strong, sustained support from local authorities (CPFH, 1989g).

In Zaire, the first CBD program was established in the port city of Matadi and a neighboring rural area of Nsona Mpangu in 1981-82. During Phase I (1981-83), prevalence increased from approximately 4 percent in all areas to 18 percent in the urban and 12 percent in the rural area (Bertrand et al., 1986). During Phase II (1985-89), prevalence further increased to 23 percent in Matadi, one of the highest levels reported for an area in a francophone African country. No increases were found in the rural area; this was due to a change in the chief health officer of the zone, which had a severely detrimental effect on the program (Tulane University, 1989).

**The Impact of Household Visits.** In the Zaire project mentioned above, two strategies were tested: (1) increased access to contraception at fixed outlets, plus systematic household distribution, vs. (2) increased access to contraception at fixed outlets, but no household distribution. In both the urban and rural areas, the former strategy yielded a slightly higher prevalence rate (approximately 2 points difference), which was not statistically significant. Moreover, this strategy was more expensive because of the salaried employees involved, resulting in a high cost per CYP. Because of this, in subsequent CBD efforts in Zaire, the salaried workers were replaced by community volunteers, who were encouraged to do home visiting (Bertrand et al., 1986).

Data from a CBD effort conducted in Ecuador (1986-89) also yielded mixed findings on this issue. In this study, there was no significant difference between the home visiting and non-home visiting group in terms of CYP distributed. However, with the CYP of the clinic clients from the home visiting and non-home visiting *parroquias* (areas) included, home visiting was shown to have a positive impact on total CYP (The Population Council, 1989i).

An OR project in Mirebalais, Haiti compared the alternative strategies of (1) employing satisfied users (*aide-promotrices*) to make home visits for resupply vs. (2) conducting group meetings on family planning. The results of this study suggest that satisfied users conducting home visits for the purpose of information and resupply can be effective in increasing contraceptive prevalence (CPFH, 1989h).

Indonesia has one of the most effective family planning programs in the developing world, yet this program has been more successful in rural than urban areas. To increase its effectiveness in the latter areas, semi-commercial outreach workers (NUCDs) were trained to contact eligible couples periodically, provide IEC, make referrals to family planning centers, and distribute contraceptive supplies. In a subsequent survey of the target population, 62 percent had been visited by NUCDs. However, the

design does not allow for an assessment of the impact of the intervention on prevalence (URC, 1989c).

**Characteristics of Successful Distributors.** In almost all CBD programs, some distributors recruit numerous acceptors, while others recruit few. One study of distributor performance in Bangladesh showed that high-performance fieldworkers visited their clients more often than their low-performance counterparts. Moreover, they tended to make the visits better-equipped and to spend more time with each client (URC, 1989d).

An OR study from Latin America was designed to test the hypothesis that men distribute more condoms than women and that they are more successful in recruiting male clients. Preliminary results indicate that men did distribute more condoms than women, while women distributed more pills than men. On balance, the two groups sold approximately equal numbers of CYP (Population Council INOPAL Project, 1989j).

In Zaire, only women were used as distributors in CBD programs prior to 1987. At that time, men, too, were recruited and trained as distributors in selected sites. Preliminary data indicate that women on the average sell a slightly higher volume of contraceptives (based on CYP) than men, but that the difference is not sufficient to exclude men in the future. Number of children, education, and religion were not predictors of distributor performance (Bertrand et al., 1989).

The findings on the relative effectiveness of male vs. female distributors are mixed. There is no evidence from these recent studies to contradict the observation of Osborn and Reinke (1981) in their review of CBD programs: "...agents with a wide range of characteristics have been excellent promoters, while other women with similar qualifications have had rapid turn-over rates. The tentative conclusion is that intangibles such as maturity, tact, perseverance and enthusiasm are equally effective."

**Mix of Services and Supplies.** Previous OR studies have indicated that offering other health services can provide credibility for family planning, and can help develop rapport between community workers and clients. It also has been demonstrated that phasing in a small number of new services over time may be the most feasible way to implement an integrated CBD program (Gallen and Reinhart, 1986). A key issue here is whether it is useful or detrimental for CBD workers to sell other health products (such as oral rehydration salts, antimalarial drugs, and aspirin) in addition to contraceptives. The conclusions on this issue are mixed.

In Zaire, seven of the eight health zones experimenting with CBD used the integrated approach. Anecdotal evidence from project personnel suggested that having illness treatments in addition to contraceptives made the job easier for those at the field level (Bertrand et al., 1984). By the same token, the most successful program (in the city of Matadi) was the one that did not include illness treatments, indicating that inclusion of these services was not essential to the ultimate acceptance of the program by the population, at least in an urban area (Tulane University, 1989).

The CBD project in the Sudan demonstrated that oral rehydration therapy (ORT), if properly introduced, could be understood and accepted; approximately 75 percent of mothers reportedly knew about and used ORT within a year of its introduction. Phased training and the sequential introduction of interventions were deemed to be important to the success of the program (CPFH, 1989f).

On the other hand, in at least one case, Ecuador, the addition of extra interventions apparently overburdened the CBD workers and resulted in a decrease in program output, compared with a period in which they had not had these additional items to sell (Population Council INOPAL Project, 1989j).

**Training and Supervision.** Earlier OR studies on this topic have confirmed the following points (Gallen and Reinhart, 1986):

- Job-related training is one of the most important determinants of workers' knowledge and/or performance.
- Training programs that develop specific practical skills appear to be more effective than training that emphasizes theory.
- Repeated training is needed to maintain community workers' skills and knowledge.
- Continuing supervision is necessary to keep workers active.
- Routine supervisory activities, such as resupply and clerical work, can sometimes be performed less often, saving money without hurting community workers' performance.

Two projects in Latin America have dealt with the issues of training and supervision of CBD workers. In an OR project conducted in the indigenous areas of Guatemala, one group of CBD workers received routine training (a three-day course given every six months in the provin-

cial capital) and a competency-based supervision approach. The second experimental group received the competency-based supervision approach and a new training strategy, which consisted of three sessions of one day each, given once a month in locations closer to the community. A third (comparison) group had routine training and supervision, according to methods in use by the organization at the time. The phased training did not result in higher knowledge acquisition, whereas competency-based supervision did, and knowledge was found to be positively associated with sales of contraceptives (Population Council INOPAL Project, 1989k).

A project in Peru experimented with two training systems for CBD distributors: (1) initial group training, followed by group retraining, and (2) initial group training, followed by individual, on-site retraining by supervisors using an immediate feedback form. Scores on standardized knowledge tests indicated that the two groups had equivalent levels of knowledge at the onset of service delivery. However, four months later, the control group had lost an average of four points in knowledge, while the experimental group had gained three points. This study underscores the utility of the feedback form that permits supervisors to identify and correct specific deficiencies in individuals' family planning knowledge, and the study recommends using individual retraining to replace group retraining (The Population Council, 1989).

The above two studies underscore the need for knowledge reinforcement in order for knowledge to be maintained, and suggest the use of a carefully structured instrument to conduct supervision (Population Council INOPAL Project, 1989k).

A study conducted in the Dominican Republic (1987-88) also focused on methods of supervision and retraining of distributors. The study design included two experimental groups sharing the same control group. The first intervention consisted of using a new system of supervision, in which visits to promoters varied with the promoter's performance, instead of the existing system, in which all promoters were visited with the same frequency. The second intervention focused on retraining of distributors, with the aim of modifying their behavior so that the distributor would require less supervision and assume promotional tasks. Regarding supervision, the system of one-on-one reinforcement of knowledge proved to be more effective than the traditional method of providing retraining to large groups of promoters. In addition, those who received the special training had a higher level of couple months of protection (CMP) and more promotional, follow-up visits (Population Council INOPAL Project, 1989m).

An OR study in Lesotho (1989) did not entail a test of strategies, but an analysis of what had gone wrong in an earlier attempt to establish a CBD service. This study identified a lack of adequate training and supervision as key elements in the failure of the earlier program (CPFH, 1989i).

## MARKET-BASED PROGRAMS

### Characteristics

Market-based distribution is a relatively new variation in service delivery. It combines elements of CBD (the sale of contraceptives by community volunteers) with elements of social marketing (the harnessing of an existing commercial network for the sale of contraceptives). This approach was first developed in Ibadan, Nigeria, in a project initiated in 1985 (Ladipo et al., 1990), and this model has provided a number of valuable lessons. It has since been tested with modifications in Ilorin (CPFH, 1989j) and Lagos, Nigeria (CPFH, 1989k), as well as in the neighboring country of Ghana (CPFH, 1989l). One experiment with market traders is also available from Latin America (The Population Council, 1989n).

Under the Ibadan model, existing market traders are recruited and trained as agents to sell contraceptives (orals, condoms, and vaginal foaming tablets) and selected medications (malaria treatment, oral rehydration salts), in addition to their regular wares. These individuals (primarily women) undergo a training program of several weeks on reproduction, contraception, ORT, first aid, and treatment of malaria. At the close of the training, they are given a supply of contraceptives, a sturdy case to hold them, a sign advertising their services, and a certificate indicating that they are trained. Under this model, these market traders sell contraceptives along with their regular wares.

### Research Issues and Main Findings

The Ibadan market project addressed three main questions:

- Would market traders be willing to sell contraceptives?
- Would people purchase contraceptives in the marketplace?
- What characteristics of traders and markets would be best suited to sales of contraceptives?

The findings from this project clearly demonstrated that traders were willing to sell contraceptives and that people would buy them in the marketplace. Sales statistics indicated approximately 900-1000 transactions per month among a group of some 200 traders. Female traders had a higher mean number of transactions than male traders, though the latter played an important role in ensuring support for this approach. (In contrast, in the Lagos project, preliminary data showed males had a higher average level of sales; in the Ilorin project, men sold more pills, while women sold more condoms.)

In the Ibadan project, the personal characteristics of the distributor--age, education, and religion--were not determining factors in performance. Rather, the subjective characteristics of personality and salesmanship played a more important role. By contrast, in the Ilorin project, younger traders had lower average sales, possibly because they lacked credibility with their customers.

The Ibadan project provided a number of provocative findings, some of which have been confirmed or refuted in the subsequent market-based projects:

- The project proved to be more acceptable to the population than might have been expected on the basis of focus group discussions among shoppers and traders, in which a main theme was that Nigerian women were unlikely to purchase contraceptives openly.
- Even when there was a steady stream of consumers around the marketplace, the volume of sales of any product was low for many traders. This contrasts markedly with the common impression of constant sales activity in the marketplace. The same proved true in the Ilorin markets.
- The traders were given the title of "health agents," which conferred a certain prestige. This appears to have been equally if not more important in attracting and retaining them in the program than the 25 percent commission they received on sales.
- The acceptability of the program appeared to be enhanced by the fact that it offered medications in addition to contraceptives, and that it was identified with a well-known medical institution locally. In the Ilorin project, some agents dropped out when they were not permitted to sell one of the illness treatments (malaria medication)

in which they were trained, stating that the sale of contraceptives only would negatively affect the sales of their normal wares.

- A large percentage of the customers for contraceptives were in fact fellow traders.
- Over the life of the Ibadan project, the proportion of all sales that were contraceptives increased from one-third to almost one-half.
- The more successful agents in the Ibadan project tended to take their products home to sell to family and friends, thus increasing their pool of potential clients. By contrast, the Ilorin traders claimed that their sales were restricted to the marketplace.

The Ibadan project has served as a model for subsequent efforts in Ilorin and Lagos in Nigeria, and in Accra in Ghana. As a variation on the original model, the Ilorin project used community health educators (CHEs) to inform shoppers of the agents' services and to encourage their use. Markets with CHEs sold approximately 70 percent more than did markets without them.

In the Ghana project, the market activity was developed as an extension of social marketing. In this project, vendors were resupplied by pharmacies in or near each market, thus allowing the pharmacy to make some profit as well. In addition, this project was heavily supported by a special media effort, including handbills and posters, as well as radio and TV spots. Interviews with shoppers suggest that these messages did increase awareness; of those who knew of the family planning services in the market, 54 percent cited the media as their source of information.

The only market project outside Africa (reported in the OR literature to date) involved market traders receiving small business loans in Lima, Peru. The traders were trained as distributors, received their first stock of contraceptives free, and then had to pay for resupplies from their profits. The cost per CYP was low, which boded well for sustainability. However, four promoters accounted for 85 percent of all supplies purchased, and 47 percent of the traders did not return for a second supply. The researchers concluded that market women and street vendors are no more effective than traditional CBD distributors in providing services to individuals and couples, although some market women may be very effective wholesalers of contraceptives (Population Council INOPAL Project, 1989r).

The positive experiences with market traders in Africa are particularly noteworthy in light of the disdain often voiced when contraceptives are

sold informally in African marketplaces, a practice that is common in some countries. In the latter cases, it is often assumed that the contraceptives were obtained by dubious means; that by the time of sale the products have been exposed to sun and rain; that the individual selling them has little knowledge as to their correct use; and that the sole motive for their sale is financial. The OR projects with market traders have capitalized on their role in the local economy while legitimizing them as providers of family planning services.

## EMPLOYMENT-BASED PROGRAMS

### Characteristics

Employment-based programs are not new; in fact, they originated in the 1950s in India when large plantation owners offered family planning services to their workers. Since then, many factories have added family planning services for their employees in developing countries around the world, with more programs having been established in Asia than in any other region of the world.

These family planning services may be provided by hired staff, by worker-volunteers, by union leaders, through a contract with a family planning organization, or through social security health facilities. They are generally targeted to employees and their family members, and sometimes to those living near the work site. A 1987 issue of *Population Reports* provides an excellent summary of employment-based family planning programs (Reinhart et al., 1987).

While employment-based programs have been in operation for over 30 years, most of the research in this field was done during the past decade. Two large A.I.D.-funded projects, Technical Information on Population for the Private Sector (TIPPS) and Enterprise, have greatly expanded the base of experience with employment-based programs. In addition, there have been several work site projects conducted within the OR Program.

The OR work has focused on two forms of employment-based services. In one, family planning services are integrated into employee health care facilities, which may be run by paramedical staff (i.e., a clinic-based service). In the second, the company allows worker-volunteers to be trained to provide on-site education and distribution, similar to CBD. As such, these work site programs combine elements of the clinic-based and CBD approaches. The purpose is generally to increase the use of contraceptives

among a very specific target group (the population at the work site) by facilitating access to the services.

### Research Issues and Main Findings

While OR on this topic is limited, the main issues have been the following:

- Do employment-based programs increase prevalence?
- What is the relative cost-effectiveness of the clinic-based and CBD models of service delivery within the work site?
- How sustainable are these programs?

Two OR projects have compared the impact and cost-effectiveness of clinical vs. CBD-type services within the work site. One was conducted on the Mexican side of the U.S. border in *maquiladoras*, which are assembly plants employing 60-65 percent female workers (Rosenhouse et al., 1988). The second took place in selected factories in the Caribbean country of St. Lucia (Landry et al., 1987).

In the Mexican project, the clinical approach consisted of training and supplying plant-paid medical personnel working in the *maquiladora* clinics. The alternative was a promoter program, employing plant workers as promoters to be trained, supervised, and supplied by the local family planning organization. The promoter program yielded a higher level of CYP than the clinical approach. It was also more expensive (31 percent more costly than the clinical approach), but because of the higher output, the cost per user was actually lower than in the clinical program (Rosenhouse et al., 1988). Moreover, the promoters attracted a greater number of male users, and they enjoyed a more comfortable rapport with their clients.

In the St. Lucia project (conducted from 1983-85), the factories were small and did not have existing work site clinics. Thus, the clinical approach consisted of two visits a month per factory by a family planning nurse. In the second group, a worker was selected and trained as a promoter to sell contraceptives at the factory on a continuous basis. The approach based on the worker-promoter resulted in higher prevalence and was more cost-effective than the clinic-based approach. This difference can be attributed partially to the continuous access clients had to the worker-promoter, which was not the case with the visiting nurse (Landry et al., 1987).

A similar factory-based study was conducted in a second Caribbean country, Barbados. One strategy consisted of using peer distributors, while the second consisted of contraceptive distribution carried out by an educator from the local International Planned Parenthood Federation (IPPF) affiliate during a monthly visit. Again, the peer distributor approach was more cost-effective than the monthly distribution (at least among persons who had already accepted family planning), based on both cost per user and cost per CMP. However, the educator proved more effective in recruiting new acceptors to family planning. And, as in the St. Lucia case, the cost per new contraceptive acceptor was high (Population Council INOPAL Project, 1989o).

In contrast to these projects, which tested the CBD vs. clinical approach to service delivery at the work site, a project in La Paz, Bolivia (1987-89) called for use of both strategies in four unions. Of particular note, the unions with the most active promoters also had the most successful clinic program, suggesting a spillover effect of the promoters' efforts (Population Council INOPAL Project, 1989p).

While employment-based services have succeeded in increasing contraceptive prevalence, a major drawback has been the high cost. In the case of St. Lucia, the total number of factories in the country is limited, and the number of employees per factory is small; thus the cost per CYP was very high. High costs were also cited in the Mexico example.

A problem related to high cost is underutilization of the service. The Association for Women's Development (ADIM) project in Lima, Peru set up a clinic for loan recipients at their office headquarters (Population Council INOPAL Project, 1989n). In a one-year period starting in October 1986, overall contraceptive prevalence among MWRA increased from 44.9 to 70.6 percent, a very impressive change. However, within three months, visits to the clinic began to plateau, and the clinic became a vehicle for maintaining, not increasing prevalence. Moreover, the clinic saw only 1.6 patients and 0.94 family planning clients per hour. The study concluded that "in-house family planning clinics or special groups can be highly effective in increasing contraceptive prevalence...however, when the target population is relatively small, in-house services rapidly become inefficient."

One alternative to workplace-based family planning services is a hospital-factory link, whereby contraceptive services are provided by a private hospital or clinic outside the work site location. In an OR project in Indonesia consisting of a cost-benefit study, it was projected that three years after program initiation, factories in the program would receive a

positive return on their family planning investment, based on benefit/cost ratios greater than one. Other hypothesized benefits included reduced employee absenteeism and turnover, increased worker morale and performance, reduced maternal and child health expenditures, and improved health status of workers and their dependents (URC, n.d.).

The main conclusions from the OR studies to date on employment-based services are as follows:

- The CBD approach within the work site is useful in that it provides continuous access to family planning services and easy communication among peers.
- The cost of either the CBD or clinic approach at the work site may be high relative to other service delivery mechanisms, especially if the target population is small.

## CONCLUSIONS

OR has served as a useful vehicle for introducing new and potentially controversial mechanisms of service delivery. This is amply demonstrated by OR on the CBD approach in Asia, Latin America, and North Africa in the 1970s. OR continues to be useful in this same context in sub-Saharan Africa today. However, the trend is now to go beyond using OR simply to demonstrate the feasibility and cultural/political acceptability of these alternative modes of service delivery; rather, OR is being used as a tool for identifying ways to make these alternatives more efficient and effective.

Future directions of OR on service delivery modes will parallel the main issues in service delivery for the country in question. For example, in many African countries, the main issue continues to be the expansion of culturally acceptable services in areas where family planning has received limited attention to date. Much attention may be focused simply on strengthening basic components, such as training, supervision, logistics, and simple management information systems. By contrast, countries in Latin America and Asia with advanced family planning programs will profitably focus on a different set of issues, such as the most appropriate service delivery modes for reaching new, underserved populations, including adolescents and males; testing greater privatization of services among already-motivated populations; increasing the sustainability of well-established programs; incorporating the prevention of AIDS and sexually transmitted diseases (STDs) into family planning services; and other topics

of country-specific interest. Whatever the level of program development, OR represents a valuable tool in strengthening service delivery systems.

## NOTES

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## **2. EFFECTIVE FAMILY PLANNING SERVICE COMPONENTS: GLOBAL LESSONS FROM OPERATIONS RESEARCH<sup>1</sup>**

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### **INTRODUCTION**

The purpose of this paper is to review the results of operations research (OR) in improving the effectiveness of family planning program components. OR is the systematic application of research methods to improve programs and policy, and better satisfy the needs of users. Components of delivery systems are organizational subsystems that use resources to facilitate program operation. They include personnel selection, training, and supervision; information, education and communication (IEC); method options, access, and logistics; organization and composition of services; and research and evaluation. Issues of broader program management and community relations, often considered components, are not addressed here. While this paper focuses on OR on delivery system components supported by the U. S. Agency for International Development (A.I.D.) and the World Health Organization (WHO) during the past 20 years, it also includes the results of other applied family planning research that addresses issues related to the performance of these components.

### **THE SUPPLY OF FAMILY PLANNING SERVICES**

The mean prevalence of use of modern methods in developing countries, excluding China, is now about 30 percent (Population Reference Bureau [PRB], 1989). This is a remarkable feat, given that contraceptive use was very low in almost all developing countries prior to 1970. This trend is due in part to organized family planning programs, and in part to the modernization accompanying socioeconomic development. Despite this global increase in contraceptive prevalence, policy makers and program directors feel that important problems still exist in the supply of family planning and maternal and child health (MCH) services. These problems

can be categorized as weak or nonexistent national policies and support for family planning, problems of accessibility and acceptability of services, and problems of management and resource utilization.

Virtually all family planning agencies, regardless of their stage of development, need to deal with one or more of the following problems:

- Limited coverage and low utilization of family planning services, particularly among groups with special needs
- Inadequately trained staff
- Availability of a limited number of family planning methods, and inadequate information about them
- Lack of mechanisms to facilitate continuous use of contraception
- Containment of costs, cost-effectiveness, and sustainability
- Difficulty in using information on program performance for decision making

Modern management places a premium on innovation (Peters, 1987). Innovation in family planning delivery systems must adapt to the changing environment, and this requires new perspectives, in every function, by every person. For example, increasing demand for methods, coupled with reduced donor support for supplies and services, requires immediate adjustments in the way programs are designed and costs are analyzed. Given continued rates of population growth above 2 percent and the prospect of serving over 3 billion couples in developing countries, program managers urgently need new strategies to increase the coverage and quality of care, while coping with limited budgets.

## **OR: SYSTEMATIC CHANGE IN SUPPLY**

### **OR and Components of Service Delivery Systems**

Family planning programs supply the information, methods, and services that individuals and couples need to control their fertility. They have been characterized as systems with many interrelated parts and complex relationships with the social, economic, and political environment, as well as with individual users (Simmons and Lapham, 1986). Figure 1 illustrates how components of supply influence contraceptive use. Population policies, the

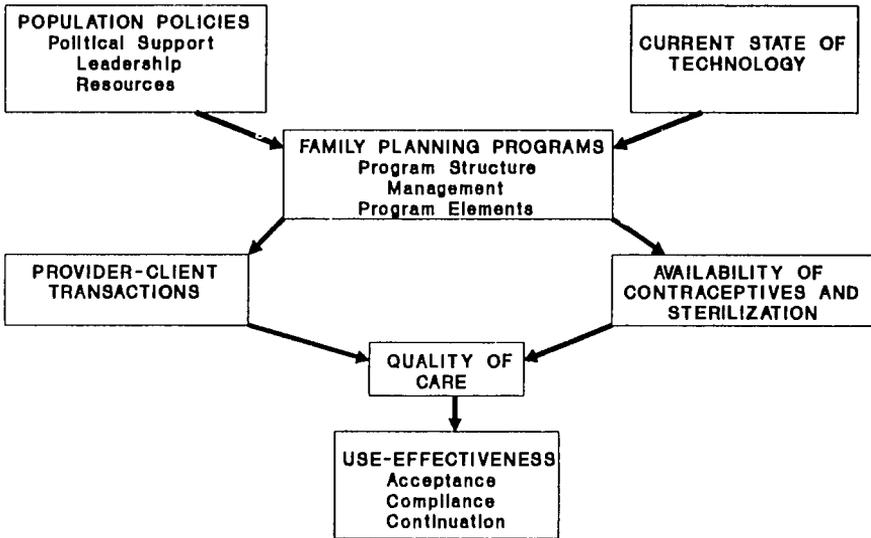


Figure 1. Supply Side Elements of Family Planning Effectiveness

environment--including available contraceptive technology--and OR each contribute to the way programs are structured and management mobilizes program components to provide services to users. By increasing the availability of contraceptives and improving the quantity and quality of provider-client interactions, overall quality of care is enhanced, and contraceptive use is increased.

The process of service delivery refers to the way services are actually provided, that is, the specific content of exchanges between providers and clients, and the adequacy of these exchanges for ensuring effective contraceptive use. The process is the link between inputs, including program components, and outputs, such as the continued use of contraceptive methods. As noted above, components of delivery systems include the following:

- Personnel selection, training, and supervision
- IEC
- Method options, access, and logistics

- Organization and composition of services
- Research and evaluation

In many countries, family planning programs began in small private clinics. As contraceptive use became more acceptable, demand increased, and services were extended to the community through outreach efforts. Simultaneously, commercial programs took advantage of the demand for methods, and there was increased competition in the private sector. With the development of more sophisticated delivery systems, the need for more functional program components became increasingly acute. Components evolved then as subsystems of family planning organizations. Table 1 illustrates the major management tasks and information needs of programs at different levels of development.

**Relationship of Components to Delivery Systems.** Delivery systems, once established, generally are manipulable by managers only through program components. Furthermore, these components are present in all delivery systems because they tend to be functions rather than structural characteristics of organizations. Although they are one step removed from clients, they intimately affect the quantity, quality, and cost of services.

Table 1. Development of Programs

Stage (Prevalence)	Management Focus	Information Needed
Pre-emergent (0-7%)	Develop relations with national groups	Description of problem
Launch (8-15%)	Obtain and mobilize limited resources	Identification of weaknesses; evalua- tion of effort
Growth (16-34%)	Expand resources; change with growth	Analysis of tensions implicit in growth
Consolidation (35-45%)	Strengthen operational systems	Monitoring of effi- ciency and effective- ness
Maturity ( > 45%)	Redefine objectives	Analysis of adequacy of procedures

The content of the subsystem changes with the delivery system. For example, contraceptive social marketing (CSM) programs are less concerned about selection of personnel in that most outlets are self-selected, but are more concerned about training and supervision. Most research on components has focused on community-based distribution (CBD) programs, less on components within clinics, and very little on CSM. Moreover, components in these areas are often developed by what is considered "good professional practice," rather than research.

These components commonly develop at different rates. For example, new organizations have very simple training components and often provide a small range of methods. As an organization matures, there is a need for more sophisticated activities in IEC, training, logistics, and referral networks, among others.

**Interrelationships Among Program Components.** Program components are often centralized in their design. Because of their functional nature, they tend to be highly specialized. For example, administrators rarely address issues of logistics and training in the same forum. As a result, little sharing of information occurs among those responsible for specific components.

In contrast, at the local level, the components are often completely integrated. In decentralized organizations, midlevel managers must know about all of them, and the same person may be responsible for many of them.

All components are essentially cost centers, generating demands for resources, and at the same time presenting opportunities for savings. For example, if personnel selection is poor and supervision is inadequate, the cost of retraining in CBD programs becomes unwieldy (Lewis, 1987).

OR in the context of program components is essentially concerned with improving quality and efficiency (Gillespie, 1987). Components are the functional leverage points through which a manager can influence service delivery. Managers can manipulate the content, frequency, and extension of the components, as well as make investment decisions based on the perceived impact and probable costs of a component. As a result, policy makers can link service delivery targets to costs and select the most cost-effective way to achieve a specified level of output. Improvements in components also produce services of better quality, as they are powerful points for intervention.

## Sources of Information on OR and Service Delivery Components

Although OR closely followed the development of organized family planning programs, systematic empirical work on service delivery programs and their effects is still limited. The first comprehensive summary of findings from family planning research was prepared by Ross et al. (1972). It provided an initial compilation of knowledge about fertility change, program strategies, and contraceptive use dynamics, with major emphasis on early program efforts in East and South Asia.

Nearly 20 years later, the Maximizing Results of Operations Research (MORE) conference examined the over 200 OR studies supported by A.I.D. and WHO since the early 1970s (Gallen and Rinehart, 1986), and nearly 100 additional OR projects now being completed (MORE, 1989). OR during the past 20 years has solidified the evidence on many early findings, and clarified the variable nature of others.

Table 2 provides an overview of where investments in OR have been made from 1974 to 1986. Of the 140 projects reviewed in the *Population Reports* edition on OR, half dealt with introducing or modifying delivery systems. Nearly 50 percent dealt directly with management and related issues, such as fees and financing, cost-effectiveness, or institution-community relations. The largest number of projects dealt with specific program components. The selection, training, and supervision of personnel was the topic of 73 percent; IEC of 14 percent; composition of services of 13 percent; and method options of 9 percent. Despite the large investment in family planning program design and service delivery, there is a limited body of literature from OR, and with the exception of research on personnel issues, there have been relatively few studies conducted on the individual components of service delivery systems.

It is of interest to note that the distribution of experiences is also skewed by region. Selection, training, and supervision have been a focus of interest in all the Latin America projects, while in Asia only 59 percent studied these issues. In contrast, in Asia contraceptive method options were a concern of 20 percent of the projects, but only a few OR projects in other regions dealt with this component. Most of the African projects (78 percent) were concerned with basic management issues related to program start-up, while in the Near East and North Africa, only 29 percent of the projects focused on management issues. The clustering of issues corresponds to the concerns of local managers, and is very likely a reflection of the different stages of program development.

Table 2. Distribution of OR Projects (1986)

Region/Topic	Delivery Systems	Selection, Training & Supervision	IEC	Method Options	Service Composition	Management/Community
Africa (n=23)	48%	74%	4%	-	22%	78%
Near East/ North Africa (n=17)	59%	88%	6%	6%	18%	29%
Asia (n=49)	39%	59%	20%	20%	8%	39%
Latin America and Caribbean (n=41)	73%	100%	20%	5%	15%	61%
TOTAL (n=140)	50% (70)	73% (102)	14% (20)	9% (13)	13% (18)	48% (67)

NOTE: Several topics may be involved in any project, so that the rows do not sum.

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In the following section, the results of specific OR projects on each major component are highlighted.

## RESULTS FROM OR BY COMPONENT

### Selection, Training, and Supervision of Personnel

**Many types of personnel are capable of providing high-quality family planning services.**

From the client's perspective, the individual provider is often the only contact with the delivery system. The issue of personnel selection--who should be the provider--continues to be much debated. A number of studies have demonstrated that community health workers can safely provide orals, condoms, and injectables, and that paramedical personnel (nurses, midwives, and health visitors) can successfully insert IUDs (Treiman and Liskin, 1988). Also, by initiating and resupplying users in the community, user knowledge and contraceptive prevalence can be increased, and continuation rates at 12 months can be as high as 80 percent, as in St. Vincent (Bertrand et al., 1986).

Nurse midwives in private maternity homes in Ghana have been tremendously successful, recruiting over 8,000 new users among the first 134 midwives trained in family planning. Not only have about 80 percent of the clients been new users of family planning, but the continuation rate among these users of temporary methods was 69 percent at nine months (Center for Population and Family Health [CPFH], 1989). On the other hand, despite obvious cultural advantages, working with traditional birth attendants (TBAs) has not always been successful in Côte d'Ivoire, Ghana, Nicaragua, and Guatemala because of high dropout during training, feelings of inadequacy due to illiteracy, and reluctance to promote family planning services, even when trained (Heiby, 1981; CPFH, 1989).

**Female service providers are often viewed as more acceptable to clients than males. The actual performance of female providers is often better than that of male providers in clinics, and differs little from that of males at the community level.**

There is considerable support for the principle that females are more acceptable providers of most family planning services for females, particularly for orals and barrier methods (Repetto, 1977). Even for clinic services, the International Planned Parenthood Federation (IPPF) affiliate in Paraguay (Centro Paraguayo de Estudios de Población [CEPEP]) found

that young women physicians were more successful at promoting the use of family planning posts than older male physicians (CEPEP, 1989). Similar results were observed in Indonesia, where IUD services were offered by 30 percent of the doctors and 74 percent of nurse midwives; the services were also cheaper at nurse midwives' clinics (Kak, 1989). In Mexico, women who serve as community doctors seem to be better accepted since the majority of the patients are women and children (Arango, 1989).

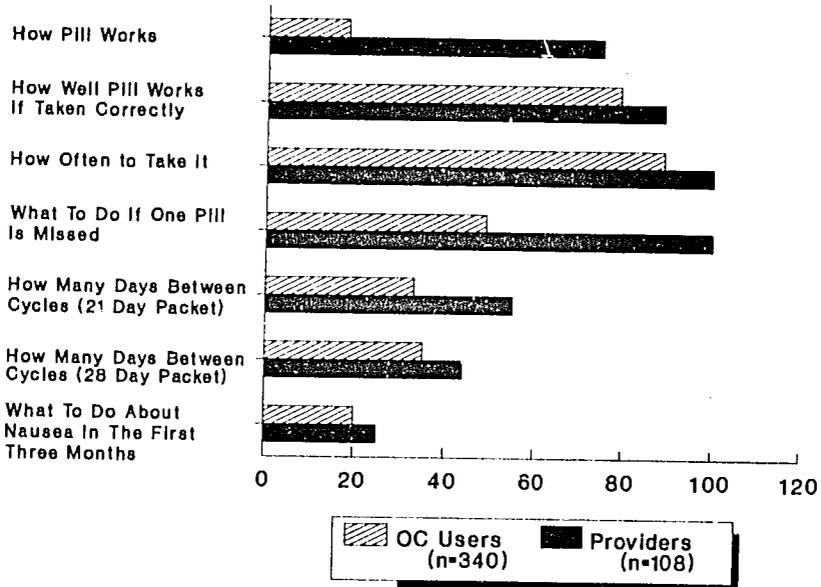
At the community level, however, studies of public providers in Zaire (Bertrand, 1989) and private family planning agencies in Ecuador and Peru suggest that male and female fieldworkers distribute about equal numbers of couple years of protection (CYP). The client mix may be influenced by the provider. For example, in Peru, male CBD workers distribute about twice as many condoms and serve up to three times as many male clients as female CBD distributors. Thus, recruiting and training male distributors is a potential way to extend family planning services to men. Where females tend to perform better, for example, in the Kisangani CBD project in Zaire or the Ibadan market-based project in Nigeria, the difference is not large enough to justify systematically excluding males in future CBD or market-based efforts. Availability and willingness to collaborate seem more important than the sex of the provider (Bertrand, 1989).

**Efforts to improve quality of care require a variety of strategies to influence provider competence.**

In-service training of personnel to improve provider competence is an important ingredient of quality of care. Following initial training, provider knowledge, skills, and/or motivation frequently erode over time. For example, in Colombia, many community-based distributors were unable to describe correctly the most important contraindications to the use of orals and the way to use the pill correctly. This is reflected in the fact that 58 percent of oral users did not use the pill correctly. Common problems reflected providers' lack of knowledge about the transition between cycles and what to do about side effects (Potter et al., 1987; Townsend and Ojeda, 1985) (see Figure 2).

Job responsibilities may also change. For example, in the social security systems of Honduras and Mexico, training in reproductive health significantly improved both physicians' and nurses' knowledge about family planning and the acceptability of providing family planning services as part of their routine practice (Murray, 1990). During the past few years, basic information for AIDS prevention has been included as well in the tasks of many community-level family planning workers.

## PERCENTAGE WITH CORRECT KNOWLEDGE



Source: Townsend, 1990

Figure 2. What Oral Contraceptive (OC) Users and Providers Know

Competence also includes the skills to initiate and sustain personal relations with clients and provide appropriate counseling. These skills are rarely emphasized in training programs. For example, in Nigeria and Peru, market sellers of family planning methods rarely initiated conversations about the contraceptives or other health products they sold (Asociación para el Desarrollo e Integración de la Mujer [ADIM], 1988; CFPH, 1989).

Effective counseling requires not only good training, but also the motivation to apply what has been learned to actual client encounters. For example, in South Asia, the evidence suggests that training in client counseling often does not change staff behavior in the expected direction. The real obstacle is often staff motivation because quality of care has not been established as a central value for the program (Simmons and Simmons, 1990).

There are cost as well as quality consequences of poor motivation. A lack of motivation among public health providers has been recognized as a serious impediment to program efficiency and success, but it has not always

been recognized as a cost to programs. Costs rise with inefficiency, and reducing those difficulties will assist in improving cost recovery (Lewis, 1987).

**While supervision remains a serious management problem, competency-based supervision offers opportunities for improving fieldworker performance and reducing costs.**

Regardless of the type of personnel and training, supervision is needed to maintain quality performance. In theory, supervision should motivate workers, and should improve their knowledge of contraindications and expected side-effects, as well as practical instructions for using a method. Several studies have associated increased supervisory contact with increased program performance (for CBD distributors in Nigeria, Ruffing et al., 1986; for CBD distributors in Guatemala, Bertrand et al., 1981; and for nurse midwives in Turkey, Akin et al., 1984). However, when supervision is ineffectual or focused on clerical matters, an increase in its frequency has no effect on performance (Foreit and Foreit, 1984).

An exhaustive analysis of issues in the supervision of CBD projects worldwide found that paraprofessionals' performance is often hampered by underfinancing, excessive red tape in releasing materials and funds, unreliable supply lines, poor coordination and cooperation among service agencies, and ambiguity about who is responsible for what (Reinke, 1983). Essentially, these are problems of management. The gender or personal characteristics of supervisors show no consistent relationship with performance (Finkle and Ness, 1985).

Because many of these problems are management-related, specific tools can be developed to improve the quality and scope of supervision. For example, a project in Ecuador identified a number of simple tasks to improve supervision, including revising norms for the content and frequency of supervisory contacts, identifying appropriate personnel for supervision, developing itineraries, specifying adequate supervisor-fieldworker ratios, and using checklists for monitoring and a form for the control of inventories (Primary Health Care Operations Research Project [PRICOR], 1987).

Studies in Bangladesh and Colombia (Bernhart and Kamal, 1991; Gomez, 1981) found that superior fieldworker performance was associated with the following supervisory behaviors: supervisors make home visits with workers to observe workers' interaction with their clients; supervisors question clients about fieldworker activities in the presence of the worker; supervisors discuss clients' problems with the fieldworkers; and supervisors visit more client homes.

Another project, in Lakshmipur, Bangladesh (Society for Project Implementation, Research, Evaluation and Training [SOPIRET] and Development Research Associates [DRA], 1989), found that a simple management intervention implemented through a supervisory process could increase contraceptive prevalence by about 5 percent (from 32 to 37 percent) in merely eight months. The new mode of supervision included guidance on how to deal with religious opposition, greater focus on dealing with side effects, flexible target setting and work plans by fieldworkers, and the documentation of supervisor/fieldworker meetings.

In the Dominican Republic, an experimental strategy of one-on-one reinforcement of knowledge during supervision was 31 percent more effective in maintaining promoters' knowledge of family planning than the traditional Asociación Pro Bienestar de la Familia (PROFAMILIA) method of providing retraining to large groups of promoters. It also doubled the level of couple months of protection achieved, while reducing by about 75 percent the percentage of pill users with contraindications (PROFAMILIA, 1990).

The effectiveness of individual versus group retraining is further demonstrated by results from a similar project with the Instituto Peruano de Paternidad Responsable (INPPARES), the IPPF affiliate in Peru (see Figure 3). Using a simple standardized test of CBD worker knowledge, the results of a traditional refresher course were compared with those of individualized retraining during supervision. On-site retraining of CBD distributors by supervisors using this diagnostic and teaching instrument resulted in 34 percent higher levels of family planning knowledge than did group retraining. In addition, on-site retraining directed at identified weaknesses was found to be much less time-consuming for distributors (about 3 hours) than a formal refresher course (20 hours). The coverage of individual retraining was also generally higher. For example, 36 percent of promoters trained under the traditional system were absent in the refresher course (León, 1989). In contrast, virtually all promoters can be contacted individually.

Retraining can be expensive and time-consuming. In Colombia, Asociación Pro Bienestar de la Familia (PROFAMILIA), the IPPF affiliate, found that supervision that includes on-the-job training may be the most cost-effective mechanism for improving CBD distributors' knowledge about the use of orals, the IUD, and natural family planning (Vernon and Ojeda, 1988). Because of training and supervisory costs, OR projects to improve the CBD programs in Cité Soleil, Haiti and La Paz, Bolivia concluded that it was much easier to change the CBD program from one using a large number of volunteer TBAs and community agents to one employing

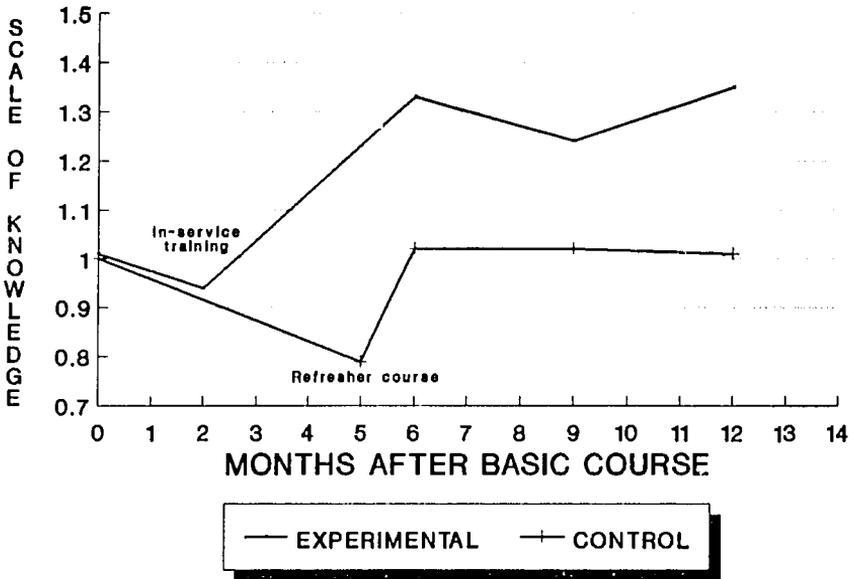


Figure 3. Knowledge Loss and Learning Under Alternative Retraining Systems

a very small number of promoters as full-time employees (CPFH, 1989; Centro de Investigación, Educación y Servicios [CIES], 1990).

Although individual supervision is the most common mode, a Kenyan study found that group supervision was equally effective, cost about half as much as individual supervision (U.S. \$6.30 versus U.S. \$11.80 per visit per worker), and permitted supervisors to cover two to three times as many workers (Jacobson et al., 1985).

In modern family planning organizations, service providers must be empowered by involvement in decisions, minimal hierarchy, and increased rewards based on new performance parameters (e.g., quality, responsiveness). Highly trained and thus more flexible workers, with a big stake in the action, are a must for the constant adaptation to customer needs (Peters, 1987).

### **Pending Challenges:**

- High turnover, together with the recurrent costs of recruitment and training, continues to be a characteristic of many programs using volunteer community workers. There is a need to rethink the role of volunteers and to research its actual costs to family planning programs.
- TBAs provide services, including family planning, in most public health systems. More research is required on how to improve the effectiveness of their collaboration.
- Techniques for competency-based training should be developed in every family planning organization; OR should assist in the development of these techniques.
- Technical assistance should be available to all family planning organizations for implementing selected supervision strategies. Individual on-the-job training should be an essential part of every family planning program.

### **Information, Education, and Communication (IEC)**

The basic proposition of IEC is that people who are well-informed will select a method appropriate for them and use it more successfully. IEC helps ensure that clients are satisfied, will return for services, and will recommend the method and/or services to others (Gallen and Lettenmaier, 1987). The broad issues of informed choice, as well as specific recommendations for program managers, have been well documented elsewhere by Piotrow (1989) and the Centers for Disease Control (CDC) (1986).

**Service providers who help users understand and manage use-related side effects are able to positively affect use, continuation, and satisfaction.**

More complete and accurate counseling has been associated with higher use prevalence and client retention (Prabhavathi and Sheshadri, 1988; Bernhart and Kamal, 1991). For example, in Bangladesh, high-performing workers were more likely to inform prospective clients of possible side effects before they chose a method, and sought to identify contraindications to the use of specific methods when contacting nonusers. In Mysore, India, a follow-up study of IUD users conducted by the Family Planning Association of India found that IUD continuers were more likely than discontinuers to have received information on side effects prior to acceptance (Prabhavathi and Sheshadri, 1988). Also in South Asia, satis-

fied users of IUDs in Sri Lanka were better able to motivate others to adopt and continue family planning than community health workers alone (Fisher and de Silva, 1986).

**The effectiveness of the communication of family planning messages through mass media can be enhanced if reinforced through personal contacts.**

Since the mid-1960s, research has reported that mass-media messages prepared by skilled communication specialists can be an important source of family planning awareness. However, the relative importance of mass media and personal communication varies among studies (Ross et al., 1972). In Nepal, an OR project documented that awareness of the IUD is associated with the intensity of fieldworker activity, but depth of knowledge is correlated with literacy and exposure to media. Thus, the lack of information and misinformation about the IUD, particularly with respect to common side effects, must be dealt with through both channels--fieldworkers and media (Integrated Development Systems [IDS], 1989). Focus groups suggest that improvements in the quality of service delivery, especially counseling about side effects, would increase acceptance. In contrast, in Africa, the mass media appear to play an important role in generating family planning awareness, but may have less of an effect on stimulating use (Wawer et al., 1990). There still is a need to bridge the gap between high knowledge levels and much lower levels of usage. Similar results have been observed in mass campaigns to increase the use of the condom for the prevention of AIDS (Consejo Nacional para la Prevención y Control de SIDA [CONASIDA], 1990).

In Colombia, the use of specialized teams to promote family planning in the context of CBD services in rural areas proved to be an effective vehicle for increasing contraceptive prevalence. Following intense periods of promotion, maintenance-level services, i.e., resupply with little IEC effort, are possible, and very little is lost in terms of community-level knowledge or prevalence of use of contraception (Townsend and Ojeda, 1985).

In Africa, given the disparities in knowledge and motivation, a redirection of mass-media messages may be required to render the message more personal and to place family planning within the context of daily life situations. Increased use of face-to-face outreach is also indicated. In Ghana, personal communication was cited as the principal means of acquiring information. In Rwanda, trusted community members acting as distributors spurred contraceptive acceptance among individuals who had previously heard of family planning through the mass media and clinics

(McGinn, 1989). The fact that women tend to cite the mass media less frequently than do men suggests the importance of individual outreach.

**Community meetings have given mixed results in their effectiveness for improving the acceptability and use of family planning services.**

Many programs use community meetings to address rumors and misconceptions that circulate about family planning methods. Research in Thailand with the Prince of Songkla University demonstrated that community meetings were useful when combined with the delivery of orals and condoms by village health communicators, volunteers, and TBAs. Not only did the level of family planning service activity increase, but the training interventions increased women's knowledge of methods, awareness of community volunteers, and local contraceptive prevalence (Jintaganont et al., 1988).

While meetings may be effective in changing knowledge, they are not necessarily effective in increasing contraceptive use in areas where services are generally poor. For example, in Kinshasa, Zaire, intensive meetings in the community were employed to combat rumors about family planning, yet no increase in the utilization of the clinic could be attributed to this motivational effort. However, other factors associated with clinic attendance, such as limited range of services, may have inhibited utilization (Bertrand, 1989).

**Commercial models for advertising can improve the acceptance and purchase of family planning methods and services.**

Advertising is the approach employed for user education in commercial family planning programs and is a potentially powerful tool. For example, the simple use of information pamphlets in drugstores was able to increase significantly the sale of condoms in Colombia (Bailey and de Zambrano, 1974). Radio, billboard advertising, and mass print media have been used with positive results in strategies for increasing awareness about the availability of new methods, particularly for vasectomy (e.g., Bertrand et al., 1987). In Brazil, a short advertising campaign in magazines produced a 58 percent increase in vasectomies in the Promocao de Paternidade Responsavel (PROPATER) clinic (Foreit et al., 1989). In contrast, more traditional approaches, such as talks on vasectomy to workers in industrial sites in Brazil, Colombia, and Mexico, have proven to be a costly and relatively ineffective strategy for stimulating the demand for male surgical contraception. In the Gambia, local commercial distributors felt that public information about contraceptives was at least as important as their own training and supervision (CPFH, 1989).

**Communication is more effective and services are more acceptable when tailored to the needs of special groups.**

Adolescents account for an increasing proportion of fertility in Latin America, and pay disproportionate health and social costs for early childbearing. Although youth are keenly interested in sex education, the demand for contraceptives among young adults remains relatively low. But new strategies for service delivery are showing increased impact.

An example is Pro-Superación Familiar Neoleonesa (PSFN) in Mexico, a street educational program for poor urban youth. When combined with traditional CBD, this program was 157 percent more effective than CBD alone in increasing the number of users of contraception among sexually active youth 15-24 years of age, while a community center/CBD approach was 94 percent more effective. The street program with CBD, however, cost U.S. \$13.90 per CYP versus U.S. \$22.78 per CYP for the community center program (Townsend et al., 1987). Centro de Orientación para Adolescentes (CORA) in Mexico demonstrated that a school-based sex education and condom distribution program was the most cost-effective (U.S. \$4.08 per CYP), and the factory-based program for young working adults was the most expensive (U.S. \$26.07 per CYP). Although program costs certainly differ among agencies, special services for youth and industrial workers generally have had low coverage and relatively high costs.

Another special group is older multiparous women for whom another undesired pregnancy may present a risk to their health or the health of the infant. In Nigeria, the University of Benin Teaching Hospital provided high-parity women (four or more previous deliveries and currently pregnant) with four individualized counseling sessions on family planning methods and the health risks associated with high parity. A control group received only the standard family planning information provided at the prenatal clinic. Overall, 71 percent of the women in the treatment groups were using an effective method of birth control at six weeks postpartum, compared with 51 percent of the women in the control group. About 40 percent of women in both groups had indicated at admission that they did not want more children, but women in the treatment groups were significantly more likely to choose female sterilization as their postpartum method than women in the control group--13 percent compared with 3 percent (Omu et al., 1989).

### **Pending Challenges:**

- Quality of care should be promoted as a central function of family planning programs. Media messages should be much more personal, tie information to specific service sites, and reinforce the quality of provider-client relationships.
- The use of commercial advertising models should be adapted to the promotion of family planning to increase acceptance, improve compliance, and enhance continued use.
- More investment must be made in market research for understanding the needs of specific audience segments for family planning. More evaluation of communication efforts is needed to improve their impact on behavior.

### **Method Options, Access, and Logistics**

**Greater access to contraceptives increases use, but there are many ways to increase access, including new delivery systems, improved referral, and efforts to listen to the needs of clients.**

There is overwhelming evidence that greater access to contraceptive supplies results in increased use of contraceptives, but there is less evidence on the precise magnitude of this effect or how programs can effectively influence it. The essence of access is increasing the quantity of contact between providers and clients, as well as providing clients with a broad range of contraceptive options from which to choose. The assumption is that those programs offering a full range of contraceptives will be more able to provide methods that are acceptable to a larger number of users.

Much of the early work on the impact of CBD programs has also demonstrated that availability leads to greater use (Maguire, 1984). In the early CBD projects, the median impact on contraceptive use prevalence was approximately 20 percentage points (range 3-47 points), with the increase largely attributable to the greater use of orals. More recently, a number of studies on medical back-up services suggest that use of the IUD, when effectively offered in urban CBD programs, can be increased significantly. In Peru, the number of IUDs inserted increased from 125 to 1387 in a CBD experimental area within one year, largely because of referrals from promoters. Moreover, IUD insertions increased linearly with increased frequency of clinic sessions, up to four a month (Ramos et al., 1986).

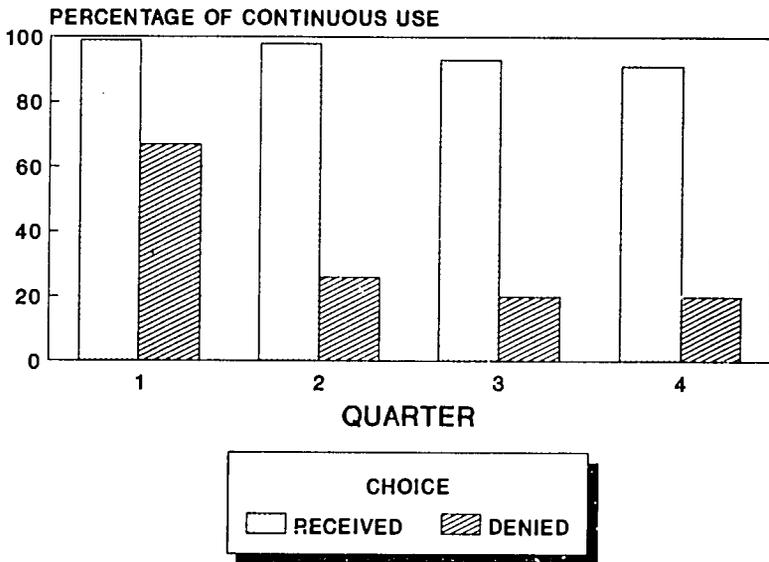
Regardless of delivery system, the most effective strategy for increasing prevalence is to concentrate on recruiting a manageable number of acceptors and providing high-quality care to ensure continuation (Berelson, 1988; Jain, 1989). For this reason, it is important not to focus on the continuation of a particular method, but rather to be concerned about the aggregate contraceptive behavior of couples. This approach recognizes the practice among users of switching between methods to conform to differing needs, ages, and lifestyles. Programs must be flexible enough to allow for changing preferences, and must provide high-quality support once a method has been selected.

**Expanding the choice of methods available to users increases overall contraceptive use. Choice affects not only acceptance, but also continuation.**

Expanding the choice of methods contributes significantly to increased use. One study estimated that the addition of one method to the choices available may produce an increase of up to 12 percent in the use of contraceptives (Jain, 1989). The experience in Matlab demonstrated that broadening the choice of available methods increases overall prevalence: household provision of injectables raised contraceptive prevalence from 7 to 20 percent in 1977, the introduction of sterilization services contributed to the addition of 10 percentage points in prevalence in 1978, and the household insertion of IUDs further raised prevalence in 1981 (Phillips et al., 1988).

Choice is also important for continuation. The WHO study on method choice (1980) concluded that when women are given balanced information and a genuine choice of contraceptive methods, their preferences often differ from previous patterns of contraceptive use. Moreover, in a study in Indonesia, 85 percent of the women who were denied their original request discontinued use within a year, whereas only 25 percent of those who received the requested method discontinued (Pariani et al., 1987) (see Figure 4). Continuation is also about 12 percent higher for women who are given information about alternative methods when they visit a family planning outlet (Prabhavathi and Sheshadri, 1988).

Efforts to increase choice should not be limited only to the more effective methods. Evidence indicates that combining methods that each have a relatively low level of effectiveness (e.g., natural family planning and condoms) may lead to levels of use-effectiveness comparable to those of orals or injectables (Thapa, 1988). Choice may even include making clinical methods more available at the community level. For example, in Paraguay, having a nurse from the nearest CEPEP family planning clinic



Source: Parlan et al., 1987

Figure 4. Continuous Use of Contraceptives: Choice Received or Denied

visit two community posts every week not only increased the CYP provided by the CBD program by 36 percent, but also increased the number of IUDs inserted by 27 percent. Furthermore, the cost per CYP of this combined strategy was merely U.S. \$5.95 (CEPEP, 1989).

**Logistics is an area in need of OR. There are major potential benefits from strengthening local logistics systems in terms of continuation and costs.**

Managers are routinely confronted by factors that limit the effectiveness of their delivery systems. For example, stock-outs undoubtedly have a negative effect on contraceptive use, method continuation, and user satisfaction. In the Dominican Republic, for example, nearly 8 percent of discontinuers indicated that they stopped using orals because they could not find their accustomed brand (Green, 1988). Similar results were reported in Lesotho, Africa (CPFH, 1989). In health posts in rural areas of much of the developing world, the problem of stock-outs of basic medical and contraceptive supplies is not uncommon, particularly for

methods that require routine resupply, such as orals, spermicides, and oral rehydration salts.

Logistics systems must work all the time to be effective, and the opportunity costs of keeping a weak system operating can be daunting. For example, in a CBD project in Lesotho, Africa, efforts simply to keep CBD agents resupplied were made at the expense of supervision, training, and other program activities (CPFH, 1989). In Sri Lanka, many traditional practitioners who received training in family planning lost contact with the system because of inadequate supplies and back-up support (Population Services Lanka [PSL], 1989).

Fortunately, improving logistics is almost always easier and less costly for managers to achieve than increasing the number of delivery systems. For example, in Mexico, merely moving Promotora de Planificación Familiar (PROFAM) brand condoms from the shelves of a supermarket to the display space next to the cashiers nearly doubled the number of condoms sold per month, in addition to reducing pilfering (de la Macorra et al., 1987). In Colombia, private physicians working in small cities who had been trained in IUD insertion were supplied with IUDs by a private distributor (Sociedad Médico Farmacéutica [SOMEFA]) in a cost-effective way: mail services were used rather than the traditional costly strategy of personal visits by salespersons (SOMEFA, 1989).

It is important to realize that the more subtle forms of limited access (such as waiting time, weak referral links, fewer hours devoted to the provision of a given method, less-prepared staff, unnecessarily restrictive admission requirements) negatively influence the number of clients selecting a particular method, as well as their willingness to continue use (Bruce, 1990).

On the other hand, the mere existence of appropriate administrative guidelines does not guarantee availability. For example, India's national family planning program has tried to increase the availability of oral contraceptives (OCs). Although there has been an increase in the number of service delivery centers distributing OCs, over 80 percent still do not provide this method. Awareness of orals ranges from 3-26 percent, and use is merely 1.5 percent (Reynolds, 1989). Although less dramatic, similar results on the irregular availability and underutilization of family planning services have been reported in the Dominican Republic (Báez et al., 1990) and Kenya (Miller, 1990).

### **Pending Challenges:**

- More OR is required on improving the operation and reducing the costs of family planning logistics systems.
- Technical assistance is required to assist service agencies in increasing the number of contraceptive options available to clients. This assistance could be either directly or through arrangements with other local service agencies. Referral systems should also be developed and/or strengthened so that clients can have access to desired methods at the nearest facility.
- The cost of contraceptive methods is a burden that must be shared increasingly by national providers and users alike. More OR is needed in the area of cost recovery.
- Systematic efforts should be made to reduce the more subtle barriers to access. Technical assistance should be available to agencies for identifying and removing barriers, without the need for formal field tests.

### **Organization and Composition of Services**

**Although the integration of family planning and other health services at the local level is not necessary to increase contraceptive acceptability or use, it remains a central policy of most public family planning programs. The mix and phasing of services seem critical to success from the family planning perspective.**

Increasingly, Ministries of Health give priority to the integration of family planning with MCH services in the context of routine health services and with a focus on reproductive health. At one time, program planners believed that by making methods such as the IUD and sterilization available through special campaigns, they could increase contraceptive prevalence without having to invest in a strong health care infrastructure. While creating an awareness of family planning, such campaigns have rarely succeeded (Klitsch and Walsh, 1988). Currently, the notion of birth spacing to protect the health of the mother is broadly acceptable as a basis for good medical practice in most cultures, and is not in conflict with Islamic or Christian religious principles (The Population Council, 1988; CPFH, 1989).

There is a long tradition of research on integrated projects (Gallen and Rinehart, 1986). One particular project under the OR Program has made

the successful transition from demonstration to a national model. The results from the Sudan Community-Based Family Health Project with the Ministry of Health and the University of Khartoum indicated that both family planning and other services in a child survival package could be successfully implemented by community workers with Ministry of Health back-up (see Figure 5). Phased training, sequential introduction of interventions, community participation, health team building, and innovative approaches to supervision were all used to improve care in 150 villages covering 160,000 people. Contraceptive prevalence increased from about 10 to 27 percent in both the original and extension communities. In addition, more than 75 percent of mothers knew about and used oral rehydration therapy (ORT) within a year of its introduction (CPFH, 1989). Excellent examples of results of this magnitude are available in other parts of the world as well; one is Mexico's "Few and Better" program, integrating rural development with health and family planning services (Alarcón and Martinez-Manautou, 1986; Klitsch and Walsh, 1988).

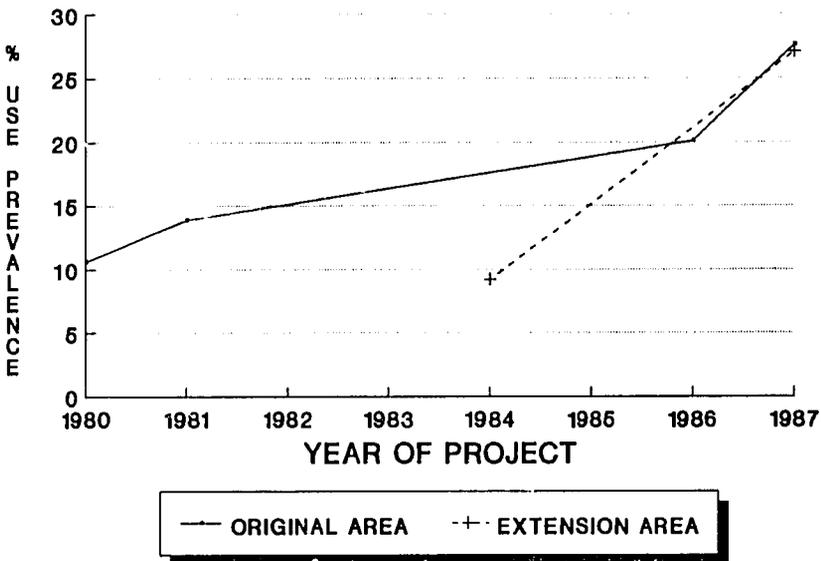


Figure 5. Use of Family Planning in Sudan Community-Based Family Health Project

In many sites, volunteers seem to gain credibility when family planning services are provided along with other health interventions, such as primary nutrition and health services, including the sale of medicines for children under 5 (Lechtig et al., 1985; Bertrand, 1989; Khuda, 1990). In addition, from the client's perspective, integrated services save time and also cut down on the number of visits required (CPFH, 1989). Experience in Bangladesh (Matlab, International Center for Diarrhoeal Disease Research, Bangladesh [ICDDR,B]) has demonstrated that some MCH services (child care) may reinforce the family planning program, while others (ORT) may make such extensive demands on field personnel that contraceptive services suffer (Phillips et al., 1984).

Simmons and Phillips (1987) analyze the results of vertical family planning programs versus integrated family planning and child health care services. They conclude that "client populations have responded well to both integrated and vertical services. The lesson appears to be that people desire good services, irrespective of their specific combinations" (p. 204). Thus, there is a need to examine the strength of the service-providing institution, however configured, and the impact of the composition of services on worker performance and client satisfaction. For example, in highland Peru, where integration often proves intractable, replacing integrated family planning services with vertical family planning services produced nearly a four-fold increase in the number of users in Ministry of Health hospitals. Moreover, during specially scheduled hours in three of the four clinics studied, more than half of the new clients were men (Vecinos Peru, 1989).

In Africa, virtually all OR projects initiated prior to 1984 offered integrated health and family planning, with family planning introduced after the health interventions to enhance political and community acceptance. Since then, opportunities to provide family planning initially or as the sole service have increased dramatically; examples are marketplaces in Nigeria and Ghana (Wawer et al., 1990). Simultaneously, more existing, vertical health programs are expressing an interest in adding family planning services, as is the case in projects in rural Senegal and Côte d'Ivoire.

**Decentralized organization of services increases the rate of innovation and responsiveness to local needs. It works best when the environment is heterogeneous, the central level is supportive, and the services provided require a great degree of discretion.**

Decentralized program control has been associated with improved program performance in Thailand (University Research Corporation [URC], 1990) and Indonesia (Hafid, 1976; Warwick, 1985). However,

where the environment is relatively stable and predictable, and the utilization of technology (contraceptive methods) can be easily routinized, a more highly centralized and hierarchical type of organizational structure tends to produce the highest performance (Finkle and Ness, 1985). Specifically, general training guidelines, service statistics, and logistics management are areas that perhaps can be best integrated at the center of an organization.

On the other hand, where the environment is heterogeneous and unstable, as in the case of rural areas and new populations, and the utilization of technology requires a high degree of human discretion, a more decentralized organizational structure, with many specialized integrating roles, produces the highest performance (Finkle and Ness, 1985). Decentralization induces the flexibility and responsiveness necessary to satisfy even slight differences in demand, for example, between one brand of orals and another, thus producing an ever-changing portfolio of highly differentiated services.

To illustrate, Indonesia's success in family planning is generally attributed at least in part to its high level of administrative decentralization. There are family planning coordinating committees at the province and district levels, which have a large degree of discretion in developing actual program procedures for service delivery and innovative strategies for responding to local needs. The Egyptian Population Development Projects experienced local success with the same type of decentralization.

In PROFAMILIA, the IPPF affiliate in Colombia, decentralization has produced the same activist, problem-solving attitude at all levels of the organization. This organizational climate breeds both innovation and flexibility, enabling staff at all levels to implement changes as needed. "Personnel at PROFAMILIA know that experimentation is regarded as a positive activity, that there is no great onus associated with failure, and the successes are recognized and often replicated" (Roper, 1987, p. 347).

The "less successful" programs in Asia (e.g., India, Pakistan, and Bangladesh) too early became standardized, rather inflexible programs applied uniformly nationwide. Services were often provided regardless of local readiness, local conditions, the availability of qualified personnel, or the need to learn and adjust to distinctive local and national conditions (Freedman, 1987).

**Postpartum services lend themselves to integration with breastfeeding, child care, and family planning.**

There is considerable research on postpartum family planning services, beginning in the mid 1960s. Essentially, the results indicate that family planning services can be efficiently and effectively provided in hospitals for women at or shortly after delivery (Castadot et al., 1975). Acceptance rates increased from 17 to 35 percent, services reached younger women, and continuation rates at 12 months averaged about 70 percent.

Recently, there has been renewed interest in the concept of postpartum services and possible options for the composition of these services. These options include breastfeeding support, expansion of the time frame for counseling and acceptance from immediately postpartum to 40 days postpartum, special prenatal services for primiparous women, vasectomy counseling for men to expand method choice postpartum, and more appropriate postpartum services for rural areas. Breastfeeding in particular seems to be an acceptable complement to postpartum services, for both women and providers (Kak, 1990). However, there is still demand for the traditional postpartum family planning services. Social security systems in Honduras, Mexico, and Peru demonstrate that virtually all postpartum women can receive family planning orientation during their hospital stay. Acceptance rates prior to discharge in Mexico and Peru ranged from 50 to 60 percent and remained high during the first six months postpartum, while rates in one project in Honduras were only 16 percent two days postpartum.

Complementing postpartum contraceptive services with information on newborn care may also increase the health impact of family planning programs. For example, in the social security system of Honduras, the decision to provide integrated breastfeeding and family planning services postpartum led to an increase of nearly 14 percentage points (from 54 to 68 percent) in the prevalence of use of modern contraceptives at six months following birth and to a similar increase in the percentage of women still breastfeeding their infants (Proyecto de Apoyo a la Lactancia Materna [PROALMA], 1989).

Postpartum services for young women can be particularly effective. Young mothers who receive prenatal counseling and home visits initiate the use of contraception from 6 to 16 percent more than mothers not receiving these services, and they use contraceptives more effectively as well (Bertrand et al., 1986; Russell-Brown, 1989). Similar results were observed in a project conducted by the Women's Centre in Jamaica, with only 15 percent of teen mothers exposed to counseling experiencing a

second pregnancy at three years, compared with 39 percent in the control group. Moreover, the Jamaican program is very successful at encouraging women to return to school: only 15 percent of women in the control group who became pregnant while in school returned to school, compared with about 55 percent of those who received counseling by the Centre in Kingston (McNeil et al., 1989).

**Mechanisms for screening, referral, and follow-up improve access to services, but have been difficult to manage.**

Screening, referral, and follow-up are critical, particularly for those interested in clinical methods, and for individuals with contraindications or side effects associated with a specific method. Screening for sexually transmitted diseases (STDs) is also becoming more important, particularly among potential IUD users. In many countries, major efforts have been made to train providers of voluntary sterilization, but the screening, referral, and follow-up systems are weak. A study in Indonesia recommended that front-line personnel need to develop criteria that will help them focus on the potential acceptors most likely to want voluntary sterilization. These criteria should include those who are not satisfied with their current method and do not want more children (Richardson, 1989).

Similarly, vasectomy is a service in which client referral and follow-up are critically important. Publicity, encouraging of communication by satisfied users, better targeting by male outreach workers (vasectomized males), and a variety of male services seem to be more important factors in increasing the number of vasectomies than the context within which the services are delivered (PROFAMILIA, 1989). Personal contact with another male who has received a vasectomy often confirms the decision to accept the method.

In Indonesia, efforts are being made to strengthen the linkages between outreach workers and service providers. Without explicit linkages, referrals are simply not made, and potential clients are lost. Nearly 60 percent of doctors and nurse midwives would be willing to give monetary incentives to outreach workers for referral services (Kak, 1989). Referral networks remain a critical problem with service models involving private physicians and community health workers (Arango, 1989). Insufficient follow-up is also a major problem with IUDs, and often leads to removal for side effects (Bangladesh Fertility Research Programme [BFRP], 1989). As a result, in one area of Bangladesh, only 3.8 percent of IUD acceptors continue to use the IUD four years after insertion.

Within the context of reproductive health, the risk approach to family planning has been problematic in its conceptualization and implementation. Training in reproductive health has improved the motivation of medical and nursing staff to increase the supply of family planning services, for example, in Mexico, Honduras, and Côte d'Ivoire (CPFH, 1989; Murray, 1990). However, it has not been able to increase significantly use among those identified as "high-risk." Moreover, the strategy has been difficult to maintain given the use of cumbersome scoring systems based largely on medical history and socioeconomic criteria.

A recent workshop on the issue concluded:

There is an appropriate role for discussion of risk in family planning counseling, but it is confined to a discussion of the [women's] particular personal history (e.g., multiple caesarean sections, complications in childbirth), and their attitude towards a new pregnancy (e.g., if desired, the need for special prenatal care, or if undesired, the need for avoidance through contraception). The risk approach and risk instruments should not be a substitute for sufficient interaction between health provider and client, nor be offered as a substitute for adequate care. (Bruce and Winikoff, 1990, p. 5)

#### **Pending Challenges:**

- Improving the operational integration of family planning and MCH services continues to be a major challenge for public health services around the world. Closer collaboration is needed between the health and family planning communities to develop workable models.
- New strategies are needed to respond to the demand for family planning support among unintegrated health and development programs. Family planning is now an acceptable component of all development efforts. We should be prepared to tell policy makers how family planning services can be integrated with rural development efforts, food assistance programs, and urban employment strategies, among others.
- Since there is no one appropriate constellation of services, program managers should be alert to the needs of their clients. The possibilities are bounded only by clients' needs and managers' resources and imagination (Bruce, 1989).

## Research and Evaluation

The research and evaluation component of family planning systems is concerned essentially with the flow of information within an institution. It is both under the control of managers and an activity requiring some investment of resources. An example of the relative importance of research and evaluation as a component of family planning programs is seen in the relative weight of record keeping and evaluation in the program effort score developed by Lapham and Mauldin (1985): policy and stage setting account for 27 percent of total effort, service activities 43 percent, availability and accessibility 20 percent, and evaluation 10 percent. More important than its weight, however, are its implications for program performance. Under record keeping, mention is made of the importance of feedback of statistics, and the fact that progress should be measured against a standard. Under evaluation, reference is made to implementation of OR; availability of professional staff to analyze and interpret results; and good coordination, working relationships, and timely sharing of information among the evaluation unit and other units in family planning programs. And perhaps most important is management's use of evaluation findings to improve the program.

Information motivates in several ways (Peters, 1987):

- It provides critical confirmation that the organization sees its staff as partners and problem solvers. At the same time, useful information creates a demand for more information. When information is "around," people start asking a variety of questions, stimulating useful responses.
- The widespread availability of data from management information systems is the only basis for effective day-to-day problem solving that supports the continual improvement of programs.
- Visible posting of information radically speeds problem solving and action taking. Information sharing stirs competition, not just against others, but also for self-improvement.

For example, in Bangladesh, an OR study with several Asia Foundation projects found that simply providing managers with information on their relative position with respect to performance, as well as recommendations for improvement (e.g., regular client contact), was enough to narrow the gap between high and low performers (Bernhart and Khuda, 1989). Similarly, in Mexico, increasing the availability of information on performance and costs to midlevel managers at Fundación Mexicana para Planifi-

cación Familiar (MEXFAM), the IPPF affiliate, produced major institutional benefits in terms of improved decision making and use of resources by managers at the program level (MEXFAM, 1988).

The follow-up to several OR projects suggests that the tools for information collection, storage, and analysis produced by OR often endure within collaborating agencies. For example, client records, service statistics, inventory forms, reporting formats, and IEC materials are adopted by family planning programs and continue to be used; an example is the Ministry of Health of St. Vincent, W.I. (MORE, 1989).

However, there is limited documentation of how program managers perceive the utility of research and evaluation as a routine program component. Trias (1989) of PROFAMILIA in Colombia maintains that administration is based essentially on supervision and evaluation. And Suyono (1990, p. 12) of the National Family Planning Coordinating Board (BKKBN) in Indonesia states that "the [BKKBN] program has a conscious commitment to research, including operations research, [and] evaluation." However, because research is often sponsored by donor funds, it is difficult to predict what level of effort would be made without external funds or accountability.

No one is advocating the establishment of evaluation units in every service delivery organization. Rather, information gathering and use must be a function of every manager. There are many possible mechanisms, much as in the private sector, in which consulting firms, universities, and agency staff collaborate in making information on program costs, performance, and client satisfaction more available and useful. At the same time, there is a need to redefine the traditional process of measurement and control, for example, a narrow focus on logistics movement and prevalence. Some maintain that if we measure the "right stuff" (quality, flexibility, innovation) and share information, systems will assist in producing desired change rather than impeding it (Peters, 1987; Simmons and Simmons, 1990).

#### **Pending Challenges:**

- Efforts to make research and evaluation more useful should never stop. Its utility should be demonstrated for service providers and users, as well as for the development of a coherent literature on program operations.

- New dissemination strategies are needed to improve the availability of information within organizations, and to share results and experiences among regions.
- It is increasingly important to support the integration of cost, effectiveness, and quality information in management information systems, as well as formats for the graphic presentation of information.
- Efforts should be made to reduce the costs of OR, through improvements in theory of program performance, and development of service delivery models, simple research methods, and data management procedures.

## **POLICY IMPACTS, RESEARCH METHODS, AND LIMITATIONS OF OR**

### **Policy Impacts**

Globally, OR has had an important impact on policy at the program and institutional levels.

The most common impact is observed in operational policies at the program level. Operational policies are defined as the service strategies designed by agencies to attain specific policy goals. For example, private family planning providers in Zambia may decide that a model clinic is an acceptable strategy for providing family planning. When a program director introduces the use of OR to facilitate institutional change, the mere process of conducting OR contributes to the systematic review of program policies and procedures. The field test of operational alternatives commits the institution to addressing the feasibility of implementing program policy recommendations. In small private institutions, changes in operational program policies have been relatively easy to implement; yet sustainability remains a concern once external funding is withdrawn.

In more complex organizations, such as Ministries of Health and Social Security Systems, the focus has been on larger institutional policies. This is where the second level of policy impact can be observed. For example, Thailand is using OR to examine the process and consequences of decentralization.

Perhaps the most important results of the OR initiative have been in the openness of program directors and service providers to examining crit-

ically all aspects of service delivery operations and consciously using program data for decision making. OR should not be viewed from a closed-system perspective, but rather as a management tool to help understand and intervene in complex delivery systems. To support directors' efforts in producing institutional change, extensive technical assistance on a broad range of substantive issues and the development of local human resources have been central features of the OR Program. This change in institutional climate is something that is not commonly monitored nor easily documented within the contract framework, but it may have the most lasting effect. Additional documentation of institutional changes is required, but certainly the preliminary results are indicative of the potential impact of OR on national family planning programs.

Above all, the institutional atmosphere in which OR is conducted is extremely important. If the institution is unwilling to examine its program critically or learn from experience, then OR will be unable to make a positive contribution.

### **Innovations in Methods for Research on Components**

During the past 10 years, there have been major changes in the research methods employed in OR on program components. The focus of early research was on large, complex experiments, whereas more recent work has focused on more discrete management processes.

For example, systems analysis is now commonly used in complex service delivery settings to assist in understanding the dynamics of service delivery problems. It identifies the components of the system, defines how they interact with one another and with other inputs to the system, and examines how the system is influenced by its external environment. Rapid assessment procedures are also used frequently as a way of understanding the effectiveness of program components (e.g., situation analysis in Kenya) and the relationship between users and providers. These techniques are described in greater detail by Blumenfeld, 1985; Delbecq et al., 1975; Delp et al., 1977; and Scrimshaw and Hurtado, 1987.

A second approach is management training. This approach provides skills to managers that will lead to increased contraceptive use by resolving specific management problems that hinder effective service delivery. Training often includes elements of basic family planning management (including operational and financial planning, program management, and human resource management, as well as techniques for achieving financial sustainability). Research activities are included to the extent that implicit hypotheses are formulated about what strategies work, and data are

collected on the impact of these activities. However, formal research is usually given a lower priority in this type of work. This strategy is described in greater detail by Jain, 1980, and Finkle and Ness, 1985.

Formal research designs, including quasi-experimental methods, are used when it is important to exclude extraneous explanations for the changes in the indicators observed. These designs are also used when reliable estimates of the effects of alternative solutions are needed. However, more formal research methods require greater control of the service setting and often cost more than the systems or management approach. The higher cost can be justified when OR assists in the appropriate design of large programs; where significant increments in coverage, quality, or savings are accrued because of the outcomes of the research; and when the project advances our understanding of the mechanisms that determine program performance. This strategy is described in Fisher et al., 1983.

The big issues for OR really are not the sample design or the statistical test, but rather sound program design, and the ability to deal with the time frame of decision makers and frustrating bureaucratic recalcitrance. Thus, technical assistance should also be available to agencies for addressing problems that are identified through the OR process, but whose solutions do not require a formal field test. For example, where improper instructions to users of OCs lead to poor utilization, retraining is required, not an experiment. The objective of OR is not only quality research, but improved institutional development. The timely provision of technical assistance, where needed, supports this broader perspective.

There are a number of trends in the research on components of family planning programs that will become common practice in OR in the 1990s:

- Greater focus on the process of service delivery and management concerns in problem identification and solution development.
- Greater use of management information systems for the field test of interventions, complemented by small sample surveys and qualitative research when necessary.
- Use of time series research designs, which reflect institutional change over time and allow comparisons among different geographic areas.
- Increased focus on quality indicators of component performance, as well as quantity.

- Increased focus on technical assistance to stimulate large systemic changes not requiring research, and discrete OR interventions in which few elements are manipulated and discrete changes can be observed in program performance.
- Focus on a series of small projects that address emerging problems, rather than large complex projects. Flexibility is a common request of program managers, and follow-up is a felt need for those interested in utilization of OR project findings.
- Inclusion of more explicit dissemination and utilization in the practice of OR. Plans for these steps will be included in proposals from the outset, and funding will be available to facilitate local decision making.
- More self-financed OR as the OR approach and specific techniques are adopted by service agencies themselves.
- More OR talent in regions than in developed countries. This will facilitate greater south-to-south cooperation.

Thus for the program manager, OR offers a new approach to resolving problems and augments the available methodological tools for the modern management of service programs. Because OR techniques can be built into the routine management process of programs and the use of existing management information systems for decision making, it does not necessarily require major funding commitments to get answers to important questions. "More deliberate use of OR can improve management by the simple fact that it forces managers to pay attention to their own organization, to look for problems in their organization, and not simply at the intractability of their potential clients" (Finkle and Ness, 1985, p. 50).

### **Limitations of the OR Approach**

The OR approach has a number of obvious limitations. First, as a source of data for scientific inquiry, it is often hindered by reliance on in-house research. OR is commonly conducted by program managers and administrators, rather than by scholars. Its focus is on manipulating service delivery systems, rather than confirming hypotheses generated by an emerging theory of management. Second, because it focuses largely on the supply side, it ignores important factors influencing contraceptive use. No one would argue that the policy environment, the demand for contraception, and the resources available to family planning programs affect the

availability and use of methods. Thus OR efforts should be accompanied by other social science research and policy endeavors in these areas.

The major limitations of OR as a management tool have been its cost and the fact that most OR studies have been designed to resolve specific program problems at a particular point in time. As noted above, the cost of OR is fully justified when it assists in the appropriate design of large programs; where significant increments in coverage, quality, or savings are accrued because of the experience of the research; and when the results of OR are generalizable, that is, when projects advance our understanding of the mechanisms that determine program performance. OR is not a panacea for the lack of demand or the institutional failure to adopt robust strategies for the supply of services. Nor is it a substitute for the routine qualitative assessments made by good managers.

Despite the significant progress made, the introduction of the OR approach is far from complete. For example, many service agencies are not interested in research on operations. Some small private agencies are not interested in any research, and want only to provide services using more traditional strategies for program management, such as trial and error. Many public providers are more interested in research on contraceptive prevalence or the evaluation of family planning program outputs. They seem more accustomed to a long-term planning framework, or feel they have little flexibility to influence the way services are delivered at the community level. Others have lethargic field operations and weak leadership, and are not interested in examining the quality of their own services as a potential limitation to demand.

Even when the approach of OR is acceptable to a particular agency, not all efforts meet with success. Failures occur in three types of settings.

First, some programs may fail to implement the proposed solutions adequately. Usually, this is indicative of broader organizational problems or the lack of adequate technical assistance. These cases are relatively rare if an adequate problem analysis is conducted initially and the primary focus of technical assistance is on implementation issues.

The second type of program failure is the lack of impact, despite adequate implementation of the proposed alternatives. This is often the case when intervention models are new, as in the case of vasectomy, or when factors exogenous to the agency adversely affect the demand for services. The careful analysis of potential solutions and the definition of explicit models for intervention usually reduce the risk of no impact. The

magnitude of the impact and its cost can be reliably determined only with an adequate field test.

The last type of program failure is the lack of impact on policy. This is a particularly difficult issue because there are various levels of policy, ranging from operational policies of service delivery to national population policies. Experience suggests that utilization is greatest when policy makers have been involved in initial identification of the problem and design of the appropriate solutions. Research and policy issues have to be clarified with anticipation and the need for information for decision making specified to ensure that OR results will ultimately be used.

## ISSUES FOR THE FUTURE

### **Global Perspective and Local Concerns: OR and Policy**

During the past 15 years, OR has made a significant impact on policy throughout the world. Examples include demonstration of the acceptability and effectiveness of CBD and the use of paramedical personnel to insert IUDs. Research methods are generally stronger now, and projects are producing quality data more quickly and at a lower cost than before.

OR provides the policy maker with data on the implementation of policy and estimates of the impact and costs of specific strategies, and identifies additional needs for conceptual, legal, and financial analysis for the development of better policy. With the maturation of the process of population policy development in most regions, OR is becoming an essential component in the effort to test operational policies, and improve the allocation of both public and private resources in the health and population sectors.

Within the policy development process worldwide, issues of quality of care and resource allocation are becoming increasingly important (Gillespie, 1987). Specific examples of quality concerns include provider competence, information provided to users, and follow-up mechanisms. Resource issues focus on the policy constraints to the supply of contraceptive methods, understanding of the dynamics of contraceptive demand and supply, financial resource analysis, alternative investment concerns, and broader sustainability issues. While these global issues provide a backdrop for discussion, regional and national policy concerns remain of paramount importance. At the global level, many of the policy and programmatic issues addressed by OR are not new, but they are vitally important in the development of national policies and programs, particularly in countries

with low availability and utilization of family planning services (Townsend et al., 1988).

There is a continuing need to strengthen the interface between OR and policy development, at both the national and international level. OR results should be a part of the political process. New strategies need to be developed to facilitate communication between those designing policy and groups with information on the quality of its implementation.

### **Strategies for Institutionalization of the OR Approach**

An essential goal of the OR approach is to improve the institution's capacity for conducting OR on its own. This includes the recruitment and selection of appropriate personnel as research staff, in-service training, the support and development of management systems, and provision of the hardware and software needed to process the information required for decision making.

There is a fundamental need to improve and expand the training of personnel in all regions in OR techniques, particularly the utilization of data for decision making. Organizations that conduct OR need people with a variety of talents--those who know the internal working, problems, and weaknesses of service delivery systems; those interested in the development of innovative solutions to everyday problems; those with organizational research skills, such as study design and instrument development; and above all, those with a commitment to providing data that is timely and useful for decision making at the agency level. With the exception of data processing, most of the required skills are not taught in universities, but must be learned on the job.

In examining organizations with modern management practices, Peters (1987, p. 613) maintains that "information availability is not enough. It must be accompanied by extensive training in ways to develop the information, record it, analyze it, and act upon it. All the best-quality programs involve training in problem analysis and data collection and interpretation, as well as in group problem-solving skills to promote the interchange of information and speed implementation."

Thus, opportunities for advanced training in specific skills should be sought. These skills may include data processing, use of qualitative information for management, or survey research techniques. Multiple formats for training should be explored, including in-country workshops, on-the-job training opportunities, and expanded international university training.

A second aspect of institutionalization is the commitment to developing and strengthening existing management systems. There are several ways in which OR is supporting this commitment. Progress is being made in learning to identify recurring decision-making cycles in important organizations, and designing the OR needed to provide information at these critical moments. In most of the projects, the data collection is carried out by using existing management information systems, rather than by doing large surveys. OR tries to promote the utilization of existing survey data in the country, but given that surveys are not the usual tool of decision makers in service agencies, greater emphasis is placed on increasing the utility of data routinely generated by the agency itself. Cost systems are grossly underutilized for program management, yet research only rarely takes advantage of this potentially valuable input. Many agencies prefer to limit coverage when a service delivery strategy is considered too expensive, rather than looking for ways of reducing cost and maximizing the coverage of services.

It is also valuable to conduct a series of OR projects with the same institutions over time. While the relatively short time frame of most OR projects assists in providing quick feedback to managers, there are also considerable drawbacks, such as unfortunately short treatment periods, curtailed planning perspectives, insufficient time for appropriate analysis of data, and possible premature reporting of progress. Because the strengthening of management is a process that requires time, additional projects should be developed with agencies that have had successful experiences with OR.

Moreover, appropriate methods should be devised for accounting the costs of OR, and for evaluating the benefits of the results for the agency. The potential return on investment in OR should not be simply the number of users served, but rather the benefits associated with the development of stronger service delivery systems, the savings accrued because of increased efficiency, and the utilization of the results for better decision making. One preliminary step in this analysis should be the follow-up of OR projects, which would explore the impact of the results on program operations, the adoption of successful interventions in new sites, and the use of OR techniques to resolve additional service delivery problems.

### **Development of a Theoretical Framework**

Despite the volume of applied research in family planning (Simmons and Lapham, 1986), there is still insufficient theoretical understanding of how effects on our principal outcome variables--acceptance, use, and satisfaction--are produced, and therefore how these changes could be replicated in different settings and time periods. There are practical

benefits to be gained from more theory-based OR (Bickman, 1987). It would help to do the following:

- Determine whether the intervention is appropriately designed to address the causes of the problem.
- Identify the intermediate causal processes that might have produced positive or negative outcomes, as well as understand whether a failure to find positive effects is due to the theory underlying the intervention or the way the intervention was implemented.
- Facilitate generalizations to other human service problems and settings.
- Identify variables that might be influenced to improve outcomes, and identify unintended consequences.
- Guide data collection on critical indicators of progress, toward goals of acceptance, use, and client satisfaction.

It may be impossible to sort out the pure effects of any family planning intervention. One colleague noted, "to compare countries on the basis of the availability of family planning services in rural areas is to some extent to compare available road networks (no roads, no availability), not the coverage of the family planning program. Likewise, a high staff-client ratio in a program may reflect a country's educational institutions, not necessarily the quality of its family planning program. Other components of the implementation of family planning programs may be rooted in cultural, political or social factors" (Donaldson, 1988, p. 14). Nevertheless, to replicate success, most of the key components must be in place. The role of OR then is to clarify what these components are. Looking at programs as single independent variables should be avoided; rather, multivariate program theories should be more fully specified and tested. The theories need to include variables describing the program itself, but must also specify those factors which influence the program's successful implementation over time.

To produce a more thorough understanding of how and why successful programs function the way they do (McClintok, 1990), essentially two aspects of program theory are needed: the components and causal dynamics of the programs, for example, evidence that information on methods and choice increases continuity, and the processes associated with the program's implementation. Thus, a more global perspective on OR is needed so that hypotheses about how to influence program processes can be tested in a variety of settings and summarized in a coherent literature.

## CONCLUSIONS

The results obtained to date are testimony that OR can make a substantial difference in the performance, quality, and impact of family planning/MCH service delivery systems, both improving services for the user, and contributing positively to the social impact of family planning and MCH programs.

By demonstrating that data generated by programs can be used to improve services for users, OR becomes a management tool. By contributing to changes in the way agencies respond to the policy environment and the way they provide services to users, it contributes to institutional development.

A Caribbean policy maker explained our persistent dilemma as follows: "OR is like contraception; we know its benefits, many of us have experience with it. But we don't always use it when we need it." There continues to be an unmet need for OR.

## NOTES

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### **3. PROMOTING FAMILY PLANNING: FINDINGS FROM OPERATIONS RESEARCH AND PROGRAM RESEARCH**

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#### **INTRODUCTION**

Information, education, and communication (IEC) activities to promote family planning should be an integral part of family planning programs. IEC activities have been identified in over 30 operations research (OR) studies included in the Maximizing Results of Operations Research (MORE) Project database. The major focus of these studies, however, has been on service delivery interventions, and the most important findings in the IEC field have tended to come from other, program-related research or from the specific evaluation of communication interventions. Yet increasingly the field of IEC has benefited by using OR techniques in both formative and summative research to improve the quality of IEC interventions and to measure their impact more precisely. As a result of using these techniques, family planning promotion, or IEC, in the 1980s became both more effective and better able to document its effectiveness.

Early IEC activities were designed particularly to increase public awareness and promote favorable attitudes toward family planning. As a result, IEC research focused initially on social norms, communication networks within communities, and diffusion of innovation within a community or society. The particular patterns for communication on taboo subjects and the role of early acceptors were extensively studied, and the findings provided useful guidance for initiating programs in many Asian countries (Rogers, 1971; Rogers and Kincaid, 1981).

In the 1980s, as awareness and approval of family planning spread, IEC programs focused more specifically on changing behavior. Family planning promotion in the 1980s was increasingly designed to help individuals and couples make informed choices about contraceptive methods and to reach larger numbers of people, as well as specific hard-to-reach segments of the population, through mass media. Attention has shifted from communica-

tion patterns within the community to interpersonal communication between family planning service providers and their clients, and to more sophisticated use of mass media and commercial channels. Findings from OR and evaluation of specific IEC projects and programs in the 1980s using OR techniques reflect this shift. They can be summarized under the following headings:

- Interpersonal communication between providers and clients
- Interpersonal communication among peers
- Mass media
- Social marketing
- The enter-educate approach

The discussion that follows addresses each of these subjects, and within each, a series of propositions. The paper ends with a brief discussion of how OR is an integral part of good IEC.

## **INTERPERSONAL COMMUNICATION WITH PROVIDERS**

**The quality of interpersonal communication with service providers influences attendance at family planning clinics, as well as initiation and continued use of family planning methods.**

OR, which focuses heavily on service delivery, has played a major role in documenting the universal importance of face-to-face communication between the provider and the client. Good communication can stimulate clients to begin using a family planning method and encourage them to continue, whereas poor communication can create such resistance that potential clients refuse even to enter a clinic. Clients respond positively to family planning when providers take the time to understand their clients' lifestyles and needs, and to explain clearly and carefully how various methods are used.

Potential family planning clients will not even visit family planning clinics if they are not treated with courtesy and respect. An OR study in Nepal using a "simulated client" approach documented the fact that lower-caste women were so poorly treated and received so little privacy, respect, and personal sympathy that they would not return to the clinics even if paid to do so. Staff were highly authoritarian with clients, discouraged 25

of them from asking questions or expressing preferences, spent little time with them, and often gave incomplete or inaccurate information (Schuler et al., 1985). Similarly, in Imo State, Nigeria, focus group discussions revealed that government health facilities were underutilized because of the harsh, rude, and uncaring attitudes of health care personnel (Attah, 1986). In a Peru study, villagers refused to go to clinics where service providers gave inaccurate information and did not provide privacy or respect (Tucker, 1986).

An overview of family planning counseling in *Population Reports* marshalled substantial evidence that women who were carefully and empathetically counseled by providers were more likely to begin using family planning (Gallen and Lettenmaier, 1987). In a Nigerian OR study, 70 percent of women who were specially counseled during their pregnancies had begun to use a modern contraceptive by their six-week postpartum visit, compared with only 50 percent of those who were not specially counseled (Omu et al., 1987). In a Lebanese hospital study, 86 percent of postpartum mothers who had received one-on-one education chose a family planning method at their nine-week postpartum visit, compared with 52 percent of mothers who did not receive such education (Sayegh and Mosley, 1976). A study in Tunisia showed that house-to-house visits by outreach workers trained in counseling led to a 125 percent increase in new users, whereas increasing the availability of medical services alone increased users by 65 percent (Coeytaux et al., 1987).

The more personal and social support the service provider can give, the more likely clients are to continue using family planning. Two years after IUD insertion, 79 percent of users in Indonesia who were counseled regularly were still users, compared with 29 percent of women who were not counseled regularly (Survey Research Indonesia, 1986). A study in Sri Lanka showed that fewer women (18 percent) who were specially counseled had their IUDs removed after 18 months than women who were not specially counseled (25 percent) (Fisher and de Silva, 1986).

**When clients are given accurate information about what to expect when using a new method, including possible side effects, they are more likely to continue use.**

Family planning clients today want more information about different methods, their side effects, and their effectiveness so that they can make their own informed choices. Since fear of side effects, real or imagined, is one of the most powerful barriers to acceptance of family planning (Ory

et al., 1983; Austin et al., 1984), and since rumors flourish everywhere, providers who tell clients in advance what to expect and how to manage minor side effects can increase client satisfaction and continuation.

Focus group research in the Dominican Republic, Egypt, Indonesia, and Thailand with women who have continued or discontinued use of NORPLANT<sup>®</sup> provides valuable insights. Women who received balanced information about a range of methods and then chose NORPLANT<sup>®</sup> remained satisfied with the method longer. Many women who had discontinued NORPLANT<sup>®</sup> said they probably would have continued if they had been counseled in advance about side effects (Program for the Introduction and Adaptation of Contraceptive Technology [PIACT], 1987). These data confirmed earlier Population Council studies showing that women in early NORPLANT<sup>®</sup> trials who had not been counseled about menstrual irregularities had a one-year discontinuation rate of 10.5 per hundred women (The Population Council, 1978). In a later trial in which women were warned about menstrual irregularities, the discontinuation rate was less than half as great (Sivin et al., 1982). Similarly, OR-like research has shown that women in Mexico City who expected menstrual changes as side effects of pill or IUD use were more likely to continue use (Zetina-Lozano, 1983); women in Bangladesh were more likely to use contraception if fieldworkers told them about side effects and covered a wide range of related topics (University Research Corporation, 1988); women in Sri Lanka who were told of the side effects of injectable contraception had very high continuation rates (Basnayake, 1984); and women in India who were counseled about side effects of the IUD were more likely to continue its use than those who were not (Prabhavathi and Sheshadri, 1988).

A client's need for accurate information is ongoing. Current as well as potential users want to know about the methods they can use now or in the future. Focus groups with both service providers and drop-out clients in Lesotho revealed that the main reason for high discontinuation rates was lack of information about side effects (Matlomeo et al., 1989). In Indonesia, half of the participants in focus group discussions said they knew something about family planning, but wanted more information about it. In particular, those already using family planning wanted to know more about the side effects, safety, and effectiveness of various methods (Survey Research Indonesia, 1986).

Many OR studies suggest that adequate information and an informed choice by the client herself contribute to more satisfactory and longer usage. For example, an OR-like study in Indonesia documented that, among 506 women who began various methods, those who received the method they had requested were much more likely to be using family

planning 18 months later. Of those receiving the method they preferred, 25 percent discontinued; by comparison, of those receiving a different method, 85 percent discontinued (Pariani et al., 1987).

**Use of supporting materials, such as pamphlets, during counseling can enhance the performance of health care providers, but few studies yet show that these materials influence client acceptance or continuation.**

Family planning providers universally request IEC support materials, such as flipcharts, brochures, and posters, to assist in counseling clients. When providers help develop these materials, they enthusiastically use and distribute them as long as supplies are available (Population Communication Services [PCS] of The Johns Hopkins University and Associacao Brasileira de Entidades de Planejamento Familiar [ABEPF] 1988). Evaluation of several method-specific booklets in Nepal and Nigeria showed that providers gave more correct information, took more time with clients, and encouraged clients to ask questions more when using pictorial booklets (Zimmerman and Perkin, 1982; PCS and the Planned Parenthood Federation of Nigeria, 1988; Wittet, 1986). In rural areas, where people are not used to seeing printed materials, the materials alone can attract the interest of the villagers (Das Gupta, 1989). In Nepal, clients who knew very little about family planning methods showed large increases in knowledge after receiving booklets during counseling sessions (Wittet, 1986).

Clients who are counseled with pamphlets or brochures are more likely to remember information than those who are not counseled with such materials. Clients in Nigeria who were counseled by health workers using methods booklets scored an average of 8 percentage points higher on method-use comprehension than did clients receiving instruction without the booklets (Kincaid, 1986). Evaluation of pictorial methods booklets in Côte d'Ivoire found that clients who had seen the booklets answered questions more accurately than those who had not, and they also talked to others about family planning (Koné and Yao, 1989). When clients bring support materials home with them, they refer to those materials and often talk to their family and friends about family planning. In Nigeria, almost 60 percent of clients who kept the booklets referred to them several times on their own, and 78 percent showed the booklets to their spouses (Kincaid, 1986). In Nepal, 37 percent of the clients showed the booklets to more than four friends or neighbors (Pyakuryal, 1987).

While these findings show that support materials help providers and clients increase their knowledge of family planning and encourage discussion outside the clinics, OR studies have found little evidence of associated changes in contraceptive practice. An OR approach in Kenya came close

to doing so. It looked at the relationship between the availability of posters, IEC materials, and group talks and the productivity of clinics as indicated by the number of clients served monthly. Preliminary data show that IEC materials and group talks were clearly associated with more productive service delivery; posters were not (Miller, 1990). The study did not control for the size of service centers, however, and further analysis is required to identify how clinic size related to the number of clients served per month. Posters may, however, be related to behavior change in Ghana. A recall survey recently conducted in Swedru, Ghana, the day after the launch of a large multimedia campaign, showed that 74.5 percent of 235 people who had seen family planning posters said the posters had encouraged them to visit a family planning clinic; 88 percent of respondents stated that the posters assisted them to accept family planning (Obeng-Quaidoo and Rockson, 1990). Because the posters were part of a larger campaign, however, they alone cannot be attributed with such changes in behavior.

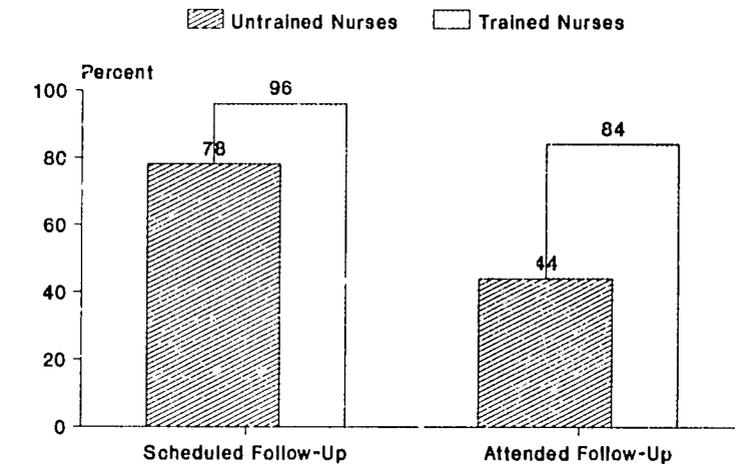
**Training providers in improved interpersonal communication can enhance their performance and improve client compliance, but this has not always been demonstrated, and therefore may also depend on the quality of the training and/or the work environment after training.**

Training service providers to improve their skills in interpersonal communication can enhance their ability to meet the needs of individual clients. Trained counselors should also be able to give accurate information to their clients and help them make an appropriate choice of methods, as well as encourage clients to return to clinics for follow-up services. Training, however, has not been shown to make a difference in areas where the values of the provider are involved or where the work environment makes ideal counseling sessions difficult. OR programs face a challenge in operationalizing and measuring the impact of training on interpersonal communication, but a start has been made.

Although family planning programs have only recently begun experimenting with training to improve interpersonal communication, researchers and programmers have long been aware of the difference training can make in contraceptive prevalence. The classic Matlab studies in Bangladesh showed a decade ago that, by improving knowledge and skills, weekly in-service training sessions could motivate previously poor-performing providers to deliver high-quality services. Three months after the training began, contraceptive use rose sharply from 6.9 percent to 20.7 percent, and eventually leveled off at 33.5 percent after 18 months (Bhatia et al., 1980). Components on interpersonal communication for providers were recently added to family planning training programs in Tunisia, Turkey, Morocco,

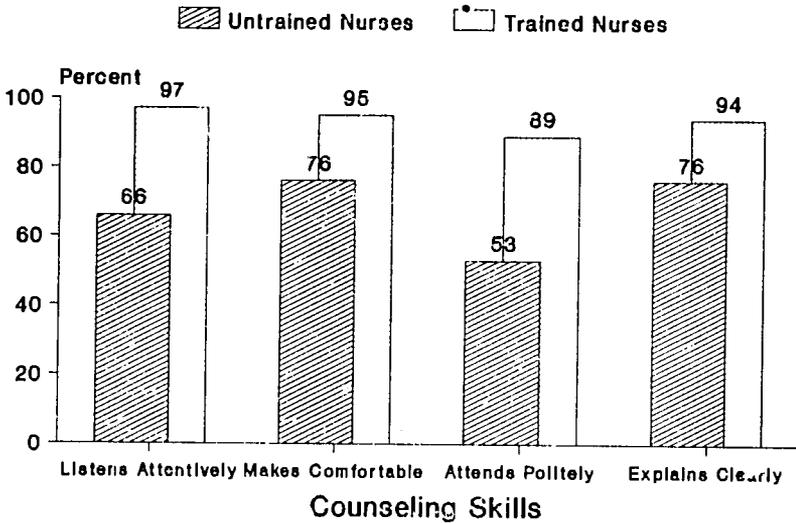
the Philippines, Brazil, Guatemala, Ghana, Nigeria, Burkina Faso, the Dominican Republic, and Mali (Gallen and Lettenmaier, 1987).

Several new OR approaches are being used to measure the effects of training in communication on client behavior. Various intervening variables are measured on the assumption that they reflect family planning behavior. One approach is to look at the number of clients who return for follow-up visits. A preliminary evaluation of a counseling training program for nurses in Ogun State, Nigeria, showed that, among 500 clients who had talked to trained nurses, 96 percent made appointments for a return visit, and 84 percent kept the appointments (see Figure 1). Among a similar number who had talked to untrained nurses, only 78 percent made appointments to return, and only 44 percent kept the appointments (Kim, 1990). Also, the trained nurses performed better than the untrained ones in almost every stage of the process of counseling, as represented by the acronym: GATHER: Greet clients; Ask clients about themselves; Tell clients about family planning; Help clients choose a method; Explain how to use a method; Return for follow-up (Lettenmaier and Gallen, 1987). The trained nurses were notably better in establishing good personal rapport with their clients, asking open-ended or probing questions, paraphrasing key points, and asking clients to repeat information (see Figures 2 and 3). Clearly, good training programs in interpersonal communication can impact these skills (Kim and Babalola, 1990).



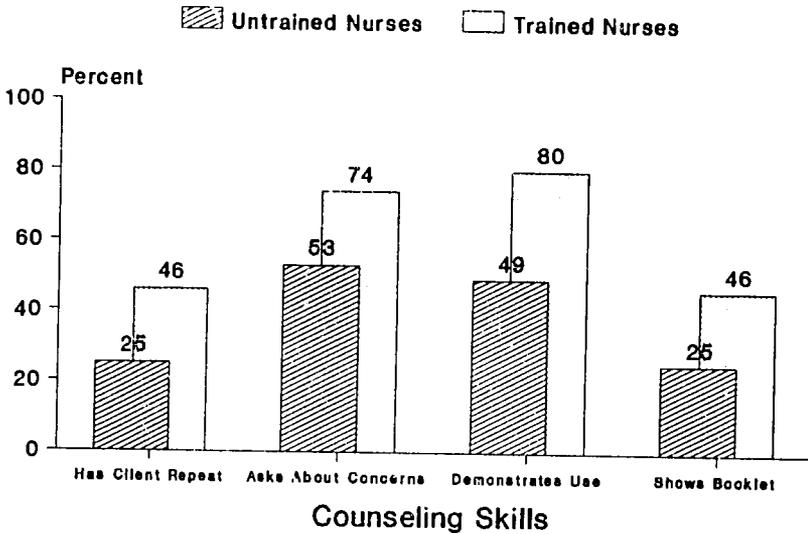
Source: FHS Nigeria, JHU/PCB  
From clinic records collected 1988-89  
N = 1001, Ogun State, Nigeria

Figure 1. Percentage of Clients Scheduling and Attending Follow-up Consultations by Training Status



Source: FHS Nigeria, JHU/PCS  
Interviews conducted during 1989  
N = 480 FP clients, Ogun State, Nigeria

Figure 2. Percentage of Nurses Using Counseling Skills in Family Planning Consultations, by Training Status



Source: FHS Nigeria, JHU/PCS  
Interviews conducted during 1989  
N = 480 FP clients, Ogun State, Nigeria

Figure 3. Percentage of Nurses Using Information Methods with New Family Planning Users, by Training Status

Another OR approach in Ghana involved "mystery clients." These clients were genuinely interested in obtaining family planning services, but they were prepared in advance by researchers to observe carefully their reception in the clinics. Immediately after the visit, they were interviewed and asked to assess the quality of the services. In this study, trained nurses performed better than untrained nurses. One problem identified, however, was the way in which even trained nurses treated young unmarried clients. As a result of the evaluation, a values clarification section was added to the training program to teach providers how to avoid imposing their own values on their younger clients (Huntington et al., 1990).

**Communication between fieldworkers or other health promoters and potential clients is more effective when the promoters can provide contraceptive supplies themselves, rather than merely providing information and referring clients to other sources.**

OR studies in Asia and Africa indicate that when service providers have contraceptive supplies on hand and can offer contraceptives directly, substantially greater contraceptive use results. If they can only talk about contraceptives and must refer people elsewhere for supplies, some who want contraceptives will not get them. An OR study in Thailand showed that when trained community workers were permitted to distribute condoms and oral contraceptives (OCs) in Muslim villages, they were more likely to make home visits, to discuss family planning with couples, to advise people to adopt family planning, and to distribute OCs and condoms than their counterparts in control villages where contraceptive levels had been substantially higher. Contraceptive usage increased from 15 to 49 percent in the Muslim villages, bringing usage much closer to the higher level of the control villages (Pongsupaht et al., 1986; Prince of Songkla University and The Population Council, 1985). In Kenya, women from households visited by community health workers who were trained to distribute condoms and pills were twice as likely to contracept as women from households not receiving such visits (38 vs. 19 percent) (Norton, 1989). In contrast, when community workers in Kenya gave people forms to take to a clinic for contraceptives, 28 percent of those who had indicated an interest in using family planning never went to the clinic for supplies; those living farthest from the clinic were the least likely to go (Jacobson and Kaseje, 1984).

**Health care providers face serious problems in communicating with young people and need to develop special approaches to meet the reproductive health needs of these clients.**

OR and other evaluation research indicates that young people, who represent a growing segment of the sexually active population, are not well served by current service delivery systems and need special attention. The "mystery client" evaluation of service providers in Ghana cited above showed that even nurses trained in interpersonal communication did not communicate well with young people, often lectured to them about their behavior, and sometimes refused even to discuss contraceptive choices (Huntington et al., 1990).

Providers who want to reach young people need to develop more effective peer group and mass-media interventions (see below). An OR project in Mexico compared two strategies for reaching young adults in poor urban areas of Monterrey: stationary centers for youth and trained youth counselors working in the community. Both approaches reached young, unmarried people not served by other programs and led to increased use of family planning, but the counselors working through informal outreach channels in the community proved more cost-effective (Townsend et al., 1987). An OR project in Barbados tested the efficacy of home visits in reaching teenage mothers to try to prevent a second pregnancy. Those who had been visited at home were more likely to know about and be using contraception and to be continuing breastfeeding than those who had been counseled only in the hospital, although the six-month follow-up was too short to permit assessment of differences in pregnancy rates (Murray et al., 1985). A family life education program aimed at lowering the number of births among teenagers in St. Kitts and Nevis, however, found that sex education classes for 12 to 15 year olds did not seem to influence age at onset of sexual activity or to increase the use of contraceptives among teens who were sexually active (Norton, 1989).

Telephone hotlines are an innovative form of health promotion that brings young people into contact with trained service providers and at the same time respects confidentiality, which is a crucial issue for young people. Hotlines designed primarily but not exclusively for urban young people have been set up by family planning organizations in Austria, Brazil, Hong Kong, Ireland, Mauritius, Mexico, the Netherlands, Sierra Leone, the United States, and the Philippines (Liskin, 1985). Evaluation of the Philippines hotline, which was part of a multimedia young people's project (discussed later) that linked popular songs to a hotline referral service, found that more than 8,000 calls had been logged in during the first six months. A survey of young people in Metro Manila suggested that as

many as 150,000 may have tried to call, but only about 9 percent of those were able to get through the constantly busy lines. Within a year, the total number of calls logged in had reached 22,285 (Kincaid et al., 1989).

*The interface between the family planning user or would-be user and the provider is a crucial area, where the quality of personal communication and IEC back-up can make a substantial difference. OR projects have explored some elements in this communication interface, yet there remain many tantalizing IEC questions that have not been well explored.*

*Questions for possible OR research in the future include the following: What are the best means of correcting and counteracting false rumors about specific family planning methods? What type or combination of IEC support--flipcharts, posters, or individual brochures--is most cost-effective for health care providers? What are the best ways to train health workers for better interpersonal communication with clients? How can health care providers best reach and serve adolescents? How can the quality of interpersonal communication with clients be improved without increasing the cost?*

## INTERPERSONAL COMMUNICATION WITH PEERS

**Interpersonal communication with peers is an effective way of encouraging people to use various family planning methods.**

One of the most persuasive forms of communication is person-to-person contact with peers. In an effort to communicate with hard-to-reach groups, such as men, young people, or others who do not visit health facilities regularly, representatives of these groups are increasingly recruited to serve as family planning promoters. OR studies in many different settings suggest that one-on-one promotion by trained and motivated peers may be more effective than similar promotion by health professionals or through group meetings.

Several OR studies in Latin America reveal the effectiveness of training local men to promote family planning and male responsibility among other men in their communities. In Mexico, male promoters who delivered thousands of condoms throughout the community were 80 percent more effective in terms of couple years of protection than in-clinic male physicians (Federación Mexicana de Asociaciones Privadas de Planificación Familiar [FEMAP] and The Population Council, 1989). In Guatemala, a

male promoter proved highly effective in encouraging men to have vasectomies (Bertrand et al., 1987).

Group meetings, long used by family planning associations to disseminate information about family planning, may be a less effective way to reach potential clients today than either individual contact or mass media. An OR study in Kinshasa, Zaire, for example, showed that group meetings did not increase attendance at the Libota Lilamu clinic (Bertrand et al., 1988). In Niger also, neighborhood meetings in the city of Niamey, organized to give urban residents information about family planning, were less effective in reaching the intended audience than mass media (Columbia University, Center for Population and Family Health, 1989). In Thailand, however, when trained village volunteers were introduced at village meetings and were authorized to distribute resupplies of pills and condoms, prevalence increased in one of the villages from 57 to 77 percent (Norton, 1989). Group meetings may still be effective in rural and traditional areas, even if they have less impact in cities.

**Peer promoters have proven effective in carrying out family planning education programs in the workplace, but their success may depend on existing levels of usage.**

Recognizing the value of peers talking to one another, industry-based programs from the Philippines to Mexico have been recruiting volunteers from among workers to promote family planning. By providing fellow workers with condoms, OCs, and other supplies, these worker-volunteers are the mainstays of many on-site programs and are often more effective than health professionals. OR in Mexico, for example, showed that worker-volunteers served more people than did nurses in factory clinics (Rosenhouse et al., 1987). In factories in St. Lucia, an OR study compared the impact of employees trained to sell OCs, condoms, and foam, as well as to answer questions and make referrals, with that of a visiting nurse who came twice a month to perform the same services. In factories with an employee as distributor, contraceptive prevalence increased from 32 to 38 percent, whereas in the factories served only by the nurse, usage actually decreased slightly (Landry et al., 1986).

In a textile factory in Bursa, Turkey, female union shop stewards were trained to tell fellow workers on their shift about contraceptives available from a clinic in the factory. Workers on another shift heard talks from a health educator about family planning and the clinic. Workers on the third shift were intended to serve as controls. Word spread almost equally fast to workers on all three shifts. Overall, use of IUDs increased from 12 to 39 percent (World Health Organization, 1986).

While educational programs in the workplace can raise prevalence rates somewhat, some programs may not be cost-effective. This is especially true in countries, such as Mexico, where prevalence is already high. The Centro de Orientación para Adolescentes (CORA) in Mexico found that a factory-based program for young adults cost a high \$26.07 per couple year of protection. In Brazil, Colombia, and Mexico, talks to workers at industrial sites have proven to be a costly and relatively ineffective strategy for stimulating the demand for vasectomy (Townsend and Forcitt, 1989).

**Satisfied users are one of the most credible sources for communication with potential clients and can increase acceptance rates.**

Data from several continents show that satisfied users can be extremely influential in encouraging both women and men to adopt a specific family planning method. An OR study in Sri Lanka showed that women who were satisfied with their IUDs were influential in convincing friends, relatives, and neighbors to accept IUDs. Working with midwives over a 13-month period, the satisfied users helped motivate 3,000 new acceptors. Also, women who were counseled by satisfied acceptors were less likely to discontinue use than those counseled by a midwife alone; satisfied users were better able to reduce the fears of side effects (Fisher and de Silva, 1986).

Focus group discussions with vasectomy adopters in Colombia revealed that satisfied users played an important role in the decision to accept vasectomy. Some 64 percent reported knowing at least one other person who had had a vasectomy, and 5.6 percent mentioned other vasectomized men as the most influential source in making their decision (Vernon et al., 1989).

When satisfied users are also health care providers, the impact can be even greater. In the Philippine Family Planning Outreach Project, the aspect of the program most associated with the prevalence of clinical contraception was its use by the staff (Commission on Population of the Republic of the Philippines, 1981).

*As family planning IEC moves from promoting general awareness and community approval to promoting behavior change, more attention in both IEC activities and OR projects is focusing on hard-to-reach groups. Recruiting members of these groups as family planning promoters and especially as contraceptive distributors is an effective approach.*

*Among the questions that OR might address to strengthen peer group approaches are the following: What types of group activities are most effective and where, and when is one-on-one or mass-media communication more effective? How can peer promoters be trained adequately? Should peer promoters be paid? If so, how? If not, how can active motivators and good performance be rewarded and sustained? What are the best IEC support materials for peer promoters?*

## SOCIAL MARKETING

**Social marketing, more than any other type of family planning promotion, depends on OR and related market research techniques to develop, refine, and monitor program operations. OR provides guidance in implementing such basic program elements as target population, products, pricing, packaging, place, and promotion, although results are rarely published.**

OR plays a crucial role at every stage in social marketing. While the term OR is usually not used, such OR techniques as focus group discussions, experimental interventions, pre- and post-test surveys, pretesting of IEC materials, and analysis of sales data are in fact applied continually. Because these are ongoing programs, managers usually apply research findings immediately to improve project performance. They are less likely than academic researchers to publish or even to reveal to outsiders the results of their market research.

At each step in development and marketing, OR techniques are used. The *target population* for a contraceptive social marketing (CSM) project is identified, segmented, and described through OR techniques such as sample surveys, open-ended interviews, and focus group discussions. OR in social marketing is often designed not only to find out the basic socio-economic status of would-be clients, but also to identify psychographic or personality traits or consumer profiles that might influence contraceptive use. For example, in most countries, users of OCs obtain their own supplies; however, an OR study in Bangladesh revealed that husbands not only purchase a couple's contraceptives, but also act as instructors (Davies et al., 1987). Audience research in Egypt by the Family of the Future project identified as a special audience women who had coitus infrequently because their husbands worked outside of Egypt. Ads for *Amaan* foaming tablets emphasized that the method had to be used only when needed (Needham, Porter, Novelli, 1985).

*Products* are introduced--usually condoms, orals, and spermicides--on the basis of a situation analysis performed in each country. Market research has shown that increasing the number of products and brands can increase overall sales and commercial viability. This has been documented by the large volume of sales in the Asociación Pro Bienestar de la Familia (PROFAMILIA) program in Colombia, which sold seven brands of pills, seven brands of condoms, four brands of vaginal contraceptives, and one injectable (Binnendijk, 1985). Adding noncontraceptive products does not increase contraceptive sales, however (Sherris et al., 1985; Binnendijk, 1985; Sheon et al., 1987).

*Pricing*, especially at the start, is based on consumer research and comparison with prices of other personal hygiene products in a country. Products priced too low are usually perceived as of poor quality, according to studies in Bangladesh, Egypt, Jamaica, and the Caribbean (Bayley and Washchuck, 1983; International Contraceptive Social Marketing Project, 1981). A small charge and small increases in price over time do not discourage customers. Large increases do discourage customers, but no increase at all discourages retailers from selling the products (Altman and Piotrow, 1980; Sherris et al., 1985).

*Packaging* communicates important messages about a product. Thus the name, type of package, color, size, and other details are all heavily researched among the intended audience and modified to meet audience preferences (Sherris et al., 1985; Altman and Piotrow, 1980).

*Place*, or product distribution, relates more to management and logistics than to communication. Yet communication to pharmacists and retailers is an important element, often guided by OR findings (see below).

*Promotion* is the basic communication component in social marketing programs. Usually carried out by advertising agencies, it is guided by market research, pretesting, monitoring of exposure, and use of surveys and/or sales data to measure impact (see below).

While OR findings in social marketing are specific to each country and even to each stage of operations, overall evaluations of social marketing programs show that they are making a significant contribution to contraceptive prevalence. An analysis by the SOMARC social marketing project suggests that, on average, a mature social marketing program increases total contraceptive prevalence by 20 percent (Stover, 1987), although this contribution ranges from more than 30 percent of all contraceptors in Bangladesh, Egypt, and Colombia to less than 5 percent in India, Mexico, and Thailand (Sherris et al., 1985). In eight countries where data were

reviewed in detail, about one-third of social marketing consumers were first-time users, and two-thirds were shifting from other, sometimes less effective methods. More than 85 percent of social marketing consumers came from the lowest socioeconomic class and had lower incomes than the typical buyer of commercial brands (Bollinger et al., 1989). Over the last five years, the couple years of protection provided by social marketing programs in the four largest countries have increased by 18 percent in India, 25 percent in Bangladesh, 40 percent in Colombia, and 98 percent in Egypt (Sherris et al., 1985; Social Marketing Forum, 1990).

**Social marketing sales are highly sensitive to promotion and advertising. Both media advertising and point-of-purchase promotion are valuable. Sales drop sharply when promotion is cut back.**

The major channels used for promotion in social marketing include general media advertising, public service or paid spots on radio and television, billboards, and point-of-purchase promotion. Hiring an experienced advertising agency to promote brand-name condoms, OCs, and sometimes other methods is the usual way to promote CSM products (Sherris et al., 1985).

Since social marketing programs launch new brands, they depend on massive publicity. Data from early programs in India, Sri Lanka, and Bangladesh show sharp drops in sales when mass-media advertising was temporarily banned (Altman and Piotrow, 1980). More recently, studies in Egypt, Kenya, and Colombia show a correlation between advertising and sales. Continuing experience in Guatemala, India, El Salvador, Jamaica, and Bangladesh reinforces the conclusion that sales drop when advertising is reduced or suspended (International Science and Technology Institute [ISTI], 1988). Increasingly, television, where available, is the medium of choice for reaching urban consumers.

Condoms are the first and the major product in most CSM programs. Because several commercial brands are usually available, the social marketing brand has to be carefully positioned and heavily promoted. An analysis of ten major social marketing programs found that condom sales were more closely linked with the extent of advertising than with any other factor, including price, cultural attitudes toward family planning, and national socioeconomic development (Boone et al., 1985). In most programs, condom sales dropped when advertising was cut back. Using brand names for condoms is believed to help sales because names are easy to remember and because they are associated with particular images created by the promotion campaigns (Sherris et al., 1985).

Point-of-purchase promotion is important. Most social marketing programs encourage pharmacists to display contraceptives. Pharmacists often receive display racks or countertop dispensers to make display easier. Displaying condoms increases sales. In a U.S. survey, 58 percent of pharmacists who put condoms in open displays reported increased sales, with the increase averaging 37 percent. One pharmacist reported that he lost sales to vending machines when he did not display condoms (Kushner, 1976). In Mexican supermarkets, condom sales doubled when condoms were moved from shelves to a display space next to the cashiers. Also, the number of condoms stolen decreased (Townsend, 1988). Displays increase sales largely because they remind shoppers of the product. Also, they save customers the embarrassment of having to ask for condoms, and they save clerks the embarrassment of having to get them (Bayley and Washchuck, 1983).

**Governments often resist mass-media promotion of CSM products. These objections tend to arise at the start of a program and to diminish as promotion becomes more familiar.**

Official, religious, and public resistance to mass-media advertising has been a problem for many CSM programs. In Sri Lanka, for example, broadcast advertising for any specific contraceptive brand is banned, although promotion of basic family planning concepts is permitted (Sherris et al., 1985). Advertising of prescription drugs is banned by law in many countries, thus ruling out brand-specific advertising for OCs. Government restrictions on mass-media advertising also have hindered programs in Ghana, Mexico, and Nepal. Even where broadcast advertisements for contraceptives are not restricted by law, officials often worry that the ads will offend some people.

Most objections to advertising are voiced at the start of a program. Some CSM programs have been able to overcome or circumvent these objections in various ways. In Egypt, for example, television ads that mention Norminest Fe OCs are directed to health professionals rather than consumers. CSM personnel have worked closely with Egyptian television and radio censors to develop acceptable ads for nonprescription products. In some other countries, ads tell consumers that safe, effective IUDs or OCs are available from local retailers, but, in keeping with the law, do not mention brand names (Sherris et al., 1985).

One benefit of OR is that careful audience research can be used to persuade policy makers, who are often fearful of a negative public reaction, that family planning messages are acceptable to the public. In Nepal, government and private agencies were briefed on research findings before

publicity began (Sherris et al., 1985). In Colombia, a generic condom promotion campaign was suspended for two weeks because government officials feared a public backlash. Officials of the Ministry of Communication were finally persuaded that the messages were acceptable when they saw pretest results (PCS, 1986). Social marketing campaigns in Bangladesh, Ghana, and the Dominican Republic initially met opposition, but later efforts in these and other countries used research findings and closer liaison with the government during the planning phase to answer government objections and provide evidence that the public would not be offended (ISTI, 1988).

**Social marketing programs need to pay as much attention to the concerns, finances, and communication skills of pharmacists or other retailers as to the ultimate consumers.**

The pharmacists and other retailers who sell to consumers are a vital link in the CSM process. They need not only a regular supply of commodities, but also publicity to bring in new customers, a sufficient profit margin to make CSM sales worthwhile, and other information and training to increase their own knowledge of family planning. In several countries, CSM advertisements try to build up the role of pharmacists and chemical sellers so that family planning users will consider them a reliable and well-informed source. Pictures of pharmacists, for example, are featured on posters in some countries. In Colombia, a radio spot featured a dialogue involving a condom purchaser, a pharmacist, and a pharmacy clerk. A recall survey showed that it was the best-remembered of several family planning spots (PCS, 1986). In Ghana and Liberia, pharmacists receive posters on which are printed checklists to help them advise buyers of OCs (Lande, 1990).

To improve distribution to pharmacists and other retailers, some programs have had to develop their own in-house sales forces. In Bangladesh, El Salvador, Egypt, Nepal, and Mexico, for example, detail men visit retailers personally to promote CSM products and tell retailers how to answer customers' questions (Sherris et al., 1985).

Programs in Latin America and elsewhere have held special training sessions for pharmacists and their staff so that they will be better able to communicate and answer questions on family planning (Rizo, 1979). OR-like evaluations in Honduras and the Dominican Republic showed that trained pharmacists sold more family planning products than untrained pharmacists. Other programs provide higher profit margins, free samples, and other bonuses to stimulate pharmacy sales. A recent overview in *Population Reports* of the role of developing-country pharmacists suggests

that better promotion techniques and more attention to the IEC potential of pharmacists could increase the number of people who buy their family planning supplies at pharmacies in developing countries from the current figure of 15 million to a much larger share of the estimated potential market of 70 million (Lande, 1990).

*Social marketing programs have used an array of OR techniques to guide the marketing of contraceptives and related health products. OR findings in social marketing are usually applied immediately because they are designed and implemented from the start by and for project managers as a management tool. For the same reason, however, there is little incentive to write up the results. In fact, results are sometimes considered trade secrets that can provide a competitive edge. Thus it is much more difficult in social marketing to provide published, academically acceptable documentation of OR findings, while it is much easier to show that OR findings have in fact influenced future operations.*

*Among the IEC questions social marketing programs can address using OR methods are the following: How can more new contraceptive buyers be recruited? Are new products really needed to promote more contraceptive sales? How can pharmacists and retailers best be trained to provide correct and useful information? How can social marketing programs promote better media coverage of specific methods?*

## MASS MEDIA

**Radio and, increasingly, television are major sources of family planning information for people of all ages, income levels, and geographic areas.**

Radio and television have the potential to reach large numbers of people in developing countries. While radio is still the most powerful medium for reaching rural areas, the audience for television expanded tremendously in the 1980s. In 1987, the number of television sets in developing countries was 35 percent of the world's share, up from 5 percent in 1965 (Singhal and Rogers, 1989). People without their own radios or televisions frequently gather around family or village sets. In fact, radio and television may be easier and more cost-effective channels for reaching many people with family planning information than trying to recruit, train, deploy, and supervise a large force of outreach agents (Hornick, 1989).

Thus OR and related communication evaluation have increasingly addressed the role of mass media and national campaigns within a total coverage area.

Even in relatively underdeveloped areas, OR and social marketing research show that mass media are overtaking interpersonal communication as the major source of new information. An OR project in Niamey, Niger, found that the primary sources of family planning information among men and women were radio, friends, and television, in that order (Columbia University Center for Population and Family Health, 1989). In Zaire, more adults in Kinshasa had heard about AIDS on the radio (96 percent of men, 83 percent of women) than through any other medium, and 86 percent of men and 70 percent of women had seen something about AIDS on television (Bertrand et al., 1988). An OR study in Bangladesh found that more than a third of radio listeners tuned in to family planning programs, and that 36 percent of males considered radio to be a reliable source of family planning information (Mabud et al., 1989). Projects in three provincial Nigerian cities (cited earlier) showed that programs designed to provide family planning information in television shows were extremely popular and directed many new clients to clinics. After the first month of the campaign in Enugu, Anambra State, for example, between 20 and 75 percent of new clients said they had learned where family planning services were available by watching "In a Lighter Mood," a popular television variety show that advertised family planning service locations. Similar results were documented in Ilorin, the capital of Kwara State, and in Ibadan, the capital of Oyo State (Piotrow et al., 1990).

In areas where mass-media coverage is already extensive--the Near East and Latin America--the challenge is to develop a media impact research system (MIRS) that can adequately track the impact of radio, television, and other mass media (PCS, 1988). This impact can be measured in terms of changes in knowledge and attitudes that lead eventually to various types of behavior:

- In Turkey, where television reaches 80 to 95 percent of households, pre- and post-campaign surveys measured the impact of an intensive three-month mass-media campaign. The post-campaign survey showed that about 80 percent of respondents recalled some part of the campaign, 25 percent had seen brochures, and 41 percent had seen posters. During the campaign, family planning awareness increased from 66 to 87 percent, and understanding of family planning increased from 55 to 71 percent (Yun et al., 1989).

- A mass-media information campaign in Peru that featured television ads using claymation was effective in dispelling fears about risks of HIV transmission from casual contact. Before the campaign, for example, 67 percent of the population surveyed had believed that saliva transmitted HIV infection, compared with only 43 percent after the campaign (Payne Merritt et al., 1989).
- A music project that reached millions of young people in 11 Latin American countries with songs and videos by popular teenage singers Tatiana and Johnny encouraged young people to delay sex. The songs were extensively evaluated through surveys, focus groups of young people, and interviews with media gatekeepers. The evaluation confirmed high recall and understanding of the songs. In fact, a survey taken three years after the project showed that over 80 percent of young people *still* remembered the songs (Instituto de Investigación de la Comunicación, A.C. and PCS, 1990).

**Mass-media promotion of family planning stimulates communication between spouses and among other members of the community.**

An important intermediate objective in family planning promotion is to encourage couples to think about family planning, and then to talk about it between themselves and to others. OR-like research on mass-media projects in all regions shows that people react to mass-media information on family planning by talking to their partners, friends, and relatives about it:

- After the three-month mass-media campaign in Turkey cited above, 63 percent of women reported that they had discussed family planning with their spouses as a result of the campaign (Yun et al., 1989).
- Young people in Latin America who heard the popular songs by Tatiana and Johnny on sexual responsibility cited above talked about them to many people. The post-survey showed that 50 percent of the respondents had talked to their female friends, 32 percent to their male friends, 34 percent to their mothers, 16 percent to their fathers, and 7 percent to their teachers (Kincaid et al., 1988).
- In the Philippines, a popular music project modeled on the Tatiana and Johnny project also was designed to encourage young people to delay sexual activity. Popular teenage singer Lea Salonga toured

high school campuses to sing the songs and ask the students pointed questions about the sexual responsibility messages in them. The enthusiastic responses on campus after campus confirmed that young people not only understood the messages quite well, but also were willing to talk about them. Post-campaign surveys showed that 44 percent of young people aged 13-24 talked to their friends and parents about the songs; 70 percent correctly interpreted the songs' sexual responsibility messages (Coleman and Meyer, 1990).

**People want radio and television to provide more information about family planning and are often ahead of policy makers in what they consider acceptable mass-media content.**

Fifteen years ago, surveys showed that many people in both developed and developing countries were asking for more information about family planning and considered it a perfectly appropriate subject for radio, television, print media, or countertop advertising (Altman and Piotrow, 1980; Sheon et al., 1987). Recently, Demographic and Health Surveys in 19 countries indicated that a large majority--an average of almost 85 percent--of married women of reproductive age approved of the use of radio and television for family planning information (Demographic and Health Surveys, 1990). Two national surveys of men--in Ghana in 1988 and Mali in 1987--showed that the proportion of men who thought radio broadcasts on the subject of family planning were acceptable was higher than the proportion who approved of family planning (Ghana Statistical Service, 1989; Traore et al., 1989). In OR projects or similar surveys in which people have been asked specifically whether they would like mass media to provide more family planning information, the answer has been a resounding "yes":

- An OR study in Barbados and St. Vincent found that male and female respondents expressed approval of family planning messages on radio and TV (Bertrand et al., 1985).
- A 1988 countrywide IEC survey in Kenya, conducted by the Centre for African Studies (CAFS), revealed that 84 percent of males and 79 percent of females of reproductive age considered radio the most effective medium for communicating family planning messages, and television the second most effective (Rimon II and Lettenmaier, 1990).
- A national mass-media campaign promoting birth spacing in the Philippines found that, even though some church spokesmen objected, 91 percent of men and women aged 18-60 in Metro Manila who were exposed to the campaign approved of the specific men-

tion of family planning methods on television (Rimon II et al., 1989).

- In a major impact survey in Egypt, 80 percent of respondents found nothing to dislike in previously broadcast materials; they wanted more about family planning on radio and television, including material on specific methods. In contrast, national leaders did not consider mass-media promotion of specific methods appropriate (Social Planning, Analysis, and Administration Consultants, 1988).
- In Côte d'Ivoire, where publicity about family planning was illegal until recently, 63 percent of 561 residents surveyed in Abidjan said television was the most appropriate means of spreading family planning information; 56 percent named radio (Koné and Yao, 1989).

Despite increasing evidence from OR and other research, some government officials are still reluctant to use mass media to promote family planning and responsible sexual behavior, although they raise no objection to commercial messages that promote unhealthy and socially undesirable products. This reluctance remains a barrier to more effective health promotion. In this respect, the people are often ahead of their leaders.

**Print mass media are not usually as effective as radio and television in reaching large developing-country audiences, but carefully designed materials for special audiences can produce worthwhile results.**

Surveys in many countries suggest that the print mass media--newspapers and magazines--reach only a limited audience, mostly literate men in urban areas. Nevertheless, IEC appeals can be designed that are especially relevant for such an audience:

- An OR project in Brazil in 1985 used advertisements in prominent regional weekly and monthly magazines over a 2.5-month period to promote vasectomy services and identify where services were available. The ads prompted many calls and visits, and led to an increase in the number of new clients daily from a mean of 13.7 for the 12 months before the campaign to 21.9 for the 12 months following the campaign. The mean number of vasectomies performed during the campaign increased by 76 percent and stabilized at a level 54 percent higher than before the campaign. Even months after the campaign, clients reported that they had heard about the service or found the telephone number in the magazine ads (Foreit et al., 1989).

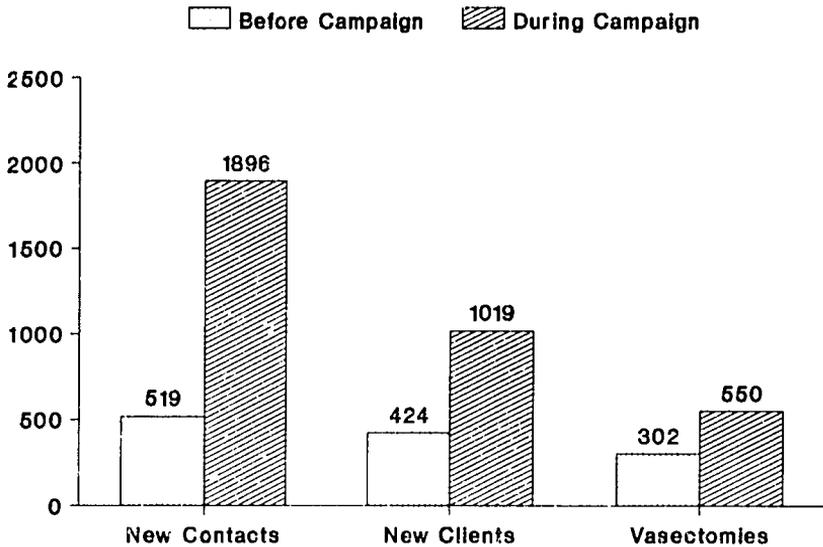
- An OR project in Mexico successfully reached its target audience--middle-class men residing or working in the vicinity of a vasectomy clinic--through billboards and signs. A survey showed that 66 percent of men who called the clinic had learned about its existence through eight billboards placed in the vicinity, including one above the clinic building (de la Macorra et al., 1989).

Print media messages have the advantage of lasting longer than radio or television messages; moreover, print materials, unlike radio or television, provide a reference to which people can return. The effectiveness of print media can be maximized by designing them to reinforce broadcast messages.

**Mass-media publicity and promotion of family planning can change behavior. Specifically, the mass media can stimulate information seeking, raise clinic attendance, and increase use of family planning and safe sex methods.**

Mass-media interventions can change behavior. Frequently, the first action people take after exposure to mass-media family planning messages is to seek more information. The quest for information may lead to a friend or relative or to a source that is linked to the mass-media campaign, such as a television show, a telephone counselor, or a clinic or service provider. Recall surveys in many IEC projects show a positive connection between mass-media interventions and people's desire for more information about family planning:

- New clients in Kwara State, Nigeria (discussed earlier), told the nurses they came to the clinic because "Mama Olu told me to come." Mama Olu was a popular TV character who encouraged her fictional granddaughter to use family planning (Piotrow et al., 1990).
- During a recent two-month television and radio campaign for vasectomy in Brazil, clinics reported a mean number of 1,896 phone calls and walk-ins per month by people seeking information about vasectomy, an increase of 265 percent over the mean number of 519 per month received in the six-month period before the campaign (see Figure 4). The mean number of vasectomies performed grew from 302 per month before the campaign to 550 per month by the end of the campaign, an increase of 82 percent (Buffington et al., 1989).



Source: JHU/COP & PRO-PATER

Figure 4. Mean Number of New Contacts, New Clients, and Vasectomies Performed, PRO-PATER Clinic, Sao Paulo, Brazil, 1988-89

- After a mass-media project in Cebu Province, Philippines, the number of new family planning acceptors in government clinics increased from 1,320 in 1988 to 5,163 in 1989, an increase of 291 percent, and in private clinics from 1,574 in 1988 to 2,428 in 1989, an increase of 54 percent. The project linked mass media to providers through very specific references to methods and clinic sites (Rimon II, 1990).
- Surveys conducted before and after a mass-media campaign in Mexico revealed increases in correct knowledge and decreases in misconceptions about AIDS and HIV transmission. The percentage of survey respondents who knew that condoms prevent HIV transmission rose from 61 percent before the campaign to 78 percent after. Self-reported condom use rose by 10 to 15 percentage points among groups at high risk of HIV infection--female prostitutes, homosexual men, and university students (Sepulveda, 1989; Sepulveda et al., 1989).

**Mass-media references to health care providers can improve their morale, enhance their status, and lead to increased public acceptance of family planning.**

When health care providers take pride in their professional roles, they tend to provide more and better services. OR projects show that mass media can bolster the number of clients served by giving public recognition to the roles and identifying service sites of specific providers.

The roles of local community-based contraceptive distributors were enhanced during a nationwide IEC project in Honduras to promote their distribution network. On a local level, radio spots repeatedly broadcast the names and locations of the various distributors, thereby increasing their prestige in their communities. In 1984, when the project began, many Hondurans believed that family planning was illegal or unavailable. By the time the project ended in 1986, 95 percent of those interviewed believed that family planning was beneficial. Some 75 percent knew that contraceptives were sold at community-based distribution (CBD) posts, and 60 percent knew a local site. CBD clients increased by more than 10 percent, with 76 percent of distribution posts reporting increases in users (PCS, 1990).

The Blue Circle Campaign in Indonesia was designed to encourage urban women to go to private sector doctors and trained midwives for family planning services. Indonesia's National Family Planning Coordinating Board (BKKBN) wanted people who could afford to pay fees to use nongovernmental facilities. The status of doctors and midwives, already high, was reinforced on television and in print media, where they were depicted as sources of high-quality, convenient family planning services. At the same time, the doctors and midwives themselves were offered training and IEC materials to help them perform their new role as family planning providers. After an initial five-month media campaign in 1988, 32 percent of the doctors and 58 percent of the midwives reported a direct impact on their practice. Their average weekly family planning caseload increased by 28 percent for doctors and 36 percent for midwives during the campaign (Suyono, 1989).

Nurses in Enugu, Anambra State, Nigeria, reported being greeted in the streets by people who had seen the clinic spots run during the telecast of "In a Lighter Mood" cited earlier. The spots featured health workers on the job and identified clinic locations. The considerable anecdotal evidence citing public recognition of the nurses, combined with an average of 55 percent of new clients identifying television (specifically "In a Lighter Mood") as their source of referral during the first full six months of the campaign,

suggests that the broadcasts not only enhanced the status of the nurses, but also influenced knowledge about clinic services and contributed to increased clinic attendance (Piotrow et al., 1990).

*The impact of mass media on behavior is a controversial subject--much researched, often overstated, and sometimes disproved. While all agree that mass media can create awareness and even stimulate wider community acceptance, some dispute that they can influence individual behavior. Certainly other factors are also involved in behavior change--the availability of supplies and services, social and economic constraints, and sometimes even geography. If the opportunity is not there, communication will have limited impact. Yet in the family planning field, a body of evidence is accumulating, through OR-like research or similar IEC project evaluations, that people look to the mass media for information and that they change their behavior in various ways as a result of what they learn. Many first look for more information, then visit family planning services, and eventually try one or more family planning methods. The more specific the activity promoted--a particular method, such as vasectomy, or a particular clinic or type of distributor--the easier it is to measure results and to find a significant impact.*

*Among the related issues that could be explored further by OR are the following: How can policy makers or gatekeepers be persuaded to allow more specific information about family planning in the mass media? How can the intermediate steps leading to behavior change and contraceptive use be identified and measured for maximum media influence? How can mass media be linked more closely with specific service sites or providers?*

## THE ENTER-EDUCATE APPROACH

**The use of entertainment to spread social messages--for example, promoting family planning or encouraging responsible sexual behavior--can reach millions of people and influence their attitudes and behavior.**

Entertainment has been used throughout history as an effective way to reach people, teach new concepts, and influence behavior. A number of large IEC projects carried out by the Population Communication Services project of The Johns Hopkins University have developed and tested this concept, termed "enter-educate," through an OR-like approach.

The previously cited music projects in Latin America and the Philippines promoting sexual responsibility among young people were among the first major mass-media projects to use entertainment on a broad scale through extensive radio and television coverage. Tatiana and Johnny launched the songs on a popular Latin American television show, and Lea and Menudo, the internationally renowned male teen singing group, performed their songs together on about a dozen prime-time television programs in the Philippines. Both projects were extensively evaluated (Kincaid et al., 1988; Rimon II, 1989). Evaluation of the Tatiana and Johnny project suggested that responsible sexual attitudes, especially among young women in Mexico, may have been strengthened because of the project (Kincaid et al., 1988). In the Philippines, a survey of 500 young people found that 51 percent were influenced by the songs, and 25 percent sought contraceptive information (Rimon II, 1989).

Entertainment was a paramount element in the intensive three-month multimedia campaign in Turkey cited earlier. Using humor, music, and melodrama presented by popular actors, actresses, and comedians, the campaign was designed to appeal to a broad viewing audience. Audience research was crucial to developing products that were well received. A survey following the three-month media blitz showed that 80 percent of the target audience--married women of reproductive age--had been exposed to the campaign through various media. More than twice as many people recalled the entertainment components of the campaign--including the serial drama and humorous TV spots--as recalled the TV documentary. Of those interviewed after the campaign, 10 percent said they had visited a health or family planning clinic, and 20 percent said they intended to. A sample of 18 health and family planning clinics reported an average monthly increase in family planning volume of 4 percent during the IEC campaign. Overall, the national sample survey showed an increase of 3 percent for modern family planning methods over the four-month period (see Table 1 and Figure 5), significantly exceeding the trend of 1-2 percent gains per year before the mass-media campaign began. An in-depth analysis found that women with primary school education (half of all women), increased their use of modern contraceptives by 13 percentage points, from 31 percent before the campaign to 44 percent after (Yun et al., 1990).

The concept of using popular music to promote family planning has now reached Nigeria in a project by the Planned Parenthood Federation of Nigeria, aimed at young adults. Preliminary evaluation of two songs written by Onyeka Onwenu and performed with top singer King Sunny Ade showed that, of 1500 respondents interviewed in three cities four months after the project was launched, 57 percent had heard one of the songs on radio,

Table 1. Turkey: Indicators of IEC Campaign Coverage

Medium	Est. % (n=2145)
Watched Family Planning Programs on TV	76.3
Saw Family Planning Posters	41.1
Saw Family Planning Brochures	25.7

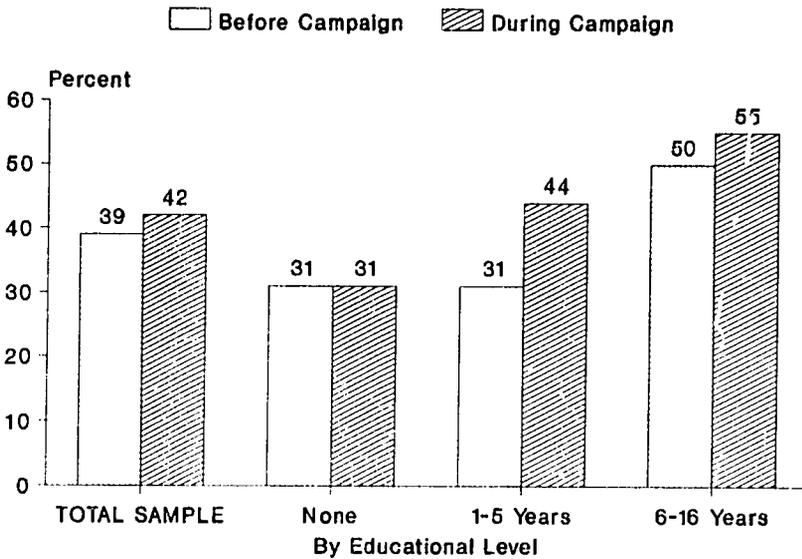


Figure 5. Impact of the National IEC Campaign of Turkey on Modern Family Planning Practice (October 1988 - January 1989)

while 38 percent had seen one of the videos on TV. Between 85 and 90 percent rated the songs "good" or "very good" (Family Health Services Nigeria, PCS, and Research Bureau Nigeria Limited, 1990). The impact on behavior has not yet been evaluated.

**The skills of entertainment and mass-media professionals are required to develop, produce, perform, and promote successful enter-educate projects.**

The effectiveness of an enter-educate project is determined by how well it does in the commercial market, how much attention it generates, and how well the social messages, which will eventually lead to behavior change, are received by the target audience. To compete in the marketplace, enter-educate projects must use professionals from the entertainment and mass-media fields to create, promote, and distribute attractive, high-quality programs. Production involves extensive audience research, pretesting, and monitoring of implementation. In addition, the educational messages need to be subordinated to entertainment values lest the audience lose interest (Coleman and Meyer, 1990).

Evaluation of both the Latin American and Philippine music projects discussed above showed that a key factor in their impact was the use of top-notch professional talent--composers, singers, and production facilities:

- After focus group research in Mexico, two professional singers were selected for the Latin America project because of their commercial potential and their images as positive role models. This insistence on professionalism resulted in a campaign that had impact on both commercial and social levels. On a commercial level, requests for the songs on Mexican radio stations reached 13 to 15 per day for a three-month period. On average, the songs were played 10 times a day for ten months. (In Mexico City a song played on the radio 5 to 7 times a day is considered a hit.) The album featuring the songs had sold over 400,000 copies by the end of the project and is still selling. Songs, videos, and the singers were featured on television, on radio, and in print. On a social level, qualitative and quantitative research showed that the messages were correctly interpreted by the vast majority of the audience (see Figure 6) (Kincaid et al., 1988).

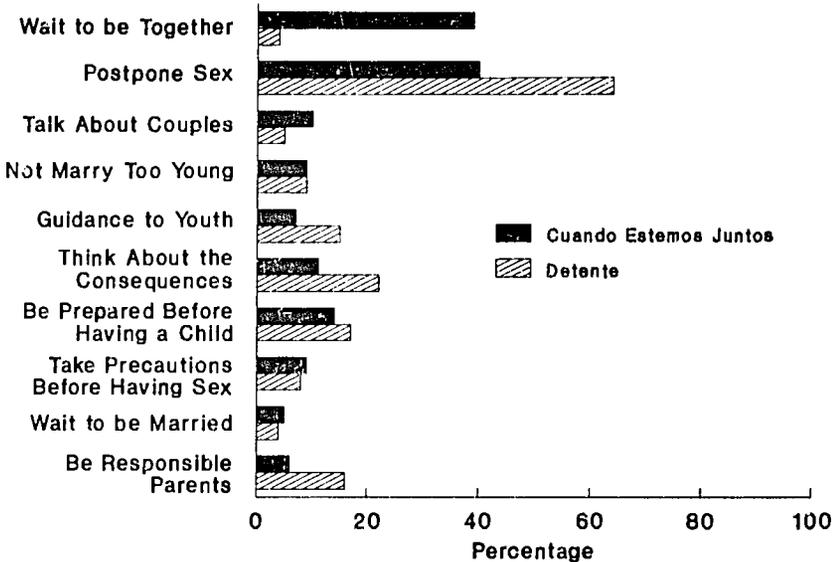


Figure 6. Interpretation of the Message of "Cuando Estemos Juntos" and "Detente"

- Top-quality professional musicians and production facilities were also enlisted for the Lea and Menudo project in the Philippines. The performers were selected for their appeal to young people and their marketing potential. The marketing plan, based on extensive preproject research, included live concerts, radio simulcasts, dance contests, message interpretation contests, wide multimedia press coverage, and guest television appearances by the singers. As in Mexico, the songs reached the top of the ratings, and, as evidenced by essay and art contests and by Lea's school tours, young people responded positively to the messages. Some 70 percent of 600 young people aged 15-24 interpreted the message of the song "I Still Believe" appropriately (Rimon II, 1989).

Other projects, in Nigeria, Ghana, Liberia, Zimbabwe, India, and Bangladesh, also attest to the importance of enlisting entertainment professionals to work with family planning experts to develop materials that are more entertaining than didactic (PCS, 1988; Coleman and Meyer, 1990; Piotrow et al., 1990). When the family planning messages are emphasized

too much, audiences may complain. The early episodes of "Hum Log," India's first family planning TV soap opera, which was broadcast in 1984, had low ratings; viewers complained that there was too much about family planning. When the messages were made more subtle, the series became a great success. "Hum Log" audience ratings reached 90 percent; most viewers reported learning positive attitudes and behavior related to smaller family-size norms, women's rights, and other social issues (Coleman and Meyer, 1990; Singhal and Rogers, 1989b).

**Commercial sponsors, broadcasters, and other media will share costs for high-quality enter-educate products, providing free airing, free promotion, and other support that can far exceed the cost of the original products.**

Evaluation of enter-educate projects shows they can transform initial seed money into substantially larger support, including millions of hours of free air time, press and other media coverage, and much associated publicity and products. In Latin America, Tatiana and Johnny's two songs, "Cuando Estemos Juntos" and "Detente," cost approximately \$300,000 to develop and launch, but returned more than one million hours of free air time, plus print publicity and personal appearances worth many millions. As noted, Tatiana's record album sold more than 400,000 copies by the end of the project; the figure by mid-1990 was more than 600,000. Tatiana herself has spoken out--on her own, without benefit of fees--to promote sexual responsibility to young people and at family planning conferences. The combination of commercial viability and a social message was one reason for this multiplier effect, interviews showed. Media representatives said that commercial viability was the main reason they promoted this campaign more than other social campaigns. In Latin America, where the mass media are privately owned, the primary concern is the "bottom line"--profit or loss (Kincaid et al., 1988).

The Philippine project was deliberately designed to attract corporate sponsorship and support. Lea Salonga's songs, developed at an initial cost of about \$250,000, received \$1.4 million of free radio and television air time, plus contributions from Pepsi Cola for posters and air time; from Nike, Nestle, Avon, and other companies for collateral promotional material; and from the Philippine Long Distance Telephone Company for six months of the telephone hotline. Thus the value of corporate support plus free air time amounted to four times the cost of the project (Rimon II, 1989).

Cost sharing was also built into the national mass-media campaign in Turkey discussed earlier. The direct costs of the campaign amounted to

\$231,637. With free air time from Turkish Radio and Television, free publications, and free advertising space, the project was able to generate \$9 for every \$1 of project expenditures (Yun et al., 1990).

The cost-effectiveness of mass-media and enter-educate projects is difficult to evaluate through the usual small-scale OR project. Unless mass media, including enter-educate approaches, are of top quality, extensively publicized, and widely used, they may not be cost-effective. Yet OR specialists rarely have the resources to develop commercially viable mass-media interventions on an experimental basis. An OR project for vasectomy promotion in Guatemala found that radio promotion was less cost-effective than using a person-to-person promoter (Bertrand et al., 1987). Reviewers noted, however, that the radio promotion materials were used in a limited area and were compared essentially with the performance of a single outstanding promoter (Piotrow and Kincaid, 1988). Comparing mass media, which require strong professional skills but offer massive coverage, with interpersonal communication, which varies greatly in content and effectiveness, may be like comparing apples and oranges. Research should be directed to ascertaining how mass media can be used to support and improve interpersonal communication, rather than compete with it.

*As in all communication, the extent of impact depends on the quality of the communication. Yet the quality of mass-media or enter-educate projects is difficult to evaluate objectively except by their impact on the audience--a catch-22 situation. This means constant monitoring and immediate feedback to keep the audience interested. For mass-media and enter-educate activities, as for social marketing, OR techniques need to be incorporated into project activities and project monitoring from the start because the interventions are necessarily too costly and extensive to allow project managers to wait until the next project before implementing changes that can improve the results.*

## **OR: AN INTEGRAL PART OF GOOD IEC**

OR projects and findings have made an important contribution to the field of family planning promotion, and OR techniques are increasingly applied at all stages of health promotion to improve results. Experimental interventions at the clinic and CBD levels have documented the crucial importance of good interpersonal communication, or counseling, between providers and clients. Well-designed IEC materials that are carefully

pretested with current and potential clients can contribute to the process of informed individual choice. Social marketing, mass-media, and enter-educate projects use OR techniques as standard procedure to chart the way to more effective and more cost-effective promotion.

During the 1980s, it became increasingly clear that family planning promotion is a process, not a product, and that the ultimate goal of IEC goes beyond changes in knowledge and attitude to specific changes in behavior based on individual decisions. Successful IEC projects recognize this goal and follow a distinct process or methodology based on audience research, a coherent strategy, a detailed dissemination plan, step-by-step implementation, regular monitoring, and an impact evaluation to check results against specific, measurable objectives established at the start. OR techniques are an integral part of this process. As noted in the review of social marketing activities, all major decisions in marketing and promoting a product are or should be based on various types of market research or OR.

During the 1990s, IEC projects will be moving into the mass media on a large scale as the concept of the "global village" comes closer to reality. Since people's access to mass media, and especially radio and television, has doubled or tripled in the last decade, this shift is entirely appropriate. Moreover, mass media can be used to enhance and support interpersonal communication efforts for all types of audiences. The audiences for family planning messages are becoming increasingly young, urban, and male (rather than exclusively female), and are less likely to visit conventional family planning clinics and more likely to be exposed to broadcast media. Using the mass media is costly and requires skilled professionals to achieve the best results. At the same time, however, mass media are usually the most cost-effective means of reaching large numbers of people. Moreover, mass-media and especially enter-educate activities allow the cost of high-quality productions to be shared and leveraged in various ways to gain wider support.

Whether with social marketing or entertainment, to achieve the best results in mass media, OR techniques need to be applied consistently throughout project design and implementation. As family planning IEC moves from small-scale pilot projects toward national and regional multi-media campaigns, OR techniques are no longer a separate activity that can be carried out by another organization or a luxury item that can be funded only if there is money left over. On the contrary, formative and summative evaluation using OR techniques is needed and is increasingly applied in all major IEC projects and at all stages of the IEC process.

The major achievements of OR in family planning promotion should be seen not only in the specific findings summarized in this overview, but also in the now well-accepted integration of OR techniques into major communication activities. Focus group discussions, pretests, pre- and post-campaign surveys, interrupted time series analysis of sales and/or service data, recall surveys, broadcast monitoring, conceptual mapping, and other OR techniques are crucial to the design and implementation of good health promotion. They are already well integrated into most large-scale social marketing, mass-media, and enter-educate projects.

Moreover, at the same time the scale of IEC activities expands into national media, the scale of evaluation must grow to cover national rather than pilot-project audiences. In this effort, the use of representative national data, such as that from the Demographic and Health Surveys, will become more important. These surveys should therefore give more attention to communication issues and especially to the impact of mass-media campaigns on the intermediate variables that precipitate behavior change. With this additional support, health promotion will be better able to make the transition from ad hoc production of materials to strategic planning for behavior change.

In the 1990s, health communication has a major role to play. Not only in family planning, but also in all of primary health care, good promotion is necessary to encourage individuals and families to make the changes in their lives that will lead to better health. The use of OR techniques and the application of OR findings to date are essential to strengthen modern health communication. With these skills and resources, family planning promotion can advance into the 1990s with a real opportunity to accomplish the long-term goals of making family planning a household word, a community norm, and an informed individual choice.

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#### 4. MANAGEMENT OF FAMILY PLANNING PROGRAMS AND OPERATIONS RESEARCH

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##### INTRODUCTION

In 1967, Bernard Berelson wrote of family planning programs, "If there is one deficiency in this field that is more serious than any other, I think it's neither lack of an ideal method nor inadequacy of our persuasion techniques. It is general lack of adequate implemental machinery. We don't have family planning administrators who know how to furnish services efficiently to great masses of population" (Berelson, 1967, p. 67). This harsh judgment, written 23 years ago, no longer applies. The skills of program managers have grown with the programs themselves, and the administration of family planning programs is now often a model to which other social programs aspire. Some of the credit for this improvement may be attributed to management's use of operations research (OR) to refine program administration. This paper reviews a sampling<sup>1</sup> of these OR studies.

A traditional definition of management is used here to organize the findings from recent OR experience. For years, the management literature has grouped management tasks as falling under one of four headings: organization, control, motivation, and planning. Alternative labels have been used, particularly for organization and motivation, but these four themes have endured. More recently, strategy setting has emerged as a fifth important task of management and has been emphasized in the literature; indeed, it would now be difficult to find a text on management that does not devote considerable attention to strategy.

The recent emergence of strategy setting as an important component of management grew out of the observation that operating managers bear considerable responsibility for defining an organization's strategy (Kudla, 1976). Research has repeatedly demonstrated that an organization's performance is associated with whether management has articulated a

formal and appropriate strategy (representative of several studies documenting this relationship is Schoeffler et al., 1974). Strategy setting has been compartmentalized by organizational level: at the top level is the mission statement, the long-term objectives, the grand strategy, and so on; at lower levels are operating and functional strategies in areas such as marketing and human resources. These distinctions are not important here, except to indicate that strategy setting is found at many levels of an organization and is not the exclusive purview of a few high-level policy makers, as might be thought. (Note that management strategy is distinct from national policy, which deals with issues of pro- or anti-natal legislation, resource levels for population programs, and so on.)

OR results, as will be shown below, have great relevance for program strategy. This relevance is worth noting since the term *operations* research would seem to denote research on nonstrategic questions.

The OR findings reported here are grouped, then, within five categories: strategy, organization, control, motivation, and planning.

## MANAGEMENT STRATEGY

### General Strategy

A fundamental question for all program managers is what groups the program will serve, what those services will be, and how they will be delivered. To date, strategic management in family planning has often been confined to the development of life-cycle models--stages every program will pass through as it grows (a happy exception is the writing of John Ickis, 1987, who takes up questions of structure and leadership). Representative of this concern with program evolution is Vriesendorp et al. (1989), who posit four stages a program will pass through during its development; these stages are defined by level of contraceptive prevalence achieved. This model may be most relevant to national programs in which a single or dominant organization provides services.

Empirical support for a life-cycle model was found in four OR projects in Bangladesh that studied one or more community-based distribution (CBD) programs in each of four stages of program evolution. It was found that the principal management challenges differed by stage:

- **Stage 1--Initiating Services.** In the program studied in this stage, spontaneous demand for services initially exceeded the program's ability to provide those services. Emphasis was on registering and

supplying couples; little or no promotion was needed, although users required some education on proper method use. The critical management systems were logistics to ensure reliable supply and broad canvassing to reach the ready adopters. Outreach workers were primarily resupply agents (Unity of Government and Non-government Population Services [UGNPS], 1988).

- **Stage II--Tapping Latent Demand.** The program that had advanced to this stage found that once the ready adopters had been enrolled in the program, promotion was needed to recruit those couples who had not previously adopted because they clung to a few commonly held concerns--perhaps cost of supplies or social acceptability. The program had to detect those issues and address them, either through community education or individual promotion. Management had to determine what attitudinal factors were inhibiting further growth of the program and develop an appropriate response (Moslehuddin and Kabir, 1988).
- **Stage III--Creating Demand.** For the programs at this stage, a plateau in coverage was again reached after the programs had enrolled those couples who once held misperceptions about contraception (Mia et al., 1988). At this point, the programs had to change fundamental attitudes regarding desired family size or the role of women. Perhaps more important than a hard sell, which had worked before, was resolving concerns about survival of children or what women can do. The program managers had to face the need to add new service components oriented to child survival or economic opportunities for women; clearly such services required new management and technical skills--and new resources.
- **Stage IV--Overcoming Marginal Effectiveness.** Meeting and surmounting the challenges of stage III were not the end of the story. Even when a program had reached a fairly high level of prevalence, fertility remained high (Mia and Bernhart, 1988). It appeared that many couples drifted in and out of the programs (and conceived when out); the groups that remained unprotected were, unhappily, at high maternal risk. The role of outreach at this stage may have been as supplier of last resort (many of the drifters were supplied by social marketing), promotion among high-risk couples, identification of migrants, and reinforcement of tepid convictions. These activities placed special demands on canvassing, client records, flexible pricing, and promotion.

The above stages of program development may be unique to the Bangladeshi context; programs in other countries may pass through different stages and/or a different number of stages. However, these stages do have the merit of having been derived from empirical research, and they appear to be linked to fertility rates, not contraceptive prevalence. In any event, they offer managers several lessons.

First, the management challenges change with the progression to a new stage. This conclusion is common to other life-cycle models. In the Bangladeshi OR projects, the program that began with simple supply problems soon had to provide proactive outreach and promotion. When these efforts were successful, they took the program into a stage that required providing a new range of services, and ultimately to the need to develop sophisticated client tracking and locating systems.

Second, prevalence will plateau if a program does not adopt the strategy needed to progress to a succeeding stage. In Bangladesh, continued pursuit of activities that were successful in a particular stage did not allow the program to expand coverage. There was evidence that use of the outdated strategy may even have been dysfunctional; one OR study of 15 small programs indicated that continued reliance on an outdated strategy was accompanied by an actual decrease in prevalence (Mia et al., 1988).

Third, programs will not advance spontaneously from one stage to another; in fact, there may be organizational resistance to the major program changes required to abandon an old strategy and adopt a new one. Managers must recognize when they have exhausted the possibilities of their current strategy and are ready to begin marshalling the resources and commitment needed to move to the next stage.

### **Political Strategy**

Program managers often find they must respond to political challenges that may be directed at the resources available to their programs or even at the legality of their programs. When family planning programs were young, the challenge often came at the national policy level. But established, mature programs may still face political challenges from an entrenched profession, from other organizations competing for resources, or from officials wary of any incursion across bureaucratic boundaries. OR studies have often been used to marshal support and to overcome political barriers of several types.

First are **barriers to program acceptance**. Early OR projects conducted in a variety of countries were instrumental in persuading national-level

policy makers to accept family planning as a component of public health care (see Cuca and Pierce, 1977). In most instances, the OR project demonstrated that family planning was accepted by the public and did not ignite controversy. In some instances, it was also possible to demonstrate the health benefits of fertility control

Second are **barriers to delivery systems**. With the passage of time, family planning gained wider acceptance, but delivery of services was rooted in clinic-based, physician provision of contraceptives. Cost-effective provision of contraceptive services required moving beyond primary reliance on clinic-based services. OR projects in Morocco (Labbok et al., 1986) and Guatemala (Bernhart, 1981), among many others, were instrumental in gaining acceptance of CBD as a legitimate means of providing contraceptive services. Credible research was useful here as the opponents of change defended the status quo on the grounds of client welfare: OR was able to overcome these arguments by demonstrating that client health was not jeopardized by easing access to contraceptives.

Third are **barriers to demedicalization**. Cost-effectiveness is also improved when paramedical providers replace or augment physicians. Projects in Turkey, the Philippines, Guatemala, and Thailand, among others, demonstrated that individuals other than physicians could provide safe and effective contraceptive services; these projects gained acceptance for nonphysician care.

Fourth are **barriers to changes in administrative and clinical practices**. Political resistance to the way services are delivered and managed does not end with CBD and demedicalization. Resistance to changes in the current way of doing things is a fact of organizational life. OR projects have been instrumental in introducing changes in the face of such resistance, in areas such as charging fees for services (in Honduras, Management Sciences for Health, 1986; in Guatemala, Bernhart, 1981) and reducing screening requirements (Bernhart, 1981). The Guatemala study documented different mechanisms inherent in OR studies for gauging the strength of opposition, persuading opponents of the value of change, overwhelming opposition through the creation of strong constituencies for change, or providing reassurance for the cautious. The uses to which OR was put are worth noting:

- Trial balloons--An OR project can test the strength and extent of opposition to a proposed change. By launching a change as an experiment, proponents can withdraw it if the opposition proves extensive, without great loss of face and credibility. This encourages more efforts to introduce change.

- Trojan horse--In some instances, it is enough to create a constituency for a change, such as a new service. Here the OR project can provide a vehicle for instituting the change--the label of experiment protecting it from attack--and gaining a strong foothold. After a period of successful operation of the change, it becomes politically more costly to withdraw the change than to keep it.
- Overcoming the immune reaction of the organism--In many instances, the perceived threat posed by a change may exceed the reality. Here an OR project can demonstrate that a change is, in fact, benign, that, for example, it does not lead to a loss of employment or status.

### Financial Strategy

All program managers share an interest in securing financial resources for their programs. This interest is of growing relevance as it becomes necessary to do more with less. As demand for contraception outstrips the resources available to programs from international donors, program managers must improve operating efficiencies while recovering more of the costs of services from beneficiaries. It is the latter point, cost recovery, that requires judicious selection of an appropriate financial strategy.

Programs can opt for one or more of several financial strategies. These include currying long-term donor support; incorporating in the portfolio of projects opportunistic projects (those that respond to a transitory donor interest); providing billable services (often curative); seeking community financing; establishing fees for supplies or services, without diminishing demand; and obtaining support from third parties, such as employers or insurers. Several OR studies have investigated potential sources and levels of support for program financing.

One source is **community financing**. The evidence here is mixed. Studies in Liberia (Cole, 1985), Brazil (Lassner et al., 1986), and Thailand (Primary Health Care Operations Research Project [PRICOR], 1984) document the communities' willingness to contribute to the costs of contraception and health care. Other projects, in Haiti (PRICOR, 1986b) and Benin (PRICOR, 1986a), found that the communities involved would not contribute to program costs. This is an area in which program managers may want to replicate these OR projects to test the viability of community financing for program services.

A second source is **contraceptive pricing**. Again, the results are mixed, but they may point to relative price-inelasticity of demand for contracep-

tives. Several of the studies conducted have demonstrated the expected sensitivity of demand to price changes. For example, Cernada (1982) reported that demand increased for a time after contraceptive prices were dropped. However, doubling the price for DMPA (Deprovera) had no effect on demand in Thailand, perhaps because clinic staff worked hard to compensate for the change (Family Health Division, Thailand, 1983), and the demand for contraceptives actually increased after prices were raised in Jamaica (Howell and Seims, 1979). A study that went directly to the heart of the question was a simulation in Thailand that estimated price elasticities of contraceptives and suggested new price levels that would optimize program income without jeopardizing coverage (Ashakul, 1989).

A third source is **fees for services**. Aside from recovering the cost of contraceptives, managers will want to know whether other services can provide a source of income for the program. Experiments in Taiwan (Cernada, 1982), Thailand (Carlson and Potts, 1979), and Guatemala (Bernhart, 1977) showed that fees could be charged for services without sacrificing program effectiveness. However, studies have also shown that a decrease in prices (in Taiwan, Cernada, 1982; in Korea, Chen and Worth, 1982) or no fee (in Thailand, Knodel et al., 1984) for supplies or services can boost demand. Further evidence of price sensitivity comes from Korea, where increases in fees for voluntary surgical contraception (VSC), or sterilization, were accompanied by a decline in demand (Chen and Worth, 1982). This appears to be an area in which each program will have to conduct its own OR to determine the effect of a change in price for service.

Fourth is "**unbundling**." A persistent pricing issue is whether clients should be charged for the individual services they obtain or whether they should pay a fixed amount for bundled services. Lassner et al. (1986) found in Brazil that charging for individual services produced the most revenue for the program.

Still another source is **employer support**. A variety of projects have attempted to demonstrate to employers that their investment in family planning will be returned (see Bertrand, in this volume).

### **Community Participation**

The value of community participation and means for obtaining it have been the foci of several projects. Researchers who have examined several community participation projects have concluded that family planning programs, particularly those with demographic targets, may be poor vehicles for such projects. They speculate that the goals and structure of typical

population programs do not easily accommodate the bottom-up setting of objectives and methods characteristic of community participation (Askew, 1989; United Nations Economic and Social Commission for Asia and the Pacific, 1988). Arguing against that pessimistic conclusion is the experience reported by Bergthold et al. (1973) in Ecuador, where bottom-up goal setting was found to improve family planning program performance.

The experience of OR projects on this question is mixed. The value of community participation was demonstrated in Thailand, where community development projects, such as pig raising, were linked to family planning (David, 1982). In another Thai study, Stoeckel et al. (1986) concluded that such linkages had not increased contraceptive prevalence rate (CPR), but had maintained it at already high levels. Gallen and Rinehart (1986) conclude that the value of community participation has been assumed in many projects, but its actual utility has not been confirmed.

Whether community participation contributes to fertility reduction is a question separate from how to involve the community. Factors of culture and organizational structure may produce a different answer in every program. For example, a project in Tanzania reported on the need for extensive communication (Nangawe et al., 1984). In Thailand, mixed results were obtained in an income generation project (Weeden et al., 1986).

The inconclusive results on community participation should not deter program managers from experimenting with these approaches. Given that community participation is associated with grass-roots democracy, empowerment of lower-income groups, and social and economic development, the successful implementation of such a project may achieve several worthwhile social objectives in addition to the benefits to family health provided by contraceptive use.

## **PROGRAM ORGANIZATION**

A broad range of issues regarding program structure, choice of services, staffing, and location of facilities have been the subject of OR projects. These are discussed in depth by J. Townsend in this volume, and only a few issues are cited here to underscore the centrality of these concerns to program managers.

One key issue is the degree of centralization. It has been an article of faith that decentralization of decision making improves both the quality of decisions (local decision makers will have fuller information at their dis-

posal) and staff motivation (a lower-level official who makes a decision will feel greater ownership of it and will be committed to its full implementation). These rationales underlie much of the donor interest in greater decentralization of health and population programs. On the other hand, there are several arguments commonly offered against decentralization: local officials lack the broad policy perspective enjoyed by national officials, local officials lack skills in information analysis and decision making, and decentralization sacrifices economies of scale. Few OR projects have addressed this issue directly; however, those that have support increased decentralization. For example, decentralized program control has been associated with improved program performance in Thailand (University Research Corporation [URC], 1988) and Indonesia (Hafid, 1976).

Another issue is range of services. Experience in Bangladesh (Matlab, International Centre for Diarrhoeal Disease Research, Bangladesh [ICDDR,B]) has demonstrated that some maternal and child health (MCH) services (child care) may reinforce the family planning program, while others (oral rehydration therapy) make such extensive demands on field personnel that contraceptive services suffer (Phillips et al., 1984).

Other issues include the method mix programs make available to clients, the location of service facilities, the density of facilities (how many and how close together), the skills required of service providers, and the personal characteristics of service personnel and their supervisors.

## **PROGRAM CONTROL**

A task immediately associated with management is that of controlling operations and resources. To accomplish that control, managers typically rely on supervisors; information systems (e.g., service statistics, management information systems [MIS], accounting data, supply reports); and formal evaluation.

### **Control of Operations/Quality of Care**

Studies have linked higher acceptance rates of contraception with higher quality of care. For example, more complete and accurate counseling has been associated with higher CPR and client retention (Prabhavathi and Sheshadri, 1988; Bernhart and Kamal, 1991). "Complete and accurate" means providing prospective clients with information on more contraceptive methods, more information on possible side effects, and more instruction on how clients might manage side effects themselves. A broader range of services available to program clients has also been associated with higher

program performance (see Gallen and Rinehart, 1986, for a review). More frequent contact with clients has been associated with higher program performance as well. Moslehuddin and Kabir (1988) report no leveling off in the effect of client contact on program performance, even when contact rates reached a weekly visit.

Quality of care can have far-reaching effects on organizational effectiveness. In a PRICOR study in Pakistan, Bernhart et al. (1990) found that utilization of primary health care facilities was influenced primarily by the quality of outreach service. If outreach workers provided more comprehensive care to villagers in their homes, the villagers were more likely to utilize the program's clinics. Interestingly, the quality of the service provided in the clinic appeared to have no effect on clinic utilization, only the quality of outreach care. This finding signals the need for programs to ensure quality service at all points of contact with clients.

### Supervision

Effective supervision serves several essential management functions, including monitoring of performance, training, dissemination of policies, and feedback to management. OR studies have addressed many aspects of supervision.

A study in Bangladesh (Bernhart and Kamal, 1991) found that superior fieldworker performance was associated with the following supervisory behaviors:

- The supervisor makes home visits with the fieldworker (also reported by Gomez, 1981, in Colombia).
- The supervisor quizzes clients on fieldworker activities, in the presence of the fieldworker.
- The supervisor discusses problem clients with the fieldworker.
- The supervisor visits more client homes.

Regarding frequency of supervision, several studies have associated increased supervisory contact with increased program performance. These include studies of CBD distributors in Nigeria (Ruffing et al., 1986) and Guatemala (Bertrand et al., 1981), and of nurse-midwives in Turkey (Akin et al., 1984). However, when supervision is ineffectual, or focused on clerical matters, an increase in frequency has no effect on performance (Foreit and Foreit, 1984).

Supervisory style is another area examined by OR. Energetic, innovative, and supportive supervisors appear to be most effective (Misra et al., 1982).

Finally, a PRICOR (1986c) OR project in Tanzania involved village health committees in the supervision of community health workers. Members of the committee participated on the team that monitored the performance of the workers.

### **Work Plans**

Work plans are written programs, typically for one month, of the activities a service provider will conduct. Such a work plan can be used for planning of activities, target setting with staff, and control of staff activities. The advantages of work plans were demonstrated in an OR project in Bangladesh, where fieldworkers improved their performance after adopting such plans (Alauddin et al., 1987).

### **Evaluation**

Formal evaluation has been demonstrated to be effective in improving managerial and program performance. Almost by definition, OR studies involve formal evaluation, but two types of studies can be singled out in particular.

The first is cost-effectiveness studies. It is no secret that program managers find themselves under increasing pressure to improve the cost-effectiveness of their programs. OR projects are excellent vehicles for assessing the relative costs and effectiveness of alternatives. Consider the range of topics of cost-effectiveness studies undertaken by the Operations Research in Family Planning and Maternal-Child Health for Latin America and the Caribbean (INOPAL) project:

- Comparison of different delivery approaches in industrial settings (in Barbados, Alleyne, 1990)--Peer distributors were found to be more cost-effective than salaried promoters.
- Costs and benefits of adding family planning to a prepaid health maintenance program (in Brazil, Junqueira Viera, 1987)--The study showed that benefits would surpass costs within three years of adding the service.

- Cost-effectiveness of mass-media promotion of vasectomy services (in Brazil, de Castro, 1987)--A campaign of magazine advertisements produced a sizeable increase in vasectomy requests at modest cost.
- Comparison of IUD promotion and distribution (in Colombia, Prada et al., 1989)--Visits by detailmen to physicians were more effective than mailings in obtaining acceptance, but mailings were more cost-effective.
- Comparison of strategies to reach young adults (in Mexico, Esteve, 1987)--A school CBD program was more cost-effective than either community- or factory-based programs.

The effectiveness of an approach may vary from one program setting to another, and the costs of implementing an approach will certainly be different. Of universal interest, however, is the methodology employed in these studies. The model used by the Technical Information on Population for the Private Sector (TIPPS) project is straightforward and has been widely tested (see Forcitt and Bennett, 1989, for a description of the methodology).

The second type of study is the formal program review. Such a review has long been a staple of population programs. Ross et al. (1989) summarize its effect on program performance and conclude that it is associated with improved program functioning.

OR is a flexible form of evaluation. Many examples of this flexibility could be cited; the two case studies presented in the Appendix demonstrate how OR can be used to focus on both narrowly defined and generally stated problems.

### **Inventory Control/Logistics**

Supply shortages obviously hinder program performance (Green, 1988). Despite the presumably straightforward nature of supply management, it is often a weak area. For example, a study of the supply systems in 18 sub-Saharan African countries found that procedural problems in logistics shackled those programs, even though there were often adequate resources for supply management (United Nations Fund for Population Activities, 1990a). Among the procedural problems noted were absent or weak forecasting, establishment of maximum/minimum supply levels, and weak information systems. Appropriately, OR projects in this area have often been directed at implementing simple control procedures (as noted in

Townsend and Foreit, 1989). Since the actual cost of contraceptives to programs is low (or nil), managers will focus less attention on maintaining efficient inventory levels and more on efficient distribution.

In the area of delivery, a project in Sri Lanka (Fernando and Perera, 1988) studied alternative resupply approaches used in a project with traditional healers. The most satisfactory system was, unfortunately, also the most expensive--personal visits by resupply agents. A mail request system fared especially poorly. In contrast, an IUD supply project in Colombia (Prada et al., 1989) found that mailings were more cost-effective than detailmen by a wide margin; however, the visits by detailmen resulted in a higher level of product acceptance than did the mailings.

Regarding supply locations, a formal supply site algorithm was employed in Ecuador to determine the most cost-effective locations for medical resupply depots. It was concluded that while use of such planning aids could lead to significant increases in supply efficiencies, their application would have to be tempered by informed judgment (Reid et al., 1986). Another formal planning model, a simulation, was used in India (PRICOR, 1987c) to identify the most pressing constraints on the vaccine supply system. This model was useful in demonstrating the effect of different management policies on supply levels.

In the area of distribution, PRICOR (1987a) conducted a study in rural Somalia to determine which drugs were in greatest demand and whether that demand was being met. The study led to recommendations for improvements in the distribution of the most-demanded drugs. Another PRICOR study (1987d) on the logistics system in Ecuador led to more efficient use of scarce supplies.

### **Management Information Systems**

It is commonplace to deplore the quality and utilization of management information. An analysis of the information systems in public sector MCH/family planning programs in 27 African, 5 Asian, and 8 Latin American countries concluded that "many countries do not produce certain basic input and output indicators and that even among those that do, information is too infrequently brought to bear on management decision making" (United Nations Fund for Population Activities, 1990b, p. 1). Not only was important information not collected; the study also noted that 14 of the 40 countries examined collected some information that had little or no practical value.

An MIS is usually an ancillary component of an OR project and not the principal focus (the same is also often the case with supply systems). Experiments with the MIS are usually adaptive, and they usually concern data collection methods. For example, data collection forms may be adapted for use by illiterate or semiliterate fieldworkers.

There are two other applications of OR to improving management information. One is paperwork reduction. Typical of many projects is the PRICOR (1988) project in Ecuador that replaced the 16 reporting forms clinic staff were required to fill out with a single integrated form. The second application is computerization. In contrast with projects that sought to develop less complex data collection systems, a PRICOR (1987b) project in a remote area of Peru demonstrated that community health workers could use portable computers powered by solar batteries to maintain client information; client care appeared to improve, as did the quality of record keeping.

## MOTIVATION

### Leadership

A component critical to the success of all organizational endeavors is believed to be the quality of the leadership and top management. Testimony to this belief is found in the significant investment donors have made in the training of program managers. OR studies have extended our knowledge of what constitutes effective leadership and how it affects program performance.

The strength of program leadership has been found to be positively associated with program success. One study, in Bangladesh, did find that strong, or even qualified, leadership was not absolutely necessary for program success, although it was positively associated with program performance (Bernhart and Kamal, 1991). The study found that a program could overcome weak leadership if it had compensating strengths.

Regarding the assignment of leadership roles, a recurrent problem for many private and some public programs is the division of responsibilities at senior management levels. Nonoverlapping responsibilities at these levels were found to be associated with program success (in Bangladesh, Bernhart and Kamal, 1991). At the same time, the study reported that shared responsibility for monitoring program finances was associated with program effectiveness.

Concerning the skills of top managers, despite reduced reliance on medical personnel at the service delivery level, a study of small nongovernmental organizations (NGOs) in Bangladesh suggests that the program director must know the technology involved in the services offered by the program (Bernhart and Kamal, 1991). This study found that managers with only a weak knowledge of contraceptive technology were among the more ineffectual of the program directors examined by the study. It should be noted, however, that the lack of technical knowledge may have been a result of low job commitment and ineffectual leadership, and not a cause; the methodology employed did not permit identification of the direction of causality.

Finally, an issue of enduring interest in the general management literature is the extent to which subordinates should participate in major decisions. A weak consensus arising from research in the private sector is that more participation by subordinates leads to higher morale and productivity. A study conducted in India (Murthi, 1976) supports increased use of participative management in family planning programs. In their compilation of effective management practices in family planning, Finkle and Ness (1985) cite studies in India and Ecuador as evidence that training in participative management can lead to increased program effectiveness. However, the history of many family planning programs may militate against a rush by senior managers to share decision making with subordinates. For example, a program that has been the creation of one energetic visionary may be a poor candidate for participative management until that individual fades from the scene. Similarly, a program that has weathered tough political battles along the way may be guided by senior managers who may be reluctant to allow subordinates to make decisions that could again place the program at risk. Judicious use of OR may aid senior managers in introducing a larger degree of participation while allaying concerns that such participation carries unacceptable risks to the program.

### **Employee Motivation**

Many managers will testify that the key to program success is the motivational level of program staff. A number of factors affect employee motivation, including supervision, organizational structure, and decision-making style. OR itself can increase motivation. The mere fact that efforts are made to improve an area through OR is a signal to staff of management's interest in that area--and in the personnel working in it.

Several OR studies have addressed topics directly related to motivation. In the area of remuneration, experiments have demonstrated the utility of the following:

- Piece rate payments (in the Philippines, Phillips et al., 1975)--Of several payment options tried, the direct link between performance and pay was the most effective in this project.
- Cash incentives to fieldworkers (in Taiwan, The Population Council, 1971)--These incentives resulted in a trebling of IUD acceptances.
- Cash incentives to "wholesalers" (in Colombia, Townsend and Ojeda, 1985)--Instructors were paid an incentive for sales to commercial outlets that exceeded a base level. This led to a significant increase in sales of nonclinical contraceptives and an improvement in the cost-effectiveness of the program.
- Bonuses paid on top of salaries--These cash bonuses were effective in Mexico (Columbia University Center for Population and Family Health [CPFH], 1981), but a similar scheme was not effective in the Philippines project reported above (Phillips et al., 1975).
- Noncash incentives (in Ghana, Perkin, 1970)--Powdered milk distributed to outreach workers resulted in increased recruitment.
- Adequate salaries (multiple studies cited in Gallen and Rinehart, 1986)--An obvious finding, inadequate pay is a disincentive.
- Recognition (in Kenya, Parker et al., 1985)--Awards and public acknowledgment can be effective motivators of increased productivity.

In the area of goal setting, targets and small payments to fieldworkers in Korea were effective in increasing vasectomy acceptance (Foss, 1969). In Ecuador, bottom-up target setting was associated with enhanced fieldworker performance. Fieldworkers set goals, which they discussed with their supervisors, and these goals were aggregated into overall performance objectives for the organization (Bergthold et al., 1973).

Regarding management style, the study in India on participative management cited earlier provided tentative support for the efficacy of participative decision making (Murthi, 1976).

Finally, in the area of supervision, several of the studies on supervision cited earlier demonstrate links between supervision and worker output that presumably reflect differences in motivational levels.

## PLANNING

Designers of OR projects hope that the results of their projects will be considered in the planning process, and that the findings will influence the future allocation of resources and organization of services. Beyond that, some OR projects have even been part of formal planning.

Regarding the allocation of geographic responsibilities to programs, an OR project in Bangladesh (Mia et al., 1988) studied the coverage provided by small CBD programs in an urban area. The results were used for reassigning areas to reduce gaps in coverage and provide more equitable distribution of responsibilities among the programs.

The feasibility of family planning in health maintenance organizations (HMOs) has also been studied. A study of the costs and benefits of incorporating family planning services in an HMO was undertaken in Brazil (Junqueira Viera, 1987). At issue was whether service provision could be shifted from government- and donor-supported programs to a self-supporting program. The results presented to management showed that the benefits from family planning would surpass the costs associated with the service within three years; significant reductions were expected in the number of induced abortions and caesarean section deliveries.

A PRICOR (1987e) OR project in Mexico demonstrated the effectiveness of decentralized or micro planning for health auxiliaries. Another PRICOR (1987f) study, in Jamaica, developed a model that allocated manpower and clinic hours. This model projected major savings in manpower costs and increased cost-effectiveness.

In Guatemala, an OR project began with a study of the family planning services desired by participating communities (Asociación Guatemalteca de Educación Sexual and The Population Council, 1989). The communities, which had been coo to prior efforts to increase contraceptive use, were involved in identifying the types of services sought. Materials were prepared and utilized in accordance with the results of the initial study. It may be instructive that a "market-centered" approach such as this is relatively rare in population programs.

## DISCUSSION

### Lessons Learned

OR projects cited here fall into two categories: studies that have pointed to a specific finding (e.g., projects showing that nonphysicians are capable of IUD insertion) and studies that have been successfully applied to a general problem (e.g., application of OR methods to formal planning exercises). The reason for this dichotomy is that in some instances, the results of the OR process can be generalized to other programs, while in other instances, only the process, not the results, can be generalized. As most researchers in this field would be quick to acknowledge, the findings from a single research project can be generalized to other programs only at some hazard. However, the findings from past research are the logical starting point for managers seeking to improve the performance of their programs.

To these two categories of studies, we can add a third: OR findings that hold promise--still unproven--of widespread applicability.

Examples from these three categories may illustrate where managers might adopt findings directly from research conducted in other programs, where they might borrow only the methodology and hypotheses, and where they might import a finding if they are convinced that the circumstances of the original study are similar to those of their own program.

**Generalizable Findings.** In the area of program control, OR has provided some general guides to action. The following are examples:

- Quality of care promotes program effectiveness. Quality, in turn, is promoted by the following:
  - More complete and accurate counseling
  - A broader range of services
  - More frequent contact with clients
  
- Supervision will improve the performance of field personnel if it has the following characteristics:
  - Frequent
  - Energetic
  - Supportive

- On site
  - Focused on operations and not administration
  - Competency-based
- Supply systems will be more efficient and effective if they prioritize by item, and the location of supply sites is rationally determined.

In the area of strategy setting, the consistency of findings on certain financial strategies also encourages their general consideration. An example is the repeated finding that program clients are relatively insensitive to price increases for contraceptives, but often sensitive to increases in fees for services.

The area of program organization provides a final example of a finding that has been replicated so often that it invites universal application: the success programs have had with nonphysicians in service delivery roles.

The common feature of these findings is that either they have been replicated in a variety of program settings (e.g., use of nonphysicians), or they have been validated more than once and have broad intuitive appeal (e.g., supervision should be competency-based).

**Generalizable Methods.** In contrast with the preceding group, some OR findings should be considered little more than hypotheses by the managers of other programs. However, the issues raised by those studies and the methods used to address them may well be generalizable.

In the area of program control, cost-effectiveness studies are an example. The methods are similar across programs, as are the issues, but no one expects the results to be exactly the same from one program to another.

A second example of a generally applicable methodology may be the application of OR as a political strategy. It is no secret that pilot or demonstration projects--as part of an OR project--are useful in testing not only the practical utility of an innovative program or method, but also its political viability. The judicious use of OR to test controversial changes can aid program managers in assessing the reaction such changes might engender before a full-scale commitment is made to their introduction.

**Promising, but Unproven, Findings.** It may be useful to further subdivide this category into three.

First are those findings that derive their attractiveness from their theoretical consistency. For example, decentralization has worked in OR projects and is supported by a logical set of assumptions regarding human and organizational behavior. However, the number of field studies on this question is still small.

Second are OR studies addressing issues in which the outcome may be a function of local conditions, but the study results provide a better understanding of what the key conditions are, and thus how to apply these results to a given program. The complex and often controversial issue of integrating population and general health activities is a case in point. Managers have found that some health activities reinforce contraceptive adoption, while others make such heavy demands on field personnel that the family planning component suffers. Whether family planning would be helped or hindered by the addition of health activities is probably a function of the activities proposed, the resources and infrastructure available, the skills of service delivery personnel, and the ability of program management to supervise the expanded program.

Third are the OR findings that point to general issues and program dynamics that may play out differently in different programs. For example, the strategic choices open to a program are so conditioned by the immediate environment that generalization would seem pointless. Nevertheless, OR studies have produced some instructive results that should be considered in strategy setting. For example, as a program matures, it may well find that what worked before is no longer effective. Program growth is seldom a smooth, continuous process. Managers may have to reshape their resources and service delivery methods significantly if they are to reach new populations.

Program managers face two challenges in utilizing the results from OR conducted in other programs. The first is the task of keeping up with the expanding knowledge base produced by OR projects around the world. The Maximizing Results of Operations Research (MORE) Project provides a welcome assist in this regard. The second challenge lies in determining whether the findings may be embraced directly or not. Here the manager must examine the extent to which a finding has been replicated, the characteristics of the programs where that replication has taken place, and the logic underlying the findings.

These may seem like daunting challenges. However, when they are weighed against the program improvements that successful OR projects have been able to produce, most managers will find the investment well repaid.

## Future OR Studies

Despite the rich legacy of OR results, program managers must undertake new research projects. Here a cautionary note is in order.

The first OR studies were essentially demonstration projects that were useful in breaching political, philosophical, and religious barriers to family planning. Given the politically charged climate in which they were conducted, it was important that their methodologies be immune to attack, and rigorous research designs were often employed. The purpose of more recent OR projects has been to assist program managers in fine-tuning their programs--but the same standards of evidence have been retained.

Strict adherence to the canons of social science in OR is unnecessary if program managers are the clients for the research. Two decades of domestic research on managerial decision styles have demonstrated that managers have little patience for academic research (see Mintzberg, 1975) and prefer information that is immediate, if partial. This is not to deny that more leisurely research is often better research in that the chance of error is reduced (see Morton, 1989). But this deliberate pace must be purchased at a price, and that price may include loss of interest in the problem, changes in the original problem, changes in implementing personnel, or changes in the organization's mission that render the original problem irrelevant.

Strict adherence to the canons of traditional social science may also have the effect of taking a basic management responsibility away from practicing managers and placing that responsibility in the hands of researchers. If a manager is reluctant to commit to a course of action, the social scientist may provide an excuse for postponing action, and, when action is finally taken, may appropriate ownership of the change from the manager. If a manager is ready to address a problem, the social scientist must convince the manager that precipitous attempts to resolve the problem would be unwise, and that the manager's understanding and instincts should be ignored in favor of a laborious research effort. Donor support and involvement have led to the externalization of many management functions: planning, policy setting, program evaluation, and financial control, to name a few. OR can have the unintended effect of adding to this list--ironically in the name of strengthening program management.

What kind of research minimizes the risk of weakening program management? The answer is simple: research that minimizes the role of the researcher. Such research would be long on practicality, and short on methodological rigor and sophistication.

Many management areas require attention. Happily they are areas in which the manager can very quickly detect whether a change is indeed an improvement, thus obviating the need for elaborate research designs. Information systems are an example. The utility of a new system is immediately obvious: data are more complete or not; they are more timely or not; the presentation is more interpretable or not; and so on. The same may be said for changes in the supply system, supervision, and financial control. There are, of course, exceptions. In the area of training, for example, the manager should be interested in verifying changes in the performance of trainees, and these take time and effort to document.

The following are examples of program changes that could be addressed by the kind of OR discussed above: quick and simple research designs that minimize the role of the researcher.

In the area of **information systems**, the focus often seems to be on the collection of data. Presentation and utilization are more appropriate issues; at least some data are usually collected in programs, but their utilization is so limited that efforts to collect more data seem pointless. When currently available data are being fully utilized, the kinds of additional information needed and the will to obtain that information may be more evident. The following are some suggested topics for OR on information systems:

- Presentation of data
  - Use of computer graphics to create charts
  - Use of time-series
  - Presentation of inputs and outputs on the same chart (Inputs might be fieldworker visits, supervisory visits, budgetary allocations, supplies, etc.; outputs might be new adopters, CPR, couple years of protection [CYP], active users, dropouts, etc.)
  - Presentation of one or more outputs on the same chart (For example, does continuation go down when [or where] recruitment goes up?)
  - Depiction of several units' or regions' performance on the same chart
  - Identification of key indicators

- Utilization of data
  - Aggregation of results, and discussion with supervisors at the field level
  - Aggregation at other levels (district, province)
  - Rapid feedback of results through sampling of submitted forms, computerization of processing, or additional personnel dedicated to information retrieval and processing
  - Periodic meetings with supervisors or field personnel at which performance results are the only topic
  - Use of performance data for resupply allocations

In the area of **supervision**, the following topics might be investigated:

- Changes in the way transportation is provided, e.g., provision of a vehicle or transportation allowance
- Provision of a checklist of basic job activities
- Requirement for a monthly report on the quality of services provided, and provision of methods for collecting that information
- Introduction of work plans
- Provision of rewards the supervisor can give monthly to recognize fieldworker(s) (e.g., a bicycle, a plaque, a bonus)
- An incentive payment or bonus tied to performance (e.g., CPR, CYP, service quality)
- Supervision performed by the community
- Supervision performed by peers on a rotating basis

There are also a number of topics for OR to address in the area of **supply**:

- Subcontracting the service, for example, to CARE, which knows how to move small bundles around the country

- Switching to a Book-of-the-Month Club system (automatically sending the standard allocation unless a service unit tells the supply depot they do not want it)
- Resupply through the mails (if they are fallible, simply keep higher safety stock levels in service facilities), or public transportation, or supervisors
- Different degrees of computerization
- The possibility that it is more cost-effective to exercise no control over supplies below the central level

Another potential area for OR is **results orientation**. Maintaining broad-based concern for program results is always difficult, and it is not made simpler by the maturing of a program. Managers may wish to undertake some small experiments to see whether the focus on obtaining results can be sustained and strengthened. Specific topics that might be addressed include the following:

- Goal setting--The nature of the goals can be varied as follows:
  - Who sets the goal. The evidence is mixed; some studies have shown that it makes no difference who sets the targets, while others have found that it does.
  - Level of difficulty. Should the difficulty of a goal be graduated over time, or constant?
  - Behaviors targeted by the goal. The target may be expressed as immediate activities (e.g., home visits), outputs (number of adopters, continuation rate), or outcomes (fertility decline).
- Rewards--Staff might be rewarded in a variety of ways to increase their concern for results:
  - Piece rate. Direct remuneration might be offered on the basis of number of activities performed (e.g., home visits) or performance level achieved (e.g., new adopters).
  - Bonus. An incentive payment could be offered on top of a base salary for achieving a stated level of activities, outputs, or outcomes.

- Nonmonetary. These rewards may be tangible (e.g., a bicycle), status-enhancing (e.g., public recognition), ego-enhancing (e.g., private recognition or greater autonomy), and so on. Again, these rewards may be tied to the achievement of activity, output, or outcome goals.

The above illustrations are deliberately simple. Good management usually consists of doing a lot of small, simple tasks right, and good OR might take a lesson from this.

## NOTES

<sup>1</sup>The studies on which this chapter is based are necessarily a sample of the total universe of such studies; some studies were not documented, and the documentation on others could not be obtained. An effort was made to canvas all studies through compendia, summaries, and computerized databases, but apologies are due to the researchers and authors of relevant OR projects that are not represented here. In selecting a study, three criteria were imposed. First, the project had to be an OR project to the extent that purposive manipulation of one or more program variables occurred or was intended. This ruled out many evaluations of static situations. Second, the project had to be documented. Finally, the program variables manipulated had to be management variables. Note that several studies on primary health care programs are included here. This was done where the results of the study appeared to hold a clear lesson for family planning managers and the study was conducted on a topic not adequately researched in family planning programs.

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## **APPENDIX**

### **APPLICATION OF OR TO MANAGEMENT PROBLEMS**

Some OR projects are tightly focused on a single question; the manager wishes to test a particular approach to a problem, say, a media campaign or a change in the frequency of supervisory visits. Other projects are more general; they start with a vague definition of a performance problem, and the first order of business is determining what factors underlie the low performance before designing changes to correct it. Below are examples of each kind of project.

## **ADDRESSING A SPECIFIC PROBLEM**

An organization in Colombia, SOMEFA, wanted to increase the number of private physicians offering IUD insertion in the country. Part of the research conducted to achieve that end was to test alternative ways of informing, motivating, and supplying physicians. Physicians were randomly selected in major cities, and three categories were set up: (1) detailmen visited some physicians; (2) a mailing of specially prepared materials was made to others; and (3) no special effort was expended (these were the controls).

The results were clear. While the recruitment rate of physicians was better for the detailmen than for the mailing, the mailing was far more cost-effective. It cost the program \$161 for every physician recruited by a detailman vs. \$20 for each physician recruited through the mailing. The same cost advantage is found for the mailings when cost of CYP is calculated: each CYP achieved through the mailings cost only 61 cents, against a cost of \$7.77 for the detailmen visits.

These are very useful results to have in hand. It might have been anticipated that mailings would have been so ineffective as to be a wasted effort. As it turned out, the mailed information was persuasive and effective. Detailed analysis of the results permitted program managers to note where the detailmen enjoyed their greatest advantage so that in the future, that resource could be concentrated on those physicians, while others could be contacted through the mails.

The total cost of this project, including development of the special materials for mailing and a training component, which is not described here, was \$85,000.

## **ADDRESSING A GENERAL PROBLEM**

The Asia Foundation (TAF) documented in 1985 that some of the CBD programs it supported in Bangladesh performed better than others. This was hardly a surprising or unusual finding, but TAF decided to investigate the reason for the differences. Since the resources going into the programs were the same (TAF tried to provide all of its grantees with roughly equivalent resources), and the programs seemed to be working in areas of equal difficulty, it was assumed that the reason for the differences in performance rested with the administration of the resources--with the management. TAF embarked on a two-year OR project designed to improve the management, and hence performance, of its grantees.

Despite the fact that program management was the ultimate target, the research started with the group most distant from the managers, the programs' clients. Researchers interviewed current, past, and prospective clients of both high- and low-performing programs; focus groups were also conducted with clients. The clients of the high and low performers gave clearly distinct responses on how they perceived the programs and what services the programs provided. These results formed the basis for the next round of research, which was with the fieldworkers.

Fieldworkers of high- and low-performing programs were directly observed on the job to determine what they were doing to produce the different responses at the client level. Again the differences between high and low were unmistakable. Based on this information, a battery of research questions was prepared for the next hierarchical level, the field supervisors.

Supervisors were directly observed on the job to determine how their activities produced the different behaviors observed among fieldworkers. The supervisors in the high-performing programs did things quite differently from the supervisors in the low-performing programs. These findings led to the final round of research, study of the programs' senior management.

Interviews with senior program officials revealed differences that could be linked to the ways supervisors operated in the field.

This "client-up" approach produced a broad range of findings that indicated how behaviors could be changed at the fieldworker, supervisor, and top management levels to improve program effectiveness. The following is a sampling of those findings:

- Fieldworkers in high-performing programs visited homes more often, visited nonusers more often, varied their promotional messages more to suit the interests of the listener, were more forceful in promoting the advantages of contraception, provided more thorough instruction on method use, and provided more information on possible side effects to prospective adopters.
- Supervisors in high-performing programs visited homes with the fieldworkers, asked clients whether the fieldworkers had screened them for contraindications, asked clients whether fieldworkers had explained side effects, checked on clients' supply levels, and kept themselves better informed on job-related matters.

- At senior management levels in the high-performing programs, it was found that the board of directors left program implementation--especially hiring of staff--to program management; however, the board and project director shared the responsibility for financial control. The project director was better informed, more often present in the field, and demonstrably more committed to the job, and participated in planning with the board.

Because the list of findings that distinguished high- from low-performing programs was so long, it was decided to implement only two key findings, with the expectation that their implementation would bring about other changes in the organizations:

- Ensure that every eligible woman is visited bimonthly.
- Use promotional messages suitable to the situation of the woman being visited (e.g., childless, pregnant, multiparous, drop-out).

What subsequently occurred is instructive (Kamal et al., 1989). The researchers decided to create an experimental and a control group of programs; the two changes would be implemented in only the former programs. However, this did not happen. All the programs supported by TAF were informed of the OR findings as a matter of courtesy for their participation in the research, and they all rushed to implement those findings. By the time the researchers returned to the field to conduct a baseline survey, the differences between the high and low performers were rapidly disappearing. While it is true that at the conclusion of the project, the low performers had increased their CPR more than the high performers, both groups were approaching 50 percent coverage--considerably up from the 30 percent at the beginning of the research--and both groups had achieved comparable levels of performance.

This project shows not only that OR directed at management problems can succeed, but also that managers will confound pessimistic predictions about their unwillingness to change. Here the managers made changes more rapidly than the researchers had anticipated they would. Presumably these managers understood the relevance of the research findings for their own activities; after all, the research had been conducted on their programs and with their assistance. Rather than erect defenses against results that cast some of the programs in a bad light, they embraced the results and achieved new levels of program effectiveness. As a final note, these programs increased their coverage by 20 percentage points during the

period of the OR project; the average CPR increase for all other programs in the country was less than 4 percentage points during the same period.

The total cost of this project was \$85,000 for all phases.

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**PART II**

**ADDRESSING THE FAMILY PLANNING PROGRAM CHALLENGES  
OF THE 1990s THROUGH OR**

## 5. THE CHALLENGE OF THE NINETIES: FAMILY PLANNING DIRECTIONS AND THE ROLE OF OPERATIONS RESEARCH

Dawn Liberi

Agency for International Development

### INTRODUCTION

This paper summarizes the Agency for International Development's (A.I.D.'s) family planning program priorities for the 1990s and the role of operations research (OR) in accomplishing those priorities. It touches on four major topics:

- The A.I.D. Services Division's strategic framework for the 1990s
- Application of this framework to analyze various levels of consumer demand and program development
- Principles of service delivery for the 1990s
- Strategic themes for OR and evaluation

### STRATEGIC FRAMEWORK FOR THE 1990s

During the course of the past year, the Services Division of the Office of Population, in conjunction with the Cooperating Agencies (CAs) with which we work, completed a strategic planning process. This process has resulted in a document entitled *Preparing for the Twenty-first Century: Principles for Family Planning Service Delivery in the Nineties* (Destler et al., 1990). Why did we conduct this strategy-building process? Why collectively engage in a process that may be difficult, and may challenge the way we currently view the world and our role in it? The answer is simple: because we cannot afford not to.

The future demand for family planning services will outstrip even our most optimistic estimates of future resources. The costs of meeting this demand will rise dramatically, and resources will not grow in parallel with the escalating demand. According to projections, the annual need for resources from host country governments and donors is likely to rise from \$2.3 billion in 1985 to \$5 billion in the year 2000, and to about \$7 billion in 2010. But resources are projected to grow only to \$3.6 billion by the year 2000.

Thus there will be an annual gap of \$1.4 billion. How can this gap be filled? International donors may increase their resources some, but the significant changes in program resources must come from three other sources: greater program efficiency, increased participation of host governments, and involvement of the private sector. Clearly, OR can be useful in monitoring the resources expended on family planning services, and the resultant impact on program operations.

In addition to resource pressures, the population program continues to face the issue of fluctuating political support. This puts pressure on our programs to succeed--and document their successes with hard data--to maintain a supportive environment. OR can be very helpful in meeting this challenge as well.

To address the increasing demand for family planning services and the need for strategically allocating our resources, the Services Division developed an analytic framework or typology for classifying countries according to levels of contraceptive prevalence. Previously, planning for country programs tended to reflect a regional perspective. Although regional characteristics continue to be important, other variables, such as contraceptive prevalence and socioeconomic status, have been found to be equally important. The typology defines five categories of countries according to prevalence of modern methods of contraception:

- **Emergent:** 0-7 percent
- **Launch:** 8-15 percent
- **Growth:** 16-34 percent
- **Consolidation:** 35-49 percent
- **Mature:** 50+ percent

## APPLICATION OF THE FRAMEWORK

Our analysis indicates that there are distinct patterns of family planning knowledge, supply, and method mix at each level of prevalence. Consequently, the typology helps in taking a macro-level look at program needs and priorities, and in making decisions about resource allocation. While we recognize that there will always be exceptions to these general patterns, we believe, nevertheless, that the typology is useful in guiding our thinking about program needs.

The challenge for all of us will be to help country programs move from one level to the next, and OR can play a key role in this process. Thus it is important to define the program needs at each level.

**Emergent** country programs need to do five things:

- Build support and credibility for family planning
- Train key personnel
- Develop policies and strategies
- Target urban elite groups
- Develop clinical services

Countries in the **launch** category generally need to do the following:

- Conduct training
- Develop management systems
- Increase knowledge and availability of services
- Generate demand through information, education, and communication (IEC) in urban and periurban areas

Programs in the **growth** category need to do the following:

- Stimulate the private sector and increase supply to meet demand
- Add a rural focus

A program in the course of **consolidation** needs to focus as follows:

- Increase program quality to retain acceptors
- Target rural, poor segments of the population

A **mature** country must seek to accomplish four things:

- Ensure availability of contraceptives
- Improve the quality of information and service to increase continuation rates
- Decide which sectors should receive continued government/ donor support
- Determine where to put resources for maximum return

Table 1 shows how the A.I.D.-assisted countries were distributed according to this typology in 1985. As noted, the typology groups countries by prevalence across regions. Thus, for example, Nigeria, Myanmar, Yemen, and Haiti are all in the emergent category, whereas Thailand, Brazil, and several other Latin American countries are in the mature category.

## PRINCIPLES FOR THE 1990s

Six principles for family planning program development in the 1990s will be key to assisting program growth through the stages outlined above.

**1. Service delivery systems must emphasize quality of care.** Quality of care is a critical factor in achieving individual acceptance of family planning and in generating demand. If quality is good, new acceptors will be attracted, users will continue, and contraceptive prevalence will rise. Quality is an important management concern. OR can be very useful to programs in areas such as determining client satisfaction, identifying aspects of quality that count in local programs, and determining the procedures needed to improve quality.

**2. Service delivery must expand to serve larger populations in more cost-effective ways.** Limiting worldwide population growth merely to the level of the United Nations *high* growth projections will require a massive expansion in the service delivery system and in resources. Since public

Table 1. Countries Receiving A.I.D. Population Assistance Categorized by Modern Method Prevalence Circa 1985

Category	Country/Pop. (Millions)			
Emergent	*Nigeria	103.1	Zambia	6.7
	Myanmar	38.0	*Niger	6.6
	*Zaire	31.7	Guinea	6.3
	Tanzania	23.0	*Haiti	6.1
	Sudan	22.6	*Somalia	5.5
	Uganda	15.2	Chad	5.1
	Afghanistan	14.6	*Burundi	4.8
	*Ghana	13.2	Benin	4.2
	Côte d'Ivoire	10.7	Sierra Leone	3.8
	Yemen Arab Rep.	8.2	*Papua New Guinea	3.4
	*Mali	7.6	Liberia	2.3
	Malawi	7.4	Mauritania	1.8
	*Senegal	6.8		
Launch	*Pakistan	99.2	*Bolivia	6.6
	Algeria	22.4	*Rwanda	6.2
	*Kenya	21.2	*Togo	3.1
	*Nepal	17.0	C.A.R.	2.7
	Madagascar	10.6	Congo	2.0
	*Cameroon	10.5		
Growth	*India	781.4	*Tunisia	7.3
	*Bangladesh	103.2	Honduras	4.5
	*Phillipines	57.3	Paraguay	3.8
	Turkey	51.5	*Jordan	3.6
	*Egypt Arab Rep.	49.7	Lesotho	1.6
	*Morocco	22.5	Trinidad/Tobago	1.2
	*Peru	19.8	*Botswana	1.1
	Ecuador	9.6	Mauritius	1.0
	*Guatemala	8.2		
Consolidation	*Indonesia	166.4	*Dom. Rep.	6.6
	Mexico	80.2	*El Salvador	4.9
	Venezuela	17.8	*Costa Rica	2.6
	Sri Lanka	16.1	*Jamaica	2.4
Mature	Brazil	138.4	Chile	12.2
	Thailand	52.6	Uruguay	3.0
	Colombia	29.0	Panama	2.2

\*Bilateral Agreement Country

sector resources may not increase as rapidly as demand, programs will need to be more concerned with cost-effective use of public resources and more innovative in their use of private resources.

**3. Service delivery systems must evolve to meet the needs of a more diverse and younger population, as well as changes in method mix.**

Current analysis suggests that client groups will become younger, more urban, and more diverse over time. Programs will need market research, programmatic and institutional analysis, and more attention to both the contraceptive and informational needs of a population with diverse needs to space their children or to limit family size.

**4. All sectors must play an increasing and collaborative role in family planning service delivery.** It is important to make maximum use of the private, for-profit sector so that government or private voluntary organization (PVO) programs can be targeted to clients with no other access to services. There is presently great variability in how much the public, PVO, and for-profit sectors participate in the delivery of services, and much room for increased collaboration. Collaborative, intersectoral efforts may make it possible to draw on the special strengths of the respective sectors to provide services.

**5. Attention must be directed at developing sustainable services.** The cost of doing business and the potential for eventual sustainability must be addressed in initial program design and in subsequent reviews. Data from OR on the cost-effectiveness of various programming options can be very helpful in this area.

**6. Greater attention must be paid to comparative advantage, strategic position, and managerial efficiency.** Donors and CAs must determine where and how they can be most effective, given their human, financial, and technical resources, and must develop strategies and systems that reflect both these strengths and worldwide needs.

## STRATEGIC THEMES

Strategic themes for OR and evaluation relate to the following questions:

- Where do we stand on relative investment; are we putting our dollar where it most counts?

- Are we helping to move countries through the levels of program development, from emergent, to launch, and finally to the mature stage?
- Are our programs increasing in quality, with broader method mix and with more client-responsive services?
- Are we making programs more efficient, with less wastage of scarce resources?
- Are we institutionalizing the changes we are making so that programs can maintain the gains they have achieved?

It is to answer these questions that we need the help of our colleagues in OR and evaluation.

### Themes for OR

In the past, OR has taught us much about what works in family planning. We still need tests of new interventions as they develop, and much remains to be done in ensuring quality of care and developing client-responsive services. However, we also need help in answering the larger contextual questions, going beyond discrete issues of what works to address whether something is worth the investment. This will require an evaluative judgment.

For example, we now know that employment-based family planning programs work. But are they worth the investment? Are they a better investment than, for example, union- or social security-based programs? As we accumulate OR findings about such issues, we will be able to use these findings as a database from which to make such judgments.

This kind of broader appraisal will require getting a better handle on what things cost. We cannot think in investment terms without this information. In his paper in this volume, Blomberg makes an excellent point about the importance of cost-effectiveness work; we share these concerns.

It is also important that OR activities be a genuine test of a viable program option. It is sometimes tempting to use OR to implement an intervention that is desired subjectively by a local organization, but that is counter to donor policy, or that evidence indicates is not feasible.

### Themes for Evaluation

In the 1990s, renewed emphasis will be placed on project evaluation and the assessment of project impact. In a world of shrinking public sector resources, programs are facing the challenge of the future: to document their impact and to show how they have changed behavior in the countries in which they work. A recently conducted General Accounting Office (GAO) audit pointed up the importance of careful documentation of the results of family planning programs, and the changes specifically attributable to A.I.D. projects. For A.I.D. to meet this challenge, it will need to build on the results of solid evaluation research.

When A.I.D. can look across the findings of such research for a number of subprojects in a country, it will be better able to make qualitative statements about the impact of its programs at the country level. Similarly, when A.I.D. can look across countries and regions and review the findings of evaluation research in substantive areas, such as quality of care, it will be able to synthesize results and determine new technical directions.

A dissemination program should also be implemented to ensure that the results of internal project evaluations become widely available.

### CONCLUSION

Let me close with a story from one of our Wild West jails. A new prisoner was thrown in jail. He immediately started planning his escape. Day after day went by, and his planning became more elaborate. One day he made his escape. Shortly after, he was recaptured and thrown back in jail with his old cellmate. The cellmate told the escapee that he'd tried exactly the same escape route--with exactly the same results. "Why didn't you tell me?" the escapee said furiously. The cellmate replied, "No one publishes null findings."

On that note, I make the plea: Please publish! Publish findings; publish null findings! But publish! Do the research and disseminate the results. The population area offers a rich range of topics. Many methodologies can be used, and a great variety of data is needed for programs to meet the challenges of the 1990s.

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Operations Research: Helping Family Planning  
Programs Work Better, pages 193-198  
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## 6. FAMILY PLANNING PRIORITIES IN LOW-PREVALENCE COUNTRIES

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### INTRODUCTION

This paper looks at family planning priorities in Ghana--one of the countries considered to be in the emergent, or low-prevalence, category in the Agency for International Development's (A.I.D.'s) family planning program typology (see the preceding paper by Liberi). Ghana makes a good case example for the typology, presenting many of the issues outlined for this group of countries.

### BACKGROUND

Given that high population growth rates pose major problems for development, family planning programs have been proposed as one of the major development as well as health inputs for Africa.

During the early 1970s, family planning programs were not readily accepted by African governments because of the belief that Africa had large open spaces, and rapid population increases would not constrain development. Moreover, there was distrust of the motives of those preaching fertility control. They were seen as appendages of colonial rule, wanting to decrease the black race because they knew there was strength in numbers.

However, from 1976 to 1988, a revolution occurred in the thinking of African leaders, which was reflected in policy changes. Since the Kilimanjaro Programme of Action of 1984 and the Mexico International Conference on Population, many African countries have initiated family planning programs and policies to support them.

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Nevertheless, despite these developments, Africa is being left behind in real attainment. Africa typically suffers from the "KAP gap" syndrome, characterized by high knowledge of at least one contraceptive method (rates of about 80 percent are not uncommon) and low use (about 30 percent ever use of contraception and current use of under 10 percent in many countries).

A number of factors have been recognized as contributing to this situation.

First is the assumption of program people that demand is low because Africans have a basically pronatalist attitude. This attitude is seen as resulting from a desire to offset any losses of children due to death, since human labor is required on the farm, and children are seen as an economic investment.

Second, because of the historically poor policy and political environment, program personnel have not translated the current wave of policy change into practical program implementation. Sometimes, hostile media attitudes, coupled with restrictive laws on advertising, have affected programs.

Third, the availability and accessibility of family planning services have been limited, partly because the coverage of health services in general has been low, and partly because family planning programs have not been well integrated into the general health delivery system.

Finally, the quality of services has not been adequate. As a result, clients do not get the care and attention they deserve, and rumors are spread on the side effects of methods.

Ghana's demographic and socioeconomic situation is similar to that of other countries in sub-Saharan Africa. The population growth rate is 3.2 percent; life expectancy is 52 years. Fertility is high, and both married women and their husbands continue to want large families. The desired family size is 5.5 among wives and 7.6 among husbands; the current total fertility rate (TFR) is 6.1. A major contributing factor to high fertility in Ghana is the low level of contraceptive use. According to the 1988 Demographic and Health Survey, although three-fourths of married women in Ghana know of some method of contraception, only 37 percent have ever used a method. Currently, only 13 percent are using a method, with just 5 percent using a modern method (Ghana Statistical Service and Institute for Resource Development/Macro Systems, Inc., 1988). Nevertheless,

there is a potential need for family planning: two-thirds of women want to either space or limit births.

## **FAMILY PLANNING PROGRAM PRIORITIES IN GHANA**

Given the above context, common in many African countries, what are the family planning program priorities for the 1990s for Ghana?

The main objective of the Ministry of Health of Ghana for family planning is to increase the contraceptive prevalence rate from 5 percent to 30 percent by the end of the decade. This is to be achieved through a number of efforts, summarized below.

### **Ensuring Availability and Accessibility of Family Planning Services**

*Assumption: that demand exists, and communities will participate in family planning programs.*

It has been established that the prevalence rate increases with accessibility of services. It has also been established that clients must have access to a variety of sources of service. The concern now is what types of sources are culturally appropriate and acceptable. Some options are use of traditional birth attendants, traditional healers, market women, chemical sellers, taxi drivers, church organizations, and private maternity homes. Operations research (OR) can help identify the most appropriate outlets for family planning, and the way community participation can best be effected.

### **Ensuring Quality of Service**

*Assumption: that rumors originating from health workers affect family planning programs.*

The framework for ensuring quality of service covers providing a choice of methods; providing adequate information, especially on side effects, to minimize rumors; ensuring the technical competence of providers; and ensuring continuity of use. Program elements involve information, education, and communication (IEC); training for all categories of staff; management training; health education campaigns to promote a positive image of staff; and most important, identification of change agents and educational agents (e.g., mothers' groups, women's groups) within the community. OR can provide answers on strategies for ensuring quality.

### **Ensuring a Supportive Political/Policy Environment**

*Assumption: that bureaucrats and administrators hamper family planning programs.*

The elements involved here include special education programs aimed at policy makers. Ghana has a special program called PIP (Population Impact Programme), based at the University of Ghana and involving well-respected academics who have also had political positions in the past. They provide information to politicians in the form of slide presentations, booklets, and newsletters.

Attempts have also been made to include powerful women's groups, such as the 31st December Women's Movement, to carry out population programs. Special educational campaigns have been conducted for media practitioners. Population issues have been included in the training curriculum of journalists.

Another aspect of ensuring the right policy environment involves strengthening the Ghana National Family Planning Secretariat. The Secretariat was founded in 1970 to serve as the coordinating center for all family planning programs. Its effectiveness has declined over the years, and one priority area is to strengthen it. With special funding from the United Nations Fund for Population Activities (UNFPA), a population policy assessment and implementation committee has been set up, with subcommittees on training, research, and evaluation; population information; education and communication; service delivery; and women and other numerable groups. These subcommittees have been charged to study problems related to each of the areas mentioned, with a view to strengthening them. OR can help in evaluating such efforts in terms of integration, cost, institutionalization, sustainability, and use of information.

### **Targeting Services**

*Assumption: that national programs require targeting first.*

Often, the delivery of services in Ghana is organized on a national basis, rather than in stages, such as urban/rural or by age groups. Efforts must be made to provide services that target special groups. A rural focus is more beneficial than an urban one. Moreover, the provision of counseling and services to teenagers is still sensitive, even though everyone recognizes the problem of teenage pregnancy. Therefore, it is important to study strategies for providing information and services to youth. OR can help determine how this can be done. In addition, the importance of male

involvement is being recognized, although the issue of targeting males and ensuring their participation is still unresolved and requires attention. OR can help in targeting these groups on a large scale.

## CONCLUSION

In conclusion, much effort is required in family planning programs to increase prevalence rates. In Ghana, a critical level has been reached at which services can increase rapidly. Taking advantage of this situation requires attention to ensuring availability, improving quality of care, improving coordination, and targeting services.

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## **7. DEMONSTRATING DEMAND FOR FAMILY PLANNING: CREATING A SUPPORTIVE ENVIRONMENT THROUGH OPERATIONS RESEARCH**

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### **INTRODUCTION**

This paper focuses on sub-Saharan Africa and the role played by operations research (OR) in creating a supportive environment for the development of large-scale family planning service delivery programs. OR as applied to family planning originated in the early pilot projects conducted in Thailand, Taiwan, and Korea in the late 1960s. Small studies in these countries tested the receptivity of prospective clients to family planning; the importance of the findings far exceeded the size of the studies. In addition to pilot projects conducted in such settings as Potharam (Rosenfield, 1971), Taichung (Freedman, 1969), and Koyang-Kimpo (Ross et al., 1969), which originated what has become known as the community-based distribution (CBD) model, there were also notable experiments with other models of service delivery. For example, small-scale postpartum family planning programs implemented in such settings as Chulalongkorn and Siriraj Hospitals in Bangkok (Rosenfield, 1972) provided a body of experience that propelled the development of broader programs (see Castadot, 1975). Such straightforward studies demonstrating demand for modern contraceptive services facilitated the development of national family planning programs in these Asian countries in the 1970s.

This on-the-ground approach to generating interest and support for family planning service delivery through pilot projects was quickly transferred to Africa. Postpartum projects were initiated in Kenya, Ghana, and Nigeria in the early 1970s (Ross, 1971). By the mid-1970s, the Danfa pilot project in Ghana was a fully operational experiment to test the use of traditional birth attendants within CBD (University of Ghana Medical School and UCLA School of Public Health, 1979). With few exceptions,

however, these early projects had little lasting impact. Most of Africa entered the 1980s with neither progressive population policies nor family planning programs in place.<sup>1</sup>

In the 1980s, there were increasing efforts to apply OR to the problems of service delivery start-up in Africa. For the most part, small studies similar to the pilot projects that stimulated program development and policy formation in Asia more than a decade earlier were undertaken. As larger-scale family planning programs developed, OR was used to solve specific service delivery problems encountered. For example, OR studies within replications of CBD pilot projects in Sudan and Zaire focused on supervision (Ali Ahmed, 1987) and cost-effectiveness (Bertrand, 1986), respectively. However, given the enormity of the problems faced, most studies undertaken in Africa to date have aimed simply to demonstrate that family planning services are feasible and acceptable.

Clearly there will be room for more varied applications of OR as interest and effort in developing national-scale family planning programs expand across the continent. Nevertheless, with few exceptions up to the present, the major issue has been that of making family planning services available. In particular, weaknesses in public sector health systems evident in many countries have led OR to develop innovative private sector approaches with potential for broad replication.

In the 1980s, severe economic difficulties, the burgeoning AIDS epidemic, and growing recognition of the health benefits of family planning combined to make modern contraception more visible within national development planning. As family planning efforts move toward the development of national-level programs, the challenge for OR in Africa in the 1990s will be to build on its past experiences to meet future needs.

## **USES AND APPLICATIONS OF OPERATIONS RESEARCH IN AFRICAN SETTINGS**

This paper focuses exclusively on sub-Saharan Africa and draws entirely from experiences of Columbia University in applying OR in that setting. Sub-Saharan Africa is clearly the world's last frontier for family planning service delivery development. Indeed, several notable scholars (see, for example, Frank, 1989 and Locoh, 1985) recently have raised sobering questions about the persistence of high fertility in Africa and cultural constraints to rapid fertility decline.

In addition to extended family structures and ancestral religious traditions that may foster pronatalist values,<sup>2</sup> a range of other factors can be identified that stand as obstacles to the development of family planning programs. For example, the diversity of ethnic groups in Africa serves as a bulwark of pronatalism that has slowed the development of progressive population policies. Similarly, beyond simply indicating the slow pace of modern development, the persistence of low levels of female literacy--often well below 30 percent--leaves largely intact the traditional social norm that attainment of status for women in many African settings is primarily through childbearing. Furthermore, in countries throughout the continent, there is often little infrastructure upon which to build family planning (or for that matter, other development) programs: management is weak, transportation poor, and capital scarce. All these factors are exacerbated by the built-in momentum of unprecedented high rates of population growth. Already, more than 10 million a year are being added to Africa's population by the excess of births over deaths; 30 years from now, this will peak at some 30 million a year.

In the face of this difficult context, pessimism about Africa's prospects for family planning program development and rapid fertility decline is easy to come by. However, despite deep traditions and strong social structures, there is evidence that change may well be on the way. In the last five years, there have been considerable advances in population policies in countries across the continent. Paralleling this development, there has clearly been an expansion of interest and programs in contraception for birth spacing, itself a time-honored tradition in many African settings. Finally, what may well be incipient fertility decline has already been documented in four countries: Zimbabwe (Department of Census and Statistics, Zimbabwe, 1989); Kenya (National Council of Population and Development, Kenya, 1989); Botswana (Lesetedi et al., 1989); and Senegal (Ndiaye et al., 1988).

In the next ten years, national family planning programs will be developed in most African countries. Thus it is important to review what OR has contributed to family planning program development in Africa and what it may contribute in the future.

OR, as practiced in Africa by Columbia University and other organizations, such as Tulane University and The Population Council, can be defined as the application of research to improve program performance, sometimes by testing one or more alternative models or means of delivering services (see Ross et al., 1987). OR is not done simply to measure and assess what has been accomplished in a particular project or program; rather, it concentrates on the processes, as well as products, of a particular

program to yield information useful for service delivery expansion and improvement. From Figure 1 it can be seen that data collection and analysis are constants at the center of OR, providing information to identify and solve service delivery problems. A wide variety of research tools, both quantitative and qualitative, can be and are employed; very often some combination of research methods is used in a single project or study.

It may well be that different types of study designs are best suited to programs at different levels of contraceptive prevalence. In Columbia's experience in Africa, pilot projects to demonstrate that family planning services, once provided, will be used have been the single most important contribution of OR to family planning program development. Clearly, however, as programs develop and prevalence increases, more complicated study designs may be called for (see Table 1).

In the remainder of this paper, specific studies conducted by Columbia in sub-Saharan Africa are described as concrete examples of how OR has contributed to family planning program and policy development in Africa.

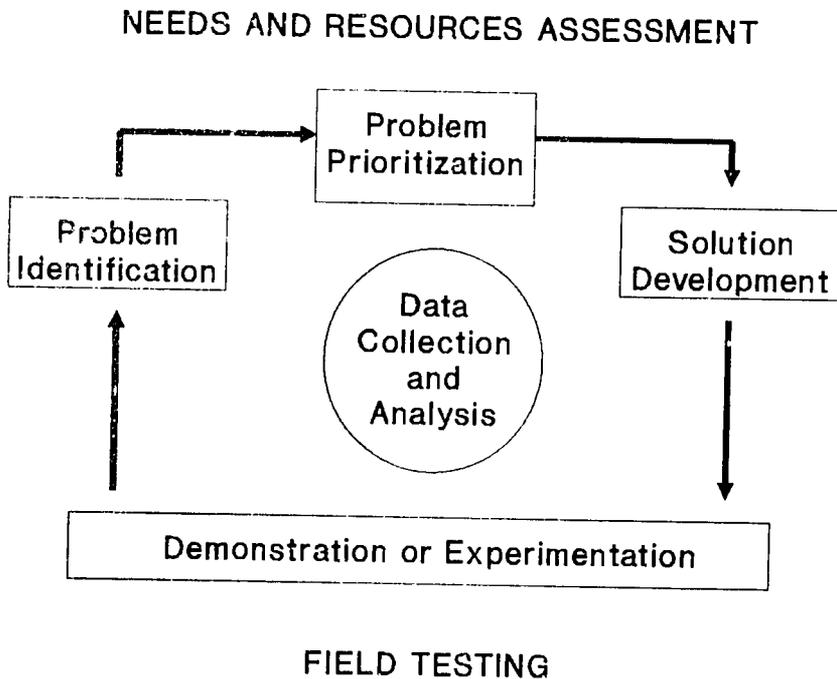


Figure 1. The Dynamic Process of Operations Research

Table 1. Operations Research Designs for Countries at Different Levels of Contraceptive Prevalence

Modern Contraceptive Prev.	Priority Family Planning Program Development Needs	Examples of Appropriate Operations Research Designs	Regions and Selected Countries
0-10%	To demonstrate the feasibility and acceptability of providing family planning services	<ul style="list-style-type: none"> <li>- Preservice diagnostic studies</li> <li>- Small demonstration projects</li> </ul>	Most of Africa
10-25%	To develop efficient systems for making family planning available on a routine basis	<ul style="list-style-type: none"> <li>- Demonstrations often incorporating family planning into broad delivery systems (e.g., government primary health care or maternal and child health, private channels)</li> <li>- Evaluations of existing programs</li> <li>- Development and testing of alternative strategies</li> </ul>	<ul style="list-style-type: none"> <li>- Most of North Africa, plus Zimbabwe, Botswana, Kenya</li> <li>- Some of Latin America</li> </ul>
25-40%	To test innovative strategies for the expansion of coverage; to improve the efficiency of family planning program operations	<ul style="list-style-type: none"> <li>- Comparative tests of alternative delivery strategies</li> <li>- Comparisons of variations on program components to improve performance and reduce costs</li> <li>- In some cases, quasi-experiments and cost-effectiveness analysis</li> </ul>	<ul style="list-style-type: none"> <li>- Most of Latin America</li> <li>- Some of Asia</li> </ul>
40%+	To refine ongoing programs; to improve the cost-effectiveness of service delivery	<ul style="list-style-type: none"> <li>- Problem analysis/solution development studies (e.g., modeling)</li> <li>- Quasi-experimental designs featuring cost-effectiveness analysis</li> <li>- Institutionalization of OR as a routine management procedure</li> </ul>	<ul style="list-style-type: none"> <li>- Much of Asia</li> <li>- Some of Latin America (Colombia, Mexico)</li> </ul>

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## A REVIEW OF OR EXPERIENCES IN SUB-SAHARAN AFRICA

Of the 26 OR projects implemented by Columbia in sub-Saharan Africa between 1980 and 1989, only 9, or 35 percent, were concerned with improving existing family planning service programs; the remaining 65 percent represented the first introduction of a delivery system that was innovative for the given country or region. In all cases, the studies were undertaken with the primary goal of influencing policy and creating commitment to family planning program development. In the process, service delivery models were developed and field tested. Experiences gained in turn provided a basis for improving operational efficiency as programs expanded.

Concern for safety and acceptability on the part of sub-Saharan governments and medical establishments has meant that service delivery models now common in Asia and Latin America, including provision of contraceptives by paramedical personnel, have required retesting. Under the rubric of research, program planners and family planning proponents have been able to initiate such services in both rural and urban settings for the first time, even if on a small scale. At times, and especially early in the 1980s, when family planning remained an extremely sensitive topic in many African countries, universities played the lead role in OR because they were able to legitimize an innovative service delivery approach as research. In addition, the research umbrella provided risk protection for managers as well: if a project were unsuccessful, it could be terminated; if a project were effective and acceptable, managers had the data to support its expansion.

Within the Columbia OR program, the feasibility and acceptability of CBD were tested in seven sub-Saharan countries in both rural and urban areas. Models tested included village teams comprising traditional birth attendants (TBAs) and male volunteers in Côte d'Ivoire (Yao et al., 1988); shopkeepers in the Gambia (Taylor-Thomas, 1989); TBAs in rural Ghana (Adjei et al., 1989) and market traders in urban Ghana (McGinn et al., 1989a); village volunteers in rural Nigeria (Ladipo et al., 1986); market traders in three cities in Nigeria (Ladipo et al., 1990); volunteer "awakers of the people" as motivators and suppliers in Rwanda (Munyakazi, 1989); and village midwives in the Sudan (El Tom et al., 1989). These models have been, or are about to be, incorporated into the programs of local ministries and expanded substantially beyond the original project areas.

In retrospect, perhaps OR in Africa overemphasized rural CBD. Rural populations and programs are not a natural first-line approach for introducing family planning services. Other settings and structures may yield

more immediately positive results in terms of rapid family planning acceptance. For example, the postpartum programs that introduced family planning a generation ago in many Asian countries and even in a few African countries could at this time be tried on a broad scale throughout Africa, particularly in light of heightened concern for maternal mortality issues. However, early emphasis of OR on rural CBD was in large part a product of the times. In the early 1980s, African countries remained tentative about family planning, and embedding services within broader health initiatives was a stepping stone to wider acceptance.

In general, the francophone countries in sub-Saharan Africa have been more cautious than the anglophone countries in developing family planning programs. Consequently, the emphasis of OR in the former countries has been more on developing efficient and effective public sector clinical services than on exploring private sector and other innovative approaches to service delivery. As a result, most studies in these countries have involved integration of family planning within small numbers of existing government clinics in urban settings. In such countries as Burkina Faso (see McGinn et al., 1989b), Niger (see Columbia University, 1988), and Côte d'Ivoire (see Bohossou, 1989), positive results in terms of rapid takeup of services have led to plans for greater expansion of this model. In Rwanda, where clinic-based services already were well established, but contraceptive use remained extremely low, OR successfully demonstrated a model for outreach in rural areas that increased contraceptive prevalence many times (McGinn, 1989). In Senegal, where a family planning service delivery system was also already in place under *Projet Santé Familiale*, an OR study focused on the use of portable computers to collect and analyze clinic-based service statistics data. While strengths and weaknesses in data collection and management were documented by the study, the OR project fell short of its objective to demonstrate successfully how the program could be systematically improved (see Samb and Kelly, 1989).

Interestingly, no single OR project has focused exclusively on laboratory testing, which, as a precondition to prescribing even oral contraceptives in many francophone countries, has been a major obstacle to family planning service delivery. Nevertheless, in a number of settings, information on the extent of unmet demand demonstrated by OR studies has been sufficient to generate policy discussions on how to remove this type of barrier. For example, in Burkina Faso and Niger, knowledge, attitude, and practice (KAP) survey and focus group data showed demand for family planning, including documentation that there was little resistance among males as well as females. Such findings encouraged the respective governments to move decisively to make services more widely available by reducing laboratory test requirements.

A supportive policy environment in many African countries may be the most crucial step toward the larger goal of reducing overall fertility rates and providing services to meet demand. In the case of Chad, growing concern among leaders about population-related issues led during the mid-1980s to a series of positive steps. A Futures Group Rapid II presentation in 1985 played a major role in the political sensitization process. Other international organizations, such as the Johns Hopkins Program for International Education in Gynecology and Obstetrics (JHPIEGO) and the Program for International Training in Health (INTRAH) began training medical personnel. In 1988, the first phase of an OR study was completed with the conduct of the country's first KAP survey and focus group research. Along with other population activities under way, the database thereby provided facilitated further discussion among high-level Chadian officials, in the context of an international conference on population and development.

Given the African emphasis on using OR to introduce family planning over using OR to refine existing programs, much of the technical assistance provided to projects has been in overall program development and management. In the Columbia version of OR, research and the methods used by researchers (surveys, focus groups, observation studies, in-depth interviews, etc.) were means to the end of putting a program in place and documenting what happened so that the service delivery model could be improved and expanded.

Experience in Africa indicates that it is necessary to provide technical assistance at a number of steps along the way. For example, when family planning services were introduced for the first time in a rural area of the Sudan, field-level observations of both health personnel and the village environment were essential components of designing a program that included contraception as well as oral rehydration therapy (El Tadm et al., 1984). Beyond imparting skills in data collection and analysis, technical assistance was also provided in program development and management.

The model tested in the Sudan study subsequently was replicated in another rural region. In the replication, the focus of the project, as well as of technical assistance to make it work, was shifted to supervision, which had been a major weakness in the original project area (Lauro, 1986). Again, substantial technical assistance was provided to design a supervision system that could function effectively within the constraints of the Sudan context. Once the system had been designed, innovative use was made of a data collection instrument, the mini-survey, so that managers at different programmatic levels could be in close contact with the way services were being received (Ali Ahmed, 1987).

An important component of OR is facilitating the progression from the implementation of projects to the practical application of findings (see Koenig and Whittaker, in this volume). Despite initial cautious host country attitudes, two-thirds of the Columbia-sponsored projects that introduced service delivery systems have been expanded or replicated by ministries, local governments, or other agencies. For example, supervisory practices tested in Niamey, Niger will be implemented throughout the country, and in Burkina Faso, family planning services will be integrated with maternal and child health (MCH) in clinics nationally following a successful pilot OR project in the clinics of Ouagadougou.

Success in pilot projects fosters possibilities for policy amplification and policy impact; decision makers in host countries need concrete findings drawn from particular program experiences. In some cases, such has been the eagerness to have data on something that works that even partial results have led to broad-level replication. The most outstanding example of this may be Rwanda, where apparent success in using *abakangurambaga*, or "awakers of the people," as field-level educators for family planning in a pilot study area led to a programmatic decision to train 17,000 *abakangurambaga* to conduct similar efforts throughout the country (Munyakazi, 1989).

## DISSEMINATION OF OR FINDINGS

The effective application of OR for policy or program change in Africa has depended less on the rigor of the methodology than on who participated in the conduct of the study and how the results were disseminated. Few of the essential partners in OR in Africa have been skilled researchers, and simplicity of design, intuitively logical methods, and relatively low technology have enhanced the probability that findings will indeed be used. This observation does not denigrate the abilities of managers and policy makers. It recognizes that they are not passive recipients of research, but in the best circumstances are active participants in a field that is not their major area of expertise. Computer applications are certainly not excluded; they have been used extensively in sub-Saharan Africa, with equipment and training provided by the Columbia OR program. What is excluded is data collection and analysis that serves academic but not programmatic and policy ends.

Dissemination of information from OR projects must remain a high priority. In Africa especially, OR is needed not so much for the final results of comparative strategies of service delivery, but more for the ideas, directions, suggestions, hints, and encouragements that may emerge from various studies. It is the process of program implementation that must be

captured and transmitted through OR, not just the tidy results of research focused on one particular service delivery variation.

In Columbia's experience, written reports of study findings have been only a useful adjunct to decision making. More important in many instances has been the opportunity provided by OR findings to hold broad-level policy and program discussions in a forum that has encouraged interaction and exchange of ideas. In Nigeria, for example, after rural village and urban market contraceptive distribution systems demonstrated the usefulness of these procedures, a series of workshops was held that generated interest nationally and laid the foundation for developing similar programs in other locations. In Niger, the research findings discussed at a conference convened for that purpose promoted recommendations by the participants that included decentralization of services and a test of CBD, and this in a country where, only three years before, contraceptive distribution by midwives was controversial. Similarly, in Ghana workshops held periodically during the course of an OR project brought together program managers, health ministry officials, bilateral and international donor agency representatives, and others active in the public and private sectors to discuss specific study findings. These workshops created understanding and support for a national-level family planning program that is now being implemented throughout the country.

## THE FUTURE OF OR IN AFRICA

OR projects in Africa have provided highly visible evidence of the acceptability of family planning programs. Careful attention to monitoring the process and evaluating the results of these projects has facilitated review of their contributions by those who make decisions about the future of program development and the way services are to be provided. The importance of OR as a means of introducing new strategies in Africa was evident at the 1986 Harare Conference on CBD and Alternative Delivery Systems in Africa, where half of the new delivery strategies presented had their origins in OR projects sponsored by Columbia, The Population Council, or Tulane University.

Beyond introducing new models, OR is oriented to producing policy or programmatic change on a large scale. Although a direct line between a specific OR project and a broad policy or program development may not always be obvious, OR has often been present at the right time in the right place. Through activities in a variety of countries, OR thus has been instrumental in setting the stage for the development of national family planning programs that appears likely to occur in Africa in the 1990s.

What is the future of OR in this context? In the early days of family planning, OR was purely a field operation. Resident advisors in Asian countries worked with local counterparts to develop and implement pilot studies of family planning service provision. As OR developed and evolved, the management of OR programs became more removed from the field. In a corresponding development, OR approaches were influenced by OR as applied in modern industrial settings. Disjunctures arose when such approaches were applied to OR projects being developed to serve the needs of low-prevalence sub-Saharan African countries. At times there was preference, and not always subtle pressure, for executing projects of experimental design. As a result, projects more appropriately designed as single-cell demonstrations sometimes were proposed and implemented as multi-cell experimental research designs. It may be hypothesized that this occurred directly because of distance from the field on the part of both OR program managers and donor monitors. With the transfer of OR program managers to Africa and increasing commitment of U.S. Agency for International Development (USAID) Missions to initiating and supporting family planning programs, OR in Africa may become the more flexible, practically applied tool it was during its Asian origins.

In those countries where interest in family planning is just beginning, pilot demonstration projects in the Asian mode of a generation ago are still most appropriate. While studies to demonstrate the acceptability and feasibility of providing family planning are no longer innovative of themselves, they still may be ground-breaking within particular national contexts. Demonstration projects will always have utility where there are major supply-side barriers to family planning service delivery.

Research provides the cloak for demonstrating how services may be delivered. OR studies to test "new" approaches, for example, oft-repeated studies of paramedical insertion of IUDs, will need to be repeated anew. As programs and problems grow nationally, other fertile ground for OR may be found in new areas, such as developing synergistic approaches to AIDS prevention and family planning promotion.

As programs, and particularly management skills, develop, some of what OR has done and can do may be subsumed under good management practices, particularly good management information systems (MIS). The use of high-quality service provision data to improve program performance will be essential as programs expand nationally. Indeed, MIS may well overtake many of the uses of OR. What a given MIS does not itself cover, specially designed evaluation studies can.

What OR has to offer that is different from MIS and special evaluation studies is a sharp focus on particular problematic issues that can be studied in an experimental mode. Beyond this is the promise of further extension of OR through modeling: a way to experiment without the necessity of complications arising from the real world of field trials. However, whether modeling or field experiments provide viable directions for OR in Africa should be based on objective reviews of OR experiences in other regions. Have programmatic or policy payoffs resulted from the findings of particular experimental or modeling studies conducted elsewhere? Are positive results more a product of the process OR sets in motion than of specific findings generated by particular studies? Do the methodologies of OR provide unique means for improving programs, or is the combination of focused attention and common programmatic sense sufficient to achieve the same end? As programs expand and contraceptive prevalence increases in Africa, appropriate guidance on how OR can usefully contribute may well lie in the experiences OR has had within the more developed family planning programs of Asia and Latin America. In short, has OR, and in what particular form, actually made family planning services more widely and readily available?

## NOTES

<sup>1</sup>With the exception of Kenya and Ghana, which promulgated population policies in the late 1960s, population policies were not of much interest in Africa until the mid-1980s. Even the population policies developed for Kenya and Ghana remained for the most part moribund and forgotten documents until resuscitated within national population committee discussions in the mid-1980s. While most small family planning projects initiated in the 1970s lasted only a few years, the Health for the Family Program of Chogoria Hospital, started in 1974, has continued until the present and has become a showcase of high achievement in terms of contraceptive prevalence.

<sup>2</sup>For the most recent recapitulation of these arguments, see Caldwell and Caldwell, 1990.

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## **8. REACHING MORE USERS: MORE METHODS, MORE OUTLETS, MORE PROMOTION**

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### **INTRODUCTION**

Reaching more people is a goal of family planning programs throughout the developing world, and family planning operations research (OR) can identify ways to attain that goal. In describing the contribution of OR to the goal of recruiting family planning program clients, this paper does not attempt a comprehensive review of the literature, but rather focuses on a few studies that illustrate three proven strategies for client recruitment: (1) adding more contraceptive methods to programs, (2) increasing the number of outlets where services are available, and (3) increasing family planning promotion through mass-media advertising. For each strategy, the paper describes important findings from past research, identifies current themes, and suggests future OR. Finally, the paper examines two relatively new family planning research areas--quality of care and market segmentation--that eventually may expand the number of strategies that are effective in reaching new users.

OR is most often associated with field experiments and demonstration projects, but much of what we have learned about family planning program operations comes from evaluations of ongoing programs and cross-country comparisons. Therefore, to include all the pertinent literature, OR is defined here as broadly as possible. By this definition, OR seeks to improve family planning programs by making them more effective, efficient, and higher-quality. It studies the impact of factors under the control of managers, such as promotion, supervision, training, and logistics, on high-utility outcomes, such as new clients, couple years of protection (CYP), prevalence, fertility change, and cost-effectiveness. Whether it is called OR or some other name, such program-relevant research has been conducted by a wide range of institutions and family planning programs in the developing world.

## ADDING MORE METHODS

No single contraceptive method is appropriate for all users. Each addition to the method mix will add new users for whom earlier contraceptive options were unsatisfactory, and will extend the continuation of previous family planning acceptors as they are afforded the possibility of switching from less to more satisfactory methods.

The impact of adding new methods on program performance and client characteristics has long been a theme of applied research in family planning. A study in Kaoshiung City, Taiwan in the 1960s examined the impact on IUD acceptance of adding oral contraceptives to the program method mix. It was found that the addition of orals increased the total number of program acceptors. As a result of the study, orals were added to the national program (Cernada and Lu, 1972).

Another early example is the large Nirodh project in India (Jain, 1973). In 1968, the National Family Planning Program decided to include Nirodh condoms in its method mix. This move was accompanied by a series of market research studies, consisting primarily of sales analysis and consumer research. The information from these studies was used to inform program policy making and fine tune the sales effort. As a result, condom sales in India increased from about 600,000 pieces per month to about 7 million, and 80 percent being used were Nirodh brand.

Phillips et al. (1988) describe a large field experiment carried out in Matlab, Bangladesh, which showed that broadening the choice of contraceptive methods increases overall prevalence:

Trends in contraceptive adoption rates and continuity of use also reflect operational decisions about contraceptive methods....The... rise in 1977 is attributable not only to accumulated unmet need but also to the household provision of injectables....The 1978 prevalence increase coincided with the introduction of tubectomy services....The addition of the IUD with its...longer duration of use resulted in switching from methods associated with poor continuity.... (p. 317)

Freedman and Berelson (1976) found that the addition of oral contraceptives to national programs in Taiwan, South Korea, Thailand, and Hong Kong, and of condoms in India, resulted in a net increase in contraceptive prevalence. Finally, Jain (1989) reanalyzed data on the availability of methods in 100 developing countries. He found that countries with more available methods had markedly higher contraceptive prevalence, and

concluded that the addition of each new method to the available mix was associated with an increase of about 12 percentage points in contraceptive prevalence.

OR continues to study the addition of new methods to family planning programs. In Latin America, the focus is now on methods, such as vasectomy, that appear to be underutilized in a given program setting. Findings from Colombia's Asociación Pro Bienestar de la Familia (PROFAMILIA, 1989) suggest that the minimum conditions for success in providing vasectomy services include (1) a separate family planning service devoted to men, and (2) specially trained counselors and staff members. Clinics meeting these conditions performed twice as many vasectomies as control clinics that did not segregate patients or specially train staff.

In the near future, NORPLANT<sup>®</sup> will become more widely available for routine program use and should also help boost total prevalence. However, at U.S. \$18 per set of inserts, it is one of the most costly contraceptive methods now on the market. OR studies will be necessary to find ways of making NORPLANT<sup>®</sup> affordable to developing country family planning programs. Relevant issues include the selection, counseling, and follow-up techniques that will increase method continuation, as well as the identification of groups most likely to benefit from NORPLANT<sup>®</sup>. The latter might include women for whom the IUD is contraindicated, such as postabortion women suffering complications and women at high risk of sexually transmitted diseases.

## PROVIDING MORE OUTLETS

In many parts of the developing world, family planning availability is restricted by a lack of outlets. OR has studied questions related to outlets, such as who can provide family planning successfully, and where, when, and how it can be provided.

Many family planning programs once required that all new acceptors be seen by a physician. In settings suffering from a shortage of doctors, this requirement placed an obvious limit on the number of potential outlets. To compensate for the lack of physicians, programs considered using other health professionals, but before such changes could be institutionalized, it was necessary to study the ability of trained paraprofessionals to prescribe methods previously restricted to physicians.

Among the earliest tests of paraprofessionals were projects that trained nurse midwives in South Korea to insert IUDs (Bang et al., 1968). These

projects were followed by studies in other Asian and Latin American countries. The greatest obstacle to the use of paraprofessionals has been the opposition of local physicians. As a result, the safety of paraprofessional IUD insertion is one of the strongest findings in the OR literature. In many countries, nonphysician IUD insertion is still not accepted, and we can expect even more studies to be added to the already large literature on the subject as more programs attempt to expand the availability of family planning. It is also likely that there will be more studies of sterilization and NORPLANT<sup>®</sup> insertion by paraprofessionals.

An important breakthrough for paraprofessional prescription of oral contraceptives was a study conducted in Thailand in 1969 (Rosenfield and Limcharoen, 1972). Auxiliary midwives were trained to prescribe oral contraceptives in four provinces; pelvic examinations were omitted. The measure increased the number of program acceptors by 400 percent in six months with no increase in complications, and method continuation at one year was 76 percent--slightly higher than the continuation rate achieved by physicians. In 1970, the Ministry of Health extended the project to the entire country, increasing the number of pill providers from 350 to about 4000.

Once the feasibility of using nonphysician health professionals to prescribe contraceptives was well established, attention shifted to the possibility of using nonhealth workers to distribute temporary supply methods, such as pills. Community-based distribution (CBD) programs are probably the best known application of this approach. These programs recruit nonprofessionals, usually housewives, to distribute nonclinical methods, such as oral contraceptives, condoms, and spermicides. A large number of studies have measured the impact and cost-effectiveness of CBD or its major variant, household distribution, around the world. In Indonesia, Reese et al. (1978) found that pill continuation rates were higher when the method was obtained in the village rather than from the generally more remote clinics. Acceptably high levels of method continuation at one year also were found in CBD projects in Bangladesh, Colombia, India, and Taiwan (J. Foreit et al., 1978). In several small projects, the introduction of a CBD program was found to produce increases in contraceptive prevalence of 7 to 15 percent in one year, while control areas increased less than 2 percent (Yen, 1976; Kahn and Huber, 1977).

Among the most influential findings from OR on CBD programs is their high degree of cost-effectiveness. CBD programs in the 1970s reported costs per CYP in the U.S. \$2.50 to \$12 range, compared with costs of \$16 or more per CYP in clinical settings (J. Foreit et al., 1978).

The effectiveness of CBD has been well established in Latin America and Asia. Studies of the basic acceptability and effectiveness of CBD are now being conducted in Africa. The Tulane University School of Public Health and Tropical Medicine (1989), for example, is conducting several pilot projects in rural and urban Zaire, and the Columbia University Center for Population and Family Health (CPFH) (1989) worked in CBD in several African countries.

Research has attempted to identify occupational groups that would make successful CBD distributors. Investigators have experimented with groups ranging from traditional midwives to market women. The literature suggests that individuals from almost any group may be extraordinarily successful, but that the typical CBD distributor of one occupation is no more successful than the typical distributor of any other occupation. In addition, targeting a specific group may increase distributor recruitment problems and costs (see, for example, Columbia University CPFH, 1983; Columbia University CPFH, 1989; and Asociación para el Desarrollo e Integración de la Mujer [ADIM], 1988).

Attention has also been given to the individual characteristics that contribute to the success of CBD distributors. Studies suggest that the most successful distributors are those with the same characteristics as the target population. In a study of the Indonesian family planning program, Repetto (1977) found that the most successful fieldworkers were older, married women with limited education. In Mexico, Azcona (1980) also found that older, married women were the most successful family planning and primary health promoters. In an attempt to recruit more male users, a project in Peru tested the impact of the sex of distributors on method mix and client gender. It was found that male CBD distributors distributed about twice as many condoms as female distributors and had many times more male clients. In comparison, female distributors distributed more pills and had more female clients. Importantly, there were no statistically reliable differences by distributor gender in total CYP distributed (Centro Nor-Peruano de Capacitación y Promoción Familiar [CENPROF] and PROFAMILIA, 1990).

Some work has also been done on the effect of outlet location on the productivity of family planning services. A study in Brazil demonstrated that CBD distributors located in public health centers provided more contraception than distributors working out of their own homes or community locations, such as town halls, communal laundries, and day care centers (J. Foreit et al., 1983).

Research on the effectiveness of providing family planning services in the workplace has produced mixed results. Rinehart et al. (1987) catalogued a large number of successful projects around the world. But very modest results are also frequently reported, even from the same region (see, for example, Materno-Infantil y de Planificación Familiar [MIPFAC], A.C., 1988; Centro de Investigación, Educación y Servicios [CIES], 1990). More research is needed to determine whether commonalities can be found among successful or unsuccessful programs.

Within the commercial retail sector, the location of contraceptives has an effect on sales. In Mexico, Promotora de Planificación Familiar (PRO-FAM), A.C. (1988) conducted a project to test how the location of the condom display affected condom sales in supermarkets. Displaying condoms at the checkout counter as well as in the pharmacy section increased total sales four-fold over stores where condoms were displayed only in the pharmacy section. Checkout counter displays made condoms available to customers who entered the store to make other purchases. About 28 percent of men who purchased the method at the checkout counter were first-time condom users, indicating that the location of the display resulted in the program's reaching a new group of users.

The physical and temporal integration of family planning with other services (such as a clinic's offering all gynecological services, or a multi-purpose community health worker) is often advocated for reasons ranging from increased acceptability of contraception to improved cost-effectiveness. However, the impact of integration is also highly situation-specific. Phillips et al. (1984) found that the impact of adding maternal and child health (MCH) services to family planning fieldworker activities varied according to the intervention: some services increased contraceptive prevalence, others had no effect, and still others lowered use. Tuladhar and Stoeckel (1982) found that vertical family planning services produced more knowledge about contraception among the target population than integrated services, but found no differences in method use. Vecinos Peru (1989) found that exclusive family planning clinics in Peruvian Ministry of Health hospitals were much more effective and somewhat more cost-effective than clinics offering integrated OB-GYN and family planning services. The addition of antiparasite medication to a CBD program had no impact on contraceptive distribution (Rodriguez and Valladao, 1985), and the addition of oral rehydration therapy to a CBD program in Ecuador (Centro Médico de Orientación y Planificación Familiar [CEMOPLAF], 1989) produced a temporary decline in contraceptive distribution.

The integration of family planning into pre- and postpartum services may be an exception to the generally negative findings on integrating family

planning with other health services. High acceptance and increased prevalence of contraceptive use have been found in postpartum programs in Honduras (Proyecto de Apoyo a la Lactancia Materna [PROALMA], 1989) and Peru (Instituto Peruano del Seguro Social [IPSS], 1990), while Potter et al. (1987) found that postpartum contraceptive acceptance in rural Mexico was associated with prenatal care and medical attention at delivery. Similarly, in rural Ecuador, women who had delivered in medical establishments were more likely to use modern contraception than women who had delivered at home (Centro de Estudios de Población y Paternidad Responsable [CEPAR], 1990).

In Latin America and Asia, where large delivery systems are in place, the key to increasing the number of outlets lies in making existing programs more efficient so that more outlets can be established without increasing program costs. OR is now demonstrating that important improvements in efficiency can often be achieved through low-cost administrative changes. A study in Brazil (J. Foreit and K. Foreit, 1984) showed that it was possible to increase the number of CBD distributors without increasing supervisory staff by reducing the frequency of supervision from monthly to quarterly. Moreover, the reduction in frequency of supervision led to no decline in the number of new acceptors.

In Bangladesh, Koblinsky et al. (1989) observed family planning fieldworkers to identify cost-effective ways of increasing home visiting. They found it was possible to manipulate work schedules to increase the number of home visiting days from 14 to 19 per month.

## **ADDING MORE PROMOTION**

The most common method of family planning promotion remains interpersonal communication through lectures given by program workers and recommendations by satisfied users. However, the mass media are rapidly becoming the promotional method of choice. (See also Piotrow and Meyer, in this volume).

Studies in the 1960s established that radio and other mass media were effective in reaching target populations with information about family planning. In Taiwan (Cernada and Lu, 1972), a media campaign including radio, newspapers, magazines, mailings, movies, and TV accompanied attempts to make the IUD and oral contraceptives more available. Approximately 42 percent of women surveyed had heard or seen family planning messages in at least one of the mass media. Radio messages were recalled most often, followed by newspapers, mailings, and magazines.

Cernada and Lu propose a two-step flow of information about family planning in which information received from the media is passed on orally to women who have not seen or heard the original spots. They suggest that the indirect effect of placing information in the mass media is as important as the direct effect.

Radio promotion was linked to increases in family planning clinic use in Colombia. PROFAMILIA began radio advertising of clinics in 1969. Depending on the data source and statistical comparisons made, it appears that during the years 1971-72, the campaign recruited approximately 5500 to 8000 new acceptors in 16 clinics (Bailey, 1973).

By the 1980s, television and print media had become more widespread in developing countries, and OR began to examine their effectiveness in promoting family planning acceptance. In Sao Paulo, Brazil, Promocao da Paternidade Responsável (PROPATER) used magazine advertising to recruit vasectomy clients (K. Foreit et al., 1989). The campaign resulted in an increase of 1500 vasectomies per year, or 54 percent more than the precampaign period. The increase appeared to be of long duration, and the total cost per vasectomy performed was estimated at U.S. \$13. PROPATER also recently experimented successfully with television promotion in several Brazilian cities as part of a project sponsored by Population Communication Services of The Johns Hopkins University (Coleman, 1990).

We now know that radio and other media can be successful in recruiting clients. But it is also true that not every media campaign attracts more users to a program. At a general level, we need to know what kinds of messages work best in which settings. For example, there is some evidence that generic messages promoting the health and social advantages of family planning and providing information about the variety of contraceptives available are effective in low-prevalence settings where family planning is a recent innovation (Bertrand et al., 1982), while selective messages that promote specific brands or methods of contraception or specific outlets are effective in higher-prevalence settings (K. Foreit et al., 1989).

Recent studies related to vasectomy promotion provide an example of the kind of information that needs to be obtained about the appeal of specific methods. In Colombia (PROFAMILIA, 1989), it was found that vasectomy seemed to have the greatest appeal to men who showed a

special concern for their wives. In Brazil, the most popular PROPATER magazine ad showed a woman with two daughters with a caption that read, "Now that you have all the children you want, will you stop loving your wife?"

## CONCLUSIONS

OR has shown that many recruitment strategies, such as use of paraprofessionals to provide contraceptive services, CBD programs, and mass-media promotion, are widely generalizable. However, the success of other strategies, such as integration of family planning with other services, is highly situation-specific.

Strategies first developed in the 1960s and 1970s with the assistance of programmatic research projects continued to be fruitful areas for OR in the 1980s. Almost certainly, OR will continue to focus on demonstrating the effectiveness of paraprofessionals and CBD programs in the 1990s, especially in Africa. In areas with well-established family planning programs and/or medium to high contraceptive prevalence, the addition of underutilized and/or new methods, such as vasectomy and NORPLANT<sup>®</sup>, to existing programs will also be a major item on the OR agenda, as will studies to improve program efficiency. Finally, the use of television to recruit users will come to dominate studies on the use of mass media as a recruitment technique, and it is possible that more research will be done on the theme of selecting appropriate family planning messages.

All of the above represent only incremental changes in long-researched subject areas. However, there are signs that in the coming decade, OR attention will also be directed at establishing the effectiveness of two new strategies--market segmentation and quality of care.

## THE FUTURE: MORE MARKET SEGMENTATION? MORE QUALITY? MORE CONTINUATION?

The concept of segmentation is drawn from marketing research. Potential family planning acceptors are treated not as a single homogeneous group, but rather as many groups with different characteristics and needs. Potential users can be classified along many dimensions, including gender, socioeconomic status, place of residence, and reproductive intentions, among others. Recognizing this, family planning programs can launch more effective recruitment campaigns by tailoring their efforts to the needs of these different segments. Programs should identify particular

market segments as priority targets and then design program efforts specifically for those groups.

Increasingly in developing countries, contraceptives are available from multiple sources, including pharmacies, private physicians, Ministries of Health, and private voluntary organizations. If family planning programs are to compete successfully, they must identify new market segments, reduce operating costs, or offer a higher-quality service than their competition.

Some recent examples of OR directed at finding effective approaches to reaching underserved market segments include a survey in Bangladesh to determine the extent of and bases for Moslems' religious opposition to family planning so that a strategy could be developed to address the problem (University Research Corporation, 1988). In Ecuador, a strategy for providing services to indigenous groups in the rural Sierra was tested by CEMOPLAF (1989). The results indicate that there is demand for family planning services in indigenous communities. Two-year acceptance rates of pills, condoms, and vaginal tablets offered through a CBD program averaged 16 percent in eight study areas.

Postabortion women are an obvious underserved market, as their unwanted pregnancies were the result of either nonuse of contraception or method failure. Bulut (1984) conducted an experiment in Turkey showing that high rates of adoption of effective family planning methods could be achieved if postabortion women received counseling and the offer of contraceptives. The experimental group had an acceptance rate of 86 percent effective methods, compared with 45 percent for the controls.

In more developed areas, as age at marriage and women's education increase, adolescent fertility is seen as an important social problem. Townsend et al. (1987) compare the effectiveness and cost-effectiveness of two strategies for providing family planning and sex education to adolescents in Mexico. A community youth program using young volunteers to provide sex education and referrals was compared with integrated youth centers where family planning was available with academic tutoring, recreational activities, psychological counseling, and skills development. The volunteer community youth program was more successful and cost-effective in providing family planning services than was the integrated youth center program.

Quality of care in family planning services can be seen as another marketing strategy. It has been the subject of panel discussions at international meetings; two major private donors, the International Planned

Parenthood Federation (IPPF) and the Pathfinder Fund, have established quality of care committees; and the Agency for International Development (A.I.D.) has included it as a priority topic in recent OR Requests for Proposals.

Bruce (1989 and in this volume) has developed a six-point framework for evaluating quality of care. It includes (1) method choice, the number of different methods offered by a program; (2) provider competence, the technical skill and experience of providers; (3) client/provider relations, the degree to which the client feels positive about the service provided; (4) follow-up mechanisms, the program's ability to ensure continuity of contraceptive use; (5) information given to users, the extent to which clients receive information needed to select and practice contraception; and (6) appropriate constellation of services, or the appropriateness of the context in which the family planning services are offered.

With the exception of the study by Jain (1989) examining the impact of method availability on contraceptive prevalence, there has been little research published on quality of care *per se*. However, studies have been able to identify existing program weaknesses in two areas that may have a direct impact on contraceptive acceptance: provider competence, and client/provider interaction.

In an attempt to determine changes in the competence of CBD distributors in prescribing contraceptives, Colombia's PROFAMILIA surveyed a random sample of its 3400 workers in 1987 (Ojeda, 1988). General competence had improved greatly over 1984 levels as the result of an intensified training program, but distributor knowledge about technical issues, such as contraindications to pill use, the advisability of pill use for women over age 35, management of common side effects, and the point at which to resume taking the pill after a cycle had been completed, remained very low. Several studies have found that patients of physicians are just as likely to have side effects and serious contraindications to pill use as are self-prescribers who obtained their methods from pharmacies (Meashum, 1976; Assistência Médica a Industria e Comércio Ltda. [AMICO], 1986). A recent cross-cultural study of physicians' knowledge of natural family planning methods conducted in four countries revealed actual knowledge to be much lower than reported knowledge (Snowden et al., 1988).

Obviously, diagnosing poor provider knowledge is only half the issue. Programs facing this problem must develop methods of enhancing distributor competence and ensuring that improved distributor knowledge is in turn transmitted to the client. Client/provider relations are often found to be poor in family planning programs. A study of provider-client transac-

tions in India showed that family planning workers had negative attitudes towards clients, tended to lecture and criticize them, and made little or no attempt to understand their needs (Rao, 1977). Also in India, Mishra et al. (1982) surveyed a sample of men and women from a family planning program target population and found that the majority of couples did not find fieldworker visits helpful.

Improved client/provider relations, follow-up mechanisms, and information given to users may both increase client recruitment and improve client continuation. A woman who does not know how to take the pill, a man who does not understand how to use the condom correctly, and a woman with an improperly inserted IUD are unlikely to be either successful or long-continuing family planning users.

This paper has focused on the large literature devoted to recruiting new clients. But recruiting new acceptors is only part of the problem. The long-term goal of most family planning programs is not to recruit clients, but to reduce fertility. Fertility reduction is a function of both contraceptive acceptance and continuation, and once acceptance has reached adequate levels, continuation is the more important component. Increasing the length and effectiveness of family planning use should be a major priority of future OR.

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## 9. INTRODUCING NEW METHODS, POPULARIZING AVAILABLE METHODS, AND ENCOURAGING CORRECT USE AND CONTINUATION

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### INTRODUCTION

The purpose of this paper is to summarize and synthesize what the international family planning field has learned about introducing new contraceptive methods, popularizing available methods, and improving contraceptive use and continuation, with particular reference to the operations research (OR) literature.<sup>1</sup> Doing so is a challenge for several reasons:

- Although family planning programs in both developed and developing countries frequently seek to introduce new methods, popularize available ones, and improve contraceptive use, only occasionally have these efforts involved OR. Oral contraceptives (OCs), condoms, the Lippes loop, and sterilization were introduced into many family planning programs long before policy makers and program managers had heard of OR. Yet this body of practical experience cannot be ignored if our goal is to understand how to deliver family planning services more effectively.
- The process of trying to increase contraceptive use by doing OR yields much more information about the above topics than is contained in the conclusions of particular OR studies. If one is limited to summarizing what specific studies have found, many important insights, perhaps even the most important ones, are omitted. On the other hand, we do not want to ignore the findings of OR studies. When a particular study is relevant, we cite it; if no citation is given, this indicates that the observation is based primarily on practical experience, rather than on any specific research.

- At the time this paper was written, the OR literature was still not easy to access. Fortunately, the Maximizing Results of Operations Research (MORE) Project is working on making this literature accessible. Many studies do not yet have published reports; some even lack basic project documentation. Moreover, the focus of this paper is the OR Program of the U.S. Agency for International Development (A.I.D.). However, there is also a considerable body of literature and experience relevant to the topic of this paper which is outside that program. An example is the field of clinical trials, which often have been a major means of contraceptive introduction.
- Until very recently, few studies done as part of the A.I.D. OR Program have looked in detail at how contraceptives are used. More often, they have focused on outcome measures, such as couple years of protection (CYP), contraceptive prevalence, or cost-effectiveness, rather than on the dynamics of use, including continuation, correct use, and method switching.
- Improvements in program performance can yield improvements in multiple outcomes (introducing a new method, popularizing an old one, or helping people use methods correctly or continue with methods). Thus, changes that yield improvements in one outcome will usually help produce other desirable outcomes, and it therefore will not be necessary to repeat the literature review for each outcome of interest. However, we will distinguish in this paper between (1) introducing new contraceptive methods, and (2) improving and increasing the use of available methods.

Keeping the above difficulties in mind, this paper attempts to assemble insights about the introduction of new methods, as well as efforts to popularize old ones and improve contraceptive use, based on both recent programmatic research and practical experience.

The terms "operations research" and "programmatic research" are used interchangeably in this paper; both refer to research done to improve the performance of family planning programs and increase client satisfaction. We assume that a wide variety of research designs and data collection approaches are appropriate, not only quasi-experimental designs. In citing research, we try to include whatever research is relevant, without being restricted to research supported by A.I.D.'s OR Program. Some attention is given to relevant studies of Family Health International (FHI) since they may be less well known in the OR community.

## INTRODUCING NEW METHODS

Contraceptive introduction may involve either wholly new methods (e.g., NORPLANT<sup>®</sup>) or new versions of old methods (e.g., CuT 380A IUD). It may involve the introduction of modern methods, as well as the introduction (or re-introduction) of natural methods (e.g., the ovulation method) or traditional methods, including breastfeeding.

Contraceptive introduction can be a long and complex process, involving such components as consensus building among donors, policy makers, program managers, and providers; training; logistics; clinical and acceptability research; and information, education, and communication (IEC) activities. The decision must *first* be made whether a method should be introduced, and if the answer is positive, how.

### Should a New Method Be Introduced?

The financial and programmatic impacts of adding a new contraceptive technology must be considered (Gillespie et al., 1989), even though this is a difficult task. The newer IUDs and subdermal implants are cases in point.

Should newer IUDs be preferred, even though they are more expensive than the older, inert IUDs? The newer IUDs have been shown to be more effective in preventing pregnancies. They also have lower expulsion rates. However, they need to be replaced periodically; in contrast, conventional types may be left safely *in situ* until menopause, an important consideration from the logistical point of view. In cases where high expulsion rates or pregnancy rates have been identified as a major problem, it may be prudent to consider introducing the new products. On the other hand, if the program is very short of funds, it may be more rational to stick with the conventional IUDs.

Subdermal implants provide another example. The implants are relatively expensive; just the implants may cost U.S. \$23-25 per user per set of implants for developing countries. Total costs will be greater when clinic costs are added. Therefore, some programs may find it too costly to provide this method on a large scale. Yet in terms of convenience of use, high efficacy, and high acceptability, the implants may be an attractive contraceptive to an otherwise underserved group of people (Thapa et al., 1990). Hence, cost considerations may be partly offset by the desirable features of the method. In addition, the calculus in costing the role of new technologies is complicated by the possibility that their introduction may raise overall contraceptive demand, as well as affect supply. One must also

keep in mind that of total financing costs, commodity costs may be less than the costs of service delivery (Gillespie et al., 1989).

These issues underscore an important point: introducing a new method may involve tradeoffs (such as high effectiveness but high cost, or high effectiveness but more side effects). Providers' accumulated experience and the availability of resources are key factors in the decision-making process, as is attention to results from well-designed and -executed studies on costs, use-effectiveness, and service delivery.

### **What Is Needed To Introduce a New Method?**

Assuming that the above questions have been answered and a decision has been made to introduce a new method, what does the process involve? Contraceptive introduction is often a delicate process. Whereas it may take decades to develop a new method (e.g., NORPLANT<sup>®</sup>), the reputation of a method can be tarnished in a matter of months or years if its introduction is not handled competently. For example, if clients are given incomplete counseling, are not told what bleeding problems may occur, or are not given access to removal, then the method may quickly become unpopular. The Indian IUD program has been cited as an example of unsuccessful contraception introduction (Townsend, 1989). Very recently, there has been concern about NORPLANT<sup>®</sup> programs expanding too rapidly in several developing countries.

Successful introduction of a new method requires planning, coordination, and implementation. It also requires a supportive environment. As noted in Townsend (1989, p. 106), family planning programs are "...systems with many interrelated parts and complex relationships with the social, economic, and political environment as well as with users....the successful introduction of a new contraceptive technology is contingent on the existence of favorable conditions in many parts of the system." The discussion below focuses on what family planning programs and programmatic research can do to facilitate contraceptive introduction, while realizing that these activities are only part of the picture.

A recent paper (Sherris and Perkin, 1989) describes three components of contraceptive introduction (supply, promotion, and surveillance); gives examples from recent experience with introducing NORPLANT<sup>®</sup>; and summarizes the pros and cons of local manufacturing. Rather than duplicate the material in that paper, we assume that the reader is familiar with the process of contraceptive introduction. Instead, we examine lessons learned from OR and practical experience about the roles of do-

nors/governments, managers, the delivery system, providers, users, and research in contraceptive introduction.

**Donors/Governments.** Donors and governments can take important steps to facilitate contraceptive introduction:

- Donors and governments are crucial in establishing a favorable policy and legal climate for introducing a new method. A government may need to give regulatory approval, import approval, tax waivers, and customs clearance. It may need to establish guidelines in areas such as who can provide and receive the method, who will provide funding, and whether health professionals are to attend training courses (inside or outside the country).
- A family planning program must have lead time to prepare for the introduction of a new method. This means that donors/governments should avoid introducing or switching methods on short notice or trying to expand a program beyond its ability to provide good-quality services.

**Managers.** The role of the manager in successful contraceptive introduction is crucial:

- S/he needs interest, optimism, and commitment to introducing the method, and must be convinced that it has at least the potential to improve contraceptive use and client satisfaction. (Finkle and Ness, 1985 and Bertrand et al., 1985 cite examples of lone program managers who contributed to the success or failure of new methods in Malaysia and Zaire.)
- If the method involves a new concept or requires new skills on the part of providers, the manager must be willing to take political and professional responsibility for ensuring that staff are trained and the program delivers the method adequately.
- The manager must be willing to do the planning and coordinating required to train providers, obtain supplies, develop the logistics system, arrange for IEC materials, and maintain quality control.
- The manager must be willing to adapt the program to new technology (Roper, 1987). S/he should be interested in identifying and solving service delivery problems, which will differ according to the particular strengths and weaknesses of each method. OR and its empirical approach can be of considerable help here.

**Delivery System.** The delivery system is also a critical element in the successful introduction of new methods:

- The characteristics of the new method must be matched to an appropriate delivery system. Thus NORPLANT<sup>®</sup> and immediate postpartum IUD insertion require a clinical delivery system, while progestin-only pills can be distributed outside clinics.
- Often, the best way to introduce a method is through a clinical trial with a well-respected clinical investigator. The trial can collect local information on safety, effectiveness, and acceptability, and provide information for local regulatory approval. FHI has almost two decades of experience with using clinical trials as a vehicle for contraceptive introduction. Yet we have also learned that a clinical trial is seldom sufficient for contraceptive introduction, and that there are many other essential institutional and logistical components to be addressed before a new method can become routinely available in a national family planning program.
- The reputation and credibility of the individuals and organizations handling the contraceptive introduction can influence how well the method is accepted by policy makers, managers, other professionals, and opinion leaders.
- Others in the health care system (hospital staff, private practitioners), in addition to the immediate providers, must be informed about the method. Otherwise, they can thwart the introduction of the method and may provide inadequate care should users turn to them (as shown, e.g., in unpublished research by Williamson on Depo-Provera in Bohol, Philippines; also found by NORPLANT<sup>®</sup> researchers).
- The program needs to resist pressures to recruit too many clients and expand too rapidly. Efforts to recruit new users must be consistent with anticipated supplies of the new method and the capabilities of the health care system to meet the demand.
- At the same time, increased use of the new method can be brought about only by increased availability (e.g., more service points, more providers, less restrictive eligibility criteria).

**Providers.** The role of the provider is also essential to the introduction of new methods:

- Providers need to be informed about the rationale for the new method. What advantages does it have that other methods in the program do not have? Will it be worth the trouble?
- Providers need to be prepared for their roles in delivering the new method. They must have clear oral and written information on these roles and on the method itself.
- Provider training (and particularly retraining) may be needed on clinical skills, management of side effects, eligibility, counseling, record keeping, logistics, and IEC. The importance of retraining of providers was shown in an IUD promotion study in Sri Lanka (Fisher and de Silva, 1986).

**Users.** Successful contraceptive introduction requires consideration of the user perspective:

- Users benefit from clear instructions (in understandable oral and written form) about how to use the method correctly and what to do if they experience problems. The Program for Appropriate Technology in Health (PATH) has extensive experience in helping countries develop these kinds of educational material. In some settings, providing information for spouses may also be useful.
- Counseling potential users can increase the use of new methods (including sterilization), even in unfavorable settings (Omu et al., 1989; Gallen and Lettenmaier, 1987). FHI is working with the Bangladesh Fertility Research Programme to determine whether counseling husbands about NORPLANT<sup>®</sup> leads to increased satisfaction with the method among their wives.<sup>2</sup>

**Research.** Research also has a role to play in the introduction of new methods:

- Even while a method is being developed, soliciting the opinions of potential users can be valuable. This is being done extensively by FHI and other organizations in the development of new male condoms and other barrier methods (vaginal ring, female condom).

- Research on acceptability can be useful in determining the potential demand for the method, what kinds of people are most likely to be interested in it, and how much they would be willing to pay for it. This kind of research was conducted for NORPLANT<sup>®</sup> in rural Sri Lanka (Thapa et al., 1989) and Nepal, Bangladesh, Haiti, and Nigeria (Kane et al., 1990), where it was found that many women were interested in NORPLANT<sup>®</sup>.
- IEC research is useful for developing materials for providers, potential users, and spouses, and for planning and evaluating promotional campaigns. PATH has conducted focus group research to help develop materials for NORPLANT<sup>®</sup> and the vaginal ring. FHI and Georgetown University have developed materials for providers and clients on lactational amenorrhea as a contraceptive method.
- Evaluation research can determine whether providers and clients are accurately informed about the method and whether clients' needs are being met. Thus for NORPLANT<sup>®</sup>, are providers willing and able to remove the device? For NORPLANT<sup>®</sup> and copper IUDs, are users being located when the effective life of the device has expired, and how can tracking mechanisms be improved?

### **POPULARIZING AVAILABLE METHODS, AND ENCOURAGING CORRECT USE AND CONTINUATION**

Family planning programs need to deliver effective methods. They also need to help clients use methods more effectively over their reproductive lives--a period of time that can last up to 30 years. As Ross et al. (1989) point out, even when people are using methods with high one-year effectiveness (say, 95 percent or above), large proportions of users will have accidental pregnancies over a 10-year period (see Figure 1). Thus, if a group of sexually active women uses a method with an annual 95 percent use-effectiveness continuously over a 10-year period, at least 60 percent of them will experience at least one unintended pregnancy during that time. Furthermore, most user-dependent methods, as actually used, are much less than 95 percent effective. Thus, 10-year failure rates will be closer to 100 percent.

In developing countries, pills have failure rates ranging from 5-15 percent, much higher than the 2-3 percent found in clinical trials. Other user-dependent methods have even higher failure rates. Early discontinuation is an equally serious problem in most family planning programs. For example,

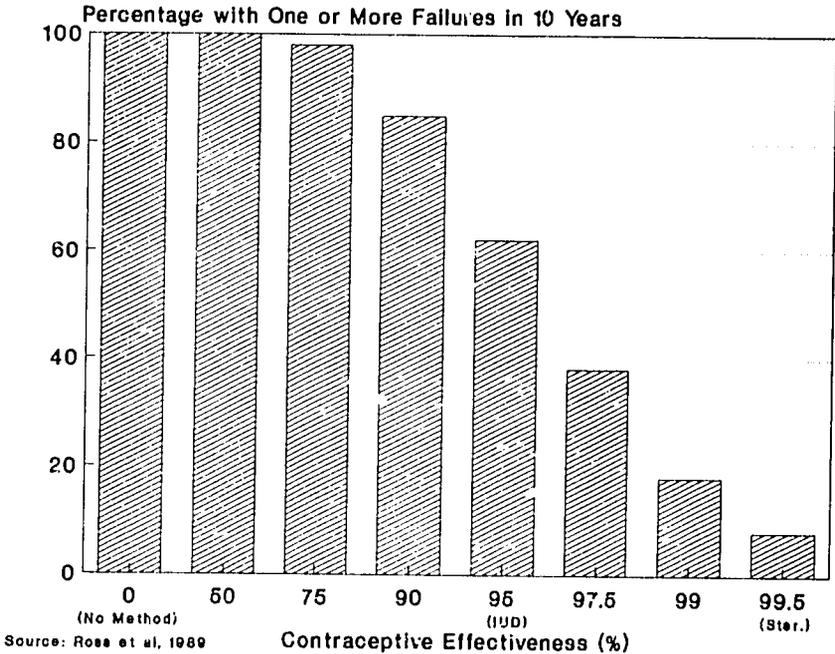
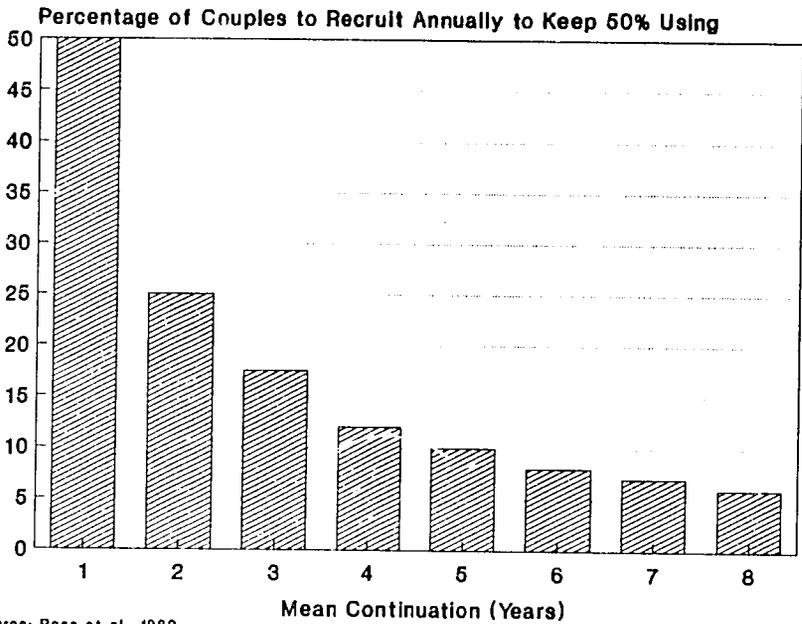


Figure 1. Many Accidental Pregnancies Will Occur Unless Effectiveness Is Very High

as shown in Figure 2, if average length of continuation is only one year, and a program wishes to maintain an overall level of use of 50 percent among couples, fully 50 percent of couples have to be recruited annually. If however, average length of continuation is five years, it is necessary to recruit only 10 percent of couples annually.

Thus, there is little room for complacency about the need for helping couples use methods more effectively, encouraging them to use more effective methods, and trying to improve continuation. At the same time, we need to develop more effective methods.

Until recently, there has been little population-based research on contraceptive effectiveness and continuation. Data from clinical trials are sometimes available, but cannot be extrapolated to the general population. National surveys have routinely collected data on prevalence, but not on effectiveness or continuation. Thus we have been in the position of knowing how many people report that they are contracepting, while knowing little about *how well* they are contracepting.



**Figure 2. A Program's Recruitment Burden Is Reduced If Continuation Rates Are High**

This situation is changing dramatically. Laing (1985) developed a calendar approach that was first used in the Philippines to collect information on both use-effectiveness and continuation. Since then, surveys in Sri Lanka, Peru, and the Dominican Republic (Thapa et al., 1988; Moreno et al., 1990) have used this approach. Bongaarts (1984) developed a simpler approach to measuring contraceptive effectiveness in surveys. In addition, questions for assessing use-effectiveness as well as compliance have been added routinely to recent national Demographic and Health Surveys. OR studies are increasingly likely to examine contraceptive effectiveness and continuation. Finally, the contraceptive use dynamics studies conducted by the World Health Organization (WHO) have investigated contraceptive use patterns in a dozen countries. (For further information about these studies, see World Health Organization, 1990.) Trussell and others are improving measures of contraceptive failure (Trussell and Kost, 1987; Trussell et al., 1990). Interest is expanding beyond modern and single methods to traditional methods and combinations of methods (Thapa and Hamill, 1988; Laing, 1985).

The early results of these studies are now becoming available (see Tables 1(a) and (b)). As more information on use-effectiveness among the general population becomes available, we are learning that some information given by family planning programs is incorrect. For example, family planning providers sometimes tell clients that OCs are more effective than

Table 1(a). Examples of Pregnancy Rates for Pills and IUDs for Selected Developing Countries (first-year life table probabilities)

	<u>Pills</u>	<u>IUDs</u>
Peru		
Core	6-7	3
Experimental	7	0-1
Dominican Republic		
Core	13	4
Experimental	6	4
Philippines	14	13
Egypt	14	4

Table 1(b). Laing Calendar Annual Discontinuation Rates (for all reasons, including failure and desire for pregnancy)

	<u>OCs</u>	<u>IUD</u>	<u>Condoms</u>
Philippines	43	20	77
Sri Lanka	46	17	68

Note: The figures in Tables 1(a) and (b) have been rounded off.

Sources: Peru: Moreno et al. (1990) (lower est.); Goldman (1990)  
 Dominican Republic: Moreno et al. (1990)  
 Philippines: Choe and Zablan (forthcoming)  
 Egypt: Entwisle and Sayed (forthcoming)  
 Sri Lanka: Thapa et al. (1988)

IUDs--99 percent versus 97 percent effective. This statistic is true only in tightly controlled clinical trials. In general practice, IUDs are much more effective than OCs and are usually continued longer. We have also learned that combinations of methods can be effective, and that traditional methods, including breastfeeding, can be as effective as modern methods (Thapa et al., 1988). Moreover, family planning providers have come to understand that people will change methods over their reproductive careers, and that it may take some experimentation for couples to settle on methods that are satisfactory to them and their relationship (Tsui et al., 1989; Kane et al., 1988).

Managers face a wide array of issues related to contraceptive use patterns. A family planning program may be designed to increase the use of a particular method or change the method mix. Program managers may feel that clients have too little choice because the program provides only one or two methods. Clients may be using only ineffective methods, or effective methods ineffectively. The program may be too expensive, with inexpensive methods being underutilized. Or methods currently available may be appropriate for many people, but unpopular.

Below are some of the lessons learned from OR and practical experience about how to improve contraceptive use patterns, looking again at the roles of donors/governments, managers, the delivery system, providers, users, and research.

### **Donors/Governments**

- Donors/governments need to provide strong and consistent commitment to the family planning program, including favorable policies, adequate financing, a positive legal climate, recruitment and training of capable program managers, and support for program managers.
- Switching of brands, doses, and types of IUDs, and other seemingly minor changes, because of donor/government contractual arrangements or policies may affect a family planning program adversely if providers and clients are not prepared for the change.

### **Managers**

- Managers can benefit from programmatic research, especially if they are involved in the research from its earliest stages.

- A highly committed, energetic, and competent manager can make the difference between an effective program and a poor one. Recruiting and maintaining committed managers is one of the most essential tasks of family planning policy makers.

### Delivery System

- To increase contraceptive use, it is essential to increase the availability of methods (e.g., by increasing the frequency of clinic sessions, the number of delivery points, the clinic hours, or the types of providers). OR has found that greater availability leads to greater contraceptive prevalence (McGuire, 1984) and increased use of particular methods, such as IUDs (Ramos et al., 1986).
- When clients are given information and a choice of methods, they may accept a more appropriate method and continue it longer (WHO, 1980). Increasing the number of methods available also tends to increase use (Jain, 1988; Ross et al., 1989).
- Better quality of services improves continuation (IUD studies cited by Treiman and Liskin, 1988; also see Figure 3 for India).
- The use of modern advertising techniques can improve sales of pills and condoms, public awareness of methods, and the number of clients for vasectomy (Townsend, 1989).
- Users may discontinue because their provider has no stock or does not have their particular brand. Improving logistical systems ought to improve this situation, although as Townsend (1989) has pointed out, there is little research on logistics.
- Prices for services/methods should be set at an appropriate level. OR can be helpful in determining appropriate prices. In Bangladesh, for example, a University Research Corporation (URC) study is looking at the impact of charging for government-supplied pills and condoms. The protocol for this study is available from URC.
- Requiring laboratory tests for women wanting hormonal contraceptives is an obstacle to use, does not promote safety, and is excessively costly (University of Dakar and FHI, 1990). Similarly, administrative and medical requirements often prevent women seeking sterilization from getting the operation (Lassner et al., 1986; Janowitz et al., 1985). Examples of impediments are imposing age-parity restrictions and requiring birth certificates or other documents.

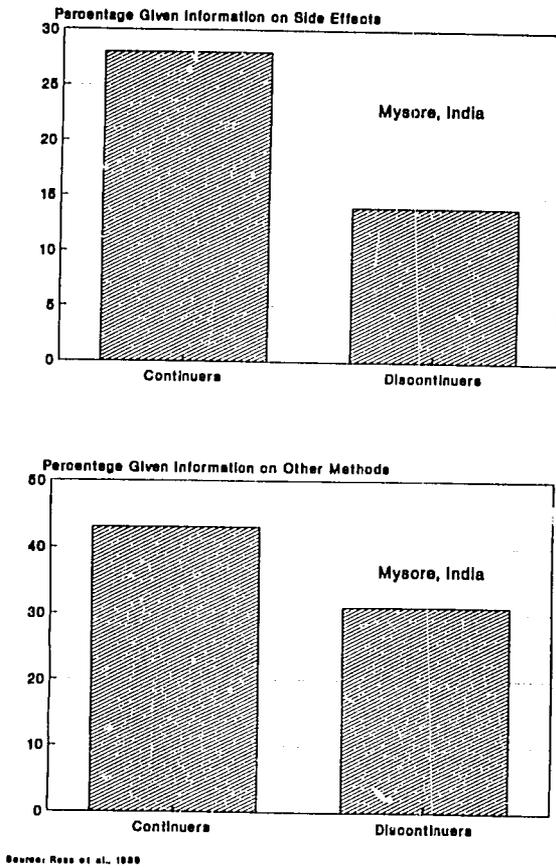


Figure 3. Quality Care Promotes Continuation

### Providers

- Female providers may be more acceptable than male providers to female clients (Repetto, 1977; Bangladesh: Phillips, 1988; Ecuador: Salvador et al., 1987; Nigeria: Ladipo, 1987).
- If providers give women the methods they want, women may continue longer than they would with a less-preferred method (Indonesia: Pariani et al., 1990).
- Refresher training for providers reduces terminations (Fisher and de Silva, 1986).

- Providers are themselves a cause of discontinuation when they recommend that women experiencing side effects terminate the method, or take periodic "vacations" from hormonal methods or IUDs (Janowitz, 1986; Egypt: Loza and Potter, forthcoming).
- Providers seldom help women integrate breastfeeding and family planning, and frequently give combination OCs to breastfeeding women.
- Providers rarely know about natural family planning methods, especially the newer methods (FHI research in the Philippines, Sri Lanka, and Mauritius; Peru: Snowden et al., 1988).
- To improve a program, it may be useful to assess provider knowledge and attitudes regarding the methods being provided. An example is a physician survey in Nigeria that found only modest support for modern methods (Covington et al., 1986).
- Competency-based training of providers can improve method compliance (Townsend, 1989).
- Periodic supervision, especially if it includes on-the-job training, improves providers' knowledge about methods (Vernon and Ojeda, 1988). Increased provider knowledge about methods improves continuation (Keller, 1973).
- Incentives for providers can increase sales (Colombia: Townsend and Ojeda, 1985; Jamaica: Westinghouse Health Systems, 1977).

### Users

- Clients may be more satisfied if they are offered a choice of methods, and information about advantages and disadvantages of different methods (WHO, 1980).
- If clients are treated with respect, they will be more willing to come to family planning clinics (Schuler and Goldstein, 1986).
- If users are given clear information on how the method works, how to use it, and what to expect, they will be more satisfied users (see Figure 3).
- If clients receive incentives, they are more likely to become contraceptive users (India: Stevens and Stevens, 1988; Satia and Maru,

1986). Research has found that incentives for sterilization do not bring in individuals who do not want to be sterilized, but may accelerate the timing of the operation for those who want it. This research also has found that incentives are not associated with later regret (Hapugalle et al., 1989; Thapa et al., 1987).

- If a male method, such as condoms, is provided to female clients, male partners may be less likely to use it than if they themselves received it (Boulos et al., 1989). On the other hand, a study in Iran reportedly found that giving OCs to husbands increased the chances that their wives would use them. More research is needed on how crucial male involvement is in contraceptive acceptance, continuation, and satisfaction.
- Clients who are given (or who buy) 3-6 months' worth of supplies may be more likely to continue than those who are given only a short supply. Similarly, users who can easily get resupplies of their usual brand may be more likely to continue. These issues deserve more research attention.

### **Research**

- Research can be helpful in assessing use patterns, including contraceptive compliance and provider/client knowledge.
- Qualitative research can identify the quality of services, and perceptions of consumers about services and methods.

### **SUMMARY: THE CONTRIBUTION OF OPERATIONS RESEARCH**

Conducting research to facilitate contraceptive introduction, improve method mix, or improve method use is certainly not absolutely necessary. Family planning programs around the world engage in these activities every day, mostly without employing OR. The question is whether programmatic research is helpful in increasing the effectiveness of these activities, and what kinds of research are most helpful. We believe that programmatic research can help in the following ways:

- Introducing new methods
  - Through acceptability research, we can assess the demand for a new method and its niche relative to other methods. We can

understand more about the attitudes and knowledge of providers, as well as of potential and actual users.

- Qualitative and quantitative studies can evaluate the quality of services being provided, including whether nonphysicians can safely deliver particular methods.
- Research can be used to determine whether a new method is attracting new users or switchers (from more or less effective methods), and how a new method affects the quality of care and overall provision of family planning services (Phillips, 1989).
- Popularizing available methods and encouraging correct use and continuation
  - Programmatic research can define the types of errors users are making and why, as well as how widespread these errors are. More micro-level studies of user-dependent methods are needed.
  - Programmatic research can identify real and perceived obstacles to contraceptive use and to continuation.
  - Programmatic research can evaluate efforts to improve service delivery, counseling, logistics, IEC, and pricing policies.

Looking to the future of programmatic research on contraceptive technology, we might cite as model examples of especially innovative and informative studies on the use of contraceptive methods and family planning services. Three recent studies come to mind.

One study (Schuler et al., 1985) looked at how family planning clients from different social classes see family planning facilities in Nepal and how they are treated by family planning providers. It used a simulated client approach and found that lower-status couples, in particular, were afraid of entering family planning clinics, and when they did, they often received poor-quality services.

A second study was conducted on OC use in Egypt (Loza and Potter, forthcoming). It integrated national survey data, focus groups with OC users, and interviews with providers to understand the surprisingly difficult process of learning to be an OC user. OC knowledge of both providers

and users was inaccurate, especially on how many days to wait between cycles.

A third study (Tsui et al., 1990) examined in depth how 300 rural married women perceived their fertility and integrated sexual activity and contraceptive use daily over a month. It showed how complex the phenomena of use, misuse, and nonuse are at the client level.

What these three studies have in common is that they all allow us to see the phenomena of fertility regulation and family planning methods and services from the client's point of view, using both quantitative and qualitative approaches. More research using similar methodologies is needed.

## CONCLUSION

Perhaps the biggest contribution programmatic research can make is that it introduces an empirical and constructive approach to service delivery: How well is the program doing? What are the problems the program and users are having? What are some of the practical solutions? Programmatic research takes seriously the concerns of consumers, and tries to determine how their voices can be heard and appropriate changes made.

## NOTES

<sup>1</sup>A particularly helpful review paper on recent findings of OR relevant to contraceptive introduction and method use is that of Townsend (1989). We have cited it liberally. We also express our debt to John A. Ross, Marjorie Rich, and Janet P. Molzan for their monograph *Management Strategies for Family Planning Programs*, Columbia University, Center for Population and Family Health, School of Public Health, 1989, from which we obtained Figures 1, 2, and 3.

<sup>2</sup>This study is ongoing and is described in FHI's Annual Report for FY90 (October 1, 1989-September 30, 1990), available from FHI or A.I.D.

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## 10. IMPROVING THE QUALITY OF CARE THROUGH OPERATIONS RESEARCH

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### INTRODUCTION

Though improving quality of care has been one of the implicit goals of operations research (OR) programs, it has not been the explicit goal of most OR projects. We believe this can and should change. In most parts of the world, the inadequate quality of services is as much a limiting factor to finding and holding a clientele for family planning services as are inadequacies in coverage and quantity of services. This paper provides a framework for defining quality of care; reviews the evidence that links improvements in quality of services with contraceptive acceptance and continuation; presents five questions managers should address in their ongoing management, and most specifically in OR; and finally, recommends a technical approach OR could use to assist managers in answering these questions.

### WHAT IS QUALITY OF CARE: SIX ELEMENTS IN THE FRAMEWORK

Quality has different connotations for different people. We define quality in terms of the way individuals (or clients) are treated by the system providing services. Using this principle, Bruce (1990) developed a working definition of quality of services that incorporates the following six elements:

- Choice of contraceptive methods
- Information given to clients
- Technical competence
- Interpersonal relations

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- Mechanisms to encourage continuity
- Appropriate constellation of services

These six elements are defined in detail in Table 1.

Quality, like quantity, is a dimension of all programs; whether that quality is termed adequate or inadequate is a judgment (Donabedian, 1980). The six elements mentioned above can be used to make this judgment.

The analytic framework shown in Figure 1 links the above six elements of quality to program effort on the one hand, and to the impact on client knowledge, satisfaction, and behavior, on the other. This framework is unusual as a tool for describing family planning programs, not simply because of its focus on the quality dimension, but also because of its vantage point--the individual client's perspective on the service experience. It asks questions about the program's performance from the client's perspective: What is the received content of the service transaction (whether it takes place in a clinic, in a pharmacy, or in the field) in terms of the six elements? In emphasizing the central importance of the service-giving process from the client's perspective (Zeidenstein, 1980), we assume that client knowledge, satisfaction, and behavior can spring from specific inputs of specific programs. We view the knowledge imparted to clients in their service transactions and their satisfaction with the care they receive not simply as bridges to continuing use, but also as valued end products of conscientious management and caring service.

We wish to engage the attention of a wide range of actors in thinking about quality of care: the policy makers who are responsible for setting the scene so that the quality dimension, like the quantity dimension, is planned and assessed; the direct managers of service provision, whose commitment is crucial if care is to be improved even in the absence of all the desirable logistics and resources; and the researchers and technical collaborators who work with managers in the identification of problems and the development of OR studies.

Over the last 18 months, we have discussed the framework and its practical uses with a variety of family planning technical personnel, cooperating agencies, and managers. In general, they find the framework comprehensive, but they make several observations consistently. The first is an appreciation of the equal emphasis on the technical and interpersonal dimensions of care. This feature of the framework derives directly from Donabedian's (1980) approach to the assessment of health care quality. It

Table 1. Elements Of Quality

**Choice of methods** refers to both the number of contraceptive methods offered on a reliable basis and their intrinsic variability. Which methods are offered to serve significant subgroups, as defined by age, gender, contraceptive intention, lactation status, health profile, and—where cost of method is a factor—income group? To what degree will these methods meet current or emerging needs (for example, of adolescents)? Are there satisfactory choices for those men and women who wish to space, those who wish to limit, those who cannot tolerate hormonal contraceptives, and so forth?

**Information given to clients** refers to the information imparted during service contact that enables clients to choose and employ contraception with satisfaction and technical competence. It includes: (1) information about the range of methods available, and their scientifically documented contraindications, advantages, and disadvantages; (2) efforts to screen out unsafe choices for the specific client, and details on the way the method should be used, its possible impacts on sexual practice, and its potential side effects; and finally (3) an often neglected element, explicit information about what clients can expect from service providers in the future regarding sustained advice, support, supply, and referral to other methods and related services, if needed.

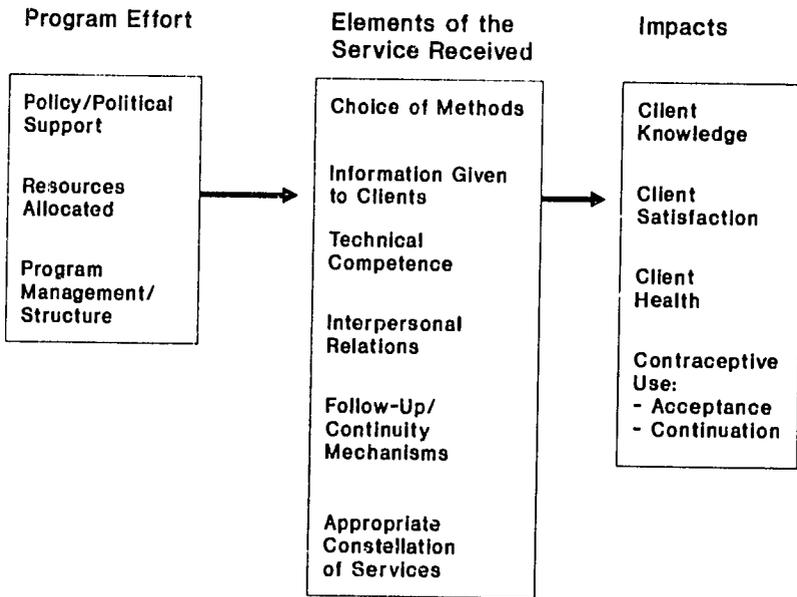
**Technical competence** involves, principally, factors such as the competence of the providers' clinical technique; the observance of protocols; and meticulous asepsis required to provide clinical methods such as IUDs, implants, and sterilization. This element overlaps with "information given to clients" to the extent that clinical information about methods is transmitted

accurately, and clients are appropriately screened for contraindications. It overlaps with "mechanisms to encourage continuity" to the extent that medically indicated follow-up is conducted.

**Interpersonal relations** are the personal dimensions of service, principally the received effective content of exchanges between providers and clients or potential clients. How do individuals feel about the service system, particularly the technical capacity and social attitudes of the personnel with whom they interact? Relations between providers and clients are strongly influenced by a program's mission and ideology; management style; and resource allocation, for example, patient flow of workers to clients, and supervisory structure.

**Mechanisms to encourage continuity** indicate a program's concern and ability to promote continuity of contraceptive use, whether well-informed users manage that continuity on their own or the program has formal mechanisms to ensure it. Continuity can be achieved by means of community media, or specific follow-up mechanisms, such as forward appointments or home visits.

**Appropriate constellation of services** refers to situating family planning services so that they are convenient and acceptable to clients, responding to clients' natural health concepts, and meeting pressing pre-existing health needs. There is no one appropriate constellation of services. Family planning services can be appropriately delivered through a vertical infrastructure, or in the context of maternal and child health (MCH) initiatives, postpartum services, comprehensive reproductive health services, employee health programs, or other mechanisms.



Source: Bruce, 1989, p. 10

Figure 1. The Quality of the Service Experience: Its Origins and Impacts

is essential that managers perceive the interpersonal and technical aspects of service as their ultimate responsibility.

Second, a potential problem in using the framework as a management tool is the overlap among elements; for purposes of analysis, it is necessary to make boundaries where, in practice, they are less distinct. For example, the choice process involves the availability of technologies (element 1); the provision of information to clients (element 2); competence and technical care (element 3); and some basic, positive affective relationship (element 4) between clients and providers such that clients feel they can act voluntarily. For this reason, it may not always be possible to isolate the effect of any one element on the client's behavior.

Another concern of managers is where program resources--the nature of the available facilities, logistics, and so forth--fit in the framework. As observed above, the framework was derived from the client's perspective,

not the manager's. As such, it does not deal directly with all of the activities that precede service giving--commanding resources, staffing, maintaining physical facilities, and the like--all valued precursors to the offering of high-quality service.

A related concern of researchers is the potential overlap between the concepts of accessibility and quality. Hermalin and Entwistle (1985) have proposed a concept of accessibility, that includes some aspects of quality of care. Most managers view the availability of appropriate resources as so linked to care giving that their own framework may be expanded to include these "environmental factors," as was proposed by the Quality of Care Subcommittee of the Agency for International Development's (A.I.D.'s) Program Performance Task Force (Subcommittee, 1990).

In fact, managers might wish to use a combination of concepts to describe their programs: the quantity of service available (number of outlets, hours of operation, members of staff, and so forth); access from the client's perspective (distance to service points, travel time, and cost where this is an important access variable); and the quality of the service rendered.

### **IMPACT ON PROGRAM EFFECTIVENESS OF IMPROVING QUALITY OF CARE**

It is hypothesized here that improving quality of care serves individuals better and indirectly decreases fertility by increasing acceptance, continuation, and thus prevalence of contraception. The magnitude of this impact, however, is assumed to depend on the intensity of the motivation to regulate fertility. Couples or individuals strongly motivated to control their fertility will accept hardship, risk, and poor services to attain their goals. On the other hand, couples or individuals with no interest in spacing or limiting will not change their objectives because attractive services are available. It is those individuals and couples in the middle range whose behavior is most likely to be influenced by the quality of services.

Empirical information linking the six elements of quality to fertility reduction is limited (see Jain, 1989a). A review of small-scale diagnostic studies suggests that positive adjustments in any of the elements (e.g., more choice of methods, better information supported by written materials) has beneficial effects on individuals' knowledge, behavior, and satisfaction (see

Bruce, 1990, for a full review). We illustrate the importance of quality by presenting selected results for two elements: choice of methods and mechanisms to ensure continuity.

There are powerful arguments and evidence to indicate that providing a choice of methods improves program performance and individual satisfaction. The proposition that providing a choice of methods increases the effectiveness of family planning programs is based on the following three main ideas:

- That individuals and couples pass through different stages in their reproductive life, and therefore, over time, their needs and values will change.
- That multiple methods provide for switching for individuals who find their initial choice unacceptable or unhealthful.
- That the availability of a variety of methods makes it more likely that, given erratic contraceptive supplies, at least services for some methods will be available.

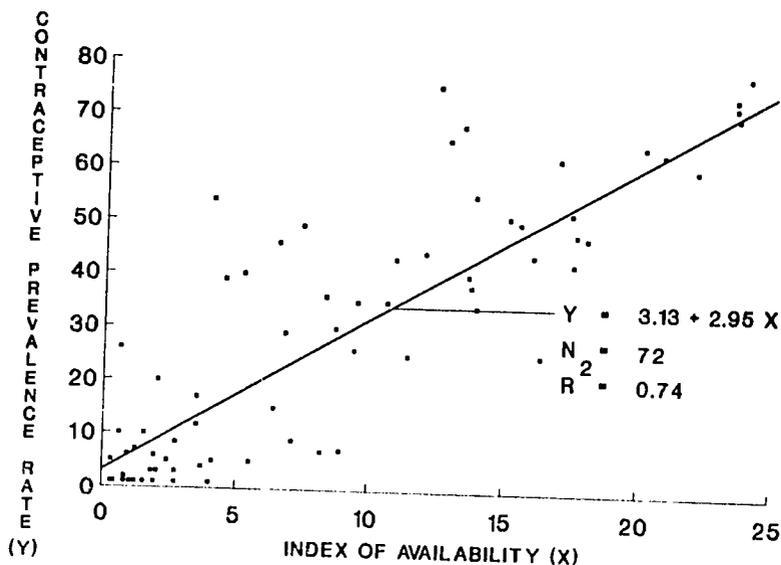
One recent analysis has taken a particularly cogent look at the impact of lack of choice on individuals' contraceptive use. Pariani et al. (1987) followed a group of 2500 new acceptors of various methods in East Java, Indonesia, and found that the continuation rate after one year depended upon whether a client's choice was 'granted' or 'denied'. She found that 14 percent of the women did not receive the method they had originally requested, even though they were not contraindicated for it; of these women, 85 percent had discontinued within a year. The discontinuation rate among the 86 percent of the women who had received the method they requested was 25 percent. Whether a client's choice of method was 'granted' or 'denied' turned out to be more powerful than all other independent variables in explaining the tendency to continue or discontinue the use of contraception.

The literature on the impact of choice on contraceptive prevalence provides support to the following four assertions:

- The addition of a method results in a net addition to contraceptive prevalence. This assertion is based on experience in Hong Kong, India, South Korea, Taiwan, and Thailand (Freedman and Berelson, 1976), and in Matlab, Bangladesh (Phillips et al., 1988).
- One-method family planning programs are inadequate to meet individual fertility goals. This assertion is based on simulation models for IUD experience in Taiwan (Potter, 1971) and for sterilization in India (Jain, 1989a).
- Availability of multiple methods improves continuation of contraceptive use. This assertion is based on follow-up studies in Taiwan (Freedman and Takeshita, 1969) and Matlab, Bangladesh (Phillips et al., 1988).
- Contraceptive prevalence depends on the number of methods available at multiple service points in a country. This assertion is based on the work of Lapham and Mauldin (1985) and Jain (1989a).

The relationship between the contraceptive prevalence rate (CPR) and the availability score (AVAIL) for 72 developing countries, shown in Figure 2, implies that an increase of one point in the availability score, on average, is associated with an increase of about 3 percentage points in the use of contraception. In other words, the widespread addition of one method (four points on the availability score) to the choice of methods available in a country would be associated with an increase of about 12 percentage points in the use of contraception. Controlling for the level of a country's socioeconomic development reduces the effect of availability on contraceptive use from 12 to 6 percentage points, but the effect remains highly significant.

This statistical relationship does not take into account the extent to which it would be feasible to add methods to the delivery systems in poorer countries. It also does not imply that the addition of each successive method will continue to increase the use of contraception under all circumstances. Field studies are required to estimate the effect of method



Source: Jain, 1989, p. 11

Figure 2. Relationship Between Contraceptive Prevalence and Availability of Methods Circa 1982 for Developing Countries

additions on contraceptive prevalence under specific conditions of motivation to regulate fertility and availability of other methods. OR can play an important role in demonstrating the feasibility of method addition and its effects on contraceptive use dynamics.

The proven positive effects of follow-up mechanisms are fairly unimpressive because the literature is thin; however, the negative consequences for program performance of a failure to promote continuity of care can be convincingly modeled. One such model (as in Figure 3) contrasts results of a high acceptance-low continuation program with those of a low acceptance-high continuation program (Jain, 1989a). The latter scenario had a markedly greater impact on contraceptive prevalence, suggesting that programs would have much greater impact if, rather than putting undue emphasis on recruitment, they took better care of their current users. It is

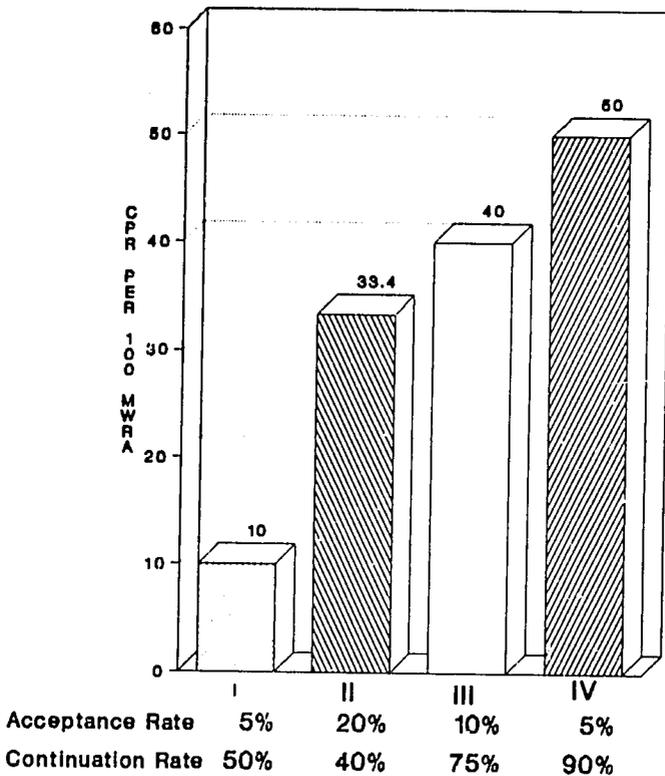
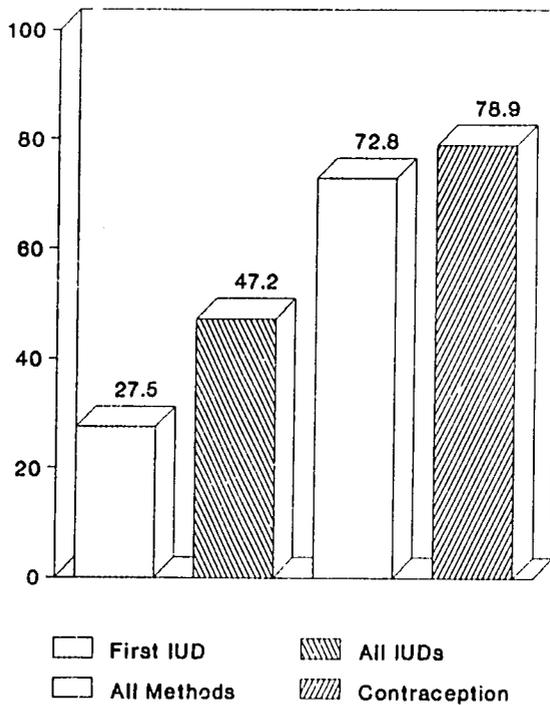


Figure 3. Contraceptive Prevalence Rate Resulting from Various Combinations of Annual Acceptance and Continuation Rates per 100 Married Women of Reproductive Age (MWRA)

important to point out that programs should not try to improve continuation only through long-acting or irreversible contraceptive methods, because dependence on any one such method is likely to be inadequate to meet individual fertility goals or achieve societal goals of fertility reduction. Limiters and spacers are different segments of 'the market', and both need care. OR can confirm or reject these and similar propositions in specific circumstances.

Several methods must be made available to meet the variety of clients' needs, which change over time. Thus, program evaluation should focus on

the total contraceptive experience of clients, rather than on their experience with any one method. A follow-up survey of IUD acceptors in Taiwan showed that the rate of contraception 30 months after insertion increased from 28 percent for the first IUD in place (see Figure 4). If the program were evaluating its performance in terms of first method continuation, this 28 percent of women with the original IUD in place would be seen as less than successful. However, an evaluation approach that followed clients' experiences (easily done in a subsample when resources and time are limited) indicated that, because of switching and changed circumstances, a full 73 percent of clients were using some method of contraception, including a second IUD. Another 14 percent of the women did not



Source: Based on Freedman and Takeshita, 1989

Figure 4. Percentage of Taiwanese Women Using Contraception 30 Months After the Insertion of an IUD or Aborting All Pregnancies During this Period

become pregnant, and therefore may have been subfecund. Only 14 percent of the the women had a live birth; some of these women may also have been successful in achieving their fertility goals because about half of them started using contraception again after the live birth. These women probably accepted the method originally for spacing purposes, rather than for limiting the size of their families. Making multiple methods available and making switching easier thus may reduce method-specific continuation, but can improve individual satisfaction and contraceptive use, measurable by all-method continuation rate. OR can incorporate this client-level focus in impact studies.

In summary, the empirical information that links quality of care elements with client knowledge, satisfaction, contraceptive use, fertility, and health, though limited, strongly suggests that improving quality of services will result in a larger, more committed clientele of satisfied contraceptive users. As mentioned earlier, some of these relationships would be excellent subjects for OR studies.

Over the long term, an expanded base of well-served individuals will translate into higher contraceptive prevalence and, ultimately, fertility reduction. Within private and commercial programs, where clients provide all or partial cost recovery, the laws of the marketplace suggest that better services at the right price will attract more patrons. Within publicly supported programs, both clinic- and community-based, it is likely that improvements in quality of services will result in greater initial acceptance and more sustained use.

## **FIVE QUESTIONS MANAGERS NEED TO ANSWER**

### **Why are we offering family planning services?**

Managers can approach the provision of high-quality services in the same way they approach the delivery of adequate quantity of services--management by objectives. However, doing so entails full clarification of why family planning services are being offered.

The offering of family planning services is variously justified in terms of the right of individuals to control the numbers and timing of their children, and individual and public health concerns. There may also be a high-level demographic rationale for the provision of family planning services among

donors, governments, and nongovernmental organizations. However, if this rationale is incorporated in the program, it may undermine attempts to offer high-quality services, especially when targets are formally set and a trade-off between quantity and quality is presumed. A demographically oriented mission statement requires an (often unrealistic) indication that family planning services are solely responsible for bringing down birth rates. If the entire demographic mission of a country is centered on the operations of the ministries of health and family planning, the pressure on managers and staff can easily result in a series of ill-advised decisions. (For more discussion of this policy dilemma, see Jain, 1989b.) The manager's desire for a (false) sense of control over clients' behavior may compromise both the effectiveness of services and their quality.

A mission statement posed in terms of assisting individuals to implement voluntary choices provides more realistic guidance to mid-level managers and care-giving staff. Staff may not value a demographic mission, and they can hardly see its progress day to day. Rather, their sense of purpose and morale are better supported by a sense that they are performing their tasks competently, and helping clients by serving them courteously, offering them choices, assisting them in switching, and informing them about alternatives. Defining goals in terms of serving individuals well provides a range of intermediate successes for managers.

The health rationale for offering family planning services, if operationalized at the individual level, also offers scope for client satisfaction and a sense of accomplishment among staff. Offering a range of family planning methods or adding a new method may attract new clients who were previously excluded because of their needs (for example, nonhormonal contraceptives or contraceptives appropriate to breastfeeding women). The addition of long-acting but reversible contraceptives provides a healthful alternative to women who might undergo caesarean section to obtain sterilization in political environments where sterilization is frowned upon. Decisions to add new methods, reach new groups, increase access, and provide more healthful alternatives can all be made within the broad goal of offering family planning services to assist individuals in meeting their needs.

In sum, a mission statement posed in terms of macro-level fertility reduction goals may reduce effectiveness of services and sacrifice their quality. On the other hand, a mission statement posed in terms of helping individuals meet their reproductive goals will not only promote attention to

quality, but can also help achieve the macro-level fertility goals. Such a clarification of the mission statement is required at the service-giving level.

**What is the standard of care the program wishes to offer?**

This obvious question is surprisingly difficult to answer for a number of programs. It is not that most programs lack credos and slogans to go by, but most have not identified explicitly or in sufficient detail what it is they want to offer clients in the way of choice, information, competence in the technical aspects of care, courtesy, follow-up, and the like. The simple exercise of specifying the standard of care a program wishes to offer may lead to a recognition, for example, that the interpersonal aspects of care have been neglected, that the technical protocols are out of date or inappropriate to the circumstances, or that management guidelines for implementing standards are insufficient. Thus the process of detailing the quality of care a program wishes to offer may itself be a step toward improving quality of services.

**Has the program prepared adequately to offer this standard?**

When the standard of care is articulated, managers have an opportunity to judge whether they have taken the necessary steps to offer this level of services. Taking the area of informing clients as an example, a program is unlikely to state as its goal "providing insufficient or inaccurate information to clients," yet few programs have developed explicit standards or procedures to ensure that their staff have the minimum accurate information to offer. Competency-based training in technical and interpersonal areas could go a long way toward solving such problems. However, the reasons behind shortfalls in meeting mandated standards of care require careful analysis. For example, one of our staff reported seeing 50 IUD insertions with only one change of speculum. Did this result from a poor understanding of the consequences of asepsis? Was it attributable to a bad decision by staff to process 50 clients in an hour, rationalizing the failure to sterilize the speculum as a concession to time pressure? Would it have made any difference if more speculums were available?

If encouraged to give honest answers, direct service-giving staff are probably able to provide managers with a good deal of information on whether the program is prepared to offer its articulated standard.

### **Are clients receiving the intended quality of care?**

The most formal phrasing of this question has two parts: What is the quality of care the program is providing? and What are clients receiving? Both parts can be answered by observing the client/provider transaction. If there is any one motivational constraint on our ability to improve the quality of care, it is the desire of managers and researchers alike to learn as much as they can from desk audits and conversations with top-level staff. Though the observation of care giving is sometimes perceived as technically difficult and inconvenient, there can be no true knowledge of the quality of service without some observational information. In some respects, the absence of information on direct care giving reflects a classic head-of-office/field problem. The head manager and the field care giver may be at odds simply because they are observing the process from very different perspectives. The care givers need to confront frankly what they can and cannot do for their clients, given their available resources. Managers need to listen and understand the real conditions under which the workers perform. Both need to suspend their own perspectives and assume that of the client. The client's perspective can be understood by following a sample of clients through the service transaction from beginning to end.

### **What is the impact of the care given?**

This end point, the impact of care given, springs from a clear mission statement. While the numbers of contraceptives dispensed, the numbers of service visits handled, and the like may be broadly linked with the quality of service, they are different from the impact of the care given on the individual client. It has been almost 15 years since many programs could determine with high accuracy the number of new clients served or the number of clients who have switched methods. A finer wrinkle on this would be to know what proportion of clients with various reproductive goals (e.g., "I don't want to have any more children" or "I don't want to have any children for the next two years") have received the counsel and technical assistance they need to achieve those goals.

## **THE ROLE OF OR IN ASSISTING MANAGERS TO ANSWER THESE QUESTIONS**

OR studies, as well as the dialogue and management process that attend them, can contribute significantly to improving quality of care. In

the development phase (or in diagnostic studies), OR can bring to light the operating standards of a program and provide empirical assessment of the unit of service rendered. OR can test the feasibility of contrasting approaches to delivering the same unit of care (in terms of quality and quantity) that vary along other dimensions, such as human and fiscal resources required. A sequence of OR projects can systematically seek to define a high-quality standard of care, implement it, prepare a program to offer it, review how successful programs are in offering attendant care levels, and finally evaluate the impact. OR studies that directly manipulate aspects of care giving can include among their dependent variables client-level outcomes in the near and longer terms. Potential contributions of the various types of OR studies are described below.

### Diagnostic Studies

Diagnostic studies can provide a systematic view of policies and the daily operating procedures that characterize programs. Indeed, much that is unwritten is observed, and much that is written may not be implemented by the mutual agreement of managers and submanagers. The recent Kenyan situation analysis conducted by The Population Council's OR program in Africa is an example of this diagnostic process. The Kenyan situation report (Miller and Gachara, 1990) gives a thumbnail sketch of service delivery at 99 points and a glimpse of 48 client/provider transactions. Quick and clean, it provides a baseline of experience that offers a preliminary diagnosis and suggestions for focusing management activity to improve quality. Despite the brevity of the study, it is able to indicate that certain problems appear to be far more in need of adjustment than others. We begin to get a picture of preparedness and service-giving behavior, and the ways norms are translated into care.

In many parts of the world, a series of diagnostic studies of more length and breadth, including an expanded series of observations of client/provider transactions, would be a tremendous service for defining quality of care. Without allowing external agencies to define standards, this process of description itself can reveal to local managers circumstances they may be surprised to find need rectifying. Moreover, a diagnostic study or otherwise achieved description of care giving is a better basis on which to design further OR activities than managers' gut feelings about what is happening in the field. Diagnostic studies can also seed more purposeful dialogue among staff at different levels about what they think of the care they are

offering. In addition, these studies use clients in an unaccustomed role--informants to the program.

### **Feasibility Studies**

Feasibility studies can be used to test the acceptability of a new policy or procedure among staff and/or clients. In such studies, there are intellectual, managerial, morale, and cost dimensions to be considered. An operational study of a service innovation can indicate simultaneously whether the new procedure or constellation of services is the correct one and whether it can be competently implemented. One of the early activities of The Population Council's Program on Operations Research in Family Planning and Maternal-Child Health for Latin America and the Caribbean (INOPAL I) provides an example.

In Peru, the quality of care being provided by community-based distributors was in question. Testing of the workers indicated that their knowledge levels were far below the desired norm. Further, there was a high turnover rate among the workers. As a result, the current three-day training period and limited supervisory system (which had been instituted for cost reasons) appeared to be less than cost-effective, given that half the workers in a given year became inactive. A series of OR studies was undertaken to see what improvements could be made in the training program offered the workers, and in the supervisor's role in identifying lack of knowledge among workers and retraining them. This project was developed as one of a series of experiments that would lead to improved care and ultimately to effects measurable at the client level. The dependent variables of the study were the knowledge levels and post-training of the workers, the comparative effectiveness of group retraining vs. retraining by the supervisor one-to-one in the field, and the turnover rate of new workers (a cost-efficiency and worker satisfaction variable).

### **Impact Studies**

Impact studies can be used to establish the link between managerial decisions and client outcomes. Though in theory a single study could link policy to client-level outcomes, a sequence of studies (as described above) is probably best. The discriminatory power of the OR study increases when the changes and outcomes being studied (e.g., the impact of a new training program on providers' competence) are closely linked in time, and when the impact of very large changes in the system is studied (e.g., an entirely

new information-giving approach). Moreover, the results are most definitive when changes are linked to client-level outcomes over some reasonably long term (12-24 months). At this point, there are no examples of such OR projects. However, since the median length of OR projects is 20 months (24 percent last more than 24 months), it would be fully feasible for many OR projects to incorporate long-term client-level outcomes. The intervention to be tested in such a study would have to include a substantial input or a group of innovations that could be expected to have measurable impact on clients' behavior.

### **SOME RECOMMENDATIONS REGARDING OR'S FUTURE ROLE IN IMPROVING QUALITY OF CARE**

OR activities can have both direct and indirect roles in improving quality of care. At the outset, it would be desirable to expand the number of studies specifically directed to this end. As observed earlier, diagnostic, feasibility, and impact studies can all meet the explicit objective of elucidating and/or improving the quality of care.

In the course of developing OR projects directed at quality of care, hypotheses should be formulated about the impact of one or another experimental change. Wherever possible, these hypotheses should address how the proposed change will affect client-level outcomes. These outcomes should include any of the following: client knowledge, contraceptive behavior, client satisfaction, and client health. Frequently, a positive impact on clients' contraceptive behavior may be listed among the ultimate objectives of a study, while immediate objectives may include studying (1) the impact of policy change on preparedness, (2) the impact of improved preparedness on care giving, and (3) the impact of different levels of care on client-level outcomes. Even in cases where relationships (1) and (2) are being studied, these should be set in the context of an overarching objective or hypothesis with regard to what the proposed changes will ultimately do for the client.

The vast majority of OR projects now, and possibly in the future, do not directly address quality of care, but should have it as an important consideration. We thus offer some suggestions to this end.

### **Quality of Care: "Before"**

Whether an OR project has as an explicit goal improving the quality of care, it should offer a "before" picture in the form of a background statement or as part of the problem statement. This description should incorporate explicit information about the operative policies guiding service, what is known about the practical observance of norms, and the actual unit of care rendered. Background statements often confine themselves to general observations about fertility, urban and rural differentials, cost considerations, geographic differences in service availability, unmet need among population subgroups, and so on. They are useful as far as they go, but need to be substantially invigorated by a picture of the quality of care at the service delivery points or in the geographic communities included in the OR project. We have heard of instances in which top managers have said, "I heard there are too few supplies in the field," or "I hear the staff is rude," or "I have no way of knowing." It seems foolish to develop OR projects in such an environment without having a diagnostic study or some sort of systematic inventory of the quality of services. It is important to note specifics, for example, most clinics are open for their stated hours, the staff work 70 percent of their reported hours, or pharmacists trained to provide information on the contraceptives turn over regularly. If such information cannot be included in the project proposal, the proposal should include a plan for collecting information on the quality of services that exist before the project is implemented.

### **Quality of Care: Viewing Care**

Though the instructional materials guiding OR list qualitative methods (unstructured interviews, focus group discussion, direct observation, content analysis of written materials) among the techniques to be used, the preponderance of OR studies to date have employed principally quantitative measures. We believe this quantitative bias reflects a limited enthusiasm for observation of direct care giving and a preference for focusing on more quantitative outcomes of that care giving--the amount of service delivery, the amount of couple years of protection (CYP), the cost of intervention, and so forth. Even OR activities that deal with interpersonal dimensions of care (e.g., the impact of group counseling vs. individual counseling) provide very scarce material on what happens in those processes. This 'raw material' is valuable knowledge for both fieldworkers and managers. Though there is much methodological ground still to be broken, an increasing number of future OR projects should incorporate observational data

about service delivery points included in the project and selected client/provider transactions.

### **Quality of Care: "After"**

If an OR project begins with a "before" statement on quality of care, whether or not its objective is to improve care directly, it should make some statement about the observed after-effects of the intervention. It is indeed possible that some OR activities may lower quality, while others will lead indirectly to improvements, and that a third, ideally large, group will study direct means for improving quality. A statement of quality of care "after" can be rendered in much the same way as the "before" statement: a discussion of the basic features of service giving in terms of choice, information given, technical competence, interpersonal aspects of care, follow-up, and so forth.

### **Quality of Care: Measuring Impact**

To measure impact in a way that gives a view of quality, it is vital that client outcomes be incorporated in studies wherever possible. Other indicators, such as CYP, may be used to measure the effectiveness of other management subsystems (e.g., number of contraceptive supplies moved, activity levels among staff), but they do not provide a view of the quality of services rendered.

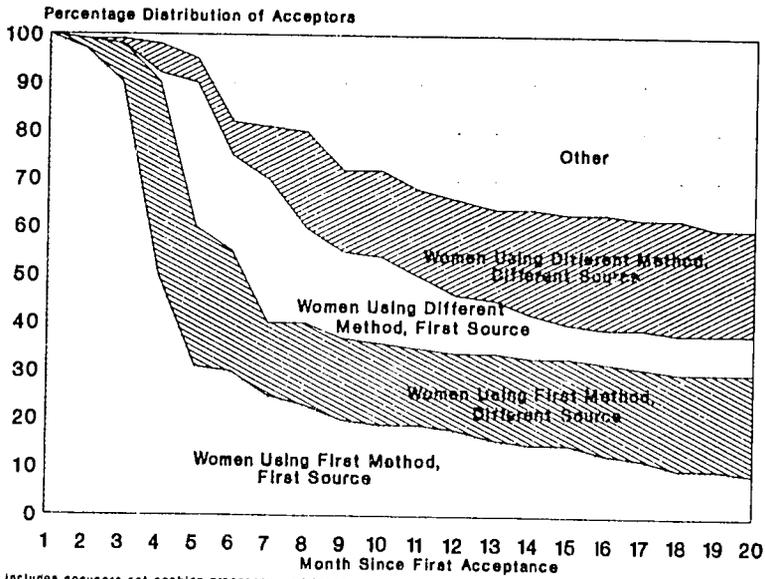
Comparing client outcome data with the conventional program performance measures may help us understand where each indicator has the greatest discriminatory power. A growing incongruence among client-level outcomes and CYP, which is usually estimated from data on distribution of contraceptives, number of IUDs inserted, and number of sterilizations performed, often attests to the great mobility of the client population among methods and service-giving systems. In some cases, the incongruence may be an artifact of unintentional and even purposeful inaccuracies in service statistics that can vastly overstate the contraceptive coverage of the population. It was a luxury of the earliest OR studies (as in Taiwan; see Freedman and Takeshita, 1969), and may remain a fact in some contemporary service settings, that there is essentially one source for contraceptives. When this is the case, one can make more plausible assumptions about the contraceptive status of clients no longer in touch. However, even in such cases, the manager of a service delivery point or a program should want

information at the client level regarding knowledge of methods, method switching, and method continuity over time.

In areas where there is a richer mix of programs and methods, it is likely that some significant proportion of clients will switch among methods and among programs. If a program cannot take account of this, it will understand little about the impact of its care. Take the case, for example, of a high discontinuation rate among new oral contraceptive users in a busy urban clinic. This may represent, in fact, a movement of those users from the clinic to a commercial system of supply precisely because the clinic has done a superior job in preparing clients to use contraceptives and to seek a higher-access/lower-cost alternative. If OR studies do not gather information on client-level outcomes in such cases, the discontinuation may appear to reflect negatively on the program, and calculations of cost-effectiveness may penalize the program when it is in fact doing an adequate or even superior job of informing new users. Of course, the reverse may also be true--that the program is losing otherwise motivated clients because they are poorly handled.

It would be desirable to have charts like those produced by Laing in the Philippines in the 1970s, which offered a longitudinal view of method use and method changes over time. A manager could immediately see the programmatic implications, such as when to follow up on new clients to avoid uncounseled discontinuation of self-employed methods. In the 1990s, such charts should include not only changes in methods, but also changes from one care-giving system to another. A hypothetical example of such a chart is given in Figure 5.

Discussions with OR colleagues have clarified another issue: the role of clients in demanding and receiving high-quality services cannot be ignored. Clients are not always passive receivers of services. Their own characteristics or the social gap between clients and providers may also affect the quality of service given and received. Without going into all the dimensions of this interaction, we believe the focus should be on the most important dimension, incorporating clients' reproductive intentions and evaluating the impact of quality on contraceptive use dynamics. Thus, we suggest that wherever possible, clients be classified on their initial contact according to their stated reproductive intentions as short-term spacers, long-term spacers, terminators, or limiters. (See Figure 6 as an example of the approach in Tunis.) Follow-up studies can use these classifications as a



\*Other\* includes nonusers not seeking pregnancy, and those currently pregnant (planned and not planned).

Figure 5. Hypothetical Scenario of Method/Program Switching

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N° ( ) ( ) ( ) ( ) (0-6)		Date ( ) ( ) ( ) ( ) (7-12)		Age ( ) ( ) (1--14)		Nom:.....		Prénom:.....		
Centre ( ) (15)		Adresse :								
Profession:		Profess. mari:		Niveau d'Instruction : ( ) (16)						
Désire un autre enfant ( ) Non (17) Il le sait pas ( ) (18) Oui ( ) (19) Dans ( ) ans (20)										
Enfants vivants: ( ) (21-22) Age du plus jeune ( ) (23-24) Garçons ( ) (25) Filles ( ) (26)										
Contraception	Pilule	DIU	IVG	LT	Norplant	TCu 380A	Barrière	Rythme calendr.	Autres	Indéterminé
actuelle										
dernière utilisée										
autres utilisées										
Choix 1										
Choix 2										
Choix 3										
Raison choix 1							Origine de l'information :			
Raison choix 2										
Raison choix 3										
Remarques										

Figure 6. Intake Card of Tunisian ONFP Services

guide to explain differences in clients' end-of-project status and interim behavior.

Cost-effectiveness studies, though not centered on quality, must take quality into consideration. Cost is the numerator, but what is the denominator? We must return to the question, "Cost per what?" An important weakness in many cost-effectiveness studies is that they fail to identify the features of a unit of service being rendered. The question addressed by cost-effectiveness work should not be "How can we do this worse at less cost?", but "How can we offer the same unit of service with less managerial overlay, with less in the way of logistical support, and so forth?" The use of CYP as an output indicator of cost-effectiveness studies is, in many cases, a problem of garbage in, garbage out. CYP often indicates how many supplies were moved, but that was also a key input. The input and the output must vary. In cases where CYP is based on data logistic systems, its use in the denominator adds very little; one might as well use cost per 13 cycles of oral contraceptives distributed. We suggest that cost-effectiveness studies include in the denominator the value to clients of the program intervention. Our concern is that a focus on sustainability should not disguise an intention to offer less to the client when we are already concerned that too little is being offered.

## CONCLUSION

In conclusion, the primary role of OR is to bring scientific clarity to the management of family planning programs. Unless OR can describe the prevailing standards of care, evaluate their adequacy, and improve the quality of care being provided, it will fall short of its goals. It is incumbent upon professionals engaged in OR, while assisting managers in solving day-to-day problems, to take a longer view of the overall goal of family planning service delivery--the empowerment of individuals to regulate their own fertility over their reproductive period. The persistent question that researchers must ask when determining what diagnostic and intervention work to undertake through a particular OR project is "What difference could it make to clients if we could solve this problem?"

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## **11. DEVELOPING PARTNERSHIPS AMONG GOVERNMENT, VOLUNTARY, AND FOR-PROFIT SECTORS**

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### **INTRODUCTION**

Quite a bit has been published over the last few years telling us about declines in fertility levels in many parts of the world and about dramatic increases in contraceptive use.<sup>1</sup> What seems very likely is that the demand for family planning will continue to grow, particularly for long-lasting methods such as IUDs and voluntary surgical contraception (see Gillespie et al., 1988). Among those working in family planning, there has been considerable discussion about how organized family planning programs can meet this demand for services during the 1990s and beyond (see Gillespie, 1987; Lewis, 1986; Nortman, 1988).

Much of the debate has centered on how to finance enough services to meet the demand, given the likelihood that there will be little increase in international donor assistance. The issues are complex, and no single solution can resolve the problem. Developing collaborative relationships, or partnerships, among government agencies, private voluntary organizations (PVOs), and for-profit agencies is one way to think about sharing the costs of family planning—either to sustain existing services or expand them to meet underserved populations, as well as to widen the range of methods available. At least in theory, existing resources could be used more efficiently if each participating agency were to contribute what it does best. Through partnerships, government agencies, PVOs, and for-profit organizations should be able to tackle jointly problems that might be too costly for any single agency to undertake. Moreover, in countries where family planning generally or specific contraceptive technologies face political and/or religious constraints, partnerships can enhance legitimacy by helping to break down those barriers.

Unfortunately, there is scarce information on partnerships in the family planning literature. Operations research (OR) projects probably have done the best job at documenting these arrangements, although few OR projects have set out to address specific issues related to partnerships. Nonetheless, the potential of partnerships has not gone unnoticed by family planning providers, and we can see that program managers have purposefully entered into these arrangements to share resources and expand services.

This paper reviews some illustrative examples of partnerships, both as business ventures and as OR projects. It also explores ways OR might help stimulate these arrangements, document their benefits, and assist managers in solving related operational issues.

The first set of examples described below includes business ventures pursued by some of the International Planned Parenthood Federation (IPPF) Family Planning Associations (FPAs) in Latin America. These arrangements are characterized by formal contractual agreements between developing country agencies, in which each agency's role and obligations are defined. In addition, one of the partners holds a contract with an international technical assistance or donor organization, which serves as a mechanism for channeling funds to support activities of the partnership. After reviewing these examples, the paper addresses some policy and operational issues involved in partnerships. A second set of partnership examples, from OR projects, is then reviewed. The paper ends with some suggestions for ways OR can be used to improve partnerships.

## **PARTNERSHIPS FORMED TO SHARE RESOURCES AND EXPAND SERVICES**

For some years now in Brazil, and more recently in Chile and Mexico, the PVO sector IPPF FPAs have recognized the benefits of pooling resources through partnerships to expand family planning services. The FPAs have developed collaborative arrangements both with other agencies within the same PVO sector, and with the for-profit private and government sectors.

### **A PVO/PVO Partnership: APROFA and the Chilean Red Cross**

In 1981, the IPPF FPA APROFA (Asociación Chilena de Protección de la Familia) entered into an agreement with two other PVOs, the Chilean Red Cross and CONIN (Corporación para la Nutrición Infantil). The Red Cross in Chile is a highly respected and influential PVO, with

190 clinics located in areas of extreme poverty, while CONIN specializes in child health and nutrition. The purpose of the partnership was to provide family planning and maternal-child health care in the Red Cross clinics.

At the time of the agreement, local Red Cross clinics were rapidly losing municipal health funding because of an economic recession in the country and a restriction on public funding, yet the demand for health care was great because of the government's inability to sustain its own health services. Up to that point, the Red Cross clinics had not offered family planning or other preventive health care services. APROFA, searching for ways to expand family planning services, possessed the family planning know-how, as well as funds to provide support for key elements of a program, but did not have the resources to establish an expansive clinic network. The Red Cross had the clinic network, and a partnership was formed.

Through this arrangement, the Red Cross contributes its clinics and voluntary staff, and disseminates information in the community about the service. APROFA trains and pays the salary of a nurse midwife in each clinic to insert IUDs and dispense other methods. APROFA supplies the contraceptives, and APROFA staff supervise the midwives and control commodities. Records on expenditures and program statistics are kept and submitted monthly to APROFA by the Red Cross.

APROFA estimates that the value of the Red Cross contribution to the partnership is around U.S. \$790,000 annually, which is about three-fourths of the estimated cost of the program. Because of this partnership, family planning services are now available in 44 Red Cross clinics in 23 cities in Chile. The number of new acceptors in the program has grown from 2,088 in 1981 to 17,464 in 1988.<sup>2</sup>

### **PVO/For-Profit Partnership: MEXFAM and Private Doctors**

Another example of a partnership established to expand services is the community doctors program in Mexico. Under this arrangement, the IPPF FPA MEXFAM (Fundación Mexicana para la Planeación Familiar) works with private doctors of the for-profit sector in urban, marginal areas where there are few organized family planning services, contraceptive use prevalence is low, and at least 20,000 inhabitants reside. Participating doctors sign a contract with MEXFAM to provide family planning services at subsidized prices along with other health services, for which fees are charged according to the local market price. Doctors must maintain accurate accounting and program statistical data, which are submitted to MEXFAM on a monthly basis. After training a doctor, MEXFAM pays his/her office

rent during the first year of the contract, after which the doctor assumes all payments. MEXFAM provides basic office furniture and medical equipment, contraceptives, and a gradually declining guarantee of reimbursement for services to new family planning acceptors. This payment disappears after two years, or earlier if the doctor has been able to achieve total self-sufficiency. Supervision and promotion of the program in the community are also provided by MEXFAM.

This cooperative strategy was initiated in 1986. In 1987, MEXFAM reported over 20,000 new acceptors recruited by the community doctors; by 1988 there were around 90,000 and in 1989 110,602.<sup>3</sup>

### **PVO/Government Partnership: Brazil State and County Government and BEMFAM**

Since 1972, the IPPF FPA BEMFAM (Sociedade Civil Bem Estar Familiar Do Brazil) has been working in partnership with state and local governments to expand family planning services to underserved populations in the Northeast of Brazil. The Northeast Region is characterized by high infant mortality and high fertility. Although contraceptive use prevalence rates are moderately high, they are the lowest of all the regions in Brazil. The population is substantially rural, residing in vast areas difficult for any health service to cover. Because of the cost implications of providing services in the Northeast, and to ensure political support for family planning activities, BEMFAM sought out a partnership with the government.

Under this arrangement, the government provides the facilities and some staff, while BEMFAM trains and supervises staff, supplies and controls commodities, and collects program service statistics. Currently, BEMFAM holds over 1,000 agreements with local and state governments. In 1989, more than 300,000 new acceptors were recruited through this partnership.<sup>4</sup>

### **POLICY AND OPERATIONAL ISSUES FOR PARTNERSHIPS**

The family planning managers involved in the partnerships described above set out to expand services by sharing resources, and it seems they have been successful at increasing the amount of services provided by the participating agencies. Once there was recognition of a common problem and the mutual benefits from tackling that problem jointly, each agency's budgetary and programmatic responsibilities were defined, and services were put in place.

These partnerships surely faced a number of problems in defining mutually agreed-upon medical policies and managerial responsibilities, as well as in setting the service delivery systems in motion. However, not much is recorded about these aspects. Some of what is known is discussed below.

### **Policy Issues**

In the case of the Red Cross-APROFA partnership, both agencies agreed there was substantial unmet need for family planning services in Chile among populations living in extreme poverty. These people ordinarily would have been served by the government program, but because of the government's economic crisis, were being turned away without receiving services. The division of labor and fiscal and organizational responsibilities were worked out to take advantage of the Red Cross clinic network and APROFA's knowledge and expertise in providing family planning.

The kinds of methods to be offered, the kind of person who should provide them, and other medical concerns were resolved fairly easily since Chile already had policies governing these matters, and years of experience with family planning. However, specific norms, such as how often a user of a particular nonclinic method should return for resupply and a check-up, were and remain unresolved policy issues within the partnership that affect program performance. The midwives spend so much of their time on revisits of active users that there is little time left for them to attend new clients. As a result, the number of new clients served more recently by the program has not grown as rapidly as expected.

### **Operational Issues**

Every time a Red Cross clinic in Chile, a municipal government in the Northeast of Brazil, or a community doctor in Mexico wishes to offer family planning services, the relevant FPA must sign a separate agreement with each. BEMFAM, for instance, individually negotiated each of the 1,000 plus contracts it holds with state and local government health agencies. These contracts will soon have to be renegotiated because of recent presidential elections and subsequent changes in policies and personnel, at both the national and local levels. An operational concern for family planning managers entering into partnerships, then, is the number of contractual arrangements needed, and the frequency with which they must be renegotiated or replaced.

In the examples cited above, we have seen that the PVOs frequently offer training; information, education, and communication (IEC)

materials; commodities; and even salaries for key medical staff. Their partners supply the clinics and medical backstopping. PVOs, which depend in varying amounts on international donor funding, are able to offer these services to the partnership because they have that funding. The PVOs are responsible for the way the funds are used and for the performance of the supported projects. Because of this, and because the PVOs described above have brought to the partnership substantial expertise in family planning management, they find themselves having to supervise staff selected and employed by another agency, to monitor contraceptive supplies stored and dispersed by their partners, and to evaluate progress based on service statistics and program expenditure records kept by others. How effectively and efficiently can the program be carried out if many routine functions must continually be negotiated with a partner?

In Brazil, BEMFAM supervisors found that when problems in the field were discovered, it was generally not possible to work directly with field staff to correct them. The supervisors had no direct authority over government staff, and most problems and solutions had to be negotiated and resolved according to government procedures and hierarchical structures. Therefore, some supervisory responsibilities have been shifted over to the government. BEMFAM, however, remains accountable to the donor for the project's performance, and as such retains regional supervisory personnel to oversee both the government's and BEMFAM's field activities.

## **PARTNERSHIPS IN FAMILY PLANNING AND OPERATIONS RESEARCH**

The second set of examples of partnerships reviewed in this paper includes those from OR projects. One of the major functions of OR is to provide managers an opportunity to test a controversial idea in a low-risk setting, as demonstrated by the early pilot studies on community-based distribution (CBD). In addition, OR is often used to determine the most effective and cost-effective way of doing something, such as using mass media, rather than group talks, to promote underutilized methods. OR has rarely been used to field test partnerships, for example, to determine whether one kind is more effective than another, or whether partnerships increase self-sufficiency. Specific service delivery components, such as supervision, which take on increased complexity under partnerships, have not been addressed through OR.

Within the context of OR projects, contractual agreements generally have been formed between international technical assistance agencies and developing country agencies, such as universities or service delivery groups

from different sectors, for the purpose of implementing a field study and conducting the research. The strategy or system being tested often involves the local counterpart's entering into a formal arrangement with some other local agency, or developing a quasi-partnership in which the collaboration is basically coordination between agencies or an ad hoc, informal relationship.

OR projects in which these types of arrangements have been established have been successful at demonstrating the feasibility and acceptability, as well as the cost and effectiveness, of specific delivery strategies for family planning in low-prevalence countries and in factories. They also have been successful at strengthening the private sector's role in family planning service delivery to help alleviate the official sector's financial burden and to widen the range of methods available to a population. These accomplishments are described below.

### **Demonstrating Feasibility**

Using OR, the Research Unit of the University College Hospital (UCH) of the University of Ibadan, with technical and financial support from Columbia University, carried out a field study in the early 1980s to demonstrate the feasibility and acceptance of CBD in Oyo State, Nigeria. The study was designed to document the effectiveness of using semi-literate, nonmedical village volunteers as providers of rural health and family planning services. At the time of this project, the government of Nigeria was committed to family planning, yet many rural Nigerian women did not have access to services.

As part of the service delivery strategy, the University of Ibadan staff called on the Oyo State Ministry of Health (MOH) nurse midwives to participate. A kind of informal partnership with the MOH was formed which took advantage of the existing government network of nurse midwives and local health and maternity centers to provide the needed medical backstopping and supervision for the delivery of CBD services. Personnel from UCH directed and supervised the project. They developed training curricula and trained the nurse midwives. Village workers were selected by village leaders to offer family planning. The MOH midwives were responsible for training the village workers in the health centers, with the assistance of UCH, and for supervising the workers and resupplying medications. Village workers reported on their activities to the nurse midwives, who in turn reported on the field activities to UCH. Through this partnership, it was shown that CBD was acceptable and feasible in Nigeria with provision of modern contraception by village workers. As a result, the Local Area Government in Oyo State formally adopted this service delivery system (see Ladipo et al., 1985).

### **Determining Cost-Effective Ways to Deliver Services**

To ensure that factory workers would have access to family planning, OR was used in Northern Mexico to set up a partnership between a PVO--MIPFAC (Materno-Infantil y Planificación Familiar)--and managers of textile, electronic, mechanical, and other assembly plants to test different strategies for serving plant workers. The research, supported by The Population Council, was aimed at determining the comparative effectiveness and cost of providing orals, condoms, and spermicides free of charge by plant clinic personnel versus volunteer plant workers. Referrals for other methods were available.

As part of the partnership, MIPFAC trained and supervised both clinic staff and volunteer workers, and supplied them with contraceptives. Plant managers contributed by donating production time to family planning activities. Some managers allowed both clinic services and group talks during normal working hours; others agreed to permit clinic services during working hours, but allowed group talks on the premises only after work hours or during slow times.

Contacts between clinic personnel and potential and current users took place at the clinic when the users had to attend for job-related injuries or an entrance medical examination, or simply when they went to the clinic to take a ten-minute break. Clinic staff were able to promote services on the premises, and, during periods of low productivity, group talks were conducted by MIPFAC personnel.

Under the promoter strategy, MIPFAC was permitted to carry out group talks in the plants in order to identify workers who would be trained as promoters. In cases where no initial talks were allowed, other promoters currently working in MIPFAC's CBD program nominated potential candidates among their friends working in the plants. In other cases, clinic staff identified potential promoters. Promoters would contact coworkers while at work, either during breaks or during actual working hours when possible, but contacts also were made after work.

The promoter strategy was found to be more effective, but also more expensive. Perhaps more important for this paper, plant managers learned from this project that family planning can be a benefit to workers, and this lesson led to further cooperative activities between MIPFAC and the assembly plant industry (see Rosenhouse et al., 1988).

### **Sharing the Responsibility for Services**

Some of the few examples where OR has been used to promote partnerships come from Asia, where governments are hoping to share the cost burden of family planning with the private sector. In Indonesia, over 80 percent of family planning clients receive services through the public sector. Two OR projects have been carried out recently to transfer costs for services to the private sector.

The first tested ways for public sector outreach workers to screen and refer clients to private sector nurse midwives. The project's final evaluation showed an increase in the number of users receiving services from nurse midwives, although 28 percent of the users reported being referred by the outreach workers, with most having heard about the nurse midwives from other sources (Richardson, 1989a).

The second OR project in Indonesia tested a network of semicommercial outreach workers delivering pills and condoms to clients for a small fee, and referring them to both public and private service providers. Over the project period, 30 percent of the potential family planning acceptors contacted by the outreach workers were referred to private providers and 70 percent to the government (Richardson, 1989b).

### **Expanding the Range of Methods**

The above Indonesia OR projects also intended to expand the range of methods by forming these partnerships. In the nurse midwife study, the percentage of women using longer-acting methods increased from 13 to 41 percent in a 24-month period.

### **HOW CAN PARTNERSHIPS BE IMPROVED BY OR?**

In this paper, we have seen that partnerships have been formed by family planning managers to expand services, but that not much is known about the policy and operational problems confronted in these partnerships. We do know that the number of people using the services provided by these arrangements has increased. In most cases, however, we do not know whether these arrangements basically substitute for other sources of services or whether, indeed, they are attracting new users of family planning. We do not know whether these arrangements are meeting unmet demand for services, although it seems likely that in the Northeast of Brazil and in the poor areas of Mexico and Chile, people are getting services where alternative services either did not exist or were too expensive.

There is evidence from the MIPFAC project suggesting that factory services, which were provided in part with donor funds, may substitute for other services not financed with donor assistance. OR, then, could be applied to help program managers determine whether a partnership is substituting, and to better target the unmet demand if the substitution is not appropriate.

Clearly in the case of the Indonesia OR studies, the objective was to substitute private sector services for government services. When one sector is asked to play a more active role, OR can be used to document how that sector funds those services and whether it does so without additional reliance on donor funds.

OR might be helpful in assisting family planning managers to identify potential partnerships and in fostering those linkages. In addition, OR could be used to document the advantages of partnerships for the sustainability of programs. Typically, the sustainability issue in family planning has been addressed through promotion of cost-recovery strategies. Cost recovery has its limitations when a program aims its services at poor, disadvantaged populations. Unfortunately, data are scarce on the monetary or in-kind contributions made to the partnerships by the agencies involved in the examples cited in this paper, except for the amount of donor funds contributed by PVOs. It is difficult to quantify how partnerships have contributed to the sustainability of family planning.

Given the increasing demand for long-lasting methods, which in turn implies the need to provide clinic support, OR could promote partnerships to test, on a pilot basis, joint delivery strategies for meeting this demand. Once OR had shown the feasibility, effectiveness, and cost-effectiveness of a partnership for this purpose, the partnership could expand. Through OR, the benefits of partnerships for expanding the range of methods could be documented.

Partnerships face many of the same operational issues as those faced by single-agency family planning programs. But they also have their own set of problems. OR could be useful in helping identify and test solutions to these problems, such as more efficient ways of supervising field activities, or more effective ways of collecting and reporting program and financial data. Knowledge of how to present and analyze data for joint decision making is critical to well-run partnerships, and OR could help foster these skills. In addition, OR could explore the question of whether, once a partnership has been established, it can become more efficient so that the participants can be freed up to form new partnerships.

Finally, many partnerships already exist, yet we know little about them. Lessons learned about them could be published and disseminated to a wider audience in a number of the current population newsletters and bulletins. Experiences could be described without the need for a field study or extensive research, fomenting discussion on the topic and perhaps stimulating agencies to try similar arrangements.

## NOTES

<sup>1</sup>There are many references on this subject, but the reader can consult the country reports for the Demographic and Health Surveys Project produced by the Institute for Resource Development/Macro Systems. Summaries of many of these reports have been published in recent volumes of *Studies in Family Planning*, The Population Council, New York, New York. For a discussion on trends and issues of contraceptive use prevalence, see Mauldin and Segal, 1988.

<sup>2</sup>Information taken from files in IPPF/Western Hemisphere Region (WHR) in New York of financial and progress reports, project proposals, and correspondence submitted by APROFA since 1987.

<sup>3</sup>Information obtained from IPPF/WHR files of various progress and financial reports and correspondence submitted by MEXFAM since 1987.

<sup>4</sup>Information on BEMFAM's program for this paper was obtained from project files in IPPF/WHR.

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## 12. COST-EFFECTIVENESS AND FINANCIAL SUSTAINABILITY IN FAMILY PLANNING OPERATIONS RESEARCH

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### INTRODUCTION

The topic of program sustainability is receiving substantial attention in Agency for International Development (A.I.D.)-funded activities. With generally low levels of funding in population and an ever-growing need for family planning service provision, generating more-sustainable programs is seen as a way of stretching scarce dollars. A concurrent emphasis has been placed on cost-effectiveness, again with the goal of delivering more services per assistance dollar. This paper examines the concepts of sustainability and cost-effectiveness. A general presentation of the conceptual issues is interwoven with examples from the A.I.D. Operations Research (OR) Program.

### THE RELATIONSHIP OF SUSTAINABILITY TO COST-EFFECTIVENESS

For the purposes of this paper, a fully sustainable program is one that has sufficient revenues to cover its recurrent costs. Sustainability refers to a fundamental characteristic of the program, rather than of the outside funders. In other words, this paper does not address the notion that a program is sustainable if another outside agent can be convinced to shoulder the load. A cost-effective program is one that delivers a given output with fewer inputs than an alternative program providing comparable outputs. A cost-effective program is not necessarily a sustainable one, therefore, and a sustainable program need not be cost-effective.

Assume that of the feasible service delivery alternatives in a particular setting, say, community-based distribution (CBD), fixed clinics, and mobile clinics, the cost per new acceptor is lowest for CBD. CBD is therefore the

most cost-effective means of delivering family planning in this setting, using number of new acceptors as the output measure. Cost-effectiveness is a relative term, of course, so if the cost per new acceptor is lower in fixed clinics than in mobile clinics, fixed clinics are cost-effective relative to mobile clinics. In referring to a program as "cost-effective," a comparison (implicit or explicit) with other programs is being made. A cost-effective program is simply the best among a limited set of alternatives.

Sustainability, on the other hand, refers to an absolute criterion, and it is important to realize that this criterion can be substantially different from efficiency. Put simply, if sustainability is the sole criterion for a program, output is irrelevant. A sustainable program is one whose revenues exceed costs (only recurrent costs if startup and other subsidies are available to meet fixed costs). Thus, returning to the example of the previous paragraph, it is possible that all three of the possible distribution schemes are sustainable. Perhaps more interesting, it is equally possible that none of them, even the most cost-effective, is sustainable, or even that more cost-effective programs are not sustainable, while less cost-effective programs are.

Consider how the last possibility might occur. Assume that the population served by the CBD program is largely rural, poor, and underserved. Assume that commodities are provided free of charge to the program, so that costs, at least from the point of view of the program, are essentially labor costs. Suppose that many new acceptors are attracted to the program, so many, in fact, that this program can generate a new acceptor at lower cost than alternative programs, and that users are charged for neither services nor commodities. Since no revenues flow in, the program depends on outside subsidies of commodities and cash. The program is cost-effective, but not sustainable. On the other hand, say that the fixed clinic operates in a town in the same area of the country. It incurs higher costs per acceptor than the CBD program, and so is less cost-effective in generating acceptors. However, this clinic charges a fee for service that is high enough to cover recurrent costs. By definition, it is a sustainable operation, although it is not cost-effective. The two hypothetical programs are serving different populations that have differing attitudes toward family planning and varying willingness to pay for services, on average.

The above example highlights the dangers of using cost-effectiveness or sustainability to make comparisons across programs that differ in fundamental ways. To the extent that different users require different programs to serve their needs, it is reasonable to expect a range of costs and degrees of sustainability across programs. Cost-effectiveness and sustainability are reasonable criteria to apply only when the programs being compared are

sufficiently similar to warrant doing so. One of many good examples of the need for caution in applying cost-effectiveness criteria across units can be found in the Operations Research in Family Planning and Maternal-Child Health for Latin America and the Caribbean (INOPAL I) project undertaken with Fundación Mexicana para la Planificación Familiar (MEXFAM), the Mexican Planned Parenthood affiliate, designed to improve the cost-effectiveness of program administration. There, many programs were found to have high costs per user and per couple month of protection (CMP), and costs were seen to follow different patterns of change as the project was implemented. However, as the project report details, the programs being compared differed substantially. Some served indigenous populations, some were at very low levels of output, some were incurring the startup costs of new programs, and some were in difficult locations.

A sharp distinction between cost-effectiveness and sustainability is drawn deliberately here in order to highlight the separate issues involved. Cost issues are issues of resource commitment, and questions of consumers' behavior enter only peripherally, through program output scale effects. The area of sustainability is one in which consumers' willingness to pay (directly for family planning or indirectly for other services or commodities whose revenue can be used to support family planning activities) is a central issue. This dichotomy is in contrast to a more general usage of the term "cost-effective," in which of two programs with identical cost per service delivered, the one with the greater revenue accumulated would be termed cost-effective. The advantage of a rigid categorization is that the perspective of the evaluator is irrelevant. For example, a program that offsets actual costs with donations of labor and contraceptive supplies and collection of a user fee might seem surpassingly cost-effective to the agency administering the program. From the point of view of the community providing the labor, facilities, and user fees, it would seem less cost-effective, and including the donor's cost of contraceptives in the calculations might make the program seem downright expensive compared with other alternatives. A clear definition of what constitutes cost-effectiveness analysis moves the results of different studies one step closer to comparability.

Cost-effectiveness and sustainability are alike in one regard: they cannot be used analytically to determine whether a goal should be pursued. The output of a project, measured perhaps in births averted or couple years of protection (CYP), presumably has some value that offsets the costs of undertaking it. Other, competing projects with the same aim also have costs. Cost-effectiveness analysis allows one to discriminate among competing courses to a goal, and to choose the one that uses scarce resources most effectively. The sustainability criterion, alternatively, allows policy

makers to choose the path toward the goal that best conserves donor resources. Whether the goal itself is worth pursuing is beyond the scope of either cost-effectiveness or sustainability analysis.

The rest of the paper addresses the notions of cost-effectiveness and sustainability separately. Cost-effectiveness results from OR are discussed first, followed by sustainability results. The paper closes with a summary of answered and not-yet-answered questions on both topics.

## OR AND COST-EFFECTIVENESS

A program that is cost-effective makes better use of available resources than does any feasible alternative. As noted earlier, a comparison among competing alternatives is implicit. Some OR projects are designed to test a single intervention, and others to compare competing interventions. Cost-effectiveness statements from the latter are likely to be more convincing, all else being constant. This is so because in practice, one must collect information on baseline costs comparable to that collected during the intervention, and then compare costs pre- and post-intervention, either over time or using a control group. This can be quite difficult to do, since the implementing agencies may differ, accounting requirements may change, and so forth. Therefore, statements on cost-effectiveness springing from a single intervention often rely only on the post-intervention experimental area cost data. An intervention that decreases unit costs (generally per CYP) is said to be cost-effective. The implicit end of the sentence is, unavoidably, "...relative to the control or pre-intervention alternative," rendering conclusions on cost-effectiveness springing from studies without control or pre-intervention data difficult to interpret at best, and meaningless at worst. Comparing competing interventions, on the other hand, allows one to make meaningful comparisons (see, for example, Rosen, 1988).

In undertaking a cost-effectiveness analysis, one must be clear about the objectives of the projects being compared. If the goal is a reduction in the number of births, the implications are quite different than if the goal is serving those members of the population most in need of family planning. For example, suppose two competing projects have outputs that can be expressed in terms of CYP, but one draws its clients from a pool of motivated, easily accessible individuals, and the other from an unmotivated, geographically dispersed population. Social marketing might work well for the first population, while CBD might be used for the second. Is one CYP from the first project the same as one CYP from the second? The answer is probably yes, efficacy differences aside, if the intent is to estimate

program impact on fertility, and probably no if the intent is to reach a decision regarding the appropriate policy to pursue. The social marketing program is likely the more cost-effective of the two projects, but this is because it is skimming the cream of potential acceptors. Thus, the alternatives being compared must be sufficiently alike, in terms of populations served and so forth, if cost comparisons are to be meaningful.

### Cost Calculation<sup>1</sup>

Costs can be broken down into two types: fixed (or nonrecurrent) and variable (or recurrent). Fixed costs do not vary with the output of the unit being studied. The costs of buildings, vehicles, and training are examples. Assigned on a per-unit-of-output basis, average fixed costs decline as output increases, which is one reason so-called "economies of scale" might exist. Variable costs of course vary with output, and represent commodity and possibly labor costs (if these are under the control of the program administrators). The assignment of costs to one or the other of these categories can be problematic. Take, for example, the case of labor. If workers are present only when they are needed, and if, in providing family planning, they are prevented from doing some other work, then their labor is clearly a component of variable cost. If, on the other hand, workers are required to man their posts regardless of demand, and if there is substantial slack time in their days, then it is less clear that their labor is a variable cost.

In practical terms, the latter situation means that an OR intervention may incur variable costs composed essentially of commodity costs. In other words, much of the infrastructure (including personnel) for delivering services and commodities may already be in place. Thus there may be a built-in bias that makes interventions look cost-effective relative to the pre-intervention situation, since simply by increasing contraceptive prevalence rates (all else being constant), interventions yield a decrease in unit costs.<sup>2</sup> It is not clear that the baseline alternatives, pursued with the vigor of the OR intervention, would have been unable to demonstrate similar cost declines. Comparing competing interventions yields more credible statements about cost-effectiveness from projects that focus on using existing personnel and facilities in different ways.

### Cost-Effectiveness Results from OR

**Africa.** Tulane University's CBD activities in Zaire contained substantial cost-effectiveness components. Using detailed information on costs broken down into broad categories of service, administration, and training, costs per CYP of U.S. \$6.60 and \$8.40 were calculated for two study areas

with well-established CBD programs started by a prior Tulane OR project. Costs per CYP of between \$60 and \$89 were calculated for the three remaining areas with usable data, all of which had relatively new CBD programs. These last figures are quite large, but, as the final report from Tulane states, comparison of costs per CYP in different settings is difficult (Bertrand, 1990). In particular, these latter figures are for new programs incurring high startup costs (training and administration), with little momentum in distribution of contraceptives.

In several urban areas in Africa, the Columbia University OR project has been implementing a "market-traders" distribution scheme. Ibadan, Nigeria is the most complete project. Market traders are solicited for a three-week training course in family planning and basic health interventions. After completing the course, they are given a sign, an initial stock of family planning supplies and drugs, and other startup items. They then sell pills, condoms, foaming tablets, oral rehydration therapy (ORT) salts, and malaria treatments, in addition to their usual products, and keep a 25 percent commission on sales. No other payments are made to these individuals. About 38.5 percent of all sales have been contraceptive sales. Thus, attributing this percentage of all ongoing program costs to contraceptive sales, a cost per CYP of \$15.71 is calculated over the three-year life of the program. It is difficult to compare this figure with anything except the approximate \$30 per CYP cost of this program soon after its inception, since it is not clear what the cost would have been to provide a CYP with some other program.

**Latin America.** Many of the projects of INOPAL I contained a cost-effectiveness component. One project that stands out in its emphasis on cost-effectiveness considerations is the project undertaken with MEXFAM to institutionalize cost-effectiveness analyses in MEXFAM's operations. In this project, a management information system (MIS) was installed in the various subprojects operated throughout Mexico by MEXFAM. Part of the goal in developing the MIS was to allow more precise assignment of costs, with the subsequent knowledge to be used in making more well-informed, and therefore more cost-effective, decisions. Evidence on the latter point appears mixed, although firm statements are difficult to make given the short (12-month) period of analysis. In some areas, costs per user or per CMP declined over the period, in some they fluctuated, and in some they increased over time. Since this was a demonstration project, factors outside the introduction of the MIS clearly played a large role in the variation observed.

INOPAL I projects in Peru focused extensively on cost-effectiveness. Rosen (1988) compares costs per CYP for several service delivery modes in

Lima. Some are fixed clinics; some are CBD programs; and some are "posts," which are fixed family planning distribution points, tied to the CBD programs and visited regularly by physicians. The data come from two INOPAL I projects. Each delivery mode uses different combinations of inputs (labor, capital, materials) to produce output (CYP, acceptors). It is particularly important in making comparisons across delivery categories to note that different modes rely to varying degrees on donated inputs. Rosen points out that CBD programs are particularly affected by changes in the price of commodities since contraceptives constitute so large a share of their total costs. Assessing commodities at market prices, cost per CYP varied from \$5.68 to \$11.98 for CBD, varied from \$12.44 to \$16.61 for clinics, and was \$16.17 in the single post program studied. Even after including the cost of (currently) donated inputs in the calculation, Rosen concludes that CBD is a cost-effective means of delivering CYP. He attributes much of the variation within program types (across delivery agencies) to program age differences and the associated variations in training and other startup expenses, as well as method mix.

CORA (Centro de Orientación para Adolescentes) is a Mexican service provision agency aimed at young adults. An INOPAL I project was designed to assess the cost-effectiveness of three alternative CBD schemes. The first was a community model, with intensive surveying of a neighborhood and informal talks on contraception. The second was a factory-based program, which operated along similar lines to the community program. The last was a school-based program, which seemed to rely heavily on informal networks within schools. With new users as the output measure, school-based distribution was cheapest, with an annual cost per user of \$4.08, and the community model was next cheapest, at \$6.28 per year. Factory-based distribution was very expensive in this study, at \$26.07 per user per year. Given that CORA's client population, young adults, is so difficult to reach using factory-based methods, a recommendation of the project was to de-emphasize this delivery mode.

A related INOPAL I study on young adults and family planning, done in conjunction with PSFN (Pro-Superación Familiar Neolonesa, A. C.) in Monterrey, Mexico, compared alternative means of reaching young adults. In addition to a CBD system already in place, two alternatives were tested. The first added specially trained young adults as distributors; the second employed integrated youth centers, providing dental hygiene, physical fitness, and other services in addition to contraceptive distribution and family planning counseling. Costs per new user in the second year of the project were \$13.40 using the young distributors and \$22.78 in the youth centers. According to the final project report, much of this difference is probably due to the low level of sexual activity reported by the client

population, since only a fraction of the youth center users are potential targets for family planning promotion.

In Ecuador, a complicated costing procedure was used in a project undertaken with CEMOPLAF (Centro Médico de Orientación y Planificación Familiar) to assess the cost-effectiveness of offering family planning services integrated with other health services and a home-visiting program for indigenous populations. Adding ORT to existing family planning services reduced acceptance of family planning, but adding family planning to ORT increased ORT delivery. The investigators conjecture that this may be due to overburdening distributors with tasks. Excluding ORT provision costs, on the grounds that they are not incurred in the production of family planning services, per-CYP costs were estimated to be \$30.13. Costs per CYP in the home-visiting program were \$24.27, and in the unmodified CBD group \$25.38. If the output measure employed is new users instead of CYP, costs for integrated, home-visit, and CBD programs were \$20.62, \$18.56, and \$15.75, respectively. CBD is cheapest per new user, but home visits are cheapest per CYP, indicating that home-visited women are likely to choose more effective means of contraception.

An INOPAL I study from Paraguay shows the limitations of cost-effectiveness analysis. The focus was on the provision of family planning posts for marginal neighborhoods in Grand Asunción. In the experimental areas, the number of new users was significantly higher than in control areas (although CYP was not significantly different). One CYP could be generated in the control groups for \$8.49, while it cost \$12.33 to generate one CYP in the experimental areas. However, users of the posts were also appreciably different from traditional clinic users (the reason they got the posts in the first place). They were less-educated and much less willing to travel any distance to reach the delivery point. In other words, experiment and control were serving two different populations, and so the cost-effectiveness differential is not especially useful for informing policy.

**Asia.** Two five-year projects have operated in Asia, the first under The Population Council and the second under University Research Corporation (URC).

A cost-effectiveness analysis of several family planning service delivery agencies in Nepal was done under The Population Council. The study was an attempt to estimate the differences in costs per service provided for the four sources of contraception then in operation in Nepal: the Family Planning/Maternal and Child Health Project (FP/MCH), the Integrated Community Health Services Development Project (ICHSDP) (both semi-autonomous Ministry of Health [MOH] agencies), the Family Planning

Association of Nepal (FPA), and the Contraceptive Retail Sales Project (CRS). FP/MCH accounted for over 90 percent of new acceptors, 1980-81, with the remainder spread over ICHSDP and FPA. CRS accounted for a large share of condoms and pills distributed. The study was based on a disaggregated analysis of time-use data. Unfortunately, sufficiently disaggregated data from sterilization camps to allow the full allocation of labor costs between family planning and competing activities were not available. Given available data, however, one finding of this research was that all of the service delivery agencies averted a birth for approximately the same cost. The low was Rupees (Rs.) 716 (for CRS), and the high was Rs. 1,085 (for FP/MCH) (U.S. \$1.00 = Rs. 25). A peripheral finding of this study is that the disaggregated cost decompositions required for the analysis originally proposed in Nepal require much more sophisticated cost data and service statistics than were available at the time of the study.<sup>3</sup>

Another Population Council study, done in southern Thailand, was aimed at comparing the government's family planning service delivery system with that of the private Population and Community Development Association (PDA). The systems operated somewhat differently, making comparisons difficult. For example, PDA, which offered only pills and condoms, recorded only the number dispensed rather than the specific clients served. The government system offered a full range of contraceptive alternatives, as well as other health care services. Estimated cost per user was 388 baht in government hospitals, 168 baht in subdistrict (government) hospitals, and between 128 and 152 baht for PDA (U.S. \$1.00 = 21.65 baht). As the study authors point out, there are sufficiently large problems in assigning costs and in making comparisons across such diverse entities that these results should be interpreted with caution.

URC undertook an OR project with the Atma Jaya Foundation in Indonesia, examining the costs and benefits of factory-sponsored family planning service provision. While strictly speaking, the study is slightly outside the purview of this paper, its focus on costs is relevant. Atma Jaya is a private hospital in Jakarta, and the study was a prospective one designed to assess the costs of initiating a factory-based outreach system. An interesting element of the analysis is the comparison of two methods for assigning fixed costs to family planning activities. Treating family planning services as an add-on to health outreach services (so that health services cover a large share of fixed costs) lowers total family planning costs by over 15 percent. Estimated costs per factory user per year are in the range of Rupiah (Rp.) 250 to Rp. 300 (U.S. \$1.00 = Rp. 1570).

A detailed cost study was done for voluntary sterilization (VS) in Indonesia by URC and Perkumpulan Kontrasepsi Mantap Indonesia

(PKMI). VS is not provided in government clinics, but the Indonesian National Family Planning Coordination Board (BKKBN) offers VS providers a subsidy per operation. The URC-PKMI study was designed to assess the costs of VS provision *vis-à-vis* the subsidy. Site visits to hospitals yielded the data needed to perform a very detailed cost analysis. The true cost of a tubectomy was found to be significantly greater than the revenues received by the hospitals. Revenues included the reimbursement, as well as any fees collected. Revenues, especially user fees collected, varied significantly from province to province, and even within facilities, depending on the status (public or private) of the patient.

## OR AND SUSTAINABILITY

There are a few examples of projects directly addressing the sustainability of family planning programs. In Thailand, formerly free pills and injections are being provided through government sources at a nominal fee. In Indonesia, some family planning users supplied through government clinics are being asked to pay part of the cost of the service; some others are being referred to private-sector suppliers; various community financing schemes are being tried; and private clinics for middle-income users are being established. In addition, a host of social marketing schemes have been implemented throughout the range of OR projects.

### **Thailand: The Contraceptive Repricing Experiment**

Work is in progress in Thailand on a project designed to assess the willingness of family planning users to pay for commodities and services. In three study provinces, pills cost 5 baht and injections 15 baht at government clinics. Formerly in study areas, and currently in other provinces and in control areas within the three study provinces, these items were supplied at no charge. The poorest 15 percent or so of the population (those with government health cards) are exempted from the charge in the study areas. In rural Thailand, government clinics account for all but a fraction of contraceptives dispensed, so there is little potential for displacement of users to private suppliers.

Preliminary statistical work by Ashakul (1989), using the most recent national contraceptive prevalence survey, has shown that higher money price or longer travel time is associated with decreased likelihood of contraception. Ashakul predicts that a price increase of 1.5 baht in rural areas and 2 baht in urban areas (increases of about 50 percent and 35 percent, respectively, after considering "donations" made to government clinics) would lead to a decline of about 2.2 percent in publicly supplied pill

users. Of these, almost half are projected to turn to female sterilization, with most of the remainder switching either to privately supplied pills or publicly supplied injections. Slightly over 10 percent are projected to be discontinuers of contraception. If prices of both publicly provided pills and injections are increased by the percentages of the previous example, Ashakul projects a slightly larger incidence of discontinuance, about 13 percent.

The revenues accruing to the government could be used to improve the public delivery system. However, Ashakul predicts that a 10 percent decrease in average travel time would increase usage by only about 0.5 percent, and a fairly sizable increase in resupply methods would be virtually canceled out by a decrease in permanent methods. If, on the other hand, a two-child norm were universal, contraceptive prevalence would increase by about 4 percent. In Thailand, it appears on the basis of what must still be considered preliminary evidence that small-family desires and the demand for contraception are sufficiently well entrenched that price changes of the magnitude Ashakul discusses will have little effect on contraceptive prevalence, and therefore that a move toward sustainability can be attempted with little risk. It should be stressed that these are exceedingly small price changes (1.5 baht is barely 7 cents), and that the effect on contraceptive prevalence of charging, say, a full cost-recovery price would be much larger.

### **Indonesia: *KB Mandiri***

*KB Mandiri*, loosely defined as family planning self-sufficiency, is a BKKBN initiative designed to shift some of the burden of providing family planning from the government. *KB Mandiri* takes different forms. In villages, for example, it may consist of collecting fees from users or undertaking income-generating peripheral projects, such as savings and loan societies or handicraft sales, whose profits are used to finance family planning activities. In cities, *KB Mandiri* represents a movement toward private-sector suppliers and fees for CBD. Revenues are used to defray operating costs, including the costs resulting from the revenue-generating activities. None of the proposed activities are cost-reducing *per se*; instead, they have the potential to lower the family planning bill paid by the Government of Indonesia and by outside donors.

In three urban areas (Jakarta, Bandung, and Bogor), one implementation of *KB Mandiri* for which URC has provided technical assistance redefines the role of some BKKBN outreach volunteers. Renamed Neighborhood Urban Contraceptive Distributors (NUCDs), these individuals provide information; distribute temporary methods; and refer clients for longer-acting methods, examinations, and complications. NUCDs

receive a fee, either for service or from private providers for referrals. In the baseline survey, taken in early 1988, 73 percent of pill users received free pills from government outlets. In mid-1989, only 41 percent of pill users were receiving supplies from this source, while 39 percent were supplied by NUCDs. Of these, 69 percent paid less than Rp. 300. Only 9 percent of those having contact with NUCDs were referred to private providers. Overall, in other words, there was little effect on government expenditures. On the other hand, referrals to both public and private providers increased markedly over the course of the study, suggesting that the financial incentives created through referral fees and service charges had an effect on NUCD efforts.

In rural areas, outreach workers are also to encourage use of private-sector supply sources for those who can afford it. A small fee is charged for home delivery of pills, condoms, or foam. The size of the fee in a given community is decided by community members and/or leaders. Revenues are to be used within the community for travel reimbursement for outreach workers, for client transportation to clinics, for treatment of side effects, and for other community-level health needs. As in the urban *KB Mandiri* project, creating demand for privately supplied contraceptives is vital. An important additional dimension of the rural project is the development of distribution networks. For example, few rural residents have access to drugstores. Baseline surveys in the three experimental areas (Bali, North Sulawesi, and Jogjakarta) showed prevalence to be high, with under a third of users paying for their contraceptives. Demand elasticities estimated from midterm surveys show some responsiveness to contraceptive price changes, with sometimes sizable responses concentrated among the poor. Work continues on this project.

### **Indonesia: YKB Urban Clinic Self-sufficiency**

Kusuma Buana Foundation (YKB) operates eight neighborhood clinics for middle-income families (monthly incomes between Rp. 100,000 and Rp. 200,000) in Jakarta. BKKBN pills are provided and distributed free of charge, while nonprogram pills are marked up by Rp. 150 (selling price: Rp. 2000) and resold. Injectables are obtained at no cost and dispensed for Rp. 1500, while IUDs are obtained for Rp. 1200 and inserted for Rp. 4500 (Lippes loop) or Rp. 7500 (Copper T). If those families who can afford to pay are selected out from the client population served by government service provision points, subsidies can be limited to those who remain as clients. The distinction between cost-effectiveness and sustainability is very clear in this context. Needed to make the program operational were customers, with operating costs taken as fixed quantities that had to be covered. Making the program more cost-effective would have made

attaining the goal of sustainability easier, but clearly was not required given the apparent willingness of YKB clinic clients to pay clinic prices.

### **Africa: Market Traders**

Columbia University's market traders distribution scheme has been described above for Ibadan. The same approach is being taken in Nigeria at Lagos and Ilorin, and in Ghana at Accra. The participation of market traders in exchange for their 25 percent commission on sales seems to indicate that their labor costs can be covered by this sort of approach. Whether the remaining 75 percent covers the delivered costs of supplies is not clear from the study results, although as long as contraceptives are donated, the revenues generated from contraceptive sales are available for other purposes. Currently, the Ibadan market traders are cooperating in a cassava growing and processing operation whose startup costs were funded using contraceptive sales revenue. Training is an expensive component of starting up the market-based distribution schemes, and some source of outside funding will be needed to extend them to other areas.

## **CONCLUSION**

Cost-effectiveness and sustainability analyses are playing and will continue to play important roles in family planning OR programs. Cost-effectiveness is desirable at any level of operation. However, scarcity of research resources typically means that only as prevalence rates increase does the focus of analysis shift away from more basic questions of how to provide services toward consideration of budget-conserving service improvements. Thus, it is not surprising that little cost-effectiveness analysis has been done for Africa, while a comparatively large number of studies in some way address cost-effectiveness in Latin America.<sup>4</sup>

Regarding cost-effectiveness analysis as it has been done in A.I.D.-funded OR projects, several points seem clear.

First, a solid understanding of the limitations of cost-effectiveness studies is not always manifested. Cost-effectiveness analysis cannot be used to help a decision maker discriminate among choices with disparate outcomes, and therefore should not be used to compare programs that serve different clients or provide different services.

Second, this survey of OR work shows a disturbingly common failure to realize that it is meaningless to calculate a cost per output measure, such as cost per CYP, for a single intervention under the heading of "cost-effec-

tiveness analysis," since the implicit comparison with alternative means of providing the same output is not made.<sup>5</sup> Without either a baseline cost figure for the pre-intervention alternative or information on the costs of employing one or more alternative service delivery mechanisms, cost-effectiveness comparisons cannot be made. Two examples from the OR literature with very different designs and aims illustrate the point:

- The Tulane work from Zaire has what appear to be very high-quality data on costs for several subprojects. Cost per CYP is calculated for the CBD program in each of five study areas, and is found to vary by more than an order of magnitude between highest- and lowest-cost areas. But since there is only a single intervention per area and no information about costs before the intervention, no conclusions can be drawn about the relative value of CBD in these areas. Moreover, considering the meager level of services available in the study areas prior to Tulane's arrival, it may be appropriate that there is little role for cost-effectiveness analysis to play in this context; the goal may be more to demonstrate feasibility than to achieve any sort of resource-conserving fine-tuning.<sup>6</sup>
- INOPAL researchers in Peru, on the other hand, explicitly compared costs for several alternative service delivery modes for similar populations, and as a result were able to make useful statements regarding the relative cost-effectiveness of several service delivery mechanisms.

In Zaire, the goal was to test a basic service delivery mechanism's feasibility, with some attention paid to costs. In Peru, the aim was to refine an existing system, with the main goal being reduced cost of service provision. Over time, more and more OR projects are likely to resemble the latter, with clear methodological implications for cost-effectiveness analysis.

When comparisons are made, it is important that they be the appropriate ones. Tulane researchers McBride et al. (1987) reinforce the point that in making cost comparisons, it is important to understand the dynamics of costs as output changes. In particular, it is necessary to determine the extent to which observed cost differentials are caused by different levels of program output in the programs under study, which in turn may require an understanding of program history, client population, or other sources of heterogeneity among programs under comparison. Studies that compare competing interventions carry the least inherent bias in this area, because it is possible to select comparable client populations and provider personnel, and to carry out the interventions simultaneously. Studies comparing the

evolution of a single intervention over time with a static baseline carry the most built-in sources of bias, since the passage of time pollutes the experiment with outside-of-project changes, the potentially special characteristics of the client population may be unknown, and the simple distribution of fixed costs over more users makes costs appear to drop.

Finally, a clear distinction between cost-effectiveness and sustainability needs to be drawn. Costs are a reflection of production considerations, given a level of services provided. Sustainability brings into the analysis the behavior of consumers, and with it a whole set of additional questions. These should be clearly understood in defining the OR agenda for the 1990s. The analysis of sustainability is only in part the analysis of costs. Knowing something about program sustainability requires knowing also about consumers' willingness and ability to pay for services, or in general about sources of program revenue. Comparatively little work has been done on sustainability, but there are several interrelated questions about users' behavior that bear examination. Can a program charge acceptors for a service that formerly was provided free of charge? If prices are increased, how does prevalence change, and what is the distribution of reactions to the price change within the affected population? How do willingness and ability to pay vary within this population? How does the implementation of non-fee revenue schemes (e.g., co-ops whose revenues are used to fund local family planning service provision) affect contraceptive behavior?

Combining the answers to these questions from the domain of program sustainability with carefully done cost analyses constitutes an important area for future OR activities in more advanced countries. There is a clear role for careful, explicitly comparative cost-effectiveness analyses in all countries in which OR projects currently operate. Notable in the survey of OR projects addressed in this paper is the relative scarcity of such analyses. Most projects have no cost component whatsoever. Of those that do include some cost measurement, the majority are unsuited to making statements about cost-effectiveness. Typically, otherwise well-planned and carefully executed interventions have had tacked on to them a cost calculation exercise, from which springs cost per CYP figures. These exercises appear to demand substantial effort from project staff for little reward. Comparative costs are what matter in cost-effectiveness analysis, and an intervention without reliable baseline or other-intervention cost information simply cannot provide enough information to allow a comparison.

Cost-effective and, where appropriate, self-sustaining programs are important conservers of scarce population assistance resources, and a goal of future OR should be to provide guidance in attaining these targets. This goal implies the need for rethinking many research designs. For the

cost and sustainability components of OR projects to attain the same usefulness as other OR components, they must be designed into projects from the start with the same care; they must enjoy the same motivation, including an understanding of their purpose; and they must be undertaken with the same level of expertise. Otherwise, there seems to be little point in committing scarce research time to the endeavor.

## NOTES

<sup>1</sup>See Kenney and Lewis, in this volume, for more detail on the difficulties in estimating costs.

<sup>2</sup>A standard finding in the OR projects surveyed is that the per-CYP costs of an intervention decline over time, which lends credence to this scenario.

<sup>3</sup>James Knowles is performing a cost study for family planning provision in Morocco that is generating apparently reliable estimates of costs at a highly disaggregated level (by cost center and type of cost, for example). Dov Chernichovsky has done similar work in Indonesia. In both cases, as in the Nepal example, the reliability of service statistics is a key consideration in making cost-effectiveness comparisons, since effectiveness is measured by service statistics.

<sup>4</sup>It is surprising that so little has been done in Asia, except for recent work on sustainability. The degree of program advancement must not be the only determinant of whether cost-effectiveness analyses are done.

<sup>5</sup>Note that all A.I.D.-funded OR studies that dealt in any detail with cost estimates are included in this survey, but that not all studies included claim to address cost-effectiveness issues.

<sup>6</sup>The Tulane project is notable for the exemplary explicitness with which its costing procedures are described and its care in avoiding the claim that it is performing cost-effectiveness analysis. It is mentioned here not as an example of a failed attempt at cost-effectiveness analysis, but rather as an example of a study design that is not, of itself, amenable to cost-effectiveness analysis. The cost data come from project accounting records, and so the costing method would be difficult to apply to any non-project-funded agency providing services in the baseline period. Eventually, should data for alternative service provision modes under similar accounting schemes accumulate, these data could form the basis for useful cost-effectiveness comparisons, and the care taken by the research staff in detailing their cost calculations so that such comparisons would be feasible is commendable.

The project report explicitly refers only to cost analysis, never to cost-effectiveness analysis, and makes only one fleeting comparison of costs with those of other CBD programs.

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**PART III**

**STRENGTHENING THE CONDUCT OF OR**

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### 13. SOME SUGGESTED FUTURE DIRECTIONS FOR A.I.D. FAMILY PLANNING OPERATIONS RESEARCH

Michael Hendricks

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#### INTRODUCTION

This paper has two purposes. The first is to help provide an overview of the activities of the Operations Research (OR) Program, managed by the Agency for International Development (A.I.D.) Office of Population. This program has been operating vigorously for the past 20 years, and during that time has learned a great deal about how to conduct OR. As new methods and procedures have been developed and tested, those which work have been integrated into field operations. The paper focuses on those subprojects initiated during 1985-89.

The second, quite separate, purpose of this paper is to suggest some possible future directions the program might consider as it looks ahead to the next 20 years. It is wise for any program to obtain periodically an outside perspective on its objectives, activities, and impacts, and the OR Program should be commended for doing so. In order to provide this insight, I have examined key program documents, analyzed preliminary data from a newly developed database of subprojects, interviewed key officials of six non-A.I.D. OR programs, and drawn upon my own experience (see the section on methodology).

As a result of this work, 32 suggestions are made for OR researchers to consider. While I believe that adopting these suggestions would improve the overall OR Program, I do not mean to imply that none of them are currently being carried out, or that every OR subproject should incorporate each suggestion. On the contrary, a number of these suggestions are already being practiced in many OR subprojects, and the relevance of some of the suggestions is affected by regional and country differences. OR researchers are asked merely to consider carefully the applicability of each suggestion to their subprojects.

#### The A.I.D. Family Planning Operations Research Program

The OR Program operates worldwide through five-year contracts and cooperative agreements with U.S.-based regional contractors, each of which

is assigned to work within a particular region. The contractors, regions, and beginning dates of the five-year projects are as follows:

- Population Council (Latin America and Caribbean; 1984)
- Tulane University (Zaire; 1984)
- Columbia University (Africa; 1984)
- University Research Corporation (Asia; 1985)
- Population Council (Africa; 1988)
- In addition, the OR Program contracts with TvT Associates to manage its informational project entitled *Maximizing Results of Operations Research (MORE)*, initiated in 1988.

The contractors conduct OR subprojects by contracting with local institutions. Figure 1 shows that the contractors have conducted a total of 113 subprojects during the past five years. Approximately 97 percent of these subprojects have involved formal OR studies and accompanying technical assistance, while 3 percent have involved technical assistance only.

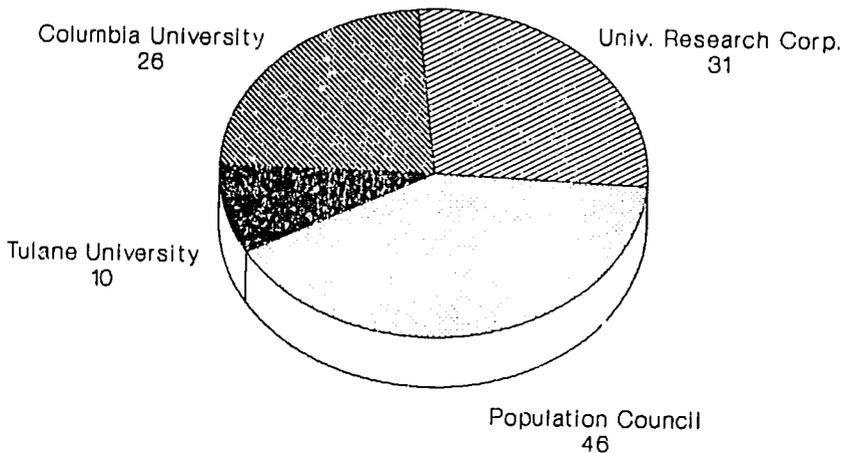


Figure 1. OR Studies Conducted by A.I.D. Contractors (1985-89)

## Methodology

The findings and suggestions in this paper flow from recent analyses of four separate sets of information.

First was a review of **key documents describing the OR Program**, including official materials prepared by A.I.D./Washington (A.I.D./W), progress reports by OR regional contractors, and various comments and evaluations prepared by outside observers. These documents are listed at the end of the paper.

Second was a quantitative analysis of preliminary data compiled for a new **OR Program subproject database** by the MORE Project. This database contains over 40 separate items of information on 103 OR subprojects initiated in 1985 or later (data on the 10 subprojects conducted by Tulane University were incomplete at the time of this analysis). At present, 81 percent of these studies have been completed, with 19 percent still ongoing. Appendix A contains the coding sheet used to create this database.

This database represents the most comprehensive set of information yet compiled on any organization's OR studies. However, there are two reasons why these data must be considered preliminary.

First, this database was created from only the written documentation that currently exists on each subproject. Not only does this severely hamper the assessment of those subprojects still ongoing, but it also limits the assessment of completed subprojects to only those aspects mentioned in written documents. For example, if a videotape was used to disseminate findings, but this was not mentioned in the written documentation, then the database will contain no record of a videotape being used in this way.

A second, related limitation of this database is that these data were compiled very recently (March-May 1990), and they have not yet been reviewed and verified by the OR contractors. As they review the coded data, contractors may be able to provide evidence of activities not listed in written documentation. If so, the database itself will become more complete and accurate accordingly.

The third set of information comprised **brief studies of six other OR-type programs** sponsored by organizations other than A.I.D.'s Office of Population:

- The Association for Voluntary Surgical Contraception (AVSC), a contraceptive service organization whose OR component is small. AVSC has conducted 12 OR studies, mostly on voluntary sterilization, in collaboration with various research groups.
- The Centers for Disease Control's Combatting Childhood Communicable Diseases (CDC/CCCD), a 10-year (1981-91) African child survival initiative of a number of organizations, including A.I.D. The program involves a variety of activities designed to strengthen African capabilities to improve service systems.
- Family Health International (FHI), a multifaceted agency that has a cooperative agreement with A.I.D.'s Office of Population, separate from the OR Program contracts. FHI's Program Evaluation Division has a staff of 22 that has conducted perhaps 200 studies in the past 10 years.
- The International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B), a longitudinal field station established in Bangladesh in the mid-1970s. ICDDR,B's four OR field staff completed over 50 papers during 1983-86.
- A.I.D./Office of Health's second Primary Health Care Operations Research Project (PRICOR II), a worldwide program of OR by host country counterpart institutions. University Research Corporation's staff of 5-6 has helped to conduct 75-80 studies.
- The World Health Organization's Health Systems Research (WHO/HSR) initiative, a largely informational and training effort to stimulate OR capacity building in developing countries.

The studies of these programs involved a review of key documents, plus (for all organizations except CDC/CCCD) a two-hour in-person or telephone interview with one key respondent. Summaries of each document review and interview were returned to the respondents for verification. The list of references at the end of this paper shows the documents and respondents for each organization; Appendix B contains the semistructured guide used during each interview.

The final source of information for this paper was **my own experience** in designing, managing, conducting, and evaluating management-focused research over the past 15 years. Experiences particularly relevant to this assignment include a 1987 workshop in Bangladesh on OR Program methods and the PRICOR II midterm evaluation. Relevant U.S. experience includes helping to create and manage a rapid-response evaluation unit (Service Delivery Assessment) for top-level decision makers in the U.S. Department of Health and Human Services.

While the above analyses were conducted in as objective a manner as possible, their integration and interpretation inevitably reflect my own perspective. The ideas in this paper are mine alone and do not necessarily reflect the views of TvT Associates or A.I.D.'s Office of Population.

### Overview of This Paper

The remainder of this paper presents an overview of and suggestions for A.I.D.'s OR Program. In many instances, the data and analyses presented were previously unavailable, and it is hoped that this new information will prove useful. The 32 specific suggestions mentioned earlier are grouped under 10 major issues for discussion:

- Issue #1--How can OR researchers develop a clearer vision of what it means to conduct OR?
- Issue #2--How can OR researchers help managers develop an even stronger interest in requesting and using OR?
- Issue #3--How can OR researchers be even more successful at developing local research capabilities?
- Issue #4--How can OR researchers more clearly acknowledge the lead role of program managers in OR?
- Issue #5--How can OR researchers more effectively tie their research to specific actions?
- Issue #6--How can OR researchers provide preliminary information as soon as possible?
- Issue #7--When additional information is needed beyond the rapid-feedback evaluation, how can OR researchers design simpler studies?

- Issue #8--How can OR researchers provide final information as soon as possible?
- Issue #9--How can OR researchers "market" their findings more aggressively?
- Issue #10--How can OR researchers learn better from their own OR experiences?

### **ISSUE #1: HOW CAN OR RESEARCHERS DEVELOP A CLEARER VISION OF WHAT IT MEANS TO CONDUCT OR?**

One characteristic of almost all OR programs is the imprecise definition of exactly what OR means. All agree that it does *not* mean the technically demanding field of OR from which the name has been borrowed. Beyond that, however, there is very little agreement on exactly what OR is. As a result, the term is applied to a variety of research activities that aim to improve family planning services. Some may see this tolerance as a strength, but when OR encompasses such a broad range of activities, it also loses its unique identity.

**Suggestion: Researchers might, in general, emphasize component studies more than demonstration studies.**

The OR Program has planned that "three types of projects will be supported: diagnostic projects, demonstration efforts, and projects concerned with components of the delivery system" (A.I.D., n.d., p. 14). Since the diagnostic studies and component studies overlap (diagnostic studies are often conducted to identify weaknesses in a component), there are two basic types of OR studies: (1) studies to *demonstrate* the feasibility of an entire delivery system or approach, and (2) studies to improve specific *components* of those delivery systems. Component studies often involve the three phases of diagnosis, solution development, and solution testing.

Figure 2 shows that, worldwide, both types of studies have been conducted about equally during the past five years: 58 demonstration studies and a combined 56 studies designed to diagnose weaknesses, develop possible solutions, and test possible solutions.

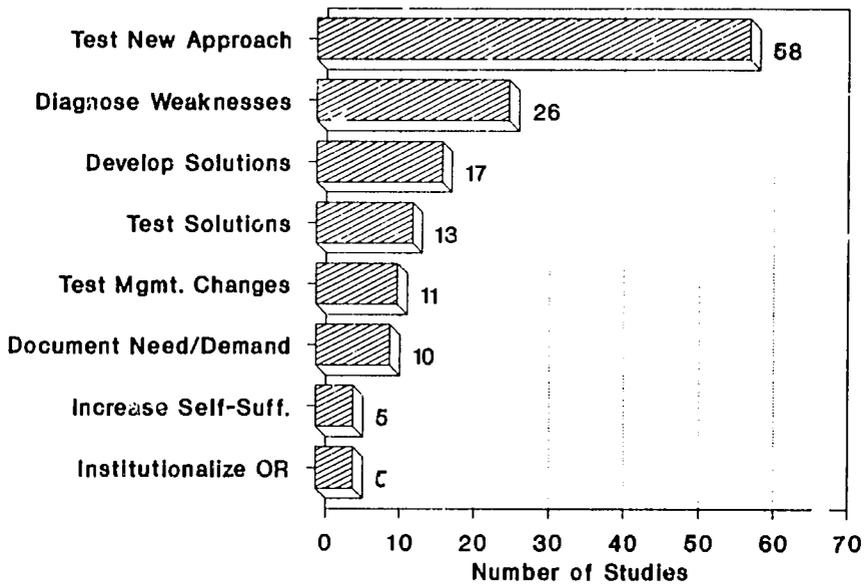


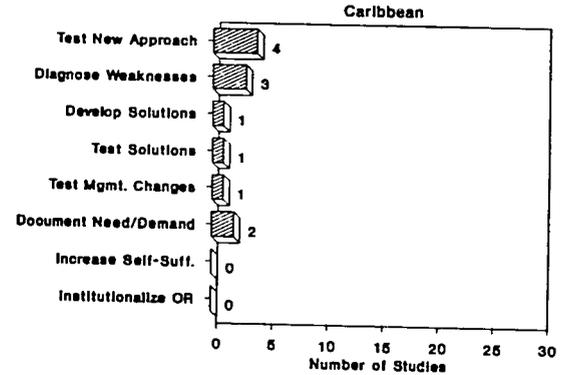
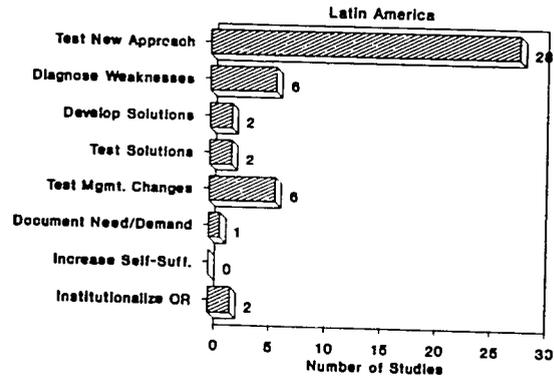
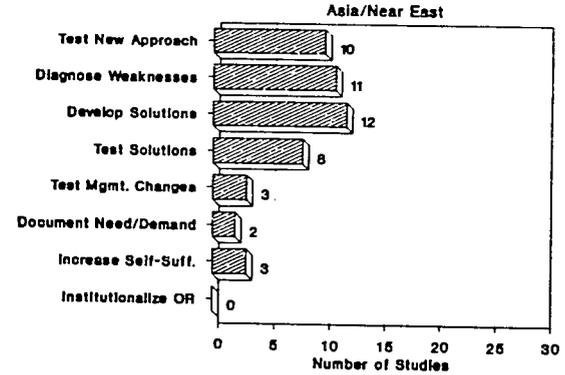
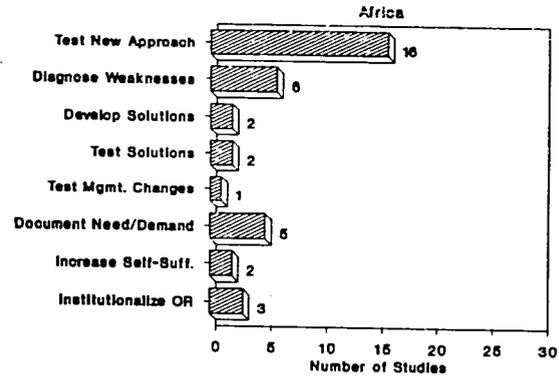
Figure 2. Purposes of Studies

However, Figure 3 shows considerable variation among regions in the proportion of demonstration vs. component studies. In Asia/Near East, more than three times as many subprojects have focused on improving components of programs as on demonstrating overall feasibility (31 vs. 10). In Africa, however, and even more prominently in Latin America, a majority of subprojects are in the demonstration category.

This blend of demonstration vs. component studies is entirely appropriate for the overall OR portfolio, and a region such as Africa with less-established services should probably continue to stress demonstrations fairly heavily. However, there are at least three reasons why a majority of OR studies worldwide should be component studies.

First, and not insignificantly, this has been the emphasis of the OR Program since its inception:

The third type of operations research is primarily concerned with specific components of the delivery system....Rather than studying the entire service delivery system, one or more aspects or components will be analyzed. The majority of the operations research efforts will be of this type. (A.I.J., n.d., p. 14)



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Figure 3. Purposes of Studies in Different Regions

Second, component studies offer a better opportunity for OR to provide information useful for existing programs and thereby to become an integral part of program management. Demonstrations, on the other hand, can too easily be dismissed as irrelevant to today's management problems.

Third, component studies allow OR researchers to draw a clearer line between the contributions they have to offer and those of other researchers.

**Suggestion: Researchers might call subprojects something other than "research."**

With a new emphasis on component studies, OR researchers might have the opportunity to shed the word "research" in the phrase "operations research." While research is often invaluable, it is not a word managers frequently use or even support. For better or worse, a subproject based on doing "research" faces an initial uphill battle to gain acceptance from most managers.

One possible new title might be Projects to Improve the Delivery of Services. This title is more descriptive of the actual objectives of the subprojects than is the word "research" since it stresses that the aim of the efforts is to improve services. This in turn would help reinforce the message that the ultimate goal is to help managers.

**Suggestion: Researchers might agree on a more explicit definition of a successful OR study.**

Explicit, agreed-upon criteria have not been developed for what must be accomplished before an OR study can be called "successful." Without such a definition, how can researchers measure their own performance? And how can A.I.D. and its OR regional contractors assess overall OR performance or study what factors might have influenced that performance?

There are several different ways to define a successful OR study. For example, must a family planning program show concrete improvement before an OR study can be called successful? If so, then even the most brilliantly conceived and executed OR study will be labeled unsuccessful if the family planning manager implements the recommendations poorly. This definition commendably recognizes that the *raison d'être* of an OR study is to improve services, but it also holds researchers accountable for actions beyond their control.

At the other extreme, is an OR study a success if it merely moves managers closer to appreciating and accepting future studies, or moves in-country researchers closer to being able to conduct an OR study on their own? This is a much less demanding criterion for success, but some researchers accept it as sufficient.

Several other possibilities exist. Is an OR study successful if the manager simply listens carefully to the findings? If the manager accepts the study's recommendations? If the study produces generalizable findings? The field might be well-served to define success more precisely.

## **ISSUE #2: HOW CAN OR RESEARCHERS HELP MANAGERS DEVELOP AN EVEN STRONGER INTEREST IN REQUESTING AND USING OR?**

It is important to develop the *skill* of *researchers* to conduct OR, but it is far more important to develop the *will* of *managers* to request and use OR. Skilled researchers who have no demand for their services can do very little, but managers eager for OR will insist that the skills be developed and the OR conducted. Of the two groups, it is much more critical to "win over" managers than to "make over" researchers.

Managers often have reason to mistrust research, including OR. Despite their best intentions, researchers are not always useful in solving the problems managers face on a day-to-day basis, and may even waste time or create new problems. As one respondent noted about one of the other OR programs, "The rhetoric is that OR is a problem-solving tool for managers, but that's never been the reality. Instead it's been a research activity of academics...."

On the other hand, when done correctly, OR is enormously useful in providing relevant, timely, and practical guidance for future actions. Given sufficient evidence of OR's usefulness, managers often drop their initial skepticism and embrace OR. This does not happen quickly or easily; eventually, though, managers not only trust and use OR findings, but also begin to request OR studies on their own initiative.

**Suggestion: Researchers might more explicitly identify their primary and secondary "customers."**

An OR study yields a product--information--and family planning programs are the potential customers for that product. However, programs do

not use information; *people* use information--specific people who can be identified by name and whose interest can be cultivated.

At the beginning of each OR study, the researcher might develop a list of both primary and secondary customers for the information. Primary customers are the one or two people with authority to act on the findings. Secondary customers are the few others who also have a vested interest in the findings. It is important to cultivate these secondary customers so that the findings will permeate all involved organizations, and so that an interest in OR will be developed in more than one or two people.

It is often true that OR customers should be as high-ranking as possible, especially in hierarchical organizations, in order to legitimize the OR study and maximize the chances that its findings will actually lead to improvements in service delivery. ICDDR,B learned this lesson in Bangladesh when it first tried to make changes at lower levels of government. This strategy failed, largely because local administrators had no flexibility to manipulate their own systems; they basically took guidance from the central government. Once ICDDR,B began to deal directly with top-level officials, it achieved much greater success.

However, it is also sometimes true that lower-ranking customers are actually in a better position than high-ranking customers to consider and implement OR findings. Sometimes the important decisions can be made at a level below the top, and sometimes they are best made at this level. For example, there is often high turnover among top officials, while lower-level officials remain in their posts longer, and are thus able to implement the necessary changes over a sufficient period of time.

The names of the various customers, at whatever level, might be prominently displayed in all study documents, including the proposal, interim products, and final reports. In addition, OR researchers might include in each regular progress report the current status of each customer and what has been done to "win over" each.

**Suggestion: Researchers might more often use satisfied customers to help conduct workshops for other customers.**

As the WHO respondent pointed out, "Managers, decision makers, and clinicians are still unclear as to the nature of the potential contributions of [OR], are lacking the knowledge to perceive when and how it could be employed, and believe that, like other research, it has little meaning for their tasks." The OR Program recognizes this and conducts in-country

workshops to teach program managers and policy makers how they can use OR.

Because managers often begin an OR workshop with a basic mistrust of researchers, some of the workshop leaders might profitably be other managers who have themselves "seen the light." A few testimonials and examples from now-satisfied but formerly skeptical fellow managers might be more convincing than presentations by researchers.

**Suggestion: Researchers might involve managers as closely as possible in an actual OR study.**

While workshops are useful, they are sometimes not the best way to develop a manager's will to conduct OR. Managers, like all of us, learn more from their actual experiences than from concepts conveyed in a vacuum. ICDDR,B calls for this sort of high-level commitment and involvement on a continual basis. WHO claims that the earlier in the research process the linkage is established and interaction between decision makers and researchers begins, the higher the probability that interaction will be effective (WHO, 1986).

The OR Program agrees, and its recent documents encourage on-the-ground technical assistance, more sustained collaboration, and more learning by doing (A.I.D., 1990). Many subprojects already practice this approach, including the following measures:

- Identifying the manager, by name, as a customer of the OR study (see above)
- Allowing the manager to choose the topics studied (see Issue #4)
- Convincing the manager to contribute resources, no matter how small, to the OR effort
- Discussing the findings of rapid-feedback evaluation with the manager (see Issue #6)
- Allowing the manager to help design further efforts (see Issue #7)
- Taking the manager on at least one site visit, perhaps as a way to pay for program travel the manager could not otherwise accomplish
- Continually feeding back information as it becomes available (see Issue #9)

- Holding "story conferences" with the manager to interpret jointly what the findings mean
- Having the manager chair any final workshops that report the findings (see Issue #9)
- Listing the manager (not the researcher) first on any reports or publications resulting from the study (see Issue #9)
- Working with the manager to capture lessons learned about the OR experience (see Issue #10)

### **ISSUE #3: HOW CAN OR RESEARCHERS BE EVEN MORE SUCCESSFUL AT DEVELOPING LOCAL RESEARCH CAPABILITIES?**

It is not easy to conduct an OR study correctly. OR is fundamentally different from conventional social research in its functions, relationships, procedures, products, and rewards. A major shift is needed to move from conducting conventional social research to conducting OR. Many conventional researchers find it difficult to make this shift. Because so many of their attitudes and practices are second nature, they are rarely aware of the extent to which they have kept many of their old habits, to the detriment of their OR efforts.

Given this situation, outsiders (such as developed country contractors) who have seen OR work effectively in other settings can play a useful role in showing both managers and researchers what is possible. Even though there will naturally be some initial resistance, these outsiders can eventually be respected and appreciated for their contributions. However, the influence of these outsiders is inevitably limited, and the best possible long-term outcome is for developing country managers and researchers to become self-sufficient in demanding and conducting OR. In plain terms, each A.I.D. contractor might aim to make itself unnecessary eventually.

**Suggestion: Researchers might emphasize strengthening local capabilities more than producing results.**

There are currently two objectives of the OR Program: (1) "improve the quality, accessibility, and cost-effectiveness of family planning service delivery systems," and (2) "strengthen developing country institutional capabilities to use operations research as a management tool to diagnose and solve service delivery problems" (A.I.D., 1989, p. 1).

In the ideal situation, these two objectives complement each other quite well. While working with experienced OR researchers on actual studies to improve service delivery, less-experienced researchers learn how to conduct OR. The end result is that the OR study both improves services and strengthens capabilities. In reality, however, there are tensions between these two objectives. Even when OR researchers are completely committed to strengthening local capabilities, they face strong pressures to produce studies quickly and well. The more they involve less-experienced researchers in their studies, the slower they progress in improving services. On the other hand, if OR researchers relegate local researchers to lesser roles, they miss valuable opportunities to strengthen local capabilities.

CDC/CCCD shares these same two objectives, and one observer of that OR program explained this tension eloquently:

While these objectives are not inherently at conflict with each other or mutually exclusive, their emphases differ--the first is more focused on "results," while the second is more concerned with development of human resources (i.e., "training"). Since information needs [are] frequently so fundamental that they [are] indispensable to program planning and/or implementation, the "training" needs implicit in developing local researchers [are] often secondary to the need for obtaining usable results. (CDC, 1989, p. 10)

It is not entirely clear which of these two objectives the A.I.D. OR Program emphasizes, but OR regional contractors' progress reports spend more time reporting on improved services than on strengthened capabilities. That, plus the fact that the latter objective is listed second (WHO, for example, lists strengthening local capabilities as its first priority) suggests that the emphasis of the OR Program may have been on improving services more than on strengthening local capabilities. In any event, A.I.D./W has reordered its priorities to call for greater emphasis on institutionalization of OR, and researchers might well heed that call.

**Suggestion: Researchers might continue to use local resources whenever possible.**

It goes without saying that local capability cannot be developed unless local resources are involved as much as possible. For that reason, the OR Program has decreed that, with very few exceptions, all phases of OR subprojects, including data analysis, are intended to take place in the country where the subproject is undertaken.

**Suggestion: Researchers might continue to emphasize one-on-one mentoring over more formal training.**

There are basically three ways to train local researchers to conduct OR: (1) hands-on experience, (2) formal workshops, and (3) academic programs. By participating in the conduct of actual OR studies, local researchers can learn, in context, not only what is done, but also why. The OR Program recognizes this and encourages on-the-ground technical assistance, sustained collaboration, and learning by doing.

**Suggestion: Researchers might also fund formal training efforts on occasion.**

A second way to train local researchers is through formal workshops. These workshops can be especially useful if they are held regularly, focus on clearly defined topics, and emphasize participation and involvement. The OR Program incorporates skill-building workshops for local researchers into its regional projects:

...the workshops should encourage local researchers, many of whom are familiar with conventional survey techniques, to be creative and problem-oriented, and to adapt conventional research methodologies to the specific needs and timetables of family planning program managers (A.I.D., 1990, p. 10).

WHO believes that such workshops also should be tailored to the specific needs of different participants, so it is currently designing two different training courses for researchers: one for those who are not yet accomplished researchers (junior researchers and health system personnel), and another for academic researchers whose research might be quite good, but not very applied. In addition, WHO is developing different training courses for decision makers, and for trainers and research managers.

The third way to train local researchers is to fund academic programs for local researchers, including masters-level and possibly doctoral fellowships for promising researchers. However, one non-A.I.D. respondent was against the practice of "dragging people across the world to have them trained elsewhere." WHO agrees that the strengthening of local training institutions is clearly preferable to the alternative of sending students to distant centers (Illsley, 1986, p. 29).

**Suggestion: Researchers might continue to help stimulate private research firms in developing countries.**

PRICOR II suggests another interesting possibility. It currently funds mostly university schools of public health, but it also would like to fund private research firms. Under one scenario, these firms might become effective lobbyists for more OR studies from the government. Unfortunately, PRICOR II cannot find qualified firms.

Figure 4 shows that the OR Program, in contrast, has been finding private research firms, and some of these firms have even been started and nurtured by OR contractors. To date, though, the number of these firms is still small, especially when compared with government agencies, private nonprofits, and family planning associations. Thus, even more effort may be needed in the future.

#### **ISSUE #4: HOW CAN OR RESEARCHERS MORE CLEARLY ACKNOWLEDGE THE LEAD ROLE OF PROGRAM MANAGERS IN OR?**

Every manager has a group of trusted advisors forming an inner circle that advises the manager daily on issues large and small. These people have the access and credibility to influence the manager's decisions about service delivery. For OR researchers to be effective, they must have a seat among these advisors. As WHO states, OR must "seek new ways of inserting itself into the structure of decision-making so that researchers and managers do not exist as two separate communities" (Illsley, 1986, p. 24).

**Suggestion: Researchers might allow family planning managers to set the OR agenda.**

In one non-A.I.D. OR program, only one-third of the study topics originate from the field, and "the field" can include anyone in the country--donor agencies, family planning associations, local government, research institutes, and universities, in addition to the family planning managers. Issues for the other two-thirds of the studies are established by U.S. officials and by the organization's own preferences. Even this program admits that "a particular country may not even care about the one-third of our studies we do for Washington. They're sometimes quite different interests."

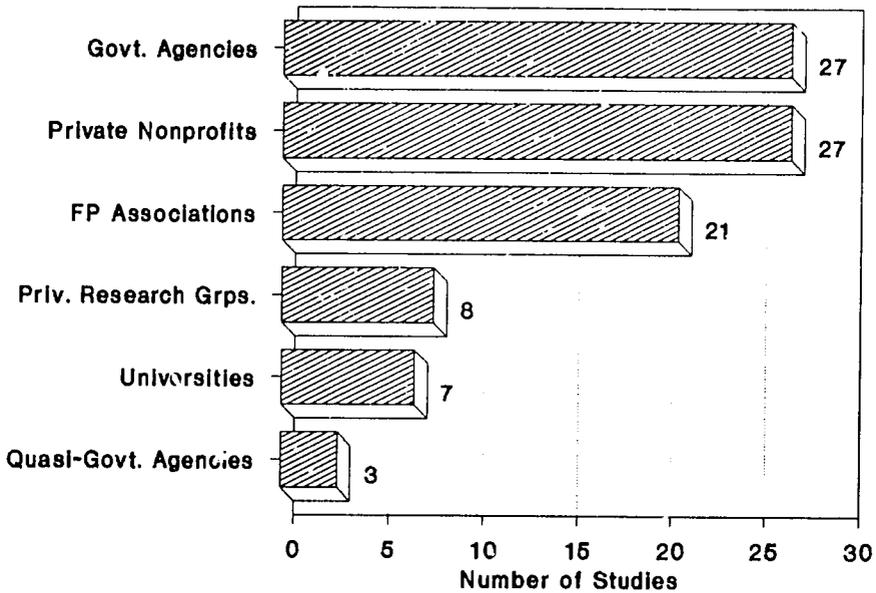


Figure 4. Collaborating Organizations

In contrast, AVSC believes that almost all OR studies should be conducted for family planning managers. "OR really needs to be done for the program people--the service providers--and I think that sometimes it isn't. Too many times the information doesn't filter down to the right people. Or the right people aren't asked what *they* need....Too often it's researchers talking to researchers." Similarly, WHO believes that "the fundamental principle is that the questions studied should be linked to the everyday concerns of policy-makers, managers, and those responsible for health promotion and health care" (Health Services Research Advisory Group, 1986, p. 4).

ICDDR,B's experience in Bangladesh illustrates the benefits of allowing managers to direct the OR agenda. From its beginning, ICDDR,B was learning a great deal about effective service delivery, but had difficulty in interesting program managers in the findings. In 1985, however, managers needed help developing policies for a five-year plan and possible strategies for implementing those policies. The managers turned to ICDDR,B with a number of specific questions, and were very pleased with the usefulness of the information provided.

Since then, the managers have used ICDDR,B in a much more proactive manner. They now use OR for field trials of policy changes prior to national dissemination, a mode of operation not previously practiced in the Bangladesh program (MCH/FP Extension Project Intervention Team, n.d., p. 30). Officials involved in this shift believe that an important factor was the managers' confidence that they could set the OR agenda.

For the A.I.D. OR Program, it appears that both local managers and outsiders can influence the OR agenda:

In identifying topic priorities, the Contractor will be guided by topic priorities established by A.I.D./W. The Contractor also will seek guidance from USAID Missions to ensure that activities...are consistent with the A.I.D. country priorities. Within those parameters, the Contractor will work with public and private-sector family planning service and research institutions (including some which wish to initiate family planning services) to identify OR issues and opportunities. The Contractor is encouraged to poll staff members of other A.I.D. contractors and other donor organizations to assist in identifying needs and opportunities for OR. (A.I.D., 1990, p. 5)

Assuming that these "topic priorities" and "parameters" set by others do not unduly restrict managers from setting a useful OR agenda, the OR Program might face two problems with the resulting studies.

One potential problem is that managers are not always aware of the problem areas in their programs, so they cannot always identify the most troublesome areas to study. PRICOR II solves this problem by having every OR study preceded by an intensive systems analysis, a series of detailed observations of every step in a service delivery activity, to see where implementation fails to meet accepted standards. It then presents this analysis to the program manager and lets the manager choose areas to improve. PRICOR II uses systems analyses to measure and document particular performance problems about which managers are often only vaguely aware. (See Heiby, in this volume.)

The second potential problem with allowing managers to set the OR agenda is that a wide variety of studies will probably be requested. As FHI warns, "being so responsive to the field means that our studies tend to be somewhat of a rag-bag of activities. It's whatever the local people want. So there's a lack of coherence in some of our field-oriented work." The OR Program might simply realize that this "rag-bag" is inevitable and focus on the development of OR capabilities as its outputs, not a systematic body of findings.

**Suggestion: Researchers might measure a somewhat broader array of dependent variables.**

If OR studies are to focus more on issues concerning managers, researchers must broaden the types of dependent variables they measure. Most OR studies to date have measured either the outcomes or outputs of family planning services, such as contraceptive prevalence rates, new acceptors, cost-effectiveness, couple years of protection, client contacts, active users, and contraceptive sales. Relatively few studies have measured the processes of service delivery, including client-worker attitudes and service delivery activities.

This situation will probably change as managers begin to set their own OR agendas. In fact, process measures may predominate in future studies, as the OR Program predicts: "With the increasing emphasis of the OR program on management issues and on improving quality of services, collection of process data will become increasingly important" (A.I.D., 1990, p. 3).

#### **ISSUE #5: HOW CAN OR RESEARCHERS MORE EFFECTIVELY TIE THEIR RESEARCH TO SPECIFIC ACTIONS?**

One OR program reports that it rarely, if ever, does studies to respond to specific, upcoming management decisions. The program is more interested in producing generalizable findings. However, all other OR programs, including the A.I.D. OR Program, aim to help managers improve service delivery. Nevertheless, if an OR study is not explicitly tied to specific actions, improvements may not occur. As one observer tactfully remarked about another, non-A.I.D. program:

...the sometimes ambiguous relationship between problem identification and project objectives has made it difficult for some principals to conceive how a project's findings would be applied. This in turn sometimes contributed to less than enthusiastic support for the investigator....

This linkage between an OR study and actions managers can take in response to the findings is WHO's biggest concern. WHO worries that "many [OR] projects, particularly those initiated by individuals and research centres, make no effort to link their research to action either before or after the research itself" (Illsley, 1986, p. 26).

To avoid this problem, WHO encourages "decision-linked" research, a four-step approach for researchers and managers:

- Researchers and decision makers identify key decisions being made, or about to be made, regarding the formulation of policy or its implementation.
- Researchers and decision makers determine what information will be needed at each step of the decision-making process.
- Researchers assess whether currently available research findings or routinely collected data can provide the needed information. If not, they design and implement a study to obtain additional data.
- Decision makers use the information to make more informed decisions.

**Suggestion: Researchers might specify up front exactly how their findings will be used.**

The OR Program's most recent guidance on subproject proposal formats requires an explanation of the "plan for dissemination and use of results" (A.I.D., 1990, p. 8). Because of this wording, it is not clear whether OR researchers need to describe how their findings will be used to affect program decisions or how the results will be disseminated. If the latter, this wording misses an opportunity for managers and researchers to agree up front on exactly how the findings of the OR study will be used to improve services.

**Suggestion: Researchers might continue to view multicountry studies or research syntheses as a lower priority.**

Multicountry studies and research syntheses offer an opportunity to draw lessons from studies conducted in different countries. Whether the comparisons are planned in advance (multicountry studies) or developed afterwards (research syntheses), these methods claim to yield more generalizable lessons about family planning services. Often these efforts can, in fact, provide larger lessons and thereby be very useful.

However, these efforts can also distract OR researchers from the more immediate and more important task of improving specific components of service delivery within their own country. As with international dissemination of findings (see the earlier suggestion), the glamour of cross-country comparisons can easily obscure the fact that managers rarely see lessons

from elsewhere as relevant for their own situation. If multicountry activities must be conducted, they are best not done by researchers working within a developing country; U.S.-based contractor staff or the MORE Project might be more appropriate.

#### **ISSUE #6: HOW CAN OR RESEARCHERS BEGIN TO PROVIDE PRELIMINARY INFORMATION AS SOON AS POSSIBLE?**

Figure 5 shows the dissemination techniques used by 40 OR Program subprojects that have been completed and for which final information is available. As mentioned at the beginning of this paper, the database is admittedly incomplete on these sorts of items, so we must draw conclusions cautiously. Nonetheless, these tentative data indicate that at least some subprojects are providing information to managers before the final workshop or report.

For example, these preliminary data suggest that 20 subprojects produced interim reports and that 13 held interim meetings. These are positive findings, since managers continue to face the problem during the subproject and need information as it becomes available throughout the study. Even more subprojects might practice these strategies in the future.

**Suggestion: Researchers might conduct a rapid-feedback evaluation shortly after a manager's request for information.**

As soon as a manager identifies a need for certain information, researchers might initiate a rapid-feedback evaluation to (1) compile what is currently known about the issue, and (2) specify what more could be learned with additional time and resources. Because this evaluation would have to be completed within one month, researchers would have time only to read available documents, make one or two quick site visits to gain first-hand exposure, and contact knowledgeable sources.

Even within only one month, a rapid-feedback evaluation is able to provide the following:

- An analytical description of the issue to be studied, including a logic model of the activities involved. Logic models are graphic displays of the various components of the service (inputs, processes, outputs, and outcomes) and the way these components interrelate.
- Definitions of what might be considered successful performance for each activity depicted in this logic model.

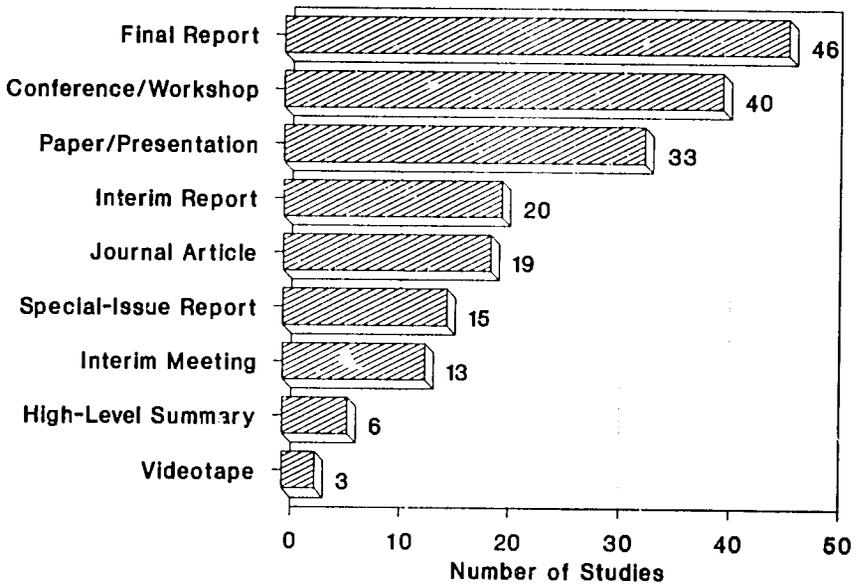


Figure 5. Dissemination Techniques

- Any information that already exists or could be quickly learned about program performance.
- Immediate implications of this information for program decisions.
- What additional information might be useful, and why.
- How this information could best be obtained.

The results of the evaluation might ideally be presented to the manager in an informal briefing, rather than a written report, and the ensuing discussion might determine next steps.

**Suggestion:** Researchers might begin some OR studies at the request of managers and USAID Missions.

Following a recommendation from the 1989 evaluation of the Asia OR project, A.I.D./W has taken an important step. As of this year, they are "making funds available for the use of OR resident advisors to fund small

subprojects without preparing a formal OR proposal" (A.I.D., 1990, p. 4). Approximately 20 small studies of up to \$10,000 each can now begin at a moment's notice.

This is an excellent decision, and another small step in the same direction might be warranted. Perhaps a certain percentage, say, 10 percent, of total subproject funds might be earmarked for at least one larger study that also could be quickly initiated if the OR resident advisor, family planning manager, and USAID Mission agreed on its value. This flexibility might allow OR researchers to respond to at least one larger request from a manager, as well as the several smaller requests noted above.

#### **ISSUE #7: WHEN ADDITIONAL INFORMATION IS NEEDED BEYOND THE RAPID-FEEDBACK EVALUATION, HOW CAN OR RESEARCHERS DESIGN SIMPLER STUDIES?**

There will be times--perhaps a surprising number of times--when the quick information from the rapid-feedback evaluation will be sufficient for a manager's needs. Often, though, it will be necessary to gather additional information. How can researchers ensure that their plans to gather this additional information are no more elaborate than need be?

**Suggestion: Researchers might recognize that experimental and quasi-experimental designs are not always appropriate for improving service delivery.**

There are three basic types of research designs, any of which might be used for an OR study (see Reynolds, in this volume):

- True experiments, with randomized assignments to different conditions
- Quasi-experiments, such as nonequivalent control groups or longitudinal time series
- Nonexperiments (sometimes called pre-experiments), such as case studies or before-and-after studies

Some OR programs have actually used true experimental designs, although they have usually regretted making the effort. One respondent lamented that "we had randomized designs, treatment, and controls, and we thought it was highly elaborate for the kinds of work we ultimately got

into. It was too elaborate." Another reported that "we've tried some true experiments, but not with great success."

While true experiments are rare, quasi-experimental designs are common. Figure 6 shows that, in fact, over half (50) of all relevant OR Program subprojects have used such a design.

However, quasi-experimental designs will probably be less common in the future. Figure 7 shows that, as might be expected, such designs are less common in studies that describe conditions or situations than in studies that test various interventions.

Since descriptive studies are now being encouraged, nonexperimental designs will become more common. As the OR Program explains:

While quasi-experimental field tests have merit and can be successfully undertaken under certain circumstances, experience has shown that they may also have significant limitations. Resource constraints and the need to produce findings rapidly to inform decision-making point to the need for innovative research designs and methodologies for data collection

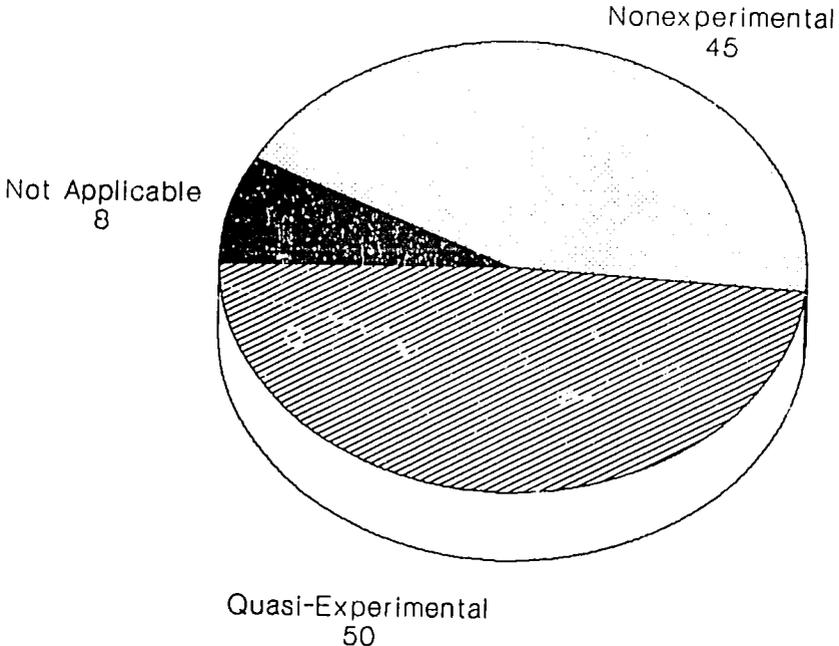


Figure 6. Research Designs Used

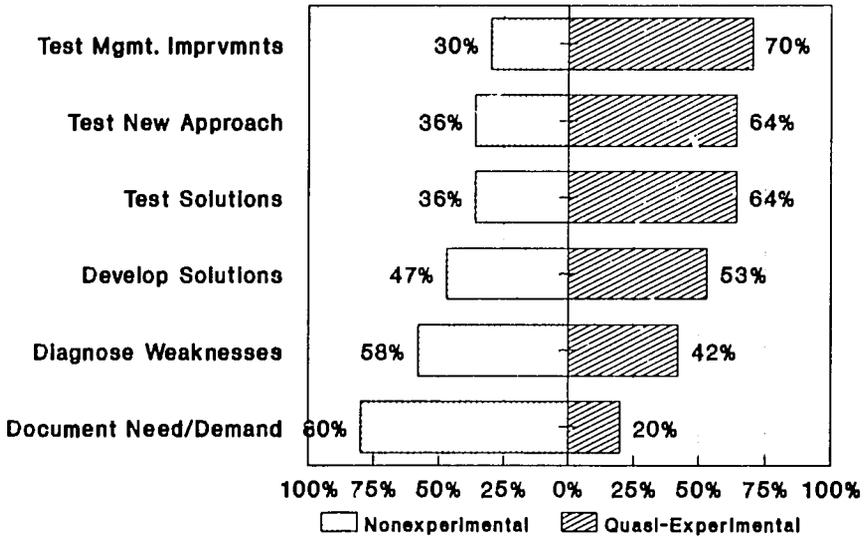


Figure 7. Research Designs in Studies with Different Purposes

and analysis. While it is anticipated that quasi-experimental designs will continue to play a significant role in the family planning OR program, the current need is to develop OR methodologies that are quick, flexible, and process-oriented. (A.I.D., 1990, p. 3)

In fact, this trend has already begun. Figure 8 compares research designs used in earlier OR studies (i.e., studies initiated during the first three years of the OR Program) with designs used in later studies (i.e., studies initiated during the last two years of the OR Program). As this graph shows, the tendency to favor quasi-experimental designs in earlier OR studies has been almost exactly reversed in recent years.

**Suggestion: Researchers might use flexible, emergent designs.**

A conventional research study employs what might be called a static research design. Once a study is designed, it is implemented exactly as planned, with no changes to the procedures, measures, or analyses. If the study has been designed perfectly, useful information results. But if the design is not perfect, or if unexpected implications emerge, then the most useful information can be missed.

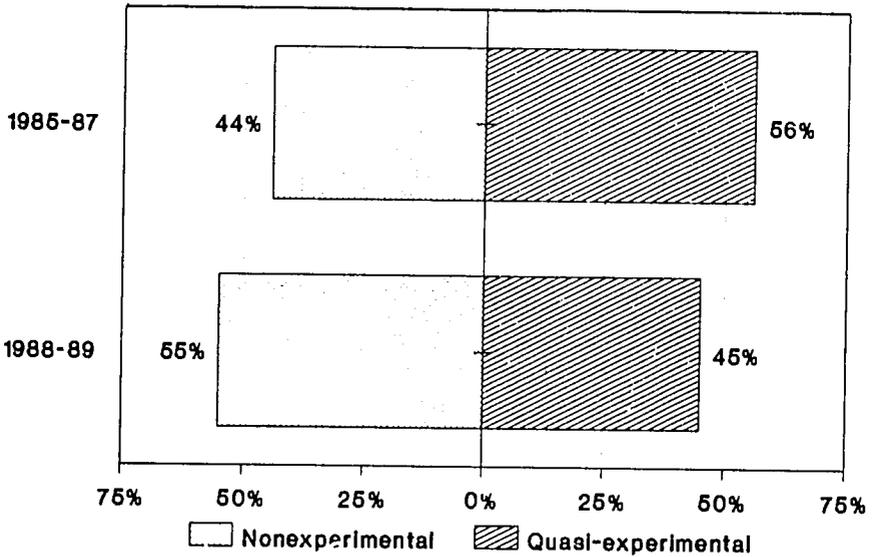


Figure 8. Changes in Research Designs

An alternative to this approach is to use an emergent research design. Such a design begins with clear plans, but the wisdom of pursuing the design is examined continually as the study advances. As findings emerge, the design may be continued intact, adjusted slightly (to add different sources of information, for example), or changed radically (perhaps to pursue a critical new issue that was hidden until the first findings became available).

**Suggestion: Researchers might collect information iteratively.**

With a static design, researchers know in advance exactly what information they will collect, when, and in what quantities. With an emergent design, information is collected as it is needed. If enough information has been collected (for example, during the rapid-feedback evaluation), then no more is gathered; if more is needed, then researchers conduct another iteration of data collection. This sequential approach has the advantages of (1) collecting only as much data as are needed and (2) allowing the data collection to be fine-tuned depending on current needs.

**Suggestion: Researchers might rely less on surveys to collect information.**

Figure 9 shows that sample surveys are by far the most common technique used to collect data for OR studies. Surveys are excellent for gathering structured answers to predetermined questions. But the collection of process data will become increasingly important for the OR Program, and surveys are a poor tool for gathering the rich data needed to understand processes.

Unfortunately, this trend away from sample surveys has not yet begun. Figure 10 shows that the reliance on surveys has, in fact, been increasing in recent years. Sample surveys comprised 37 percent of the techniques used in earlier studies, but increased to 41 percent of the techniques used in later studies. It is somewhat encouraging, though, that the use of focus groups and interviews also increased during this time.

Future OR studies will probably use qualitative techniques, such as observation, interviews, and focus groups, even more frequently. These techniques also might be complemented with a much greater use of service

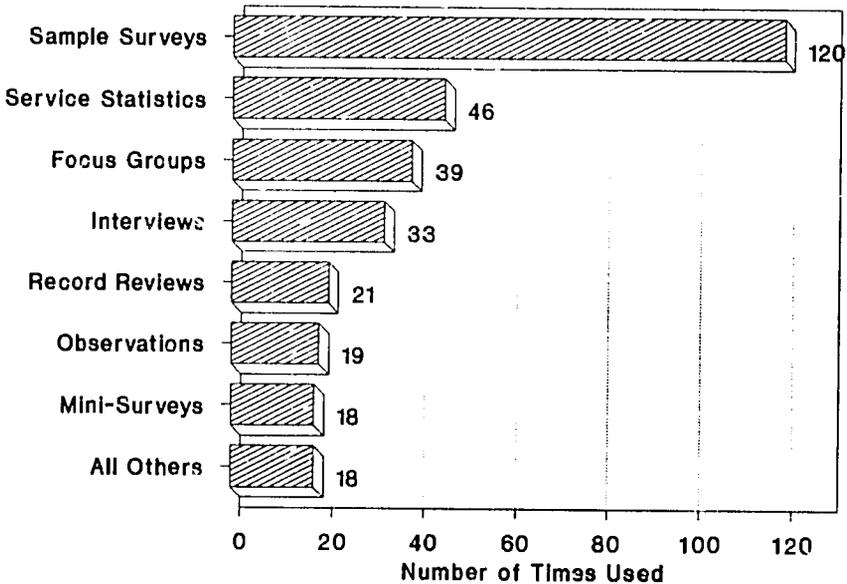


Figure 9. Data Collection Techniques

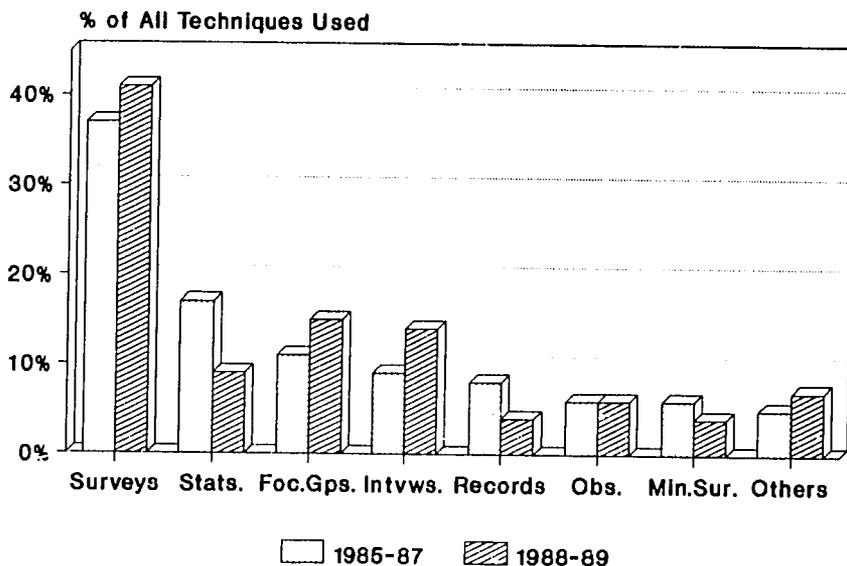


Figure 10. Changes in Data Collection

statistics and/or program records; by using the same data available to managers, researchers might help to improve these systems as they conduct their studies. Unfortunately, the use of these two techniques has decreased during recent years (see Figure 10).

**Suggestion: Researchers might continue to consider costs of services, but not necessarily conduct formal cost-effectiveness analyses.**

Costs of services are important, and OR researchers need to consider them in their analyses. Figure 11 shows that 16 OR Program studies have included some sort of cost analysis. Formal cost-effectiveness analyses are difficult to conduct under the best of circumstances, however, and there are other options available.

A cost-feasibility analysis, for example, calculates whether enough funds are available for a planned activity, while a cost-utility analysis compares the actual costs of an activity and the estimated utility or value of the activity's outcomes. These estimates are made subjectively by informed

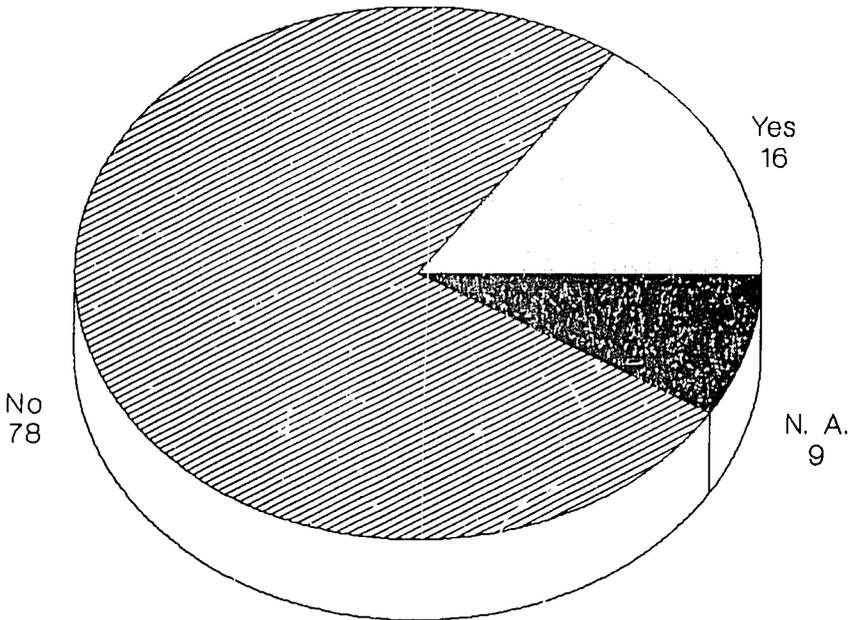


Figure 11. Cost Analyses Included As Part of Studies

experts, based on (1) the probability that an outcome will result, and (2) the utility of this outcome should it occur. Either of these two techniques might be more practical than a cost-effectiveness analysis within the constraints of an OR study.

**ISSUE #8: HOW CAN OR RESEARCHERS PROVIDE FINAL INFORMATION AS SOON AS POSSIBLE?**

Every day counts when a manager needs information, and researchers who want to be useful need to provide that information as soon as possible.

**Suggestion: Researchers might keep workplans flexible enough so that important new studies can begin almost immediately.**

OR researchers might take advantage of each occasion when an opportunity arises to provide useful information. To this end, it must be

possible to begin a new study almost immediately. Unfortunately, this is not the case in other OR programs. One respondent complained about the amount of red tape involved in beginning a new study, while another reported that "it can take many months, even years, before proposals get funded."

**Suggestion: Researchers might continue to complete studies more quickly than in the past.**

Just as studies need to be started as soon as possible, they also need to be completed as quickly as possible. ICDDR,B reports that managers in Bangladesh wanted results back within three months. "They were not interested in our long studies. These studies need to be quick." Most OR programs cannot produce results that quickly, but most report that they can complete a study within 12 months. Figure 12 shows that, for the A.I.D. OR Program, the average and median length of a study is approximately 20 months.

More strikingly, Figure 13 shows that almost one-fourth of OR Program studies took more than two years to complete.

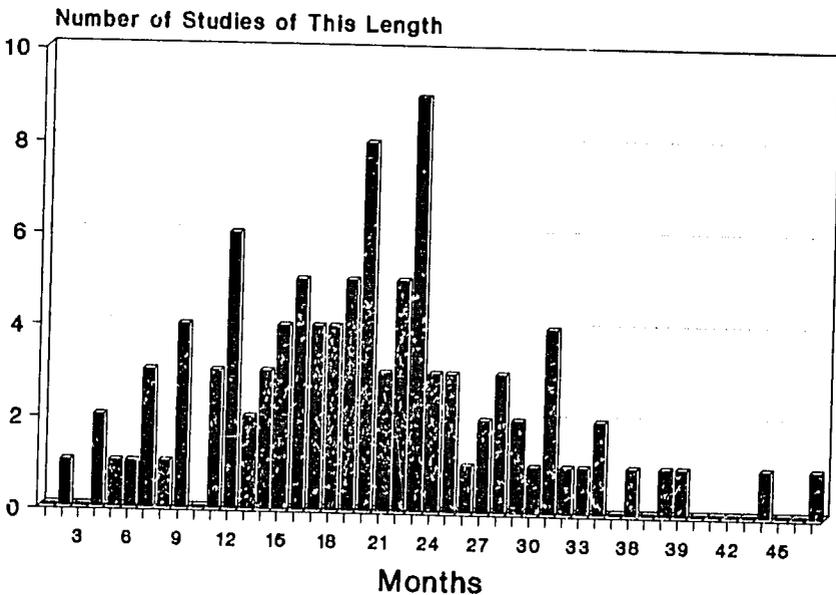


Figure 12. Lengths of Studies

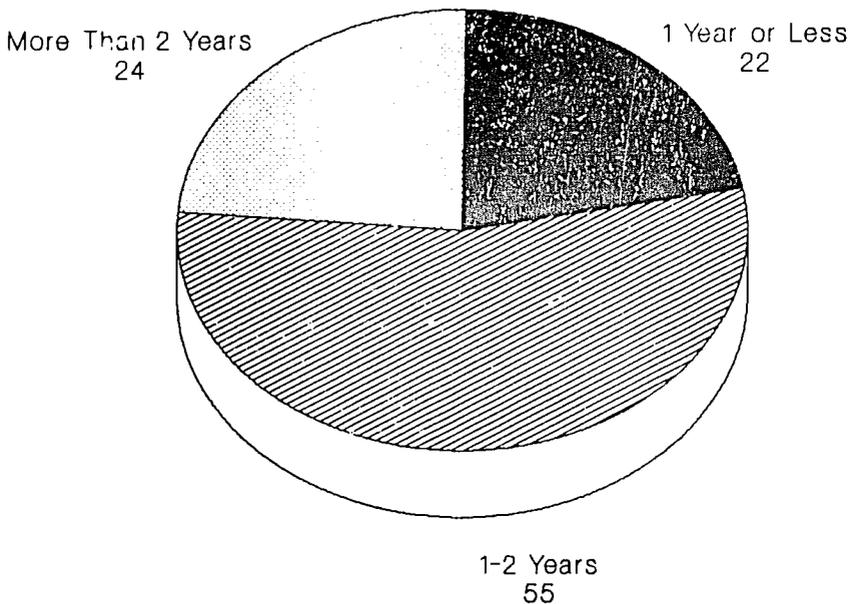


Figure 13. Lengths of Studies

The OR Program recognizes this as a serious problem, and has consistently been encouraging its regional contractors to reduce the length of studies. Figure 14 shows that these efforts have been successful: for earlier subprojects, the average length of an OR study was 23 months, or almost 2 years; for more recent subprojects, however, this average decreased to 14 months, or just over 1 year.

Completing studies more quickly will also reduce the cost of each, thus allowing more studies to be conducted. Figure 15 shows that costs correspond almost perfectly with the length of a study and that studies of six months cost approximately \$25,000 (versus the average cost of \$72,000 and median cost of \$60,000). A length of six months and a cost of \$25-30,000 might be reasonable targets for most OR studies in the future.

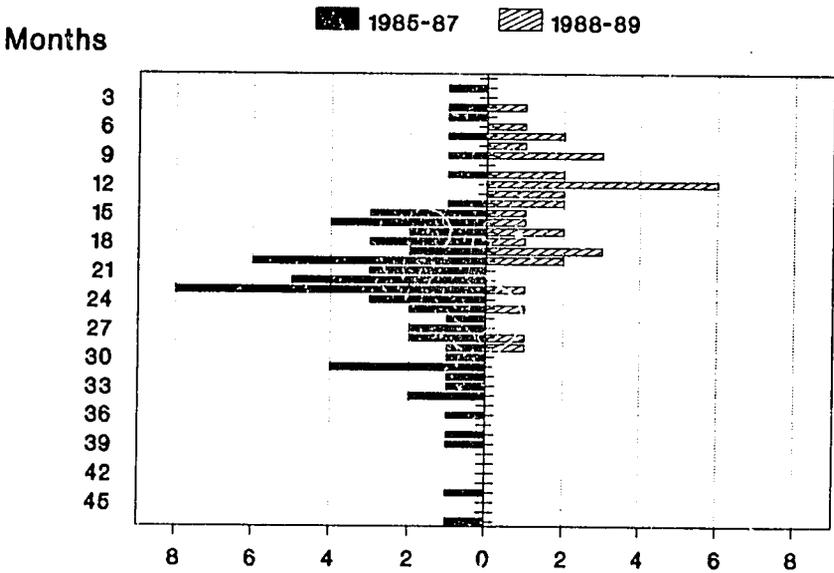


Figure 14. Change in Lengths of Studies

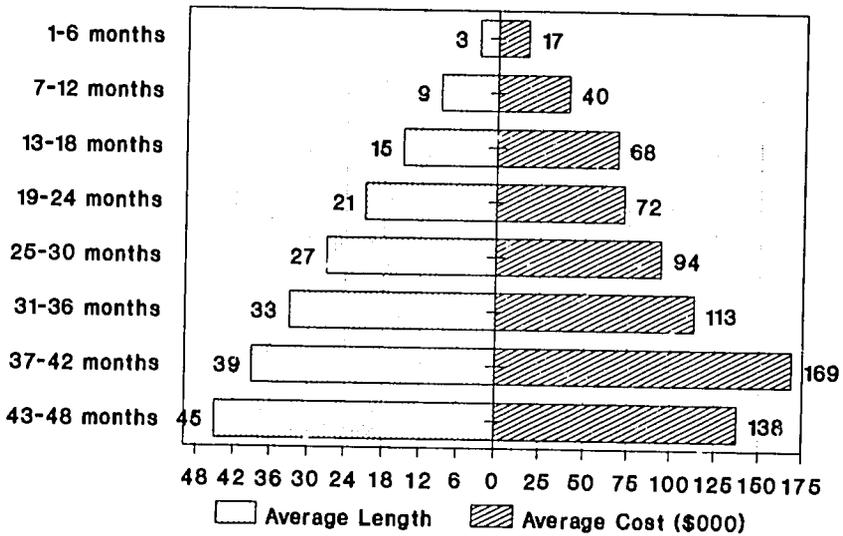


Figure 15. Length and Cost of Studies

**Suggestion: Researchers might ensure that managers have time to digest findings.**

The findings of an OR study need to be carefully considered if they are to be useful. First they need to be reported and understood; then researchers and managers need to discuss the implications of the findings and what actions the manager might take. In addition, contractors need to follow up appropriately. This takes time, requiring a reasonable interval between the completion of separate OR studies.

Figure 16 suggests, however, that a large number of studies have officially ended at approximately the same time. According to these preliminary data, almost half of the studies initiated during the past five years ended during the six-month period May-October 1989. One contractor's progress report suggests that this apparent logjam may be more than an artifact of contract dates:

Because there are still 13 projects ongoing, the final months of the project will be flooded with results. Careful attention will need to be paid to ensure that findings do not get "lost," particularly to service providers, cooperating agencies, and policymakers.

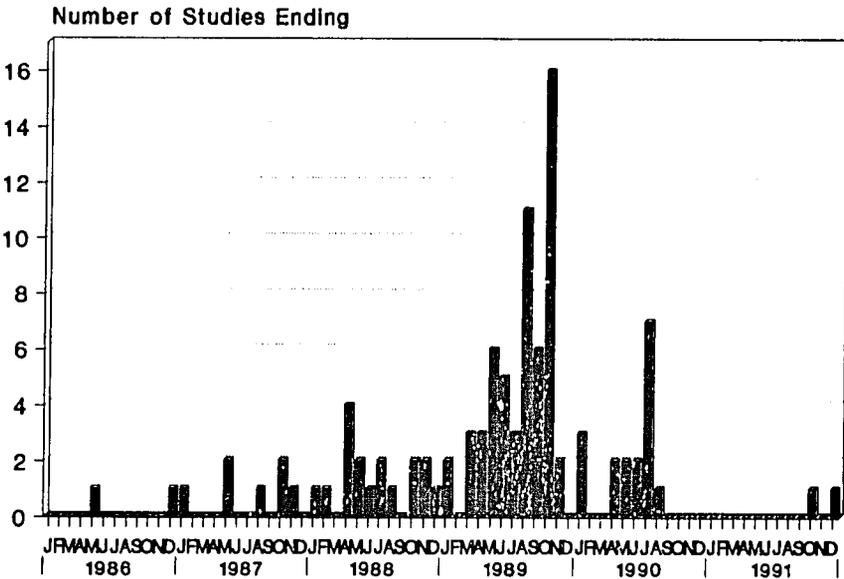


Figure 16. Official Ending Dates

It is possible that this contractor was able to help managers successfully digest the findings and implications of 13 studies. But it seems more likely that some of the OR findings did not receive the attention they might have deserved.

### **ISSUE #9: HOW CAN OR RESEARCHERS "MARKET" THEIR FINDINGS MORE AGGRESSIVELY?**

Earlier in this paper, OR studies were referred to as products. The fact that the OR product is information makes no difference; researchers who want to be useful must find ways of enticing customers to examine and use this product. The burden is on OR researchers to "sell" their products, not only at the end of a study, but also at the very beginning and throughout.

**Suggestion: Researchers might acknowledge that "salesmanship" is part of their job.**

Conventional researchers may object, but an important part of OR is selling, marketing, or championing the findings from studies. With managers being too busy to attend to the overload of information coming their way, researchers must take responsibility for ensuring the best possible hearing for their information. In fact, WHO suggests a new profession--"boundary spanners"--to translate research findings into a form and language managers can use.

It is not entirely clear, though, whether a developed country researcher can effectively "sell" OR findings. At least one respondent believes that Westerners can never be the champion of findings because they are always the outsiders: "Because of language, the hierarchical tradition, and other traditions, I think not. They can ignore Westerners, but not someone local. They know that in two years we'll be gone."

**Suggestion: Researchers might emphasize continuous contacts over intermittent reporting.**

Continuous contacts with managers are better than occasional contacts, simply because, as one respondent noted:

...the primary thing is...somebody who can work inside who is credible to the system. How you develop that credibility is up for grabs. It takes a long time for an outsider to build up credibility.

More contacts over a longer time increases the chances of building the necessary credibility.

ICDDR,B found itself in almost the perfect situation when a member of its staff was given a desk in the Ministry and allowed to interact informally with top officials throughout the day. This staffer was an outside person with no connection to the Ministry officials, yet he sat inside the Ministry and could "talk up and down the line." He could overcome the status differences that normally inhibited frank discussions between top officials and front-line workers:

We began being successful, in my mind, when [this person] began sitting inside the Ministry. When he began to have a continuous dialogue with the central government officials, he was able to reach a level with authority and to influence their orders. He was a conduit, but an active conduit. He would pick up on information the Ministry needed, know that we had a field situation that could get it, okay that with the Ministry, tell us what was needed, then feed the findings back to the Ministry.

**Suggestion: Researchers might emphasize personal discussions over written reports.**

One reason for the success of the "active conduit" mentioned above was his ability to talk informally with managers throughout the day. He often held informal chats with managers in the halls and before and after meetings on other topics. In this fashion, he was able to convey findings long before a written report could have been prepared.

This illustrates an important lesson: written reports are often unnecessary for OR, and they are sometimes even counterproductive. If findings are negative or controversial, managers often appreciate a confidential briefing rather than a written document.

**Suggestion: Researchers might offer recommendations after each study.**

The role and use of recommendations is a topic on which researchers differ. Some OR programs prohibit recommendations from some of their reports, preferring to let the facts speak for themselves. Other OR programs require recommendations and send back all draft reports that have none. Still others have no special requirements either way.

The OR Program has no official policy on recommendations, but it can be inferred that recommendations are important:

The operations research projects will have one invariable characteristic: each will have actionable implications for family planning program managers. The projects will be practical. Each will provide an answer to a question on which the program manager can act to improve the service delivery system. (A.I.D., n.d., p. 13)

Figure 17 shows that the possibility of offering recommendations was relevant for 33 of the 40 OR studies for which complete information was available at the time of this writing. The figure also shows that, of those relevant studies, over one-third did not include recommendations in their final reports.

Recommendations must be carefully crafted, however, as one respondent reminds us:

A lot of times recommendations are so discouraging. When you have conclusions like that, people just throw up their

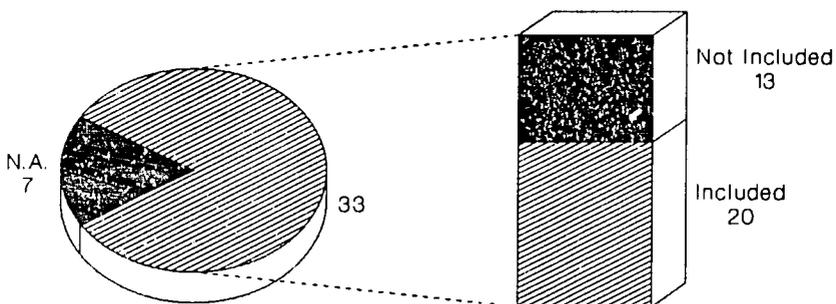


Figure 17. Inclusion of Recommendations in Final Reports

hands and say "Impossible!" I think you have a better chance for positive changes if the findings aren't so global and if they don't require vast resources.

**Suggestion: Researchers might downplay international dissemination of OR findings.**

Professional journals and international conferences are impressive showcases for OR efforts, but this type of dissemination is a mixed blessing. First, most journals have a scientific bias that favors experimental or quasi-experimental designs over the nonexperimental research that might be more useful for improving service delivery. This bias might encourage OR researchers to design and conduct more complex studies than is necessary.

Second, the glamour of publications and conferences might lead some researchers into believing that international dissemination is more important than local marketing. This emphasis is incorrect and dangerous, since it reduces the efforts spent on the more important task of helping managers change programs.

Figure 5, presented earlier, is based on preliminary data, but it suggests that more OR researchers have prepared presentations and journal articles than have prepared interim reports, special summaries for high-level managers, or special-issue reports. Yet these latter types of products are more likely to improve programs than is international dissemination.

If international dissemination is important, researchers might leave it to other staff who can focus on that task. FHI is an excellent example of this strategy, with a separate U.S.-based staff of journalists whose sole task is to identify and publicize interesting studies. These journalists interview FHI's OR researchers regarding such studies, then take the lead in preparing a dissemination plan and/or the products themselves. OR Program regional contractors' U.S.-based staff or the MORE Project might fill this same role for the OR Program.

## **ISSUE #10: HOW CAN OR RESEARCHERS BETTER LEARN FROM THEIR OWN OR EXPERIENCES?**

The OR Program has been operating rigorously for the past 20 years, and it has amassed a wealth of experience in this field. Even so, almost every respondent commented that there is a great deal to learn about how to do it correctly. "[OR] is still at a relatively early stage of development." "We need to learn how to change programs." "The entire idea is a new

and unfamiliar topic, so we have to start at ground zero....We've a lot to learn ourself; we have to do more methodological work ourself in this country...." "Coming out with methodologies for how to do this work and/or making OR a recognized discipline would be exceedingly useful. We couldn't find people to do this work, even in the U.S. We need to make it into a legitimate exercise."

**Suggestion: Researchers might capture the lessons learned from each OR experience.**

Researchers learn a great deal during an OR study, not only about the issue(s) being studied, but also about good (and bad) ways to conduct OR. These lessons cover many aspects of OR, from how to begin quickly to how to market findings effectively. But these lessons cannot be shared with other researchers, and they often cannot be remembered, unless they are captured in a systematic fashion.

One option is to prepare a short "lessons learned" memorandum after each OR study. This informal product might include any and all thoughts about improving the conduct of OR, and it might be disseminated widely. The MORE Newsletter might be an appropriate way to share many of these lessons.

**Suggestion: Researchers might convene regularly to discuss general issues surrounding the conduct of OR.**

Almost every respondent commented spontaneously that it is a good idea to learn from each other's experiences. "What you're doing is really useful, because I think there's a lot to be learned from these other programs. There could be some excellent cross-fertilization if someone looked in-depth and shared their lessons."

However, many respondents also regretted that there is, at present, no forum for such sharing. "There's not been a forum where the heads of the evaluation units of these organizations could meet, ever, on a yearly basis. It just hasn't happened. If A.I.D. said, 'We want the evaluation capabilities of all the groups to work together, and we want someone to call the meetings,' I think a lot of people would attend."

We may hope that A.I.D.'s June 1990 conference and workshop were the first of a series of forums to respond to this need.

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APPENDIX A

CODING SHEET FOR OR SUBPROJECT DATABASE

FAMILY PLANNING OPERATIONS RESEARCH DATABASE  
CODING FORM

RECORD TYPE:(Circle one) (O)riginal (U)pdate (F)inal DATE CODED \_\_/\_\_/\_\_

SUB-PROJECT DESCRIPTION

1. CONTRACT NO: \_\_\_\_\_ 2. TVT NO. \_\_\_\_\_

3. CONTRACTOR: \_\_\_\_\_

4. SUB-PROJECT TITLE:  
\_\_\_\_\_

5. CURRENT STATUS: (Circle one)

APRV ONGO EXTN NCOS TERM CANC NRPT COMP

6. COUNTRY: \_\_\_\_\_ 7. BILATERAL AGREEMENT: Yes No

8. REGION: (Circle one) ASP NEA AFR LAC INT

9. SUB-PROJECT TYPE:(Circle one) Formal Study (FORMAL)  
Technical Assistance Only (TECASS)

10.SERVICE PROVIDER: \_\_\_\_\_

11.AGENCY TYPE: (Circle one) GOV QGO FPA UNV PFP PNP NA

12.RESEARCH GROUP: \_\_\_\_\_

13.GROUP TYPE: (Circle one) GOV QGO FPA UNV PFP PNP NA

SUB-PROJECT SCHEDULE

14.PROJECT STARTED \_\_\_/\_\_\_/\_\_\_  
15.PROJECT ENDED \_\_\_/\_\_\_/\_\_\_  
16.END DATA COLLECT \_\_\_/\_\_\_/\_\_\_  
17.FINAL REPORT \_\_\_/\_\_\_/\_\_\_

SUB-PROJECT COSTS

18. TOTAL COST (Sum 2-6) \_\_\_\_\_  
19. AID/W OR SUB-PROJ COSTS \_\_\_\_\_  
20. MISSION BUY-IN \_\_\_\_\_  
21. OTHER MISSION FUNDS \_\_\_\_\_  
22. PRIVATE FPA/PVO \_\_\_\_\_  
23. OTHER FUNDS \_\_\_\_\_



29. LOCATION OF SUB-PROJECT SERVICES (Circle one)

Urban(URB)                  Rural(RUR)                  Both (BUR)                  NA

RESEARCH METHODS

30 (*) TYPE OF DATA	31 (**) FREQUENCY	32 (***) GROUP	33 (****) SAMPLE
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Data Collection

(\*) TYPE OF DATA

Baseline Census	(BASEC)	Sample Survey	(SAMP)
Endline Census	(ENDLC)	Mini-Survey	(MSURV)
Baseline Sample Survey	(BASES)	Observation	(OBSER)
Endline Sample Survey	(FNDLS)	Photographs	(PHOTO)
Case Studies	(CASES)	Program Records	(RECD)
Existing Documents	(DOCEX)	Service Statistics	(STATS)
Focus Groups	(GROUP)	Site Visits	(SITEV)
Other Qualitat. Intervs	(INTVW)	Unobtrusive Measures	(UNOBH)

(\*\*) FREQUENCY

(O)ne time (M)ultiple (I)teractive (R)epetitive (C)ontinuous

(\*\*\*) GROUP INTERVIEWED

Program Management (e.g. supervisors, program managers)	(PROG)
Direct Service Providers ( e.g. front-line staff)	(STAF)
Clients (e.g. present users)	(CLT)
Potential Clients (e.g. couples, MWRA, sexually active male/female)	(POTE)
Former clients (e.g. drop outs)	(FORM)
Community leaders (e.g. heads of villages, market assoc.)	(LEAD)
Local experts (e.g. university researchers)	(LOCL)
Persons working with clients on issues other than FP	(OTHR)
Potential Providers	(PPRO)

(\*\*\*\*) SAMPLE

(R)andom (N)on-Random (O)Not applicable

Data Analysis

34. ANALYSES CONDUCTED:(D)escriptive (M)ultivariate (N) Quantitative Analysis

Outcome Measures and Record Relevant Values (Select all that apply)

<u>OUTCOME MEASURE</u> (***)	<u>Baseline</u>	<u>Interim</u>	<u>Final</u>	<u>Location</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

- (\*\*\*) OUTCOME MEASURE
- |                          |                               |
|--------------------------|-------------------------------|
| Active users (USE)       | Cost-Effectiveness (CEF)      |
| Continuation Rates (CON) | Cost per CYP (CPC)            |
| Contacts w/clients (CWC) | Fertility Rates (FER)         |
| Contr. Prev. Rate (CPR)  | New Acceptors (ACC)           |
| Contracept. Sales (CNS)  | Contraceptive Knowledge (KNO) |
| Contracept. Distr. (CND) | CYPs (CYP)                    |

RECOMMENDATIONS: Did the final report of OR Project include specific recommendations based on study findings?  
 Yes                      No                      NA

REPORTING

38. TYPE OF DOCUMENT      39. LANGUAGE OF REPORT:  
English (ENG) French (FRE) Spanish (SPA) Local (LOC)

Full Report (FUL)                      \_\_\_\_\_

Exec. Summary (SUM)                      \_\_\_\_\_

40. TYPE OF DISSEMINATION ACTIVITIES (Check all that apply)

- Conference/Workshops (CONF) \_\_\_\_\_
- Paper/Presentations to confer/wkshps (PAPR) \_\_\_\_\_
- Final Report (FINR) \_\_\_\_\_
- Interim Progress Reports (INTR) \_\_\_\_\_
- Meetings discuss preliminary findings (MEET) \_\_\_\_\_
- Journal articles (JOUR) \_\_\_\_\_
- Reports specific issues (SMAR) \_\_\_\_\_
- Special summaries high level audience (SPEC) \_\_\_\_\_
- Videotapes (TAPE) \_\_\_\_\_

## APPENDIX B

### INTERVIEW GUIDE FOR OTHER OR PROGRAM RESPONDENTS

- How do you define "operations research" or an "operations research" study? Please give me a (brief) typical example.
- In the largest sense, why do you conduct OR studies? What do you hope to achieve with your overall OR effort?
- How many OR studies have you completed? Where?
- Organizationally, how do you get your studies done?
- How do you get ideas for your studies?
- What types of services do you study?
- What kinds of issues do you look at? (Scope)?
- What types of research designs do you use?
- What dependent variables do you generally measure?
- What are your sources of information/data?
- What are your data collection methods?
- What distinguishes between "good" and "bad" OR studies? What characteristics make the good ones successful?
- How long do your studies tend to last?
- How much does it cost (in \$US) to do a study? Who provides this money?
- What products result from your studies (not outcomes, but outputs)?
- How are your findings communicated? Do they include recommendations?
- What are the typical impacts/results/outcomes of your OR studies? What are you accomplishing with your studies?

- **What are the strengths of your OR approach? What do you do well?**
- **What are the weaknesses of your OR approach? What do you not do well?**
- **How do your OR studies differ from those done by others?**
- **What new directions do you see for your own future?**
- **What advice would you have for improving OR studies?**
- **What written materials should I have?**

## 14. TECHNICAL AND OTHER CONSIDERATIONS IN IDENTIFYING OPERATIONS RESEARCH PROBLEM AREAS, SELECTING TOPICS, AND DESIGNING STUDIES

Andrew A. Fisher and Robert Miller

The Population Council

### INTRODUCTION

The thinking of operations research (OR) practitioners is often dominated by technical issues involved in the identification of OR problems, the selection of study topics, the design of studies, and the analysis of data. Yet clearly, technical considerations are not the only issues of concern; indeed, they may not always be the most important in determining whether an OR study is approved for funding, is implemented, and subsequently influences service delivery. As anyone who has spent even a day in a field setting knows, there is a set of nontechnical, often political issues that must be addressed. OR practitioners frequently find that throughout the process of developing and implementing OR studies, these issues can be as influential as technical ones. For example, just when a technically sound OR proposal is taking shape, nontechnical questions concerning people, personalities, institutions, social customs, cultural values, and politics begin to intrude. At this point, a carefully crafted research design with a well-defined set of objectives and hypotheses may begin to look weaker than it did originally. Components may be added or taken out of OR proposals for any number of reasons that have very little to do with technical research issues.

This paper is concerned primarily with the first stage in the OR process, namely, problem identification and OR study selection. More specifically, our interest is in the tensions that arise when the technical guidelines used by OR practitioners for identifying and selecting OR topics are compromised because of the concerns and issues, often political in nature, of donor agencies, proposal reviewers, and field implementing organizations.

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## TECHNICAL CONSIDERATIONS IN IDENTIFYING AND SELECTING OR PROBLEMS

OR is a process used for identifying and solving program problems; it looks for causes and possible solutions to problems affecting service delivery. As currently applied in health, family planning, and other development programs, the process includes five basic stages: (1) problem identification and diagnosis, (2) strategy selection, (3) strategy experimentation and evaluation, (4) information dissemination, and (5) information utilization. The OR process is designed to increase the efficiency, effectiveness, and quality of services delivered by providers, and the availability, accessibility, and acceptability of services desired by users.

What happens during the initial stages of the OR process affects what takes place subsequently. If an inappropriate problem is identified or an irrelevant topic is selected for study, the findings from that study almost certainly will have no impact on improving service delivery. Thus, issues influencing the identification of OR problems and the selection of study topics are essential to the subsequent success of a study.

OR, like all other research, is set in motion by the existence of a problem. A problem is a perceived difficulty, a feeling of discomfort with the way things are, a discrepancy between what someone believes should be and what actually exists (Fisher et al., 1983). With this definition, one would think that identifying an OR problem would be a fairly easy task. After all, problems are everywhere, and opinions on solutions abound. If the conduct of OR were dependent entirely on the mere existence of problems, OR practitioners would have an endless supply of work, each problem being a candidate for an OR study. Unfortunately, this is not the case. While finding a problem is a necessary condition for starting research, it certainly is not a sufficient condition for initiating the OR process.

From among the thousands of potential problems that might be selected for an OR study, it is necessary to make an initial selection. Clearly, not all problems should or can be studied. Based on our experience with OR, four guiding questions can be asked to help identify a set of problems that lend themselves to an OR approach, or put another way, to help eliminate a set of problems that should not be the focus of an OR study.

**(1) From among the constellation of problems affecting a program, which ones are amenable to research?**

A problem is amenable to research when two or more reasonable, plausible, and competing causes for the problem (and thus two or more reasonable and plausible solutions) can be hypothesized, but it is not known which cause or which solution is more important. Many problems are simply not amenable to research because the cause of the problem is already known, and there is really only one viable solution. In short, there is nothing to research.

For example, suppose that contraceptive supplies are not reaching service delivery points. To be sure, this is a problem, but it may not be one that requires an OR study. The reason no supplies were delivered might be because the transport truck had a flat tire, or because the driver was sick. Instead of an OR study, what is probably required is a timely administrative decision to repair the tire or hire another driver. As another example, frequently one finds that although information, education, and communication (IEC) materials have been produced in quantity and adorn the walls of the family planning headquarters building, they cannot be found at rural service delivery points. Again, this is a problem, but not necessarily one amenable to OR. Rather, it is a problem that requires timely administrative action by the head of the IEC unit to send the materials out. In both of the above examples, there is really only one possible and plausible solution to the problem, and OR is thus inappropriate.

**(2) Which program problems are capable of being solved through administrative action?**

Some problems involve social, cultural, or religious beliefs that simply do not have an operational or programmatic solution, and therefore are not capable of being solved through administrative action. For example, while the religious beliefs of people unquestionably have a powerful effect on contraceptive use, studying the religious belief systems of people may yield relatively few potential solutions to program problems that can be implemented through administrative action. Similarly, other program problems may be so intractable or systemic in nature that the solution(s) includes major political decisions involving policy changes that are not easily addressed by administrators; such problems certainly cannot be solved through administrative action.

Identifying problems that are amenable to research and capable of solution through administrative action will narrow the list and yield a set of

potential OR problems. But merely having identified a potential problem does not mean that an OR study should immediately be planned and implemented. Clearly, some problems are more important than others. From the range of potential OR problems that could be studied, it is necessary to make some sort of selection. Foreit et al. (1989) have outlined a framework for selecting OR research topics that generates two additional questions to ask when considering various OR topics.

**(3) Is a potential problem relevant?**

Relevance, Foreit et al. note, is a function of the number of independent variables included in the definition of the problem that are under the control of managers, and of the extent to which the dependent or outcome variables are viewed as important by decision makers. Foreit et al. observe, "The more control a manager has over an independent variable, and the more interest there is in the dependent variable, the greater the relevance of the research" (p. 2).

**(4) Is a potential problem salient?**

Salience refers to the perceived importance of the problem to immediate institutional goals, and the potential for replicating the solution arising from a study. The last point is important. If the potential solution to a problem cannot be implemented in a larger area or throughout a system, an OR study of such a problem will have little impact.

Taking the above questions together, a relevant and salient problem for OR is one in which the possible solutions to the problem can be influenced by administrative action, the outcomes are important to administrators in helping them reach valued goals, and there is potential to generalize the solution to a wide area.

A positive answer to the above questions usually results in the selection of a single problem situation to be developed into a technical OR proposal. At the proposal development stage, the OR practitioner faces another set of questions, some concerned primarily with technical research issues and others with the implementing agency's capabilities. Among these questions are the following:

- What are the relationships among key independent and dependent variables? How should these variables be operationally defined and measured?

- Is the study design appropriate to answer the research hypotheses? Does the design control for threats to validity?
- Is the study sample representative of a larger universe? Is the sample size large enough to yield statistically significant results?
- Are the data collection techniques capable of producing relatively precise and representative quantitative findings or relatively insightful qualitative findings?
- Is the analysis plan capable of revealing real relationships?

The objective in answering these questions is to design a study that minimizes possible errors by maximizing the reliability and validity of data collection procedures and analysis. The OR practitioner seeks to design a study that will avoid reaching mistaken conclusions, such as accepting a hypothesis when in fact it is false, or rejecting a hypothesis when in fact it is correct.

Finally, before an OR proposal can be submitted for review, another set of questions must be asked concerning the implementing agency's current resources and administrative capability to conduct OR. Such questions include the following:

- What is the past experience and record of the implementing agency with organizing and conducting studies and analyzing data?
- Does the agency have trained research personnel available for the OR study?
- Is there sufficient computer access for data analysis?
- Is the implementing agency willing and capable of sharing research and service delivery costs?
- Does the agency have experience with information dissemination?
- Does the agency have a record of using research findings for service delivery improvement?

The technical issues of research design and data collection and analysis, as well as the evaluation of an agency's research and administrative capabilities, are areas in which the OR practitioner's graduate training and field experience can be applied. In these areas, the answers to questions are

fairly straightforward and relatively unambiguous. These are areas in which the language of research and the signs and symbols of statistics seem to enhance the importance of an activity and help legitimize it. These are also areas that receive considerable attention from OR proposal reviewers. Thus it is not surprising that these areas are discussed in some detail in most proposals.

## **NONTECHNICAL ISSUES IN TOPIC SELECTION AND RESEARCH DESIGN**

Despite the emphasis by most OR practitioners on producing technically sound study proposals, the realities of conducting OR in field settings sometimes result in the identification of study problems and the development of study proposals that are less than technically perfect. Guidelines for identifying OR problems are sometimes not considered in sufficient detail by OR field practitioners. With the pressure to meet work schedules and produce deliverables, a "good" OR problem often becomes the first problem encountered in the field or the most convenient problem to study. This can sometimes lead to a great expenditure of time and funds on trivial program concerns.

For example, no matter how relevant and salient a topic may be to a particular service delivery institution, it may appear less so to other institutions or people. Donor agencies, and certainly one's own agency, may have strong views regarding topics they consider taboo, such as abortion, or population groups they consider inappropriate for OR, such as unmarried teenagers. Other topics, such as quality of care, or other themes, such as cost recovery, sustainability, and privatization, may be considered so highly relevant and salient for a donor agency that the OR field practitioner would be committing "proposal suicide" to leave them out.

A similar situation may hold for certain research approaches. Some agencies can be counted on to insist that cost-effectiveness be a central focus of all studies, whether it is an appropriate focus or not. Some reviewers believe all studies should use contraceptive prevalence as an outcome measure. Other reviewers insist that OR studies use couple years of protection (CYP) as the outcome measure. Some consider the collection of qualitative data through focus groups to be essential to all studies. Reviewers seem to be about equally divided on their like or dislike of such things as multivariate techniques, surveys, and continuation rates. Almost everyone, however, greatly appreciates quasi-experimental designs, as long as they are simple and relatively easy to understand. The specific concerns of one donor agency frequently differ from those of another agency, and

the preferences of one OR proposal reviewer are sometimes quite different from those of another. The agendas of donor agencies and the predilections of proposal reviewers usually result in the addition of elements to a study that in some cases should not be there, or the deletion of elements that should be.

It is not just donor agencies that have their particular concerns and agendas; it is also OR field implementing agencies, such as Ministries of Health, national family planning organizations, and various nongovernmental organizations (NGOs). Components that may seem unnecessary are sometimes added to a study. For example, a study director may decide that in addition to testing a new service delivery system using traditional birth attendants, it is essential to tack on a subsidiary study dealing with method side effects or the social and demographic characteristics of new users.

As another example, despite the careful random selection of experimental and comparison sites to ensure that they are equivalent and representative of a larger universe, the director of an implementing agency may decide (for any number of personal or political reasons) that the area selected for the experimental intervention is simply not suitable. It is inaccessible and too far from headquarters, or it does not have a good mix of service facilities, or it is an area where another competing organization operates. Many service delivery agencies are involved in rivalries for power and influence with other government departments or NGOs. The rivalry may be an important factor behind the selection of one OR study topic over another, the selection of one study area over another, or the focus on certain population groups or variables.

Obviously, it is important for the OR practitioner to know about donor agency agendas and implementing agency concerns that can influence OR topic selection, as well as result in the addition or deletion of various study components. The difficult question for the OR practitioner is what to do about these agendas and concerns that intrude on an otherwise clean research setting.

For many social scientists, dealing with these intrusions is not a particularly comfortable activity. Sociologists, economists, and physicians are trained to consider and evaluate technical aspects of a problem and develop technical approaches to overcoming the problem. They may find it difficult to compromise the research integrity of a study because of social, cultural, or political factors that intrude on the research environment.

As difficult as compromise may be, in our experience the selection of OR problems and study topics and the design of OR study proposals

almost always represent a compromise between technical research issues and nontechnical, often political issues and concerns. It is usually necessary to add components to a study that were not originally in the proposal or to delete ones that were. The final form of an OR study is usually a negotiated settlement, a compromise between the concerns and agendas of an OR field implementing agency and a donor organization, with the OR practitioner or advisor acting as the middleman.

There are no hard-and-fast rules to guide the process of compromise, except possibly to say that the addition or deletion of a study component can be accepted so long as it:

- Does not disturb the research design.
- Does not result in a redefinition or recasting of the central research hypotheses.
- Does not result in a significant addition or substantial diversion of study personnel and resources.
- Does not raise ethical questions concerning the denial of services to people who otherwise would receive them.

Beyond these rather obvious guidelines, it is difficult to identify additional ones. We simply pose a series of questions faced by most OR practitioners in field settings:

- To what extent should nontechnical, often political concerns and issues be considered in selecting OR problems, identifying relevant and salient topics, and developing reliable and valid study designs?
- More often than not, is the process of problem identification and OR topic selection essentially haphazard, capricious, ad hoc, and random, or does it follow established guidelines?
- How far should an OR practitioner go in accepting the addition of a new study component or the deletion of another for reasons that have nothing to do with the identified problem or with technical research issues? In other words, when does one say "yes" and accept, and when does one say "no" and reject?
- What are the allowable trade-offs, the compromises that can be made between accepting a donor's or implementing agency's requests and compromising the reliability and validity of a research

design? In other words, how can technical research issues be balanced against nontechnical ones?

## SUMMARY AND CONCLUSION

Problem identification and OR study topic selection are the foundations upon which the success of the entire OR process depends. Both technical and nontechnical issues impinge on these early stages of project development and must be dealt with simultaneously. This paper has proposed a set of guidelines or questions for weighing the technical considerations of OR, that is, for selecting relevant and salient problems that have competing solutions implementable through administrative action. However, it is not as easy to come up with a similar set of guiding questions for judging the nontechnical, often political considerations that usually result in compromises in project development. It may be hoped that further discussion of these issues will lead to the development of clear and useful guidelines.

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## 15. A RECONSIDERATION OF OPERATIONS RESEARCH EXPERIMENTAL DESIGNS

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### WHAT IS AN EXPERIMENTAL DESIGN?

Most researchers have been taught that cause-effect relationships can be established if three conditions are met: (1) the cause (X) precedes the effect (Y), (2) X covaries with Y, and (3) all other rival explanations for the changes observed in Y are ruled out. If these three conditions are met, we can state as a "fact," for example, that an increase in the supply of contraceptives caused an increase in contraceptive prevalence.

Experiments are researchers' basic tool for testing cause-effect relationships. An experiment is the manipulation of causal (independent) variables and the observation of their effects on other (dependent) variables. Experiments have traditionally been classified into three categories: true experiments, nonexperiments, and quasi-experiments.

### True Experiments

True experiments are more common in research laboratories than in field settings. They require the random assignment of subjects to experimental and control groups, and the control (or avoidance) of all other effects on the subjects during the experiment. The classic model of the true experiment is shown below. Subjects are randomly assigned (R) to each group; then both are observed ( $O_1$ ). One group receives the experimental treatment (X); then both groups are observed again ( $O_2$ ) to detect changes in the experimental group that did not occur in the control group.

<u>True Experiments</u>				
Pre-test/post-test with control group				
Experimental group	R	O <sub>1</sub>	X	O <sub>2</sub>
Control group	R	O <sub>1</sub>		O <sub>2</sub>

### Nonexperiments

Two common nonexperimental designs are illustrated below. What distinguishes these designs from the true experiment is (1) nonrandom assignment, and (2) no control over other variables that might affect the dependent variable.

<u>Nonexperiments</u>			
Post-test only			
Experimental group		X	O <sub>1</sub>
Pre-test/post-test			
Experimental group	O <sub>1</sub>	X	O <sub>2</sub>

In the first design, the experimental group (e.g., a village) receives an intervention (e.g., a sterilization campaign) and then is observed to measure the effect (e.g., on contraceptive use). This is called a post-test only design. Because the village inhabitants were not randomly selected, they do not necessarily represent the population in the area (e.g., they could all be senior citizens), and there is no certainty that some other factor did not cause the desired effect (e.g., they all might have been sterilized in a previous campaign). These two concerns--random assignment to ensure that the subjects represent the population and control of other factors that could have caused the effect--are the key issues that researchers try to deal with when selecting a design.

The second design adds a pre-test, or baseline observation, prior to introducing the intervention. Not surprisingly, this is called a pre-test/post-test design. It allows a little more control than the first design, since the baseline enables the researcher to show whether there has been any change in the dependent variable before and after the intervention was introduced. However, this design does not allow the researcher to say that the intervention *caused* the change. The change could have been due to something else, or it might have occurred anyway as the group became older, more educated, or richer.

**Quasi-experiments**

Campbell and Stanley (1963) introduced the term quasi-experiment and presented 10 different quasi-experimental designs as alternatives to the extremes of true and nonexperimental designs. These designs allowed the researcher to control for some of the 12 "threats to validity" that Campbell and Stanley identified at the time as inherent in any design. Thus, by selecting an appropriate quasi-experimental design, an investigator could dramatically increase the precision and accuracy of the study results. Two quasi-experimental designs have been used frequently in OR studies. The first is called a nonequivalent control group design, the second a time series design.

<u>Quasi-Experiments</u>						
Nonequivalent control group						
Experimental group	O <sub>1</sub>		X		O <sub>2</sub>	
Control group	O <sub>1</sub>				O <sub>2</sub>	
Time series						
Experimental Group	O <sub>1</sub>	O <sub>2</sub>	O <sub>3</sub>	X	O <sub>4</sub>	O <sub>5</sub>

In the first design, there is no random assignment; rather, a matched or comparison group is selected. A typical example would be a district where an intervention will be tried (e.g., increased fieldworker contacts with clients) and a similar district where no change will be introduced. Obviously, the more similar the groups, the greater the likelihood that observed

changes can be attributed to the intervention. This is probably the most common quasi-experimental design used in family planning operations research (OR).

The second design involves periodic observation of the dependent variable (e.g., knowledge of NORPLANT<sup>®</sup>). At some point, an experimental intervention is introduced briefly (e.g., an advertising campaign) and then withdrawn. The trend in the dependent variable will normally be seen as a straight line with a "blip" at the point of the intervention. Growth monitoring of infant weight is a common example of this type of design. The weight of the child is plotted over time and compared with a standard growth curve. Many service statistics can be adapted to this approach as well (e.g., contraceptive prevalence, acceptors, dropouts, couple years of protection, and home visits).

### **EXPERIMENTAL DESIGNS USED IN THE OR PROGRAM: A BRIEF HISTORY**

Since the Agency for International Development (A.I.D.) OR Program began in the early 1970s, close to 200 studies have been carried out in Asia, Latin America, the Caribbean, and Africa. In 1981, A.I.D. also funded the Primary Health Care Operations Research (PRICOR) project, which has sponsored close to 100 studies. In the first decade of the OR Program, there was a good deal of emphasis on true and quasi-experiments, and there were advocates of both approaches. In 1984, Mamlouk and Gillespie summarized the studies done to date according to the type of design used. They concluded that what was needed was more true experiments. Around the same time, Fisher et al. (1984, pp. 5, 9) argued for more quasi-experiments as "the only reasonable alternative to true experimental designs." They argued that "two features of true experimental designs often prove problematic for health and family planning field studies...random selection of study units...[and] maintaining full manipulative control over the timing, intensity, and duration of the experimental intervention variables."

In fact, probably no true experiment has ever been conducted in the OR Program because of these two difficulties. Most studies have been quasi- and nonexperiments. But the heavy emphasis on the social science approach to OR (i.e., hypothesis testing) has resulted in an implicit acceptance of true experiments as the standard against which most studies would be judged.

In recent years, there has been an acceptance of quasi-experiments as the standard, and a gradual shift toward the less rigorous quasi-experiments, nonexperiments, and even designs that are usually not considered experimental (e.g., diagnostic studies, evaluations, qualitative studies, process analyses, and cost-benefit analyses). In addition, since the PRICOR project introduced a problem-solving approach to OR, there has been more acceptance of problem analysis and solution development as legitimate aspects of OR (Blumenfeld, 1985).<sup>1</sup>

Three recent examples illustrate the acceptance of nonexperiments in OR. A study in Mexico assessed the impact of an AIDS mass-media campaign by surveying 683 persons from the general population in September 1987 (before the campaign began) and 631 in May 1988. Technically, this is a nonexperimental pre-test/post-test; there were no control groups or random assignment of subjects. A study of five private clinics in Indonesia tracked the effects of a variety of improvements in service delivery on client load and income in 1988-89; this study also was nonexperimental and had no control groups. In Bangladesh, a 1988 study of low- and high-performing subprojects showed how the performance of the low performers could be raised rapidly and significantly; again there were neither control groups nor random assignment.

Interestingly, all three of these studies are considered successes in that they demonstrated how services could be improved, and their results were adopted.

The apparent shift in designs selected for OR projects has not been radical, nor is it complete. Quasi-experiments are still being implemented, and there is still pressure from A.I.D. and from researchers themselves to conduct quasi-experiments whenever possible. At the same time, there seems to be greater acceptance of the value of alternative approaches, that is, various types of nonexperimental designs. Why this is so is not clear, but three factors may help explain it. First, there is more emphasis on OR for family planning managers and on improving the management of family planning programs. Managers are typically interested in quick results, not long-term experiments. They are also more likely to accept a much lower level of confidence than social scientists. Second, funds for family planning have been decreasing, and there is more interest in practical studies that can show managers how to improve efficiency, reduce costs, and increase income. These are problems that do not necessarily require rigid experiments. Third, the OR community itself has begun to question the need for rigorous experimentation in the OR Program.

For example, at a recent Regional Conference on Family Planning Operations Research in Asia,<sup>2</sup> one working session of researchers and managers came to the following conclusions with respect to experimental designs in OR:

- The largest problem with experimental designs is the frequent contamination of control areas, due to effects of other family planning projects, spontaneous adoption of interventions by local managers, or unequal impact of civil unrest or natural disasters.
- It is virtually impossible to locate true control areas in the participating countries in Asia, both because there may be multiple family planning projects under way in some parts of the nation, and because specific geographic areas may be assigned to the donor or project.
- It is impossible to control statistically for the exogenous effects of social and economic development in the experimental and control areas.
- Flexibility in changing the OR design is more important than ensuring the validity of complicated statistical comparisons.
- Nonexperimental designs are useful to managers even if they do not confirm impact statistically because they may suggest valid trends.
- Nonexperimental studies may be more attractive to managers because they are often less time-consuming, less complex to manage, and more feasible to implement.

### **STRENGTHS AND WEAKNESSES OF ALTERNATIVE DESIGNS**

Different designs can be assessed on two types of strengths, or weaknesses. The first relates to the relative validity of the results produced, that is, how close they are to the truth. Obviously, everyone wants the results to be as valid as possible; the more the threats to validity are controlled and the more the study population represents the target population, the more valid the results are likely to be. Validity is important to managers and policy makers, who must decide whether to accept study results and take action accordingly. Again, obviously, the more valid the results, the more likely they will be accepted and the less the risk to the manager.

The threats to validity are well known to most researchers<sup>3</sup> and will not be described here. However, recent debate on the validity of quasi-experiments indicates that their control of these threats to validity may not be as strong as originally thought. The current thinking is that there is much more subjective judgment inherent in quasi-experiments than most researchers realize:

All the developments just outlined (in this monograph) point to an increasingly realistic and complicated life for quasi-experimentalists. The overall picture that emerges is that all quasi-experimentation is judgmental. It is based on multiple and varied sources of evidence, it should be multiplistic in realization, it must attend to process as well as to outcome, it is better off when theory driven, and it leads ultimately to multiple analyses that attempt to bracket the program effect within some realistic range.

In one sense, this is hardly a pretty picture. Our views about quasi-experimentation and its role in causal inference are certainly more tentative and critical than they were in 1965 or perhaps even in 1979. But, this more integrated and complex view of quasi-experimentation has emerged directly from our experiences in the conduct of such studies. As such, it realistically represents our current thinking about one of the major strands in the evolution of social research methodology in this century. (Trochim, 1986, p. 6)

The second strength/weakness relates to the practical effects of applying each type of design. In general, the more rigorous designs:

- Cost more because of the need for control groups, random assignment, and so on.
- Require more time to implement, in part because the more rigorous designs usually require at least a year between pre-post observations.
- Are more complex technically and often require more technical expertise, e.g., in design and sampling.
- Have a greater (usually negative) effect on service programs because they require more control over the service system during the test, which interferes with management control.

Basically, the researcher always faces a dilemma in selecting a design: the tradeoff between certainty and practicality. The more rigorous the design, the greater the validity, but the less the practicality. The less rigorous the design, the greater the practicality, but the less the certainty that the results are valid. Unfortunately, the designer usually cannot have both a high degree of certainty and a quick, inexpensive, simple design.

## OPTIONS FOR OUR PROJECTS

A number of adjustments to quasi-experimental designs have been suggested to increase their practicality, and similarly, suggestions have been made for decreasing threats to validity in nonexperimental designs. A number of these suggestions are summarized below.

### Control Groups

- Use a comparison group instead of a randomly selected or matched control group. A comparison group may or may not be similar to the experimental group in any significant way, but it provides some control over changes that could be attributed to something other than the experimental intervention.
- Use a "natural" control group, one that is similar to the experimental group, but precluded from participating in the experiment for "natural" reasons. Examples are groups in other geographic or political districts where the intervention will not be implemented.
- Stagger the implementation of the intervention among groups so groups that have not yet received the intervention can act as controls for those that have.
- Use "reflection in action" approaches, or controlled and systematic trial and error, whereby an intervention is implemented, documented, assessed, revised, implemented again, etc.

### Sampling

- Use small cluster samples from a large number of clusters (e.g., 7 respondents from 30 clusters distributed throughout the study area).

- In areas where the entire target population has been registered and recorded on computer, select experimental and control groups at random from the computerized register.
- Similarly, where village maps have been drawn, use them to select random samples in randomly selected villages.
- Try lot quality assurance sampling, which requires a random sample of only 8-10 subjects to tell whether a study population has reached a predetermined threshold of outcome or not.

### Indicators and Data Collection

- Use a trend analysis (quasi-experimental time series) to collect data on a randomly selected sample of subjects over time (e.g., 100 randomly selected women who provide monthly data on contraceptive use).
- Limit the indicators to 1-2 key outcome variables instead of the 50-200 variables in a normal survey. Or, conduct a dual survey: a quick count survey of a randomly selected sample on 1-2 key outcome variables, and an in-depth survey of a smaller, less-rigorous sample to provide supplementary data on other variables of interest.
- Similarly, supplement survey data with in-depth qualitative data (interviews, observations, process assessment) to explain the observed changes and account for selected threats to validity.
- Use rapid and mini-surveys to collect data on 10-30 binomial (yes-no) variables quickly.
- Collect specific data to account for potential threats to validity that are not controlled by the design. An example is history data, monitoring significant events that occur during the test period to identify any that might explain the observed change. Another example is maturation data, probing during the follow-up survey to identify any significant changes in the experimental or control group subjects that might explain the observed change in the dependent variables.
- Use a multidisciplinary team to examine the topic from several perspectives at once, thereby helping to explain away potential threats to validity.

- Set up a temporary, mini-management information system (MIS) to collect service statistics on key variables during the test period.
- Develop stock mini-survey instruments that can be applied as is, complete with analysis and graphic presentation procedures. These can then be used periodically without requiring new investments in design.

### **Analysis**

In addition to the analysis implications listed above:

- Have different researchers examine the same data independently.
- Conduct the follow-up survey in stages: (1) analyze key indicators, and identify areas that need additional data; and (2) collect and analyze the supplementary set of data.
- Similarly, conduct a careful, full-blown contraceptive prevalence survey every three to five years to get accurate data; in the interim, collect data through less rigorous approaches, relying largely on available sources (e.g., service statistics).

### **"Real" OR**

- Use modeling techniques that have been well-developed in OR to test various hypotheses by computer; examples used in family planning are RAPID and Target-setting.
- Conduct "what if" analyses (and use other decision modeling techniques) with managers to help them select interventions to apply--without testing.
- Use different management science techniques to describe and explain why systems do and do not work (e.g., flowcharts, systems analysis).

## Multiple Approaches

A common suggestion for dealing with the validity-practicality problem is to use multiple approaches. Fisher et al. (1984, p. 6) propose the "principle of the three multiples":

- Seek multiple data sources to obtain information on the same variables.
- Seek multiple measurements of the same variables over time.
- Seek multiple replications of the study intervention in different field settings.

Similarly, several of the authors in Trochim's monograph call for multiple analyses to "bracket bias." "We have virtually abandoned the hope of a single correct analysis, and we have accordingly moved to multiple analyses that are based on systematically distinct assumptional frameworks and that rely in an increasingly direct way on the role of judgment" (Trochim, 1986, p. 6).

During the initial presentation of this paper, one participant pointed out another advantage of multiple approaches. When the quasi-experimental design he had set up collapsed, he was able to draw enough data from the other approaches to demonstrate that the intervention was effective.

Unfortunately, the multiple approach to dealing with validity problems in quasi-experiments requires more work--more data collection, more analysis, more time, and, of course, more cost. Again, the original dilemma remains: the greater the validity desired, the longer the study will take and the more it will cost.

## CRITERIA TO CONSIDER IN SELECTING A DESIGN

In addition to the obvious conclusion that no one design is best for all OR problems, it is difficult to provide specific guidelines on which designs are best for which problems. The foregoing discussion would indicate that there is a tradeoff involved in the selection of any design, and that the suggestions made for improving validity and practicality also involve tradeoffs.

One of the reasons for this is that design selection to date has been measured against a technical criterion--the degree to which the design will produce valid results. With the current emphasis in the OR Program on

providing useful information to managers, the practical criterion also needs to be included in the equation--the degree to which the design is acceptable to the manager. That is, the selection of the design has usually been left to the social scientists; it may be time to include the managers in that decision, especially if they are to be the users of the results.

Managers (including policy makers) generally face several practical concerns when contemplating undertaking an OR study:

- *Time*: How long will the study take? Will it be done in time to be useable?
- *Cost*: How much will the study cost in terms of money, staff time, disruption of the program?
- *Utility*: How useful will the study results be for program or policy decisions? If an evaluation is involved, will it be constructive and useful, or critical and damaging?
- *Risk*: How accurate, valid, precise do the results have to be to be acceptable?
- *Audience*: Who else will use these results, if anyone? (Each target audience will have its own assessment of the importance of the above factors.)

The researcher, while also concerned with these issues, has at least four additional concerns:

- *Complexity*: How simple or complex is the issue to be studied? How much detail is required?
- *State of knowledge*: How much is already known about this problem? How much new information will need to be collected and analyzed?
- *Indicator*: Outcome measures are more difficult to measure than process indicators; input indicators are simplest. Which indicator(s) have to be measured accurately?
- *Contamination*: What are the chances that the experimental and/or control groups will be contaminated during the course of the study?

Clearly, the longer the time required to conduct a study, the less useful it is likely to be to the manager. The greater its cost, the less is its perceived value. The greater its utility, the more likely the manager is to want to have it done. The greater the risk involved in accepting the results, the more certain the manager will want to be about the validity of the results. And the larger the audience that will have access to the results, the more reluctant the manager is to conduct the study, unless it is likely to produce useful and valid results. For the researcher, the greater the complexity of the problem, the less that is known about the subject, the more difficult the indicators are to measure, and the greater the risk of contamination, the more time, effort, and care it will take to do the study.

Using these criteria, the researcher could help the manager decide how much of an investment to make in the study design. A general guideline would be that an OR topic would be rated on these nine criteria (e.g., on a continuum from high to low or 0-10, or just qualitatively) to select the most appropriate study design (see Figure 1). For example, the least rigorous

<u>Criterion</u>	<u>Rating</u>										
	Low										High
Time	0	1	2	3	4	5	6	7	8	9	10
Cost	0	1	2	3	4	5	6	7	8	9	10
Risk	0	1	2	3	4	5	6	7	8	9	10
Audience	0	1	2	3	4	5	6	7	8	9	10
Complexity	0	1	2	3	4	5	6	7	8	9	10
Utility	10	9	8	7	6	5	4	3	2	1	0
Knowledge about topic	10	9	8	7	6	5	4	3	2	1	0
Indicator difficulty	10	9	8	7	6	5	4	3	2	1	0
Contamination potential	0	1	2	3	4	5	6	7	8	9	10

Figure 1. Suggested Criteria for Selection of an Experimental Design

nonexperimental designs could be applied to studies that can be done quickly, that have high utility, that are inexpensive, that involve low risk, that are limited to the manager as the audience, that are not complex, about which a good deal is already known, for which the desired indicators are easy to measure, and for which the risk of contamination is low. The most rigorous designs would be selected for studies at the other end of the continuum: ones that are lengthy, that are expensive, that involve high risk, that have multiple audiences, that are complex, about which little is known, for which the desired indicators are difficult to measure, and for which the risk of contamination is high.

## DISCUSSION

Many family planning managers and researchers have been confused about what OR is, and that has probably contributed to uncertainty about the type(s) of designs that are appropriate. It may have been unfortunate that the term "operations research" was borrowed from another discipline and applied to the OR Program. But it may have been a blessing in disguise in that it has forced the field to look at what OR does and why.

Family planning OR began in the late 1960s and early 1970s as social science-based research, with roots in demography and sociology. This seemed logical and reasonable at the time. Those roots dictated the methodologies of OR, which were basically demographic analyses and sample surveys. The dominant tools of OR in those early days were life tables; population projections; and knowledge, attitude, and practice (KAP) surveys. At about the same time (1960-70), another field was developing--program evaluation, which had no theory or disciplinary home, and therefore no methodology to offer OR. Ironically, the field for which family planning OR was named (operations or operational research) was (and is) not represented methodologically in the OR Program. Mathematical modeling is the principal tool of "real" OR. Such techniques as linear programming, Markov chains, queuing theory, and simulation are used regularly to help managers solve operational problems, but they have not been used in the family planning OR Program. It is interesting to note that classical OR is actually very close to mathematical demography.

A change may be occurring, as evidenced by other papers in this volume; by the recent changes in the Requests for Proposals (RFPs) for the OR Program; and by the studies undertaken in the current regional OR projects, where more emphasis is being placed on management issues, providing managers with information they can use to solve management problems and institutionalizing OR within the management structure. This

new direction suggests a different methodological approach and discipline--management science.

Also ironically, and perhaps fortunately, management science is another name for operations research (Wagner, 1969, p. 3). Management science is characterized by several features that make it an attractive "home" for the OR Program: multidisciplinary; emphasis on problem solving; concern with improving performance (effectiveness and efficiency); focus on management decision making; a nonexperimental emphasis; use of evaluation, process analyses, and qualitative techniques, as well as simulation and computer models; and significant interest in cost, personnel, logistics, supervision, management information systems (MIS), and quality--i.e., all of the functional areas of concern in the OR Program.

If there is a change occurring, should the OR Program embrace it? Should more people be recruited from the field of management science? Should a conscious effort be made to incorporate and use a management science philosophy and techniques?

It may be safe to say that few, if any, quasi-experiments have been carried out in the OR Program. Most have been nonexperiments because the researchers have been unable to control the subjects or the interventions, much less the environment. Few of the threats to validity have been or can be controlled in the field settings in which the OR Program operates. Are we, perhaps, deluding ourselves, and wasting time and resources trying to carry out quasi-experiments in this context? Would a management science approach be more fitting and productive?

## SUMMARY AND CONCLUSIONS

Of the three types of experimental designs used in social science research (true experiments, nonexperiments, and quasi-experiments), the most common in family planning OR are two quasi- and two nonexperimental designs.

There has been a shift over time in the OR Program from true to quasi- and now, apparently, to nonexperimental designs. The strengths and weaknesses of these designs can be summarized as a tradeoff between greater validity and lower practicality, or greater practicality and lower validity. A number of suggestions have been made for improving the validity of nonexperimental designs or improving the practicality of quasi-experiments, but these suggestions do not significantly reduce the tradeoff.

The designer, therefore, has to make a choice when selecting a design. With the current emphasis in the OR Program on providing useful information to managers, it may be time to include the managers in that decision, especially if they are to be the users of the results. It may also be time to look to other methodologies, particularly management science, for appropriate tools and techniques to use in family planning field settings.

Nine criteria have been suggested for helping manager-researcher teams select an appropriate design: the time it takes to carry out a design, the cost involved, the expected utility of the results, the risk involved in accepting the results as valid, the audience that will use the results, the complexity of the issue to be studied, the state of existing knowledge about the subject, the difficulty of measuring the indicators selected, and the risk of contamination of control or experimental groups. Using these criteria, a researcher could help the manager decide how much of an investment to make in the study design. Nonexperimental designs could be applied to studies that can be done quickly, that are inexpensive, that involve low risk, that are limited to the manager as the audience, that are not complex, that have high utility, about which a good deal is already known, and for which the desired indicators are easy to measure. The more rigorous designs would be selected for studies that are at the other end of the continuum: that are lengthy, that are expensive, that are high-risk, that have multiple audiences, that are complex, about which little is known, that are difficult to measure, and that have a high chance of contamination.

Obviously, no single methodology or study design should be applied to all OR problems. Experiments are important in certain circumstances, but not in all, perhaps not in many. The alternatives available in other disciplines, especially management science, could provide the OR field with new tools for addressing selected operational problems in the delivery of family planning services.

## NOTES

<sup>1</sup>PRICOR defined OR as a problem-solving process consisting of three phases: (1) systematic analysis of the operational problem, (2) development and assessment of potential solutions, and (3) validation (testing) of the selected solution(s).

<sup>2</sup>Family Planning Operations Research: Asia Regional Conference, March 4-8, 1990, Singapore.

Two types of validity, internal and external, were introduced by Campbell and Stanley (1963). Later, Cook and Campbell (1979) introduced two other kinds of validity: statistical conclusion and construct. *Internal validity* is concerned with the causal relationship between two variables. To the degree that internal validity is high, other factors that would have caused the outcome can be ruled out. *External validity* is concerned with the generalizability of research findings. To the extent that the findings can be generalized to other persons, situations, and time periods, external validity is high. *Statistical conclusion validity* is concerned with the legitimacy of inferences based on statistical tests of significance. To the degree that the assumptions of tests of significance are established, then the application of the tests to the data will be appropriate and statistical conclusion validity high. Finally, *construct validity* is concerned with identifying the true reasons for change. To the extent that the appropriate change variables have been identified, construct validity will be high.

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## 16. PROCESS AND OUTCOME EVALUATION: EXPERIENCE WITH SYSTEMS ANALYSIS IN THE PRICOR PROJECT

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### INTRODUCTION

This paper is based on the efforts of the Agency for International Development (A.I.D.) Office of Health Primary Health Care Operations Research (OR) Project (PRICOR) II to develop a specific type of process evaluation that we have termed systems analysis. The focus of these efforts is on child survival services other than family planning, and any inferences regarding population programs require caution.

The discussion first reviews the rationale for examining the process of service delivery. It then outlines the process evaluation methodology adopted by PRICOR II, which breaks service delivery down into fairly narrow, concrete activities; this methodology largely determines the way the project describes the service delivery process. After summarizing the methodology itself, the paper provides an overall framework for the different systems that should be examined in any working program. After illustrating the findings from systems analyses, the paper briefly addresses potential applications of this approach for routine management evaluation, and for the development of small, rapid, cheap, and relatively simple OR studies.

The impacts of a health or family planning program reflect the net result of a large number of distinct service delivery activities carried out by individual program staff. Understanding how staff actually carry out these activities, in comparison with defined standards of performance, is the sense in which process evaluation is used here.

Process evaluation has limited practical application where measures of the program's overall cost-effectiveness are satisfactory. Techniques for outcome evaluation are relatively well developed and may indicate the relative performance of major categories of service delivery. For the program manager, outcome data serve the function of a screening test, documenting

broad areas where performance is unsatisfactory. Process information helps pinpoint which specific activities within these areas evince performance problems requiring management action.

For the past five years, PRICOR II has examined the way child survival services are actually implemented in large-scale programs. This focus is based on the premise that the health impact of a program is the net result of how well a broad range of service delivery activities are carried out. A recent study (Walker et al., 1988) showed that the death rates among children hospitalized for diarrhea in five Jamaican hospitals were consistently related to deficiencies in the quality of care provided. The closer actual care, as reflected by patient records, approached the standards developed by a panel of experts, the fewer children died. Although there is no apparent reason why the same relationship should not apply in child survival programs, the PRICOR II mid-term evaluation noted:

The attention focused on the process of service delivery is all too rare; no one has ever attempted to develop a systematic approach or tools to identify implementation problems and develop solutions to those problems at the periphery (Pyle et al., 1989, p.23).

There is a large body of research, much of it supported by A.I.D., which examines the effect of child survival interventions on the basis of epidemiological or knowledge, attitude, and practice (KAP) surveys. These studies provide important information on parameters such as immunization status or mothers' knowledge of oral rehydration therapy (ORT). However, they treat the program delivery system largely as a "black box," a poorly understood entity which somehow produces the effects that are then so carefully studied. Surprisingly little research addresses the details of service delivery, such as the nature of program efforts to ensure appropriate follow-up of children treated with ORT.

Certainly, program evaluations have examined service delivery activities, often producing valuable guidance. However, the approach used represents more art than science. The subjective insights of experts may be accurate, but they are not the product of a well-defined methodology that could be applied by program managers after the experts have departed. Visits by teams of experts are relatively rare events. Moreover, the practical logistics of brief reviews of complex programs also limit what can be accomplished. For example, a distinguished team reviewing the Indonesian Expanded Program on Immunization (EPI) and ORT programs found supervision to be pervasively "weak," but was able to say little about what specific activities were performed inadequately or what concrete changes were needed. Their report understandably does not provide objective

benchmarks for use in monitoring improvement in the supervisors' performance. Details, such as how supervisors monitor patient counseling in EPI sessions, are implicitly left for local program managers to analyze and improve.

The design of PRICOR II reflects skepticism about the degree to which local managers themselves know the details of service delivery activities in their own programs. While service statistics are often collected routinely, managers' knowledge of the actual activities carried out by their staff are unsystematic, if not casual, and highly incomplete even for the most perceptive observer. A central PRICOR objective is the development of practical methodologies for gathering information on the process of service delivery, including the quality of care; the nature of efforts to reach target populations; and the effectiveness of support functions such as supervision, training, and management information. A.I.D.'s leading role in this field was recognized by the mid-term evaluation team, which noted:

...what PRICOR II was attempting to do was experimental in nature...there was no precedent to follow, no reservoir of knowledge or experience to tap. PRICOR had to chart its own course and test various approaches and methods to identify and develop some useful tools. (Pyle et al., 1989)

### **A WORKING DEFINITION OF QUALITY OF CARE IN CHILD SURVIVAL PROGRAMS**

As the first step in examining the process of delivering child survival services, the project developed a list of the activities of interest. Drawing on the public health literature and a panel of outside experts, the staff developed a consensus list of the concrete activities believed necessary to provide effective services. The project's approach was explicitly reductionist, breaking complex functions down into their component activities. The process of taking the clinical history of a patient with acute diarrhea, for example, included ten distinct tasks.

A central requirement of the list is that each activity be defined in quantitative terms that allow the measurement of change in performance. If one were to use these definitions in observing history taking for diarrhea patients at two different points in time, one could say that performance had gotten better, gotten worse, or stayed the same. The ability to make such measurements is critical for developing interventions, such as OR, designed to improve performance.

The project has termed the activities list a thesaurus. Like any list based on expert opinion, it must be considered provisional rather than definitive; some of the activities may be defined inadequately or missing altogether. But the thesaurus reduces service delivery activities to measurable terms, presented systematically in a widely distributed document. In this way, the project seeks to facilitate criticism, empirical testing, and refinement of our ideas about how services should be delivered.

For program staff that provide services directly, quality of care can thus be defined concretely: the essential activities can be identified and their performance measured in quantitative terms. The activities of interest include not only clinical care, but also patient counseling and outreach. The thesaurus also attempts to define in similar terms the performance of staff who support service delivery. Staff activities in supervision, training, logistics, and management information are intended, in principle, to affect the performance of service providers. Within the program, these support activities are the major determinants of the quality of care that is actually provided. On the whole, there is less expert consensus on the performance of these activities than on that of direct service delivery activities. Authorities may broadly agree, for example, on how a child with diarrhea should be managed by a service provider. In contrast, there is less agreement on what the supervisor of such a service provider should be doing to monitor and support high-quality services.

The thesaurus provides a framework for examining the activities of both service providers and support staff. Taken individually, the specific, concrete activities listed are highly approachable as research topics. There is little reason to doubt that we can study an issue as narrow, for example, as the role of the supervisor in monitoring the follow-up of the presumptive treatment of pneumonia. Indeed, it is remarkable that service delivery details of such obvious relevance are so rarely the focus of research.

In terms of practical management decisions, such narrowly focused studies appear to be far more generalizable than the more traditional studies that address broad issues. Take, for example, a study demonstrating the feasibility of a new outreach strategy. Such large-scale modifications in a delivery system are likely to be associated with a number of poorly understood, potentially confounding variables. A well-chosen comparison group eliminates these extraneous factors for the purposes of the particular study, allowing the investigator to isolate the effect of the new outreach strategy. The rigor of the study design allows the investigator to effectively ignore a range of factors that may affect outreach, but are not included in the study.

The perspective of the program manager is different: How can the program provide effective outreach? For the manager of a similar program in another country, applying the findings of such a broad study is problematic; the manager cannot afford to ignore arbitrarily any factors relevant to the effectiveness of outreach activities. By focusing on narrower issues, PRICOR II is seeking to develop studies in which the range of potentially confounding variables is greatly reduced, allowing wider application of findings.

Even child survival programs that are very different overall include a number of comparable specific activities. The detailed listing of activities in the thesaurus is intended to exploit these points of similarity. Where different programs attempt to carry out the same service delivery activity through different combinations of supervision, training, and other forms of support, a natural experiment exists. For specific activities, such as the supervisor's monitoring of pneumonia follow-up, simply describing how this is done in several programs (and the results) appears useful. Programs should be learning from the experiences of other programs, rather than re-inventing the wheel. And if poor performance of an individual activity is highly prevalent among a number of programs, this fact probably deserves priority attention as a research topic.

The listing of service delivery activities in the thesaurus largely defines the universe of which a sample has been examined in the field through the project. Program personnel have also found other uses for the thesaurus, including development of training courses, supervisory tools, and process evaluation.

## **AN ASSESSMENT OF QUALITY OF CARE IN TWELVE CHILD SURVIVAL PROGRAMS**

Within the framework provided by the thesaurus, PRICOR II carried out what the mid-term evaluation team regarded as the first large-scale, detailed examination of the delivery of child survival services. Project staff and their host country counterparts used a range of techniques to collect information on how services were actually delivered in the program under study. These techniques included the following:

- Observation of service delivery
- Review of clinical and support facilities
- Observation of home visits

- Records review
- Key informant interviews
  - Clinic staff
  - Nonprofessional health workers
- Client interviews
  - Household
  - Exit (from clinic)
- Role-playing observation
- Training course observation
- Observation of supervisory contacts
- Supervisor interviews
- Community key informant interviews
- Population-based surveys

The exercise of developing data collection instruments, making the corresponding field observations, and analyzing the results is the systems analysis referred to earlier. The instruments are highly structured to minimize the influence of the observer's subjective judgment. The structured format also permits the use of relatively unskilled observers. The resulting database includes 6,000 observations and interviews addressing 1) immunizations, 2) ORT and diarrheal disease control, 3) malaria, 4) pneumonia, 5) maternal health, 6) child spacing, and 7) growth monitoring and promotion.

For the purposes of the systems analysis, the design of a program consists of the various concrete individual activities carried out by the program staff. In examining the degree to which the various activities are actually carried out, the analysis is addressing the implementation of this design: Are people doing what they are supposed to be doing? The activities of interest can usefully be viewed as organized into a few distinct categories or systems, each of which can be subdivided to the level of observable activities. These categories are described below.

**Quality of Care.** The extent to which service providers comply with accepted quality standards, allowing for local variations. Specific areas of focus include the following:

- Clinical history
- Physical examination
- Treatment
- Follow-up
- Record keeping

**Outreach.** The activities of program staff to provide health education related to various child survival services, targeted to clinic attendees, the general population, or specific subpopulations. Areas addressed include the following:

- Content of messages
- Methodology of presentation
- Effectiveness (knowledge and behavior)
- Coverage

**Primary Supervision.** The activities of field supervisors to monitor the quality of care and outreach activities of service providers, identify performance problems, and deal with them. Areas of concern include the following:

- The service provider activities under consideration
- The problem-identification and problem-solving methodologies used
- The effectiveness of the supervisor's intervention
- The level of attention given to the various service provider activities over time

**Second and Higher Levels of Supervision.** The activities of program staff who supervise supervisors, focusing on the monitoring and support provided to the problem-solving process. The following areas are taken into account:

- Service provider activities in which the subordinate supervisor intervened
- The problem-identification and problem-solving methodologies used by the subordinate supervisor
- The methodologies used by the senior supervisor to assess the subordinate's efforts
- The effectiveness of the senior supervisor in assessing problem identification and problem solving
- The methodologies used by the senior supervisor to correct shortcomings in the subordinate's efforts
- The effectiveness of the senior supervisor in resolving shortcomings in problem identification and problem solving
- Guidance provided to the subordinate supervisor regarding which service delivery activities to examine and which methodologies to apply

**Training.** The degree to which formal training actually provides the competencies needed to perform the individual service delivery and support activities listed in the thesaurus (as modified for local use). Consideration is given to the following:

- Whether and when training addressed the service delivery or support activity of interest
- The methodologies used, if any, to measure competencies
- The availability of documentation for these competencies, particularly individual results

- Direct measurement of current competencies, including those of supervisors and trainers, as well as those of service providers, and addressing logistics and information management
- Program efforts to convey practical job knowledge as well as technical competencies, including the documentation of trainees' knowledge of specific job responsibilities and the availability of written guidelines

**Logistics.** The overall adequacy of the supply of drugs, forms, and equipment for child survival services and the effectiveness of the program's system for distributing these supplies. Areas such as the following are examined:

- Actual supplies compared with the estimated requirements of the target population
- Responsiveness of the logistics system to supply requests in terms of both time and amount
- Level of inventory at which supplies are ordered
- Minimum and maximum stocks over the past year, and number of stockouts

**Management Information.** The role of information in the implementation of services at the peripheral levels of the program. Included is consideration of the following:

- Content of records
  - Quality of care measures in health worker or supervisor records
  - Identification of high-priority subgroups for follow-up based on information from clinical records or community sources
  - Summary of supervisory problem-identification and problem-solving activities
  - Coverage of the target population for specific services and education
  - Effectiveness of educational activities
- Utilization, or the use of records in the following:
  - Clinical screening of patients
  - Organization of population outreach activities

- Supervision, including problem identification and targeting of the problem-identification activities of subordinate supervisors
- Verification, or the accuracy of program records, including the following:
  - Program efforts, if any, to verify selected information
  - The validity of program information based on direct verification in the systems analysis

In summary, for any given child survival service, the systems analysis is concerned with seven major systems, which, as outlined above, are further subdivided into about 40 issue areas. Within these areas, there are on the order of 200 distinct and observable staff activities of interest for each child survival intervention.

The project examined staff performance in service delivery programs in 12 countries: Thailand, Zaire, Haiti, Costa Rica, Colombia, Indonesia, Philippines, Peru, Niger, Pakistan, Senegal, and Togo. These studies were not designed to include a statistically representative sample of the implementation of the country's programs, or of child survival programs in general. Nevertheless, PRICOR II appears to be the first large-scale, systematic effort to map quality of care and its program determinants in less developed country (LDC) child survival programs. The findings leave little room for doubt that 1) deficiencies in the quality of care provided in these programs are extensive and serious; 2) program mechanisms for detecting and correcting these deficiencies are poorly developed; and 3) under widely varying circumstances, it is feasible to examine service delivery and determine practical solutions to many of the identified problems.

## METHODOLOGICAL ISSUES

As developed under PRICOR, systems analysis is an overall strategy for describing the process of service delivery, rather than a detailed protocol. Even though the data collection instruments and the sampling approach varied from one country to another, performance deficiencies were so gross that every study found them in large numbers. Nevertheless, it appears feasible to refine the systems analysis approach to improve its cost-effectiveness. This refinement involves several issues, discussed below.

**Observation Methodologies.** Most systems analysis observations were direct, with an observer present in the treatment room, using a highly structured checklist. The observer effect on performance is, of course, a concern. In Peru, the measurement of competencies through role-playing simulations was highly correlated with actual clinic performance ( $r = .82$ ), suggesting that this less expensive approach could substitute partially for direct observation. There is a need for similar comparisons of different methodologies for measuring process, such as health worker interviews, record reviews, and client exit interviews.

**Selection of Service Delivery Activities.** A large number of distinct activities are of potential interest, but resources for examining these activities are always limited. Little is known about the distribution of deficiencies among different activities. If certain elements of performance are highly correlated, it may be feasible to examine only one representative element. If certain activities are consistently well performed, the systems analysis can emphasize other areas. The stability of performance over time is also a central consideration if more than a single evaluation is planned.

**Sampling.** Sampling strategies included multistage random sampling and complete samples (of two small programs), but most of the systems analyses were stratified by high, average, and low levels of perceived clinic or district performance. In practice, identified performance deficiencies were generally distributed evenly among the three groups.

From a management perspective, a nationally representative sample is important chiefly for identifying performance deficiencies that can be addressed at the national level. Only two studies had such a focus. For local or district levels, systems analysis should provide the manager with the basis for deciding whether an intervention is warranted: the point is not merely to describe performance, but to support improvements in performance. Here lot quality assurance sampling (LQAS) provides useful guidance on the appropriate sample size. By focusing on an acceptable/unacceptable classification of a given activity, LQAS permits conclusions with a defined level of precision using sample sizes that generally range from 6 to 20 for each "production unit." (The unit of interest may be a health worker, clinic, or other administrative grouping.)

The logistical uncertainties involved in planning observations of patients in scattered clinics resulted in wide variations in the actual sample sizes for different services, as shown in Table 1.

Table 1. PRICOR Systems Analysis Observations

Country or Program	Number of Cases Observed, Children Under 5				
	ORT	ARI	GM	MAL	EPI
Colombia	18	36			
Costa Rica	207				108
Indonesia	159				
Philippines	84	380	937		1013
Thailand	49	58			60
Senegal	130			132	330
Zaire	38		459	57	405
Niger	134			81	
Haiti	9		57		87
Peru Cono Sur	79				374
Pakistan/Model Clinic	27	40		25	42
Pakistan/Punjab	169			195	77

ORT: Oral rehydration therapy for acute diarrhea

ARI: Acute respiratory infection

GM: Growth monitoring

MAL: Presumptive malaria

EPI: Expanded Program on Immunization

## ILLUSTRATIVE FINDINGS

As discussed above, systems analysis results under PRICOR are expressed as the percent of cases in which the specific activity at issue was observed to take place. In addition to the observer effect, which applies to all of the findings presented below, results should be discounted for effectiveness. Activities observed to take place were not necessarily carried out fully or effectively. These measures should be considered to overestimate true performance.

### Clinical History

- Screen for signs of *Shigella* dysentery in diarrhea cases
  - Pakistan/Model Clinic 89%
  - Pakistan/Punjab 52%
  - Thailand 6%
  - Peru/Cono Sur 60%
  - Philippines 28%
- Question on previous chloroquine use in presumptive malaria
  - Pakistan/Punjab 5%
  - Niger 0%

### Physical Examination

- Count respiratory rate in acute respiratory infection (ARI) cases
  - Philippines 19%
  - Pakistan/Model Clinic 30%
  - Colombia 0%
- Assess hydration status in diarrhea cases
  - Senegal 39%
  - Thailand 12%
  - Niger 10%
  - Zaire 43%
  - Pakistan/Model Clinic 18%
  - Pakistan/Punjab 20%
  - Colombia 0%
  - Philippines 15%

### Treatment

- Administer correct dosage of chloroquine in presumptive malaria cases
  - Niger 53%
  - Pakistan/Punjab 60%
  - Zaire 48%
  - Senegal 41%

### Counseling

- Interpret results of growth monitoring to mother
  - Haiti 5%
  - Philippines 10%
  - Thailand 15%
  - Zaire (children with weight loss) 20%
- Ask mother to repeat ORT instructions
  - Peru 10%
  - Pakistan/Punjab 2%
  - Colombia 25%
  - Pakistan/Model Clinic 8%

### Supervision

- Supervisor's estimate of service provider performance (compared with direct observation of the service provider's performance)

	Supervisor Estimate	Observed
- Counsel mother of child with ARI	66%	1%
- Advise on completing antibiotic regimen for ARI	82%	8%
- Ask about signs of <i>Shigella</i> dysentery in diarrhea cases	87%	28%

### DISCUSSION

Process evaluation in health and family planning programs is not well developed. In contrast with outcome evaluation, widely accepted and refined techniques for characterizing the process of service delivery are not available. Even detailed performance standards--a precise description of what program staff are supposed to do--are not well developed in most

programs. Before the practical value of process evaluation can be defined, the techniques themselves must be further refined. We also need more experience with using process data.

Nevertheless, it seems highly likely that future programs will invest a substantially greater effort in process measures. Early, fairly unsophisticated efforts have revealed an abundance of implementation problems. In some cases, redesigning elements of the program may produce an improved outcome. In many others, however, the more promising strategy is to first try to understand how the old design was implemented, addressing each of the specific activities involved. OR that focuses exclusively on outcomes may fail to give managers the information they need to implement even the most elegant approach.

It is understandable that issues such as supervision, management information systems, and of course quality of care are often associated with qualitative methodologies. Nevertheless, PRICOR has emphasized the importance of being able to measure change in performance. Devising measures for the performance of service providers has proven fairly straightforward; supporting activities, such as supervision and management, present much more difficult measurement problems. Where it is not possible to devise practical quantitative or scaled measures that are correlated with a program effect measure, qualitative methodologies may be the only alternative. Such methodologies may even be preferable where the objective measurement of change is not important. In our experience with child survival services to date, quantitative methodologies have produced the most useful findings, but traditional standards of precision must be adapted to the more modest requirements of the day-to-day management decision.

The strategy of systems analysis is to compare actual performance against an accepted standard. Traditionally, comparisons among programs are viewed with caution. The narrow focus of the systems analysis observations may, however, permit useful generalizations among diverse programs. For a specific process variable, such as giving the correct dose of chloroquine in cases of malaria (see above), only a limited number of corrective interventions appear feasible. If verified in several programs, a list of determinants of performance would have broad utility for other program managers. A series of similarly focused OR studies could then be developed into a body of knowledge to guide the implementation of service delivery, in effect defining the conditions associated with acceptable performance.

Systems analysis was effectively carried out by field staff with no more technical qualifications than those of local supervisors. Over time, these

observations could be carried out by existing supervisory staff; the 4-12 weeks allowed for field work under PRICOR simply reflects the logistics of a research project. The most important potential implication of integrating this approach into the supervisory system is the fact that service provider performance can be measured objectively. Thus, the effectiveness of field supervisors in monitoring service delivery, identifying deficiencies, and addressing those deficiencies is potentially subject to verification. In effect, the performance of field supervisors in problem solving can be actively managed, at least for quality of care.

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## **17. COST ANALYSIS IN FAMILY PLANNING: OPERATIONS RESEARCH PROJECTS AND BEYOND<sup>1</sup>**

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### **INTRODUCTION**

With recent declines in government and donor resources, the role of cost analysis in family planning programs has grown in importance. As governments attempt to do more with less, operations research (OR) projects focusing on costs and specifically on cost-effectiveness analysis will be expected to shed light on how governments can best achieve their objectives--e.g., achieving target fertility or contraceptive service levels--for a given funding level. By guiding more efficient resource use, OR can help governments and other organizations meet growing contraceptive needs. Managers at both the policy and program levels are likely to look increasingly to cost-related OR studies that are conducted within the framework of ongoing programs (not just as pilot projects) to help them meet contraceptive service objectives affordably. (See also Jensen, in this volume.)

The key to reducing costs without affecting program capacity, both at the overall program level and within specific program areas, is improving and sustaining the efficiency of service delivery. Enhanced efficiency translates into a lower cost per unit of output. The alternative, if long-term sustainability is to be achieved, is generating more revenue or reducing services in quantity or quality.

A given allocation of resources is considered efficient if no shift in resources from one use to another will result in greater output. To attain internal economic efficiency in family planning programs, resources should be allocated in such a way that output (e.g., couple years of protection [CYP] or births averted among the chosen target group(s)) can be produced at the lowest possible cost. Where large inefficiencies persist, fewer clients can be served and/or the quality or accessibility of service provision will suffer. Properly designed cost analysis in family planning programs can help identify inefficiencies and options for rectifying them.

Efficiency concerns are relevant to several dimensions of family planning programs. Cost analysis can address the following: (1) whether the overall allocation of resources across program subcomponents (e.g., information, education, and communication [IEC], service delivery, training) is efficient in meeting the program's objectives; (2) whether the allocation of resources is efficient within any one major subcomponent; and (3) whether resources are allocated efficiently across subcomponents at the facility level or delivery point. Cost analyses in OR projects tend to concentrate on the latter two dimensions.

In most family planning OR cost studies, output (e.g., effectiveness) measures are combined with cost estimates to permit meaningful comparison of the costs and impact of alternative approaches to service delivery. Since a review of all OR cost studies is beyond the scope of this paper, examples of issues that have been addressed are given here:

- A study that examined the effects of altering the frequency of medical backup sessions for a community-based distribution program in Peru (León et al., 1990) showed that biweekly sessions were more cost-effective than bimonthly sessions. While more frequent backup sessions were associated with more visits overall, relative cost-effectiveness hinged on how the average fixed and variable costs changed with the frequency of backup. Biweekly sessions were more cost-effective than bimonthly sessions because the fixed costs were spread over more visits. Biweekly sessions were more cost-effective than weekly sessions because they were associated with lower average variable costs.
- A study of alternative supervisory practices showed that group supervision could be less costly than individual supervision of fieldworkers, while not lowering the number of clients served or the number of visits made by the fieldworkers (Gallen and Rinehart, 1986).
- In a study of adding family planning services to employee benefits, projections showed that companies would experience lower outlays overall with this approach because the resulting lower birth rate would mean fewer expenditures for maternity leave and other related benefits (Atma Jaya University, Economic Faculty, 1988).
- The approach of combining outreach with stationary family planning services, as opposed to relying solely on stocking posts with contraceptives, was examined (Bertrand and Mangani, 1985). It was found that while this approach raised costs, it also raised out-

put, making it only slightly less cost-effective than using stationary service points alone.

Cost analysis is a component of an increasing number of OR projects. According to a 1986 summary of OR projects (Gallen and Rinehart, 1986), 10 percent of the 156 OR projects examined included cost analysis. This compares with 29 percent of the 113 more recent projects summarized in a December 1989 report (MORE Project, 1989). Nevertheless, while cost analysis appears to be included in OR projects more frequently, fewer than one-third of the more recent projects contained a cost analysis component.

This paper first addresses why cost analysis is a critical component of OR projects. It then defines financial, economic, and resource costs; details complications that arise in practice; and describes three innovative approaches to cost analysis. Finally, it defines issues that deserve more attention and makes recommendations for next steps.

## IMPORTANCE OF COST ANALYSIS IN OR PROJECTS

Cost analysis is important in OR studies for several reasons. First, less developed country (LDC) governments are confronted with the task of providing family planning services to more and more clients as the number of eligible couples increases because of prior high fertility patterns, and as the overall demand for contraception increases. At the same time, resources available to many LDC government programs have declined as a result of slow economic growth, high external debt, and other macroeconomic problems that are often associated with the imposition of strict fiscal controls by the International Monetary Fund (IMF) and other donors as a condition for access to capital. Moreover, worldwide donor resources for family planning appear to be leveling off or even declining on a per capita basis (Gillespie et al., 1989); simultaneously, shifts in donor priority countries are reducing support for more established programs. Thus cost and resource allocation issues are relevant to both new and mature family planning programs.

If government objectives are to maintain or raise contraceptive prevalence, or to improve the quality of service, it is necessary to maximize the impact of the scarce resources devoted to family planning. For the findings of an OR project to have an influence on the decisions of program managers, the findings must demonstrate not only that a project is feasible, but also that it can be implemented cost-effectively. The "external validity" of an OR pilot project (Cuca and Pierce, 1977) depends in large part on both the costs of the intervention and the financial implications of adopting it on

a wider scale. Cost analysis in the OR context is key to helping family planning professionals and planners meet rising demand as donor resources decline, by using resources more efficiently.

## DEFINITION OF COSTS AND CURRENT METHODS

In theory, the concept of cost is straightforward; in practice, it is confusing and often difficult to define and measure. Indeed, the comparability of cost studies often depends on the definition of costs that is used. There are two ways of conceptualizing costs: economic costs and financial (or accounting) costs. A third important concept is resource costs.

### Economic Costs

The economic cost of producing an output equals the opportunity costs (the purchases foregone) of all the resources used. In quantitative terms, the economic cost equals the product of the "price" and quantity of the input, summed over all the inputs used. Total cost represents the cost of all inputs; average cost (of, say, providing family planning services) is total cost divided by total output (i.e., clients served); and marginal cost is the increment in costs that comes from serving an additional client. In cost-effectiveness analysis, the unit (or average) cost of achieving an objective is compared for alternative programs, interventions, or delivery modes. Cost-effectiveness studies can thereby help identify the least costly (or most efficient) way of accomplishing a goal.

Most cost analyses focus on average costs per unit of output. For assessing the cost of expanding output with a given capital stock and for determining whether the given allocation of resources across facilities and program areas is efficient, it is marginal cost that is relevant. To the extent that there are large fixed costs and the volume level is in the region where average costs are falling, increases in volume may have very low additional cost; however, if additional (or marginal) costs are high, then average costs will understate the cost of additional units.

Therefore, when trying to estimate the cost of expanding a particular service, it is inappropriate to extrapolate using average cost estimates, especially if the facility is not operating at an efficient scale of operation (i.e., marginal costs are rising). If one activity has a much lower marginal cost than another, it might be possible to serve more clients, holding costs the same, by shifting resources from the activity with high marginal cost to the one with low marginal cost. Marginal cost is also important for setting pricing policies when external efficiency is an objective.

Because economic costs reflect the cost borne by society to produce that output in terms of foregone opportunities (i.e., the opportunity cost), the price assigned to each input should equal the opportunity costs of using that input. The opportunity cost may differ from a budgetary or financial outlay. For instance, if a project relies on the volunteer services of a physician, the economic cost of the physician's time equals what he or she would be paid in the private market for performing similar services. Economic costs are appropriate when the cost-effectiveness of two alternatives is being considered, or when efficiency issues are being addressed; problems arise in calculating economic costs when there is no competitively determined (i.e., market) price for the input.<sup>2</sup>

### Financial Costs

The financial cost of producing a good or service equals the budgetary outlays (expenditures) associated with that output. In the above example of the physician who donates his or her services, the associated financial cost of the physician's time equals zero. While financial costs constitute useful information for planning purposes, they will not equal economic costs under the following circumstances:

- When resources or inputs are donated, sole reliance on budget data will understate the true economic costs of an activity. For example, when supplies such as condoms are donated, financial costs will exclude them even though they represent a real resource cost.
- When resources are not valued at market rates, budget data may overstate (or understate) the true economic costs of an activity. For example, if personnel are paid at rates that exceed or fall short of their market value, financial costs will not reflect the true cost to society of employing the personnel in the task at hand.
- When capital equipment is used which provides an annual stream of benefits that is independent of the financial outlays, the use of budget data alone (without amortizing or depreciating the capital expenses) may overstate costs in some years and understate them in others.
- When budgets take into account only part of all the resources being used in an activity (e.g., costs borne by host country organizations are excluded), economic costs will be understated.

## Resource Costs

Another concept in cost analysis is the resources needed to produce a given output. Budgets and official expenditures are typically used to measure costs, but they may be misleading estimates of the resources actually required to produce efficiently or effectively. Expenditure data do not always convey what is actually being purchased. For example, if staff do not show up, this is a "cost" borne by the family planning program; however, it is not a resource needed to provide family planning services. The difficulty is that the resource needs and actual expenditures have not been compared. Moreover, it is not always evident what resources are needed to produce a given output. The implicit assumption of traditional costing is that the existing mix of personnel and other inputs is efficient, and that all inputs are consistently available and able to perform. Since this is not the case in all instances, especially in public programs, this assumption often leads to expenditure-based cost estimates that can be misleading. A recent study that measured resource costs in a public hospital is discussed below.

Thus in cases where there is waste (e.g., oral contraceptive supplies that are not stored properly or have been allowed to expire) or irregular availability of staff (e.g., employees who are paid for full-time work, but who work many fewer hours per week), equipment, or other supplies, it may be necessary to measure the resources actually required to provide the service in question in order to obtain the true resource costs.

## COMPLICATIONS IN COST ANALYSIS

Complications arise in cost analysis in four areas: nontraceable costs, the need to control for quality, the issue of measuring demand, and the importance of the scale of operation.

### Nontraceable Costs

While several OR cost studies have attempted to measure opportunity costs instead of relying exclusively on budget expenditures, they have encountered additional problems. One difficulty relates to how fixed costs should be assigned to individual services when the services are provided jointly. For example, McBride (in Bertrand and Mangani, 1985) compared the cost per CYP in areas where service outlets were stocked with contraceptives and outreach was used, with the cost per CYP in areas where service outlets were stocked, but no outreach was used. Costs were measured at several points during the project and in several rural and urban

locations. One major difficulty encountered was that the so-called non-traceable costs (i.e., those costs shared across all components of the program) were a large share of overall costs, even though the study was explicitly set up to assign costs to specific outputs. These nontraceable costs include, for example, management and administration, and utilities. Thus, when many different services are provided, decisions about assigning shared or nontraceable costs can affect the comparability of different studies.

### **Controlling for Quality**

Another complication in cost-effectiveness analysis and in comparisons across programs and facilities is that quality is not held constant across the alternatives being considered, so that the outputs are not always comparable. For example, it may not be justified to conclude that one facility or program is operating more efficiently than another solely on the basis of lower costs per client because those lower costs may reflect lower quality (or higher demand; see below), and not necessarily greater efficiency. One facility may have lower costs per visit relative to another because its staff are poorly trained or because it does not have contraceptive supplies, not because it is more efficient.<sup>3</sup> Moreover, there may be significant differences in income, education, or distances to outlets that affect output measures. Thus it may be necessary to account for these differences in drawing conclusions about relative efficiency.

### **Measuring Demand**

In cost analyses, effectiveness is often measured in terms of CYP, where the outcome measure is an average cost per unit of output. Thus, the outcome measure reflects both the success of the project in generating demand for family planning services (the denominator) and the resources expended to obtain the outcome (the numerator). Underlying demand plays a significant role in the relative cost-effectiveness of a program, other things being equal. Indeed, high demand can make an average program look spectacular; low demand, by the same token, can make a good program look like a failure.

The level of demand will influence what type of delivery system has the lowest costs. For example, recent cost analysis in rural Morocco suggested that mobile teams are more cost-effective than fixed facilities because of the low levels of facility utilization, and the resulting high average costs and excess capacity of the facilities (Knowles, 1989). This points to the importance of conducting prospective studies of demand. The most cost-effective delivery mode may depend on the target group in addition to the level of demand (i.e., anticipated volume or scale).

### Scale of Operation

The scale of operation, which is affected by demand, plays a role in determining average costs. Two facilities may be operating equally efficiently, but have very different unit costs because of differing output levels. Since average costs can vary with the level of demand or scale of a program, they will not remain constant if the scale changes or demand shifts. The relationship between the average costs found in a pilot project and those that would prevail in a larger-scale implementation hinges on the presence of economies of scale (in which average costs decrease with output) or diseconomies of scale (in which average costs increase with output). Thus, the costs of a delivery arrangement based on a small pilot project may be significantly greater when the arrangement is expanded to encompass a system of clinics, hospitals, and outreach services. Where programs have large fixed costs, cost estimates based on the pilot project will tend to overstate what would be incurred if the intervention were put into place nationwide.

### INNOVATIVE COST STUDIES

Most cost analysis in OR projects is based on data from a controlled experiment. The advantage of this approach is that comparable results are generated for improving the effectiveness of interventions and for producing data to allocate costs accurately to different outputs and activities. However, these studies can be very costly; it may be difficult to disentangle the research from the implementation costs (Ainsworth, 1984); and the study findings may not carry over when implemented by governments on a larger scale (Simmons, 1987), as noted above. This section describes some recent innovations in measuring and analyzing costs that could help enhance the usefulness of OR cost analysis.

#### Multivariate Analysis (Hedonic)

An approach to cost analysis that moves beyond traditional OR approaches is found in recent studies in Guatemala (McBride et al., 1987), Colombia (Amadeo et al., 1990), and Indonesia (Chernichovsky et al., forthcoming). In this approach, regression analysis and actual program data are used to study cost, productivity, and efficiency issues. Controls for environmental, social, and economic factors that might also affect the outcome variables are introduced through the use of multivariate analysis.

In the Guatemalan study, retrospective facility-level cost and volume data were used to analyze the cost structure of providing sterilization

services. The results indicated significant economies of scale in the provision of sterilization services because of high overhead and administrative costs, making it more efficient for a single organization to oversee and administer sterilization services provided at many different facilities.

In the community-based distribution portion of the Indonesian analysis, specific issues addressed included the relationship between the number of eligible couples and output (at the fieldworker level), and the way fieldworker productivity is affected by the worker's division of time between service provision and promotional activities, and by the worker's characteristics (age, sex, experience, and education). Separate equations were estimated for three different provinces. The number of contraceptive users per fieldworker was regressed on a set of variables that included the number of eligible couples, the number of eligible couples squared, the availability of one of three different incentive schemes, and the percentage of time the fieldworker devoted to IEC activities. In one province, it appeared that output would be higher if fieldworkers spent less time on IEC activities and more on service delivery. Unfortunately, the analysis of the impact of catchment size on fieldworker productivity produced results of questionable value; this occurred because the data on users were obtained from service statistics, which are closely linked to the number of eligible couples because of target setting. In assessing what made workers more effective, the log of the proportion of eligible couples contracepting was regressed on the fieldworker's age, sex, marital status, years of schooling, and use of family planning. No one variable was consistently significant for all three provinces. The coefficient on education was significant in two of the three equations, and indicated that more-educated workers were less productive.

One aspect of the analysis of the Colombian Asociación Pro Bienestar de la Familia (PROFAMILIA) program involved a multivariate analysis of output levels in 26 different clinics. Several variables were used to measure output: the number of consultations; sales levels of pills, condoms, and spermicides; and revenues from consultations (all in natural logs). The explanatory variables included estimates of the total number of physicians and nurses at the clinic, the ratio of certified nurses to physicians, two dummy variables for medium and large clinics (measured in square meters), and average household income and literacy rate among women in the surrounding area. Higher output levels were consistently found in clinics with higher nurse-to-physician ratios. The results indicated that output could be increased by 10 percent without higher budget outlays by using fewer physicians and more nurses. This finding indicates the types of efficiency improvements or cost savings that can be identified through this kind of analysis.

The major problem with these analyses has been the quality and quantity of available data; otherwise the approach is very promising and broadens the types of issues that can be addressed. For example, these analyses can provide guidance on such issues as whether to use more or fewer fieldworkers to achieve a specific goal, and what types of areas should be targeted (i.e., where fieldworkers will be most effective). These issues are of clear operational significance and are within the scope of government action.

### **Measurement of Economic Costs and Quality**

Progress in measuring actual resource use in publicly provided and financed health programs was achieved in a recent study of a public hospital in the Dominican Republic (Lewis et al., 1990). Existing data were limited to lists of staff and wage rates, making it necessary to collect and analyze information on the use and cost of all inputs for direct and indirect patient care. A large and comprehensive data set was compiled from nine separate surveys and accompanying registries, and time and motion studies of the medical staff. Price data were collected for all consumables, equipment, pharmaceuticals, and other nonpersonnel inputs.

The results indicated that actual expenditures exceeded budget or official expenditure figures because of unrecorded government transfers, as well as modest revenues from charges. Staff performance was shown to be well below that contracted for by the central government. Only 12 percent of all physician time was devoted to patient care. Given the minimal non-patient responsibilities of physicians at public hospital facilities, gross under-performance is implied. Moreover, whereas 82 percent of the facility's budget was allocated to staff, staff costs made up less than 20 percent of all patient costs.

Quality of care measures, such as shortages, training and capability of staff, comparisons of ordered and completed tests and drug prescriptions, and comparisons of medical norms for diagnosis and treatment with actual practices, suggest that the quality of services was well below accepted Dominican norms. Given the low demonstrated standard of care and the number of patients seen, average costs were very high. However, the unit cost per patient using only budget data suggests a moderate cost of care. Thus, improving efficiency and raising basic quality throughout the hospital could improve the impact of the government expenditures. The study provides specific guidance on how to achieve these goals. It also indicates the level of resources required to achieve specific goals, and suggests general means of enhancing efficiency through reallocation and better management of resources.

While this comprehensive approach is costly for analyzing a full range of health services, it would be relatively inexpensive for family planning because of the homogenous nature and smaller scope of services. The results of this approach provide detailed insight into the operating efficiency, quality, and actual costs of family planning programs, all key components for OR studies.

### **Cost-Benefit Analysis--TIPPS**

Another, newer dimension to cost analysis in the context of OR family planning studies is a focus on for-profit private sector organizations. These studies have placed attention on obtaining sound estimates of the expected demand for family planning services, which is a key element of cost-benefit analysis. Such applications include analysis of alternative family planning and health packages available through a private hospital in Indonesia (Atma Jaya University, Economic Faculty, 1988), an analysis of whether a Brazilian health maintenance organization (HMO) should add family planning to the services it offers (*Assistência Médica a Industria e Comércio, Ltda. [AMICO]*, 1986), and analysis of the costs and benefits to individual firms of including family planning services in employee benefit packages. The majority of these studies have been completed under the U.S. Agency for International Development (A.I.D.)-supported TIPPS (Technical Information on Population for the Private Sector) project.

The TIPPS model is a straightforward application of cost-benefit analysis. The cost-benefit calculations encompass the costs of offering family planning, and the expected savings (in terms of savings on social services that are foregone--in dependent health care, maternity services/leave, children's education, and other services for employees) due to increased contraceptive use and lower pregnancy and birth rates. In all cases cited above, analysis of the demand for services formed the basis for the likely increase in contraceptive use expected to result from adding family planning services to health care benefits for employees or health insurance plans (e.g., offering family planning as a health benefit).

In the study of the Brazilian HMO (which formed the basis for the TIPPS model and was performed in the INOPAL project), HMO members were surveyed to ascertain their current family planning practices and their anticipated use of HMO-provided family planning services. Service statistics were used to project service use rates and to allocate costs across service categories. Clinic operations were studied to determine whether clinics were at full capacity. Turnover among HMO members was also considered to ascertain the stream of financial benefits produced by a preventive service.

The information gathered from these sources was used to calculate a cost-benefit ratio for adding family planning services to the HMO menu of services.<sup>4</sup> A positive ratio emerged from projections two to three years after family planning services were added. A key part of the analysis established that the staff and the facilities were operating at excess capacity, so that family planning services could be added at low marginal cost.

A feature of the TIPPS studies that deserves special attention is the fact that demand is explicitly examined. Using demand-side information is likely to improve greatly estimates of the number of service users, which is important because actual costs and benefits depend on the level of service use. This holds true for the government as well as for the private sector. When a government is contemplating building a family planning clinic in an area, a demand study within the catchment area can be used to better determine the probable extent of demand for the services. Demand in turn determines the cost-benefit ratio, the cost-effectiveness of an intervention or service, and the delivery mode that is least costly/most efficient, as discussed earlier. Thus, careful measures of demand can help improve the efficiency and effectiveness of public programs, although they are rarely a part of project planning.

Another positive feature of the TIPPS cost-benefit model is an attempt to consider all relevant costs and savings, an approach seldom taken in publicly designed and financed programs. When governments contemplate building a new facility, the projected number of users alone cannot be used to gauge the savings resulting from contraceptive use at the facility. The composition of users will influence the costs and benefits; to the extent that some "new" clients were already contracepting, the savings resulting from their contraceptive use cannot be attributed to the new facility. Furthermore, if these clients switched from nongovernment sources to the government facility, government savings might actually be negative (because the government previously incurred no cost in serving them). Accounting for substitution is key.

## ISSUES

Cost, cost-effectiveness, and cost-benefit analyses are useful tools for OR; however, their relevance and applicability in guiding policy, project design, and program operations are based on underlying assumptions about data and methodological appropriateness. Measures of cost and cost-effectiveness are commonly compared across countries and projects (Gillespie et al., 1983) to provide estimates of what family planning services cost. However, cost measures are often not comparable across countries because

of broad differences in the definition and sources of cost data, use of different outcome measures, and variations in costs depending on the scale and scope of projects and programs. This section addresses the key issues in current OR costing efforts. Some of these issues have been touched on earlier, and are developed here in the context of future OR costing efforts.

### Measuring Costs Appropriately

Budget studies (combined with appropriate adjustments when the budget figures are incomplete or misleading because of donated resources or capital goods) are likely to provide accurate cost estimates when there exist functioning financial control and management information systems, and performance accountability. In public programs lacking inventory and control systems for supplies, and having supervisory and remuneration systems that do not reward high performance and penalize poor performance, budget studies are likely to be misleading measures of the true resource costs of producing a service.

The difficulty in obtaining sound cost estimates will depend on the scale of the analysis, the availability of financial or expenditure data, and the reliability of budget data. Cost estimates are simplest in the context of small-scale pilot projects set up explicitly to compare alternative service delivery modes. In these instances, data needs are identified up front, and training, supervision, and performance are carefully monitored. Measuring costs in outpatient settings that offer only family planning services is more difficult than in small-scale pilot projects because of the possible incongruence between resources recorded (e.g., budgets) and resources actually used in service delivery. Obtaining accurate costs in outpatient settings that offer family planning and other health services, and in inpatient settings that offer sterilization, is considerably more complicated because of the additional problem of allocating resources across multiple activities.

Although conducting proper cost analysis is easiest in small pilot projects, the findings from such efforts may be misleading for several reasons: worker productivity levels cannot necessarily be replicated in the context of a public program; the small sample may not be representative of the system as a whole; and scale effects (e.g., higher or lower average costs) may distort the applicability of the findings at a larger scale. Moreover, staff performance and managerial quality in a pilot project may well exceed what is typically available or sustainable. Oversight and implicit training by researchers and supervisors, as well as participation of more-motivated workers, may ensure lower costs during a study due to higher productivity and more consistent performance. Without that oversight, subsequent behavior and performance in public programs may deteriorate.

Cost studies that rely on budgets can be complemented with information from other sources, such as management information systems, surveys of facility expenditure patterns, time and motion studies of staff, and evaluation of the distribution and stocking system for contraceptives and service use. Together with budget figures, such data provide additional insights into the true economic costs and enrich the budget data.

In addition to improving cost estimates, integrated data collection and analysis offer the opportunity to identify possible efficiency gains in service delivery and thereby lower costs. For instance, budget studies combined with detailed service statistics could point to areas where resources are wasted. For a public program in which public contraceptive supplies are not well controlled (resulting in, for example, wastage, expired products, and deterioration in product effectiveness), very high contraceptive outlays per contraceptive will exist alongside more modest service statistics, indicating that many clients did not in fact receive contraceptives or that fewer commodities were received than were distributed. This analysis would show that the actual resource costs of the service provided are lower than those indicated by the budget outlays. Such information could point to potential areas of large efficiency gains, resulting in the possibility of lower budget outlays at constant service levels.

### **Measuring Cost-Effectiveness**

Cost data are only half the information needed to evaluate the financial standing of family planning projects, programs, or policies. Assessing the effectiveness or relative impact(s) of family planning efforts offers significantly more information for evaluating alternative interventions, management and delivery arrangements, and other elements of family planning programs. This, of course, has been the rationale behind the consistent reliance on cost-effectiveness analysis in OR projects.

Output measures added to costs permit comparisons across family planning efforts. However, the output measure does affect comparisons across alternative arrangements in OR projects. An example of how output measures affect relative cost-effectiveness is given in Gallen and Rinehart (1986), where it is shown that comparisons of cost per new acceptor vs. cost per acceptor can result in different conclusions about what is cost-effective. Reliance on births averted rather than CYP as the effectiveness measure implicitly accounts for inappropriate use of supply and wastage, among other factors (see Cochrane et al., forthcoming, for a discussion of effectiveness measures).

## CONCLUSIONS, SUGGESTIONS, AND NEXT STEPS

Costs and cost-effectiveness provide a strong rationale for the type and design of family planning programs. However, there are different ways of defining and measuring both costs and effectiveness. The variability of the former is probably more important than that of the latter, and less well understood. Not only do cost definitions and measures differ, but costs also vary over the life of a project or program. Thus, there is not a single cost for a particular or specific type of program.

Efforts at measuring costs and comparing cost-effectiveness in OR projects have provided planners and program managers with useful operating information. These data generally do not, however, provide the information needed to make decisions on such issues as the costs of expanding or upgrading services, and the expected level of demand. What is lacking is a methodological approach based on the practical needs of planners and managers. Currently, financial data are adapted to all uses, and are typically the basis for cost measurement and analysis. Unfortunately, such data can be misleading and therefore may not always be ideal for measuring costs or cost-effectiveness.

Innovations in data collection and analysis methods discussed above hold promise for new ways of defining, measuring, and analyzing costs. Fundamentally, the level of sophistication needs to be raised in order to better measure costs and cost-effectiveness, and to provide information that can guide the design of truly cost-effective programs. The following are some specific initiatives that would both enhance and expand the scope of cost analysis in family planning, and make cost-effectiveness analysis more relevant and appropriate for policy and program needs:

- All family planning costing efforts, including OR projects, would benefit from a broader scope including programmatic issues such as efficiency, productivity, and quality. These issues can be assessed in various ways. Collecting data to complement the financial information typically available would enrich the database and provide a basis for more practical and accurate analysis.
- Technical efficiency measures are largely the domain of OR projects; however, these same measures can be applied in less controlled settings to provide guidance and improvements in operation, as well as reductions in cost. OR projects, while invaluable sources of information on how to design and operate family planning programs, may suffer from Hawthorne effects, and benefit overly from the involvement of researchers and other experts. These factors

can reduce the relevance of results. Studies of ongoing efforts, while more contaminated, would complement the OR results.

- Costs need to be defined more carefully in accordance with the objective of the analysis; thus, information and data collection will be tailored to those objectives. As discussed, costs can be defined and measured in various ways, and the validity and usefulness of the analysis is tied to the appropriateness of the definitions and measures of costs selected.
- Demand factors can determine whether a new program will be effective, which has a direct bearing on costs. Costs per user/acceptor/CYP will be relatively high if demand is low, and overhead and direct costs are spread over a smaller group of clients. Thus, demand for services should be explicitly measured and analyzed in assessing the likely cost-effectiveness or cost-benefit of proposed investments in family planning.
- More attention is needed to the relationship between cost and service quality in family planning. For example, quality can be enhanced at low or no cost by improving such elements as staff productivity and management capability and accountability, and by reallocating resources across family planning outlets. These kinds of initiatives are thus important considerations in assessing both program costs and effectiveness.
- Management information systems should be set up to permit the tracking of inputs and outputs so that managers can monitor costs on an ongoing basis. Simple management tools can lower costs and raise effectiveness. An additional element is the need for accountability; otherwise, all but the strongly motivated have an incentive to ignore the management data.
- A systematic compilation or annotated bibliography of cost analyses undertaken in family planning programs would be a helpful input for those working in OR and family planning more broadly.

## NOTES

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<sup>2</sup>For practical examples regarding the calculation of economic costs, see Brown (1987).

<sup>3</sup>The impact of quality differentials on average costs is complex, however, because quality is likely to affect both the demand for and the costs of producing the service.

<sup>4</sup>Cost-effectiveness compares alternatives for producing the same output, while cost-benefit quantifies in financial terms the benefits of introducing family planning services.

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**PART IV**

**IMPROVING THE DISSEMINATION AND APPLICATION  
OF OR RESULTS**

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## **18. APPROACHES TO STRENGTHENING THE UTILIZATION OF OR RESULTS: DISSEMINATION**

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The Population Council

### **INTRODUCTION**

The purpose of this paper is to analyze the dissemination approaches used in the U.S. Agency for International Development (A.I.D.) Operations Research (OR) Program. The paper describes the principal activities carried out, the target audiences, and the results achieved. Some lessons learned about the dissemination and utilization of results are also presented.

### **OR PROGRAM EMPHASIS ON DISSEMINATION AND UTILIZATION OF RESULTS**

Beginning in the 1960s, pilot, experimental projects were carried out to find better ways of delivering family planning services, and to provide empirical evidence that family planning programs could reduce fertility. The Population Council provided both financial support and technical assistance through grants from the Ford Foundation, the National Institute of Child Health and Development, and several universities. However, these large-scale projects proved difficult to implement and expensive to maintain because of their complex design. Even though the research and field experience were valuable, the projects were not generally replicated in the countries where they were conducted or elsewhere. Nevertheless, they produced comprehensive final reports, as well as guidelines on how to implement major field experiments, and contributed to the literature on applied research in family planning.

A.I.D.'s worldwide OR Program was formally initiated in the early 1970s. Its objective was to provide technical and financial assistance to developing country family planning program managers for designing and testing new or alternative service delivery strategies.

The specific objectives of the OR Program are as follows:

- To increase the availability of family planning services
- To increase the self-sufficiency of programs by improving efficiency or cost recovery
- To expand services to underserved populations
- To increase the availability of underutilized and new contraceptive technology
- To strengthen the quality of services and make services more responsive to client needs

More recent studies conducted under the OR Program have been smaller, simpler in design, completed more rapidly, and on average about one-tenth as costly as the earlier OR studies (Population Reports, 1986). Moreover, in addition to problem identification, solution development, and field testing, dissemination and utilization of study results have been conceptualized as essential stages in the OR approach, although they are considered as strategies for achieving certain ends, rather than objectives themselves.

Many of the projects developed in the 1970s focused on demonstrating the feasibility of implementing the community-based distribution (CBD) of contraceptives, or maintaining effective integrated health and family planning programs. U.S. universities, including Columbia, Johns Hopkins, Hawaii, Michigan, Tulane, and UCLA, were the principal collaborators in these projects. They often produced extensive final reports and published reviews of the results. At the same time, they began to think systematically about dissemination and utilization.

For example, the Danfa Project's final report includes a set of recommendations for communicating the results to target audiences, including the University of Ghana medical school, other training institutions, the Ministry of Health, and other relevant ministries. These recommendations were as follows: (1) organize a policy advisory committee for the project; (2) incorporate the project experience into the curriculum of medical schools and other training institutions; (3) foster formal and informal relationships among project staff and relevant government ministries and agencies; and (4) encourage project staff to transmit project experience by means of published articles, manuals, and conference presentations (UCLA School of Public Health, 1979).

Similarly, the Lampung Health Development project in Thailand maintained a continuing dialogue on project approaches and progress with both Thai and international health agencies. They provided project information through periodic progress reports, organized annual reviews, and conducted special workshops and seminars for the review and refinement of project approaches and key features (Ministry of Public Health of Thailand, 1981).

Given that OR addresses problems that are subject to direct control by program administrators--management information, supervision, logistics, training, and planning--information is needed on how to manipulate these components. Essentially, utilization of research results is the goal of every OR activity. How does OR stimulate the process of utilization? There are only two fundamental requirements. First, "relevant decision makers and information users must be identified and organized--real, visible, specific, and caring human beings, not ephemeral, general, and abstract 'audiences,' organizations or agencies. Second, evaluators must work actively, reactively, and adaptively with these identified decision makers and information users to make all other decisions about the evaluation--decisions about research focus, design, methods, analysis, interpretation, and dissemination" (Patton, 1978, p. 333).

There are a number of reasons why service delivery systems fail to utilize research results. For example, results may lack validity because of the difficulty of conducting research in service agencies. Many service agencies are not sufficiently organized or do not have management staff able or willing to incorporate OR results. The complexity of the administrative decision-making process may simply attenuate the impact of any OR project results (Attkisson et al., 1978). In any case, however, a lack of dissemination guarantees that utilization will be limited.

Beginning in the early 1980s, regional OR programs were supported by A.I.D., first in Asia and subsequently in Latin America and Africa. Although dissemination of results is not specifically mentioned as a priority in the OR Program's objectives, there is a strong emphasis on the dissemination and utilization of results in the regional OR projects in Africa, Latin America and the Caribbean, and Asia and the Near East. The regional projects aim to achieve OR Program objectives by providing technical assistance to disseminate project results in country and regionally, and to facilitate the utilization of data for decision making. In the area of dissemination, technical assistance is provided to interpret research findings for policy and program operations, as well as for the dissemination of results. However, this assistance is often provided by OR professional staff with social science research backgrounds, without guidance from communication experts.

The A.I.D. Office of Population, concerned with the level of utilization of OR findings and wishing to systematize dissemination worldwide, initiated the MORE (Maximizing Results of Operations Research) Project in 1988. MORE dissemination activities are aimed at increasing the flow of information to decision makers; enhancing the visibility of OR studies and findings, particularly among Cooperating Agencies (CAs), A.I.D. Science and Technology, Office of Population (S&T/POP), and Regional Bureaus; and helping to increase the utilization and application of OR results (MORE, 1989).

The themes of dissemination and utilization are intimately related, but they are different. Essentially, dissemination is undertaken with the goal of eventually improving utilization.

## OBJECTIVES OF DISSEMINATION

The general objective of dissemination activities is to make OR results widely available at both the national and international levels, with the ultimate goals of helping decision makers improve family planning programs and policy, and better satisfying the needs of family planning users.

The specific objectives of dissemination in the OR Program should be the following (The Population Council, 1990):

- To increase the awareness and understanding of OR methods through the use of technical assistance.
- To increase the use of results of specific OR projects through the dissemination of clear, easy-to-read publications in English and local languages, addressed to managers, policy makers, researchers, and service agency staff at all levels.
- To improve the skills and capabilities of family planning service agency staff to utilize OR methods and apply project results to improve service delivery.
- To foster close collaboration among administrators, researchers, and other agency staff in order to increase the use of systematic research procedures for detecting and resolving service delivery problems.

- To encourage the adoption of OR as an essential component of the management of family planning strategies and service delivery programs.
- To synthesize the OR experience worldwide, to inform the international family planning community about the process and impacts of OR.

## TARGET AUDIENCES

Two main groups of target audiences have been identified by OR contractors:

- In country
  - Program managers
  - Policy makers
  - Researchers
  - Other service providers
  - Missions
- U.S./other donor countries
  - A.I.D. S&T/POP
  - A.I.D. Regional Bureaus
  - CAs
  - Nongovernmental organizations
  - Researchers
  - Donors

OR results are intended primarily for use by local family planning programs, as stated in the OR Program objectives. The local programs have the power to implement changes suggested by OR findings, and require systematic, relevant, and timely information on program performance. Other local organizations providing family planning services are also target audiences of research results. These audiences need information on how to develop strategies, not only for addressing broad national and international issues in population and family planning, but also for resolving the more mundane problems that inhibit the daily effectiveness of family planning programs. OR also helps programs use funds efficiently, making the programs sustainable over time. Local audiences for these findings include all health and family planning direct service providers, researchers and evaluators, and USAID Missions.

U.S.-based audiences are equally important, and include A.I.D.'s Office of Population and Regional Bureaus, CAs, international organizations, and researchers. The OR Program's objective to improve the delivery of family planning services is also a high priority for these audiences. OR findings provide feedback for them to use in designing, modifying, and improving the performance of programs with which they collaborate. Furthermore, these audiences require evidence on the immediate program benefits of alternatives tested through the OR process. They also need to weigh the value of investments in OR relative to other types of population research or to direct assistance to family planning programs.

## DISSEMINATION APPROACHES

The effectiveness of dissemination depends on having clear strategies for communicating appropriately with target audiences in developing countries. Close collaboration is required among A.I.D. (S&T/POP, Bureaus, and Missions) and field staff in analyzing and disseminating results.

The focus of dissemination activities may vary from region to region, according to the stage of development. In much of Africa, where family planning programs are often tied to developing maternal-child health programs, infrastructure is weak, and modern contraceptive use prevalence is low, OR projects often test the feasibility and acceptability of simple clinic and outreach (CBD) efforts that essentially introduce family planning services to the population. Therefore, dissemination activities in Africa need to focus on information related to issues affecting entire delivery systems. The information needs of program managers may well be different in Latin America and Asia, where there is an increased emphasis on improving specific components of delivery systems.

Regional OR projects in Africa, Asia and the Near East, and Latin America and the Caribbean have used various dissemination approaches that have helped increase the utilization of OR findings to effect sustained program improvement. One such approach is the simple use of demonstration activities employing the OR approach, which has facilitated the adoption of new service delivery systems. For example, CBD was shown empirically to be a cost-effective and acceptable alternative to clinic-based service delivery. However, as the problems being addressed by OR become more varied and complex, more than demonstration is needed.

The elaboration of a dissemination plan is one approach that can help structure the operational strategies for communication with target audiences.

Such a plan facilitates the identification of target audiences, media, and channels to increase the availability and utilization of OR results. The existence of a dissemination plan also reflects a commitment to communicate OR results at the national and international levels to meet the needs of decision makers. For example, the Population Council's Operations Research in Family Planning and Maternal-Child Health for Latin America and the Caribbean (INOPAL) project and University Research Corporation's (URC's) Primary Health Care Operations Research (PRICOR) project developed dissemination plans describing objectives, identifying audiences, and setting forth the activities to be carried out.

In the 1980s, a range of media were used by contractors to disseminate OR results appropriately to different target groups. Table 1 shows the

Table 1. Appropriateness of OR Dissemination Media for Target Audiences

Medium	Audience			
	Policy Makers	Program Managers	A.I.D. CAs	Researchers
<b>Printed</b>				
● Brochures	A	A	A	LA
● Newsletters	A	A	A	LA
● Project Reports	A	A	A	A
● Summaries	A	A	A	LA
● Publications	LA	LA	LA	A
● Monographs	LA	LA	A	A
● Manuals	LA	A	LA	A
<b>Visual</b>				
● Videos	A	A	LA	I
● Slide shows	A	A	A	I
● Posters	LA	LA	LA	I
<b>Interpersonal</b>				
● Conferences	A	A	A	A
● Workshops	LA	A	A	A
● Field visits	A	A	A	A
● Follow-up visits	LA	A	A	A

A = Appropriate LA = Less appropriate I = Inappropriate

appropriateness of the various media for specific audiences. For example, in terms of printed matter, policy makers, program managers, and A.I.D. CAs need brochures describing the OR Program, newsletters, project reports, and summaries. Researchers, on the other hand, are more interested in journal publications, monographs, and technical manuals.

In practice, dissemination of OR findings to target audiences in the United States (S&T/POP, Regional Bureaus, CAs, and researchers) utilizes mainly printed materials in English, especially project reports; papers presented at international conferences, such as the American Public Health Association, Population Association of America, and National Council for International Health; and publications in scientific journals (e.g., *Studies in Family Planning* and *International Family Planning Perspectives*). Project reports are also commonly sent to POPLINE for inclusion in the family planning database, and all OR contractors collaborated in the summary of the OR literature published in *Population Reports* in 1986 (Gallen and Reinhart, 1986).

The dissemination approaches employed in country and regionally by OR projects include the use of different media in local languages and in English to reach target audiences. Project summaries have been prepared by all the contractors, as a way of both communicating efficiently with A.I.D. and informally disseminating results in each region. Newsletters have also been employed (such as *ALTERNATIVES*, the Population Council's bulletin for OR in Latin America and the Caribbean, and more recently in Africa; and *MORENews*, the worldwide OR Program newsletter from the MORE Project).

Visual media, such as videos, slide shows, and posters, that illustrate regional OR experiences and enhance the presentation of findings are an increasingly common strategy for dissemination of results to in-country policy makers and managers, as well as to U.S.-based audiences. These media are most appropriate for policy makers and program managers, less appropriate for CAs, and perhaps inappropriate for researchers. As examples, the Population Council (OR in Latin American and the Caribbean region), Columbia University (Nigeria market projects), Tulane University (Zaire CBD) have each prepared a video on OR, illustrating its utility in specific country settings. Photo banks are less frequently used, but are important for documenting project activities (Williamson, 1988). They are also useful in the preparation of dissemination materials for the worldwide OR program; an example is the MORE video.

Various media, including regional conferences, seminars, and training workshops, have been used for dissemination at the interpersonal level. Close personal contact with potential users of information seems to make a difference. Meetings among OR staff and CAs have been one of the most immedi-

ate ways of disseminating project results. The Association for Voluntary Surgical Contraception (AVSC), the Center for Development and Population Activities (CEDPA), Development Associates, Family Planning International Assistance (FPIA), the International Planned Parenthood Federation (IPPF), Management Sciences for Health (MSH), Pathfinder, and the Futures Group, among others, have all had contact with OR staff regarding their OR approach and specific project results, either in the field or at headquarters. These U.S. audiences use OR findings for project design, and for modification of subprojects in the field to improve their performance.

Within the regions, perhaps the most common dissemination vehicles are end-of-project seminars; national meetings of program managers, decision makers, and researchers; and field visits to project sites by policy makers. The press, including radio and TV news programs, cover large conferences on research results, thus widely disseminating information within countries and regions.

Evaluation of the impact of dissemination activities has been relatively weak in all regions. Qualitative feedback from collaborators has been sought at conferences, at workshops, and during technical assistance visits, and small surveys have been conducted among newsletter readers. Efforts to evaluate dissemination have clearly been a lower priority than the production of dissemination materials. Nevertheless, some lessons have been learned, as discussed in the next section.

## **LESSONS LEARNED ABOUT DISSEMINATION AND UTILIZATION OF PROJECT RESULTS**

Dissemination and utilization are critical if OR is to have broader impacts beyond resolving local problems and providing limited field tests. Such broader impacts include improving management theory to provide a framework for incorporating evidence from disparate sites, times, and populations, as well as sharing results of utilization and replication. These impacts in turn should enhance the contribution of OR to program effectiveness.

Often, the process of conducting OR gives managers a new way of dealing with service delivery problems, and a strategy for activating field operations and stimulating institutional development. The enthusiasm of managers who have used OR can be shared. As Norton observes in a comparison with family planning users, "satisfied users of operations research processes and findings might meet with those who have not yet used OR to explain how it benefitted their projects and the steps they took within their organization to incorporate OR and use this information regularly" (Norton, 1989).

Within both public and private institutions, the impact of OR is enhanced to the extent that it is applied over time, and the dissemination and utilization of results becomes almost second nature. Examples of long-term use of OR include the Asociación Pro Bienestar de la Familia (PROFAMILIA, the IPPF affiliate in Colombia) and the National Family Planning Coordinating Board (BKKBN, the national family planning program in Indonesia). For example, the Executive Director of PROFAMILIA contends that "a month without information for institutions is as dangerous as a minute without oxygen for personal survival."

### **Dissemination contributes to the utilization of OR findings.**

Dissemination efforts contribute significantly to the application of OR findings. During end-of-project seminars, researchers and decision makers develop specific utilization plans based on research findings and interpretation. Information sharing can have powerful impacts. For example, in 1986 an OR project in Bangladesh in collaboration with the Asia Foundation compared high- versus low-performing family planning programs (University Research Corporation, 1988). Significant differences were found between the two groups in field outreach, supervision, and management. The findings were presented to all the program managers during an end-of-project seminar in Dhaka. A survey conducted four months later found that the gap between the high- and low-performing programs had virtually disappeared. Further qualitative research indicated that the low performers did not know they were doing poorly until they were given a high-performance model to emulate. Thus, simply sharing comparative information on levels of performance can motivate managers to improve.

### **A dissemination plan helps develop specific communication strategies and activities to better reach target audiences.**

Dissemination plans are as important at the agency level as they are for the regional OR programs. Each project should have its own dissemination plan and strategies for following up on the use of results to guarantee that its experience is shared by others. For example, Promotora de Planeación Familiar (PROFAM) in Mexico faced strong reluctance from supermarket managers to introduce the sale of condoms in large supermarket chains. OR results showed that the volume of condom sales increased four times when they were displayed next to the cashiers. PROFAM prepared an attractive brochure highlighting these findings for other store managers, and indicating the satisfaction of customers with the sales promotion. Now condoms are sold in supermarkets throughout the country.

**Dissemination helps legitimize new service delivery strategies.**

Adequate dissemination also contributes to the legitimization of new strategies for service delivery. For example, in Nigeria the dissemination of information from the Oyo State and Ibadan market projects helped stimulate replication and expansion by focusing attention on the idea of CBD, and showing its relevance for the delivery of health and family planning services. In addition, replication was improved when managers were provided with information on the specific steps and procedures needed to design and carry out CBD programs in rural areas or in the markets.

**Dissemination contributes to institutionalization of the OR approach.**

Dissemination also helps in institutionalizing OR as a management tool. Institutionalization results from dissemination activities such as OR workshops for program managers on how to analyze problems and develop solutions, which are common in OR programs in all regions, and technical assistance to increase the utilization and application of OR findings. The utilization of data for decision making is promoted through close collaboration of managers and researchers during all phases of the OR project. However, opportunities for follow-up are most easily developed when findings are interpreted and strategies for the future can be fortified by data at hand. For example, a private agency in Mexico conducted several OR workshops in-house to develop or improve service delivery models, and to define and allocate costs and cost-effectiveness monitoring systems. As a result of this effort, the agency is using its own funds to continue to test, refine, and strengthen its management systems.

**Funds should be available for communicating findings and helping programs apply them.**

While considerable emphasis has been placed on the dissemination of OR findings, more could be done to communicate findings and help program managers and policy makers apply them to improve service delivery. One experienced observer of the field describes the problem in the following fashion:

One serious flaw in many projects is the withdrawal of donor support at the point when the research has been concluded and the results can be applied. Funds may be provided for a final report, but not for communicating findings within the country or for helping the program make changes suggested by the research findings. Funding constraints of this kind not only hinder the application of the results, but also lead to the loss

of valuable information on how well those results work in broader practice. (Ross et al., 1987)

OR projects should always include plans and funding for the dissemination/utilization of results. Donor support is needed after the research has concluded and the results can be applied. Funds should be provided for communicating findings both in country and internationally so that valuable information is not lost. When possible, OR programs should include funds to follow up on prior research and facilitate the continued use of research results.

## STRATEGIES FOR FUTURE DISSEMINATION

Several strategies could be used to facilitate communication among groups involved in OR and those involved in policy development. These are discussed below.

### **Develop a dissemination plan with key decision makers.**

As suggested above, a dissemination plan is an important component of an OR project. Such a plan should be developed from the outset, preferably in the research proposal. A dissemination plan describes objectives, target audiences, and media and channels for reaching those audiences. It also describes the processes and specific activities to be implemented, including a work schedule and budget. For example, the INOPAL project in Latin America and the Caribbean has developed a dissemination plan for the next five years (1990-94) to facilitate planning, design, and monitoring of dissemination activities within the region. Objectives, audiences, and process/activities are regionally focused. Dissemination is conducted in most countries in the region, and materials are sometimes developed in four different languages (Spanish, English, French, and Portuguese). The regional approach has facilitated the dissemination of specific OR findings and has fostered collaboration among program managers, policy makers, and service providers in different countries.

In terms of influencing policy, it is important to involve individual policy makers in research and dissemination plans from the outset. Certainly, they should be central figures in the definition of priority OR issues and themes. One practical way of doing this is by including key policy makers as project directors or co-investigators. Although in some settings, where policy makers are skeptical about the role of family planning, it may be more productive to demonstrate the feasibility and acceptability of family planning services through OR before involving high-level policy makers.

**Make policy and programmatic implications explicit and attractive.**

The policy and programmatic implications of OR results should be clearly identified in all reports, and should be tied as closely as possible to the concerns of decision makers. At the same time, OR should also be concerned about replicating results and making generalizations about specific substantive areas, which may be more useful to policy makers internationally than project-specific results.

Special attention should be paid to the way data can be presented to influence different audiences. Concise reports and summaries should be distributed to all appropriate people, and at least a seminar organized to discuss the findings and review policy implications. For policy makers at the highest level, information on the existence of demand for family planning services and its acceptability may be more important than programmatic concerns of management and sustainability. Simple messages should be developed for policy makers, while more detailed information on improving services through OR should be prepared for program managers. Regardless of their level, the messages with the greatest potential impact are simple and clear. Focus groups can be of great assistance in refining the packaging of material.

**Improve identification of target audiences.**

It is essential to identify target audiences for dissemination and to design appropriate communication strategies for reaching them. Effective dissemination analyzes audiences to determine their characteristics and needs for specific information. Decision makers from in-country public organizations and researchers from the United States may have different information needs. A good annotated mailing list, allowing programs to identify the interests of individual decision makers, is extremely helpful in focusing dissemination messages.

**Use professional communication resources.**

Local public relations or marketing firms can provide ideas for improving the communication of OR results, experiences, and lessons learned. Marketing firms can also help ensure that certain study results get to the general public, who often can influence key policy makers. Technical assistance for dissemination should be guided by communication experts, so that results can be disseminated in a creative and innovative fashion. These experts can serve as liaison between researchers and the mass media, helping to design newsletters, reports, slide shows, videos, and other visual or printed materials for

dissemination nationally and internationally. They can be hired as consultants or included as part of the OR team.

**Use a variety of communication media.**

A variety of communication media should be used as appropriate for the specific target audiences. Options include microcomputer technology for graphic presentations, video, and broadcast, as well as print media. Currently, a number of CAs are working on creative ways to communicate policy-relevant information on family planning.

Many channels are needed to increase the flow of information to decision makers, donors, and other CAs. Project summaries, newsletters, and international meetings help exchange experiences in implementing findings. Regional seminars and workshops can have a powerful impact on the definition of issues and dissemination of results. Moreover, they can be used to mobilize political support for specific initiatives. Site visits by policy makers can also be used creatively to demonstrate how alternative delivery systems can be implemented. Professionals working in policy development and OR in Latin America and the Caribbean, Asia, and Africa should systematically plan opportunities for sharing information among the regions about strategies, methods, and results. CAs interested in integrating OR into their subprojects are a key audience that should be targeted continually. They should be informed not only of successes and results, but also of experience in implementing findings so that implementation problems can be identified and addressed. Negative results should also be disseminated since we often learn more from failures than successes.

**Evaluate the cost-effectiveness of dissemination efforts.**

Evaluating dissemination efforts is no less important than evaluating other areas of technical assistance. Investments in dissemination have opportunity costs, and should be justified by the results observed. Dissemination activities can be evaluated in terms of whether their objectives have been achieved and the target audiences have received the information they need. Questionnaires, periodic follow-up letters, telephone calls, and personal interviews can be used to assess audience awareness of OR activities, project implementation, and findings both in country and regionally. Given the limited evaluation of dissemination efforts in the OR Program to date, this is an area requiring additional focus and effort.

## CONCLUSION

In conclusion, dissemination is an integral part of the OR approach. We are just now beginning to explore systematically what its role is, who should be responsible for it, how it should be done, and what level of investment is required. Nevertheless, the field today is much more experienced and equipped to conduct quality dissemination than ever before. The challenges are clear; the opportunities are present.

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**19. INCREASING THE APPLICATION OF OPERATIONS RESEARCH FINDINGS IN PUBLIC SECTOR FAMILY PLANNING PROGRAMS: LESSONS FROM THE ICDDR,B EXTENSION PROJECT<sup>1</sup>**

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**INTRODUCTION**

In the past decade, the use of operations research (OR) to improve family planning service delivery has become commonplace in many developing countries. In a number of settings, OR has played a central role both in resolving problems in existing programs and in testing innovative new approaches to service delivery. While the use of OR to identify promising and innovative approaches to service delivery has increased substantially, the application of OR findings continues to lag considerably behind (Phillips et al., 1985; Ross et al., 1987). The gap in translating OR findings into tangible improvements in policies and programs remains perhaps the most significant limitation of current family planning OR projects. This is especially true in the weakest and technically least sophisticated programs, where promising OR findings might be expected to have their greatest impact in improving service delivery.

Perhaps nowhere is this problem more evident than in the large public sector family planning programs of South Asia, which continue to comprise the predominant mode of service delivery in this region. Although these programs represent some of the earliest and most ambitious organized family planning efforts in the developing world, their performance has with few exceptions been disappointing. Moreover, although active family planning research programs exist in many of these countries, the public sector service delivery programs have until recently continued to remain largely outside of, and uninformed by, the OR process.

The weak application of OR results within these programs can be traced to a number of factors. First, the technical expertise available to interpret, carry out, or synthesize OR findings is usually weak, particularly in developing countries whose programs show the poorest performance.

Frequently exacerbating this is the rapid turnover of senior program managers, and thus the likelihood that the individuals occupying these positions will have only limited prior exposure to family planning programs in general, and to OR in particular. Moreover, because most OR recommendations have traditionally arisen from findings of special pilot projects, and because public sector programs face a unique and systemic set of constraints (human resource, administrative, and financial), OR findings are likely to be viewed as largely irrelevant by senior program managers. Even when the potential positive benefits of OR findings are recognized, the bureaucratic inertia that typifies most public sector programs tends to restrict the scope and pace of change in programs and policies. With few exceptions, public sector programs and their managers tend toward risk aversion when contemplating changes in service delivery, and favor incremental changes in the status quo over radical restructuring of ongoing programs and policies, however promising.

This situation characterized the Bangladesh family planning program when the International Centre for Diarrhoeal Research, Bangladesh (ICDDR,B) Extension Project began field operations in 1982. Despite organized family planning activities that began in the 1950s, the service delivery program remained weak, and continued to fall far short of stated contraceptive use and demographic targets. Because of this, and the fact that several small pilot projects, such as Matlab, had in contrast achieved considerable success in terms of family planning acceptance, the Government of Bangladesh requested that the ICDDR,B set up the Extension Project. The purpose of the project was to test the transferability of successful elements of the Matlab program to the government service structure in Bangladesh. The unique feature of this project is that interventions were tested within the realistic constraints of the program, with service delivery continuing to remain the responsibility of the government (see Phillips, 1987, for a description of the project design).

To date, a series of service interventions has been successfully introduced in the Extension Project field sites. These interventions have been in such areas as revised fieldworker training, improved female worker-to-population staffing ratios, expanded contraceptive choice through household delivery by outreach workers, improved accessibility of clinical contraceptive services, introduction of a fieldworker management information system, and strengthened field management and supervision. Since these interventions have been shown to work and contribute to improved service delivery in project field sites, emphasis has appropriately shifted to how the operational lessons learned can contribute to improvements in the national service program. In the effort to increase utilization of project findings for broader health and family planning policy development in Bangladesh,

much has been learned about how the dissemination of OR findings can be made more effective and the application of promising OR results improved within public sector programs.

## LESSONS FROM THE EXTENSION PROJECT

The key lessons learned from the Extension Project are summarized below.

**Program managers are more likely to respond to OR findings from similar settings. The dissemination of OR results from dissimilar settings will only rarely lead to changes in service programs.**

In recent years, the international dissemination of OR results and recommendations has expanded significantly. Although such dissemination efforts serve a useful purpose in terms of information sharing and expansion of the OR knowledge base, they rarely influence policy decisions in dissimilar settings. Specific countries differ not only in culture, socioeconomic conditions, and language, but also in the basic organization of family planning service delivery activities. The latter differences may be in areas as significant as the type of outreach services offered, or as trivial as the titles given to specific cadres of family planning service providers. As a result, promising OR findings from a country such as Colombia, for example, will rarely be viewed as relevant by a program manager in Pakistan.

**Even within the same setting, OR results from special pilot projects are likely to be viewed by program managers and policy makers as non-replicable within public sector programs.**

OR results from other pilot or nongovernmental projects in the same setting, however promising, are likely to be viewed by public sector program managers as having little relevance for their own programs. These officials will argue that precisely the factors that are largely responsible for the success of these projects--their small scale, flexibility, and absence of serious resource constraints--also mean that results cannot be replicated within larger public sector programs, where problems are myriad and systemic.

This was the experience of the ICDDR,B Matlab project in the early 1980s. Despite its high visibility and importance internationally in the family planning field, research from Matlab had little or no influence on the structure or operation of the Bangladesh government family planning program. Senior program officials almost universally viewed the Matlab

project as nonreplicable--small in scale, unencumbered by resource constraints, and supported by expatriate scientific staff (see Phillips, 1987). It was only after the Extension Project was able to demonstrate that elements of the Matlab program could be replicated within the government structure that senior program officials began to take an active interest in operational findings from the Matlab project.

**In settings where service delivery programs are weak, the positive impact of specific OR interventions on program performance must be convincingly demonstrated to program managers and policy makers.**

One consequence of the decades of poor performance of public sector programs in Bangladesh is a deeply rooted sense of skepticism among many program managers about the potential for achieving any significant improvements in family planning service delivery. Within this context, descriptions of operational problems or lessons from unsuccessful OR projects, while potentially valuable in informing the design of future programmatic activities, will usually generate only lukewarm interest among public sector program managers, who are understandably fatigued from repeated accounts of poor performance and program failures. OR findings and recommendations are likely to carry far greater weight in such settings if they are components of larger successful field interventions. The establishment of successful models of service delivery, supported by independent, objective documentation of project impact, will thus often be a prerequisite for the acceptance and utilization of specific OR findings by program managers.

**For OR findings to be useful and applied, they must address issues that are directly manipulable by program managers.**

While this lesson is true for all programs, it takes on added meaning for the effective dissemination and application of OR results within public sector programs. Specifically, OR recommendations and dissemination efforts must explicitly recognize the constraints under which public sector programs and managers operate, and the limitations to sweeping changes in program design and implementation in such programs. Results and recommendations from special OR pilot projects, however promising, run the risk of being ignored if they do not mesh with the realities and constraints of public sector programs. For example, recommendations to totally restructure the service provider workforce when termination of positions is virtually impossible within a government program, or to provide motorized transport to outreach workers when funds are inadequate for the purchase of even the most rudimentary support equipment, will have little salience for public sector managers. Rather, OR recommendations that will be

perceived as most useful, and thus will have the greatest chance of application, will usually focus on how existing service programs and facilities can be improved and made more efficient. Such recommendations will generally entail smaller, incremental changes in service operations, rather than radical restructuring of existing programs.

**Effective application within the public sector will often require a long-term perspective. Conventional experimental OR projects of limited duration are therefore unlikely to influence public sector family planning policies and programs.**

Other features of public sector programs impede the rapid and effective application of OR findings. Changes in these programs in settings such as Bangladesh typically occur in five-year planning cycles, and there is a general reluctance among senior program managers to introduce major operational changes during interim periods. Thus, several OR interventions from the Extension Project that were first pilot tested in project field sites in the early to mid-1980s--such as the provision of transportation for female paramedical staff to provide clinical outreach services and the domiciliary provision of injectable contraception by female fieldworkers--are only now being considered for wider introduction within the government program.

Continuity in planning is further complicated by rapid turnover in leadership in public sector family planning programs in settings such as Bangladesh. Senior program managers occupy their positions for a maximum of three years, and often much less. The result is an absence of institutional memory regarding promising OR findings during the intervening period, especially given program officials' reluctance to utilize, and base policy decisions upon, recommendations from earlier OR projects that have been completed. Thus, findings from completed OR projects rapidly become obsolete in terms of informing public sector policies. This has been the case in Bangladesh, where the findings from several innovative and highly informative public sector OR projects that ended in the early and mid-1980s have been essentially overlooked during recent deliberations on the content of the government's next five-year health and family planning program.<sup>2</sup>

It is perhaps understandable why under these conditions, the findings from shorter-duration OR projects have had only limited impact on public sector family planning programs. To maximize the possibility that OR findings will be utilized, it will usually be necessary to establish longer-term demonstration projects that explicitly recognize the extended time frames required to introduce changes in public sector family planning programs.

**Targeted briefing papers can play an instrumental role in the dissemination of OR findings. However, to be effective, they must be tailored to the needs of program managers and policy makers.**

The large body of family planning OR findings from scientific publications, conference proceedings, and project technical reports remains largely inaccessible to, and unutilized by, the individuals most likely to benefit from such findings--in-country program managers and policy makers. Few such individuals have the time or energy to peruse lengthy reports or published results of OR studies. As a result, these efforts are more often than not relegated to gathering dust on a bookshelf. The experience of the Extension Project indicates that summaries of these studies in the form of targeted briefing papers can play an important role in disseminating and encouraging utilization of OR results. However, to influence in-country program managers and policy makers, briefing papers must satisfy two criteria.

First, briefing papers must go beyond general findings to address specific operational components of family planning service delivery. For example, summaries of studies showing that there is unmet demand for family planning or that religious opposition does not appear to represent a major barrier to contraceptive use, while possibly useful for overall policy formulation, by themselves provide little guidance to program managers on operationalizing these findings within their own programs. Second, these reports must not simply outline operational problems, but must also contain descriptions of field intervention results or specific recommendations for resolving the problems. For example, a briefing paper outlining that IUD continuation rates are low and recommending that they should be raised provides little guidance to program managers as to how this could be accomplished. This contrasts with a paper summarizing findings from an OR project that demonstrate how IUD continuation rates could be significantly improved if supervisors gave more emphasis to follow-up visits by paramedical workers, and if record-keeping systems were introduced to measure IUD continuation and drop-out rates.

Several examples from the Extension Project illustrate how briefing papers have been used to stimulate and contribute to broader policy changes in the Bangladesh program. A briefing paper summarized findings from a pilot test that indicated the positive effects of improved staffing ratios of female family planning fieldworkers on household visitation levels and contraceptive prevalence. The paper has provided important support for undertaking this initiative on a national level. Similarly, a briefing paper outlining the extensive overlap between governmental and nongovernmental organization (NGO) rural service delivery programs has genera-

ted active exchanges within the NGO, government, and donor communities concerning how better coordination among these groups can be achieved, as well as how new NGO activity can be more effectively targeted toward low-performance areas. Finally, a briefing paper examining the cost-effectiveness of alternative approaches to providing transportation for family planning paramedical staff has generated recognition of the general need for such transportation, and the subsequent development of a donor-government project that includes the provision of transportation as a central component.

**Written dissemination of OR results will rarely by itself be sufficient to persuade in-country program managers concerning the application of OR findings. Among other forms of dissemination, the power of visual demonstration of OR results is often not fully appreciated.**

Although written dissemination through briefing papers has played a prominent and important role in the dissemination of Extension Project OR findings, its effect in-country would have been limited in the absence of continual direct interaction with key policy makers and program managers. This interaction has been achieved through a variety of formal and informal mechanisms, such as regular meetings and briefings, linkages through technical assistance activities, and participation on government committees.

Two other approaches have proved particularly effective in the dissemination of Extension Project OR findings. The first is joint field trips to project field sites with senior government officials to observe specific OR interventions. The opportunity to observe first-hand that specific OR interventions are working, and to interview local program managers and workers regarding the impact of those interventions, often serves as a powerful means of convincing senior officials that OR findings are applicable to their program. In many cases, it has only been when program officials have actually visited field sites and observed successful OR interventions that they have been willing to endorse project recommendations for program change. The second approach is the organization of workshops on specific aspects of the national program (e.g., the introduction of new contraceptive methods within the program, such as injectables or NORPLANT<sup>R</sup>; fieldworker management information systems [MIS]; the most effective role for NGOs in family planning service delivery). These workshops draw together expertise on an issue at the national level and result in highly specific recommendations on appropriate future directions.

**The provision of technical assistance will often be essential for the effective implementation of recommended programmatic changes based on OR studies.**

There is growing recognition that where technical capabilities to interpret and utilize OR results are weak, capabilities to implement new initiatives effectively are also likely to be limited. This is especially true for weak public sector programs, where the introduction of policy changes often places an additional burden on what is already an overextended and undersupported bureaucracy, one that finds it difficult to meet the demands of existing service delivery, much less take on new initiatives. In the absence of appropriate technical assistance, policy changes that have been demonstrated to lead to improvements in service delivery in pilot projects may often fail because of ineffective or incomplete implementation.

Experience with the Bangladesh program clearly illustrates this point. Largely on the basis of Extension Project recommendations and field research, the Bangladesh Government adopted the policies of recruiting an additional 10,000 female fieldworkers and introducing a fieldworker MIS as part of the Third Population and Health Plan. In both cases, however, these policy changes were not effectively implemented until the project provided extensive technical assistance at the national level to assist the government in all facets of planning, coordination, and implementation. In contrast, a government policy to support the establishment of temporary rented clinic facilities--also the result of Extension Project research, but with no technical assistance provided--has remained largely unimplemented within the national program.

Thus, the modification of program policies in response to promising results from OR studies will often represent only the initial step toward achieving tangible improvements in service delivery. If program managers cannot draw upon technical assistance from recognized experts, service innovations will often remain suboptimally implemented. In such contexts, OR projects may need to incorporate a technical assistance component explicitly into their design, or to identify other organizations capable of providing such assistance.

## DISCUSSION

The emphasis in this paper has been on lessons for the more effective application of OR findings within weaker public sector family planning programs. This focus is appropriate, both because of the continuing importance of the public sector as a mode of family planning service delivery in many developing countries, and because of the special constraints and challenges such programs offer to the effective application of OR findings. At the same time, many if not most of the points raised here have relevance to nongovernmental and private sector family planning programs as well. Our emphasis has been on the effective dissemination of OR findings to in-country program managers and policy makers--although only one of several audiences for OR results, one without whose involvement and commitment program innovations stand little chance of succeeding.

The ICDDR,B Extension Project has been discussed here neither as a comprehensive solution to the systemic problems that confront weak public sector programs, nor as a generic blueprint for ensuring the application of OR findings. Despite the project's notable successes in a number of areas in applying OR findings, many promising results remain unincorporated into the national program, and by all accounts, significant scope exists for further strengthening family planning service delivery within the public sector. The experience of the Extension Project does, however, provide insight into how the gap between promising research findings and subsequent application can be narrowed and change effected within a public sector bureaucracy where conventional OR approaches have made little headway. As the experience of the project demonstrates, these improvements are likely to often be grudgingly slow in pace, to require a longer-term perspective, and to be incremental in scope since "...public bureaucracies have rules, structures and traditions which resist change" (Phillips, 1987, p. 5). Nevertheless, if OR is to make a significant contribution toward informing and improving weak public sector programs and policies in the future, approaches to dissemination and utilization must be adapted to the realities and constraints of these programs.

## NOTES

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<sup>2</sup>For a description of the Companiganj Health Project, see Christian Commission for Development in Bangladesh (1980). For an overview of the Munshiganj Family Planning Project, see MCH-based Family Planning Project--Munshiganj (1987).

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## 20. WHAT OR CAN LEARN FROM MARKETING APPROACHES

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### INTRODUCTION

People involved in the operations research (OR) process recognize the value of conducting research, whether it be OR, communications pretesting, evaluation, or some other form. But what about those in the field?

In an incident unrelated to OR, I was recently in Egypt and participated in a conversation on the development of materials to support a major family planning initiative. A very smart, hands-on manager said, "The last thing I need is more of this research and development process. We just spent tens of thousands of dollars and almost a full year developing a simple method-specific brochure that may or may not end up being distributed and read. I don't want to spend more time and money on the process; I want to find a way to get things done."

This statement of frustration illustrates a real gap in what we, as communications people, were selling and what the customer in the family planning business thought he was buying. After the meeting, I realized that the people in Egypt were not supposed to be buying a "process"; rather, they should have been buying increased prevalence and usage of contraceptives.

This brings us to the marketing perspective. OR can learn a great deal from marketing approaches, especially those that deal with the most basic principles under the marketing discipline. The first thing we must do is move away from our product orientation and more towards a customer orientation. Let us first take a look at what we mean by marketing, which goes well beyond the commonly misused synonym of sales.

## A WORKING DEFINITION OF MARKETING

According to Kotler (1980), marketing can be defined as follows:

Marketing is the analysis, planning, implementation and control of carefully formulated programs, to bring about voluntary exchanges of values, with target markets, for the purpose of achieving organizational goals.

Taking this definition one phrase at a time:

- Marketing is a stepped, orderly process, starting with the "analysis" of a situation, developing "plans" based on that analysis, "implementing" those plans, and having a "control" mechanism--usually both process and outcome evaluation components that allow us to measure our progress. This is not very different from the basic research process.
- "Of carefully formulated programs" refers to the level of detail that goes into the planning and implementation process. As OR has learned, carefully formulated OR programs address the need to customize programs, that is, to consider cultural, resource, technology, and other factors in shaping the research program to work within the capabilities and limitations of its real-world context.
- "To bring about voluntary exchanges of value" is perhaps the most meaningful part of the Kotler definition. This is the marketing exchange. It raises the following questions:
  - What are we offering of value to those who purchase or use our services?
  - What are they getting of value when they contract for our services?
  - What value are we getting from the exchange?
  - What value must the customer give up to us in purchasing our services?
  - How voluntary are these exchanges?

We will return to these questions below.

- "With target markets" assumes that there are selected groups, based on their sense of values, that are most likely to enter into the exchange.
- Finally, "for the purpose of achieving organizational goals" assumes that we know what we want to accomplish. This is usually very clear in the for-profit arena, where sales goals drive much of the marketing machinery. In the nonprofit arena and in the areas of OR and family planning, the goals and objectives may not be as clear. For example, do we want to increase sales of OR projects? Do we want to increase prevalence of family planning? Do we want to transfer research technology? And so on.

The bottom line of the voluntary exchange is to give the customers what they want. In a voluntary system, we must make sure the customers are getting more value than they perceive they are giving up. To understand this further requires a better understanding of our customers. Who is the customer? What does s/he want? How can we connect what we do with what our customer wants?

In OR, we have a pretty good knowledge of the market, but how well do we know our customer? Is our customer the decision maker at the Agency for International Development (A.I.D.), the program manager, the front line family planning staff, in-market resource staff, or a combination of these? If we agree we have multiple customers, do they all want the same thing, or do they want different things? And are we directing our OR capabilities and programs to deliver on these wants?

## THE MARKETING MIX

Within any business environment, there are certain factors that are beyond our control, but that can have profound effects on our ability to achieve our organizational objectives. These include social, economic, technological, competitive, and regulatory factors. Changes in any of these areas can greatly influence what we do and how we do it. From a marketing perspective, while these variables cannot be controlled, they should be fully understood. We need to know how they operate now, how they might evolve in the future, and how to factor this into the planning and implementation of all our marketing activities.

Within the framework of these uncontrollable variables, marketing people manage the things they can control--the four critical components of

marketing, referred to in the Marketing 101 courses as the four P's of marketing:

- Product
- Price
- Place
- Promotion

### **Product**

The product (or services) is what we offer in the exchange. It can be tangible, such as an IUD, or less tangible, such as OR. Typically, products are defined or described along two different sets of variables: features and benefits, and performance and perception characteristics. Understanding the differences between these is critical to understanding the customer orientation.

Features are inherent parts of the product; benefits are what the customer gets from using the product. For example, one feature of a car might be a large V-8 engine, but the benefits this feature offers to the user could range from quick acceleration, to quiet and smooth operation, to the ability to haul a trailer. If we promote quick acceleration to someone wanting to haul a trailer, we have missed the opportunity to meet that person's needs and wants, and we may lose the sale. Customers buy benefits. It is our job to understand what benefits they want and to match the features we offer to those benefits. Advertising people like to say, "Don't sell the drill bit, sell the hole," recognizing that the buyer is, in fact, ultimately buying holes.

Performance characteristics, like features, are inherent in the product and are measurable. Perception characteristics are the way the customer perceives and understands that performance. For example, the performance of the same V-8 engine might accelerate the car from 0 to 60 mph in 13 seconds. A conservative sedan driver might perceive that acceleration to be very fast, while a race car enthusiast might consider it to be intolerably slow.

Frequently, perception characteristics are intentionally added to a product that do not in any way affect its performance, but help to shape and/or reinforce perceptions about that performance. The green, blue, and red bleach, borax, and brighteners in multipurpose detergents are

colored just to illustrate the multiple ingredients. The fact that the extra-absorbent waistband on paper diapers is blue does not affect the diaper's absorbency, but it does help shape the perception of the absorbency.

The point is that people respond based on their perceptions and not necessarily on performance. Hence the advertising adage, "Sell the sizzle, not the steak."

With these concepts in mind, what exactly is our OR product? What are the benefits our customers are looking for? Are we offering those benefits in our programs? Do we have features that reinforce and prove that the benefits are there? And what value are we giving the customers: a research report, data tables, accuracy and information, improved family planning program performance, increases in contraceptive prevalence rate (CPR), enhanced technical and analytical skills? Finally, what are we doing to increase the value of our services, to add new features, deliver new benefits, and shape more positive perceptions?

### **Price**

Price is what our customers give us in the exchange. Typically, this is defined monetarily. However, price can include other, nonmonetary costs, such as time, effort, the need to change, professional and social acceptance, anxiety, loss of control, and other less tangible factors.

Have we in OR examined the price issue? What are we asking our customers to give up of value in order to "purchase" our OR programs? Is our price more than just time and money? Are we sensitive to the costs associated with OR staff as outsiders coming into our customer's business? And have we found or are we looking for ways to reduce the price, to identify opportunities for changing the balance of our exchange of values in favor of our customers?

### **Place**

Place is where and when the exchange occurs. In the case of OR, the OR Program usually comes to the customer, exemplifying one of the more convenient place options. In contrast, long-distance follow-up may result in an increased convenience cost to our customers.

### **Promotion**

Promotion is every form of communication about the product, price, and place. It includes advertising, public relations, packaging, special

promotions, traditional sales, telemarketing, and so on. In the case of OR, it includes the many newsletters, articles, final reports, proposals, sales meetings, brochures, speeches, and conferences. Intentionally or not, all of these forms of communication make a statement about OR.

## CONCLUSION

It comes as no surprise that all of the above P's are very much interrelated. A change in one brings about changes in the others. For example, if we add several features to our product (make it "new and improved"), we are also in effect lowering the price or adding value to the exchange. This interrelationship is referred to as the marketing mix. The challenge for the marketing manager is to develop the best possible product, for the lowest possible price, and in the most convenient place, and to promote it in a way that it cannot be missed.

This same challenge lies ahead for people involved in OR. Just as many of these marketing concepts have been applied to the marketing of contraceptives and family planning programs, they can also be applied to achieve the organizational goals established for the OR Program.

Viewing OR services in the context of the voluntary exchange helps develop what may be called a "marketing mindset." This mindset is the first essential step in viewing the world not through the eyes of OR, but through the eyes of those who use and benefit from what it has to offer.

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**PART V**

**STRENGTHENING THE CAPACITY OF COLLABORATING INSTITUTIONS**

**21. STRENGTHENING COLLABORATING INSTITUTIONS:  
THE ROLE OF TECHNICAL ASSISTANCE IN THE  
FAMILY PLANNING OPERATIONS RESEARCH PROGRAM**

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*"Without the existence and participation of management, operations research is a meaningless academic exercise."* (Robert E. Shannon, in Encyclopedia of Professional Management)

*"If the manager is not interested in the question, it is not likely s/he will be interested in the answer either."* (Tom Crowley, former Ford Foundation advisor)

*"Operations research is more important than most administrators think it is."* (Miguel Trias, Executive Director, PROFAMILIA-Colombia)

**INTRODUCTION**

This paper addresses issues related to the provision of technical assistance within the context of the Agency for International Development (A.I.D.) Operations Research (OR) Program for improving family planning service delivery in less developed countries (LDCs). The goal of this program "is to strengthen host country capabilities to use operations research as a tool for achieving desired levels of contraceptive prevalence and fertility decline, at a cost which is consistent with local human and financial resources" (A.I.D., n.d., p. 11).

Over 50 people were interviewed in the preparation of this paper, including representatives of past and present OR contractors; past and present representatives of A.I.D./Washington, as well as USAID Missions; and representatives of past and present collaborating agencies that have conducted OR projects. The appendix provides a list of those interviewed. Although this paper was originally intended to focus on the provision of

general technical assistance within the context of the OR Program, disaggregating the technical assistance component from the project/sub-project implementation effort proved to be impossible. Interviewees moved immediately to discussing technical assistance issues within the framework of the research studies undertaken. One even went so far as to suggest that from an advisor's point of view, there is no valid distinction between providing technical assistance and developing and undertaking studies, that the implementation of subprojects is itself a form of technical assistance.

Shannon (1978, p. 811) defines OR broadly as "the study of complex systems of people, equipment, money, and operational procedures for the purpose of understanding how they function, in order to improve their efficiency and effectiveness." The A.I.D.-funded family planning OR enterprise has evolved over the years (as has the goal of the technical assistance component) from a program of demonstration and pilot projects aimed at showing the feasibility of offering family planning services where none were previously available; to studying and refining community-based approaches to contraceptive method distribution; to focusing on finding solutions to management problems in family planning service delivery in a variety of settings and structures, including those which integrate family planning with other services. The nature of the OR endeavor continues to reflect the maturity of the programs in the countries in which projects are undertaken, and even today all of the evolutionary stages of the OR Program can be found in practice in different settings.

Because of the diverse needs for differing types of OR, it has not been possible to establish a universal research agenda to which all projects would make a contribution, although certain themes have emerged. These include sustainability, delivery systems, quality of care, integration with other services, and AIDS education. The same is true of the technical assistance effort: it has had a different emphasis in different settings, based in large part on the stage of family planning program development and the associated level of contraceptive prevalence (see Liberi, in this volume).

The central emphasis of the OR Program has been on undertaking research projects (or subprojects), with contractor performance being evaluated, in part, on the basis of successful completion of the number of projects called for in the five-year contract. In recent years, A.I.D. has taken steps to build technical assistance into its procurements with OR contractors. But because contractors have felt compelled to focus on completion of subprojects, the amount of technical assistance not related to a subproject has been quite limited. A.I.D. has acknowledged that general technical assistance has been lacking as part of its portfolio of activities,

and there has been no specifically articulated goal for technical assistance within the context of OR.

While many OR advisors interviewed for this paper play down the importance of studies and subprojects, at the same time they continue to reinforce them as the main content of OR work--the vehicles for getting the work done. They see the collection of studies and findings, rather than the effects these activities have had on the collaborating agencies where they have taken place, as the *corpus* of their work, the essential product. Though they may have a continuing interest in implementation of the service delivery changes suggested by study findings, they have, by and large, tended not to focus on the transformational implications of the OR process for the way organizations conduct their business. That is, they have not given the same level of effort to instilling an OR mentality in the management structure as a sort of corporate strategy for increasing the effectiveness of the service delivery provider; this is an essential element in the institutionalization of OR (see the discussion of institutionalization below; see also Phillips et al., in this volume). A corollary theme in the interviews was a strong emphasis on findings, reports, and publications (in English), and relatively little mention of process and the way an OR framework is developed and used by service providers.

After briefly defining technical assistance, this paper addresses the practice of technical assistance in OR, factors associated with successful technical assistance, conceptualizations of the role of technical assistance in OR, the end-client focus of technical assistance, models of technical assistance delivery, assessment of the impact of technical assistance, models for institutionalizing OR, and major problem areas in technical assistance. The paper ends with a discussion of directions for the future and summary observations.

## TECHNICAL ASSISTANCE DEFINED

For the purposes of this paper, technical assistance is defined as follows: the provision of information and advice, through written, graphic, or oral presentation or dialogue, that is intended to result in another individual or group of individuals performing their responsibilities and functions more successfully, with greater understanding and efficiency, through the acquisition of new or refinement of existing knowledge and skills.

One of the most important functions of technical assistance is the introduction of new ideas and new thinking about problems. Technical

assistance is, above all, a process; it is not a finding, nor does it lend itself to precise measurement. It is neither a "single-dose" treatment nor a magic bullet; it is incremental and cumulative, though not every "dose" of technical assistance produces the results desired, nor is there necessarily a "dose-related response." It is an activity that requires persistence as well as patience. The successful transfer of skills through technical assistance requires a willingness to allow counterparts to do a less than perfect job, even to let them make (and learn from) their own mistakes as they hone their skills and increase their understanding of the work to be done.

### THE PRACTICE OF TECHNICAL ASSISTANCE IN OR

The practice of technical assistance seems to be as much art as it is science, for it relies not only on the expertise of the advisor, but also on her or his interpersonal skills and ability to impart that expertise to others. Practitioners are quick to report that their skills in providing technical assistance have come from their experience in the field--on-the-job training. At no point in their professional development were interviewed practitioners given instruction, either didactic or practical, in the process of rendering technical assistance. Many felt that the skills could be learned only in the field, and cited the value of the University of Michigan fellowship program in this regard. Others felt that technical assistance lacks a professional focus, that in the absence of a professional providers' organization through which experiences could be shared and reported on, there is little hope of compiling a body of knowledge that would speed up the transfer of skills to the next generation of advisors. Several practitioners recommended the creation of a professional organization for technical assistance providers, along with the creation of a refereed journal. One interviewee cited the comparable status of the evaluation field a decade ago, before the establishment of a professional organization for evaluators and the appearance of a number of scholarly journals on evaluation. In spite of this lack of formal training, all contractors recognize the technical assistance capability of their own staff members and believe they could provide more technical assistance effectively if they were not operating under the demand to complete a specified (and some would argue, large) number of subprojects.

The amount of technical assistance required by an organization to complete an OR project successfully varies greatly depending on the training, skills, and experience of the implementing staff of the collaborating agency or other resources upon which it can draw. Technical assistance from the contractor may range from merely refining the English in the

project proposal and final reports sent to A.I.D., to intensive, frequent, and detailed hands-on activities in the day-to-day undertaking of the research.

The gamut of technical assistance is by and large unglamorous. It may begin with assistance in assessing agency needs/resources and identifying research topics, and continue with proposal design and implementation; creation of data collection mechanisms (forms, questionnaires) or refinement of the agency's management information system (MIS) to accommodate research requirements; basic computer skills (database creation, data entry); data compilation, cleaning, and analysis; and help with ferreting out findings and formulating recommendations. Technical assistance may mean accompanying counterparts into the field with some frequency to see how the project is going, to help select and train interviewers, or to provide oversight supervision and get feedback from those involved with implementing the experiment. The more common condition is technical assistance that is provided either on a scheduled basis, something akin to monitoring, or perhaps on the basis of milestones in the implementation process ("Call me when you reach this point, and I will come by for discussions."). To some degree, the frequency and intensity of the technical assistance will be a function of the proximity of the advisor to the agency, discussed later in this paper.

Technical assistance is essentially a one-on-one or one-on-small group activity. "You provide it sitting down side-by-side," as one practitioner described it. With several notable exceptions, attempts to gain leverage or multiplier effects through a one-on-many approach, such as through workshops, have met with limited success. Exceptions include the subregional workshop in Harare for OR practitioners from LDCs on community-based distribution (CBD) studies in progress, and the workshop on rapid survey methodology recently held in Indonesia, which seem to have benefited participants in gaining practical skills.

The Harare workshop apparently was successful because it brought mid-level researchers together whose research had a common theme (CBD), who were in the midst of their research projects, and who wanted to deal with "nitty-gritty" issues of their specific research. Because they were in the middle of the research process, they could share real problems; the ideas they got from each other would be useful and could be applied when they returned home. The gathering was relatively small (with representatives from only a few countries), and, perhaps most important, the absence of "bosses" led to a more free and open exchange than is usual in such meetings. Each day, a different topic on service delivery was addressed.

The rapid survey methodology workshop brought together relatively experienced researchers to teach them a new technique of doing something with which they were already familiar (survey research).

These two workshops may have been successful because they were dealing with instrumental skills, rather than conceptual skills. Efforts to leverage technical assistance through workshops have been unsuccessful when the focus has been on such conceptual skills as proposal development; to generate an acceptable and successful proposal required one-on-one follow-up technical assistance with participants.

### **FACTORS ASSOCIATED WITH SUCCESSFUL TECHNICAL ASSISTANCE**

The success of technical assistance should be measured as a progression, beginning with the transfer of basic knowledge and skill on some topic, to ever-increasing levels of self-sufficiency in undertaking every aspect of the OR activity. However, helping counterparts achieve the capability to conduct OR successfully on their own is not the equivalent of institutionalizing OR; it means merely that the capacity for undertaking OR is present, not that it will become an integral component of the provider's collection of management tools for decision making.

Characteristics of successful technical assistance fall in three domains: the content/process domain, the interpersonal relationship domain, and the provider personality domain. These domains can be discussed as the topics of (1) the dimensions of good technical assistance, (2) the conditions of successful technical assistance provision, and (3) traits of successful technical assistance providers.

**Dimensions of good technical assistance** include the following:

- The appropriateness of the information and advice provided or skill transferred; the extent to which it is germane to the problem being addressed, useable within the constraints of the working environment, of proper scale, not beyond the interests of the counterpart group, and directed at the level of the recipient's current ability
- The quality of the information in terms of accuracy, completeness, and thoroughness

- The timeliness of the assistance; having it available when needed
- The accessibility of the advisor

**Conditions of successful technical assistance provision** can be subdivided into those related to the agency and counterpart staff, and those related to the provider her- or himself, although there is obvious overlap and interaction.

Conditions that relate principally to the agency or counterpart include the following:

- An eagerness on the part of top management to find ways to improve service delivery
- Staff stability within the collaborating agency, especially with regard to qualified counterparts
- Limited politicization of staff appointments and interdepartmental and interagency relationships (rivalries)

Conditions that relate principally to the advisor include the following:

- Mutual respect and openness between the advisor and her/his counterparts
- Trust between the advisor and the recipient (agency) (this was the most frequently mentioned characteristic of successful technical assistance)
- Rapport and understanding between the provider and the recipient; collegiality
- Continuity of advisors (except, perhaps, where short-term specialists can provide a specific expertise)
- Consistency of viewpoint when a team of advisors is working intermittently with the same organization
- Follow-through; provision of promised assistance or information according to the agreed-upon timetable ("Delivering on promises is the key.")

- The advisor's commitment to the transfer of skills/skill building
- The advisor's commitment to lessening counterpart dependence on expatriate assistance
- Recognition of the organizational politics that may confront a counterpart, the reward and recognition structure of the agency, and the constraints s/he may face in taking desirable and effective actions the advisor might recommend that would not be favorably viewed by her/his superiors

**Traits of successful technical assistance providers** include the following:

- Good listening and communication skills
- The ability to take the user's perspective about what is needed
- Sensitivity to the cultural, social, and political conditions of the environment in which s/he is working
- Adequate technical competence and experience
- Low ego needs; a limited need for credit, glory, or limelight based on the achievements of the OR undertaking
- A desire to see others succeed and achieve, to obtain goals by working through others; a willingness--even an eagerness--to give others credit
- A fascination with the work; inspiration
- True concern about the agency and the mission it is trying to fulfill
- Responsiveness to counterpart requests for help
- Flexibility and adaptability to changing timetables and modifications in implementation procedures
- A recognition that academic standards of scientific rigor often must be relaxed to accommodate organizational or programmatic reality; the ability to change what one knows how to do to fit the circumstances, adaptability

- Local (national) language skills; absent these, the presence of bilingual translators during technical assistance visits
- Patience and persistence

## CONCEPTUALIZATIONS OF THE ROLE OF TECHNICAL ASSISTANCE IN OR

The way OR contractors have interpreted their role in providing technical assistance within their contracts varies enormously, and sometimes seems to differ from the perceptions of A.I.D./Washington with respect to expectations about how the contractor will work. This section summarizes three major points on the technical assistance provision continuum, whose poles are project-related and results-oriented vs. organizational development-oriented.

1. *"We see our role as providing just enough technical assistance to get the projects done."* (OR advisor)

In this view, the only technical assistance that is intentionally provided is that required to complete the subprojects satisfactorily, and the major focus is on the development of findings through execution of the subprojects. Subprojects may be perceived by counterparts as managed by the OR contractor rather than the host country organization. Those who hold this view are more likely to see A.I.D./Washington or the broader international family planning community as the principal audience for the research findings. While an important spinoff of undertaking the research projects may be the transfer of both skills and organizational development within the collaborating agency, holders of this view do not see that as a necessary outcome.

2. *"Agencies function better when they get the technical assistance they need, and the quality of technical assistance is better when it's systematic. The studies provide the structure for making technical assistance systematic."* (OR advisor)

Proponents of this view believe that counterparts learn best when working under a project, and that the transfer of knowledge and skills is more efficient in this context. The emphasis is on provision of technical assistance required to complete the subprojects. However, advisors provide technical assistance on other projects or problems of the collaborating (host-country) agency as time permits, and to the extent there is a match between the advisor's areas of expertise and the collaborating agency's

needs. Without the studies, proponents of this view argue, organizations do not develop a vision of getting better or worse at what they do; they just get more and more technical assistance that may not be focused on refining their programs and program management.

3. *"Forget the results; all of the impact is through technical assistance. Results are not important."* (OR advisor)

In this view, the subprojects are essentially a vehicle for providing technical assistance. The emphasis is on the transfer of skills to counterparts in the collaborating agencies, with a de-emphasis on the anticipated contributions of the research findings *per se* to either the programs of the agency or the body of knowledge generated by OR about effective family planning service delivery. This focus gives highest priority to nurturing of collaborating agency self-sufficiency and long-term institution building, with a strong developmental orientation toward helping staff of the collaborating agency "do it themselves." The projects are seen as a way of gaining *entreé*, of establishing rapport, of creating legitimacy so that the advisor can provide a broader range of technical assistance to the organization. Technical assistance also may be provided to family planning managers and researchers who are not working for one of the contractor's collaborating agencies; they may be working on a project funded by another cooperating agency whose staff do not have the expertise required to address some specific issue. OR staff holding this view acknowledge that there currently is no way for them to obtain "credit" with A.I.D./Washington for the time spent providing this assistance.

This latter view also suits those who feel that even talking about "research," especially in government programs, where the idea of research is feared, is a mistake because it makes the activity suspect. Proponents of this view cite effective efforts of government officials to suppress research findings not seen as favorable to their programs. This view holds that it is possible to achieve improvements in program management and functioning through effective technical assistance while avoiding the "research stigma."

## THE END-CLIENT FOCUS OF OR TECHNICAL ASSISTANCE

*"I have to remind myself that the program director, not the researcher, is our counterpart."* (OR advisor)

What is the objective of technical assistance provided through A.I.D.'s OR contracts? Should the focus of OR technical assistance be on whoever can do research, or should it be on service providers? Do we want the

emphasis to be on better researchers or better managers? If the end sought is not merely the ability to undertake a reasonable quality of research, but rather the improvement of service delivery programs, then a critical variable in successful technical assistance is appropriately identifying counterparts. In some instances, contractors have focused their technical assistance efforts on researchers much more than on manager., convinced that the quality of the research endeavor was paramount and would be most affected by developing or enhancing researcher skills. However, as one practitioner observed, "Managers are more stable in agencies than researchers." In his view, failure to focus assistance efforts on the manager means that "the brightest minds in the agency focus on the survey when they should be focusing on the service," and working through the manager increases the likelihood that a focus on the service will remain central.

The client-counterpart of the technical assistance provider may differ in different facets of the OR endeavor, and the focus of the technical assistance will vary depending on the stage of activity of the research. At some points, the clients may be policy makers; at others, senior management; during the implementation of the research, the researchers themselves; and at some points, a mix of these.

To be sure, managers who become convinced of the value of OR, but who lack adequate internal data systems and/or access to qualified researchers, either on staff or in the community, cannot institutionalize an OR program. But establishing an OR capability that does not have an accepting management to support and encourage it will not achieve OR institutionalization either. The "comfort level" that OR advisors trained in social science research find among similarly trained counterparts increases the likelihood of an affinity between them that will not exist with managers. However, the end-client of OR, and therefore a critical target for technical assistance, is management. This technical assistance should focus on helping make managers better consumers of data, better detectors of programmatic problem areas, and better conceptualizers of the implications of research findings. Ultimately, it must help make managers more capable of implementing organizational changes implicit in the research findings and recommendations. The trend away from merely generating study findings toward looking at the integration of OR applications for management decision making should receive further encouragement.

## MODELS OF TECHNICAL ASSISTANCE DELIVERY: DEGREES OF PROXIMITY

Opinions differ as to the relative merits of the varying degrees of proximity advisors may have to agencies and countries in which they hope to develop OR projects. For the provision of technical assistance, "the closer the better," was the view of one A.I.D. administrator. Models range from one extreme of having U.S.-based advisors who travel to projects on a scheduled or as-needed basis, to the other of having a full-time advisor resident in the agency that is carrying out the OR project. A variety of permutations connect these points:

- Having a resident advisor in the region who travels to different countries and projects, as needed, to develop, monitor, or provide technical assistance to projects
- Having a regional office (and possibly one or more subregional offices) staffed by a team of advisors with diverse skills who divide responsibilities for project development and monitoring along country lines, are able to provide coverage and continuity when one of them is away, and provide their special expertise to any of the regional OR projects
- Having advisors resident in country, with either a regionally or U.S.-based office coordinating the project development and technical assistance efforts on the basis of reports and requests from the resident advisor
- A variation with greater reliance on the "brokering" of specialized technical assistance, with freelance or contract consultants being brought in as needed
- A relatively unexplored variation known as "south-to-south" technical assistance, using OR practitioners from LDCs as short-term advisors both intra- and inter-regionally in this same fashion

The most commonly supported view in the interviews was that advisors resident in country are virtually the *sine qua non* of successful OR project development, and certainly of technical assistance aimed at skill transfer and institution building. This view was by no means universal, however, and a variety of arguments for and against the different models were posited.

*"If (the advisor) is not based in country, it is hard to get anything going."*  
(OR advisor)

*"Not every country needs [an advisor]; there isn't enough to do."*  
(A.I.D. staff member)

The above quotes reflect a chicken-and-egg dilemma of deciding where and when to place a resident advisor in country. If there is not much to do, it may be because there has not been an advisor present to identify targets of opportunity and "make things happen." On the other hand, it would be a waste of resources if the advisor's time and talent were grossly underutilized while waiting for project ideas to take root within the local provider/research institutions. However, even under these ambiguous circumstances, the presence of a resident advisor will be more worthwhile if OR contractors are given encouragement and incentives to provide family planning programs with technical assistance that goes beyond OR projects. In countries with low contraceptive prevalence rates and emergent programs, a resident advisor may be just what is needed to overcome the inertia. In a high-prevalence country, there are likely to be many more organizations and targets of opportunity on which to work. Moreover, there will be bigger programs through which the institutionalization of OR could potentially have a bigger impact.

### **Advisor Resident in the Agency: The "Closest Proximity" Model**

The merits of having an advisor resident within an agency are a source of strong disagreement.

**Pros.** Some argue that having the advisor's office within the organization conducting the OR project, especially if it is a government agency, increases her/his effectiveness. According to this view, the advisor becomes much more attuned to the agency politics, the ins and outs of daily operations, the impediments to project progress, and the strengths and weaknesses of different agency staff members, and can appreciate better the context in which the project is being undertaken. A resident advisor gets to know the political and organizational landscape better than an advisor who is more remotely based. If the advisor undertakes tasks the administrator wants and needs done (even though they may be extraneous to the OR endeavor), the administrator will be beholden and may pay more attention to the advisor's advice. Being this close and well informed gives the advisor the opportunity to anticipate problems and suggest modifications that can diminish the impact of those problems, or maintain the integrity of the project through completion, instead of finding out about problems after it is too late to do anything about them. In addition, this

approach is cost-effective; the contractor does not face the high overhead of an independent office.

**Cons.** If one is too close to an organization, one is given too many tasks or asked to participate in too many activities, many of which are inappropriate and do not further the OR endeavor; "you can't get your work done." If one turns down the extraneous assignments, one's stock with the administrators declines, as do the administrators' interest in the OR and the advisor's ability to influence their thinking about operational problems. It is too easy to get mired in the politics of the organization and the personality clashes and departmental rivalries that are bound to exist. Having an advisor resident in the agency can also foster unhealthy dependencies, both for the counterparts and the advisor. Counterparts come to rely on the advisor for help they do not need; they need to recognize their own independence, their ability to do things themselves. After an advisor leaves, counterparts may feel uncertain about their own abilities. Advisors, not the local researchers, influence managers to pay attention to OR findings; when the advisor departs, so does the access to decision makers. For her/his part, the advisor can get into a hand-holding and over-protective kind of mode, making decisions that should be made by counterparts. Additionally, the advisor can tune out other project opportunities because her/his focus is totally with one institution and carrying out the projects within it.

#### **Advisor Resident In-Country, but Not Within an Agency**

Maintaining the resident advisor's office outside of a collaborating agency also has its pros and cons.

**Pros.** If the advisor remains outside the collaborating agency, s/he remains more objective and is more likely to be able to work with everyone in the agency where the study is being undertaken, thus facilitating completion of the OR work and its potential impact on the organization. It is possible for an advisor to work with a wider variety of organizations by maintaining autonomy; the advisor is not seen as working for or belonging to just one organization. This can ease rapport, especially if there are cultural issues (e.g., religious, ethnic, tribal) dividing the organizations. One has better control of one's time, and does not have to attend meetings that are not germane to one's work.

**Cons.** The advisor is more removed from what is going on in the collaborating agency. There is less access to qualitative data about the organization's day-to-day operation, reducing the likelihood of having insights on problems OR might address. There are fewer opportunities to

promote OR-type thinking with staff at all levels. Access to the advisor is decreased, slowing down the momentum of the research implementation. There is more overhead expense in the OR advisor's having a separate office, including rent, utilities, staffing, and equipment. Advisors experience isolation and a lack of ongoing exchange with professional colleagues; they find it more difficult to keep up to date with the field. Some countries are loath to have a resident advisor from the outside; such an advisor is less welcome than one who comes from a regional office in another country.

### **Advisor Resident in Region (or Subregion)**

Another group argues that country placement is not required for successful technical assistance.

**Pros.** It is noted that within-country distances and travel problems can be a great detriment to easy access to technical assistance; international travel is often easier and quicker than travel between two points/projects within a country. One advisor can handle several countries, especially if s/he is located in a country with good connecting transportation to the others. There is likely to be less "down time" in which the advisor is not working productively on a study or providing technical assistance.

**Cons.** More time may be spent in countries considered "easy targets," rather than in those where the need is greatest. Demands/expectations of USAID Missions may cause advisor confusion about where priorities really lie; prospects for desired buy-ins may overtake other considerations in setting priorities. Easy access to technical assistance may thereby be diminished. Advisors may be treated as outsiders when they visit project countries. The frequency of advisor visits may decline as projects in other countries begin to take off or create other demands. The advisors' priorities may change as some projects become easier and more satisfying to work on; the advisors may start to avoid countries in which progress is slow and/or difficult. Opportunities to identify other/new collaborating agencies may be diminished as in-country time becomes increasingly focused on agencies where projects are getting under way.

### **Multiple Advisors Resident in Regional (or Subregional) Office**

This is the model most commonly in practice in the current OR Program.

**Pros.** Diverse skills/specialties are represented among the staff, who can thus cover more bases. Support resources (both personnel and equip-

ment) can be concentrated; the U.S. backstoppers have fewer different locations with which they must maintain contact. There is coverage provided at all times, when one or another advisor is on the road, on vacation, or ill. There is greater collegiality and professional enrichment; project issues can be discussed among peers and thinking/approaches expanded. Subregional offices can be located in different language areas or in countries where need or opportunities for increased activities are greatest.

**Cons.** Multiple advisors in one office may not optimize the development of OR projects or the rendering of technical assistance; more time may get spent in the office. Every face-to-face technical assistance encounter requires a trip, which may add to the overall expense of technical assistance provision. The best projects tend to come to the country where the regional office is located.

### Observations

Which of the above models works best? This analysis does not allow us to conclude that only one or two of the models are appropriate; the decision will be contextual and will vary from country to country. But certain things can be observed:

- There are more and better OR projects undertaken in countries where there are resident advisors, either one advisor or advisors in the contractor's regional/subregional office. As one A.I.D. official coined it, "Nothing 'propinques' like propinquity."
- Technical assistance is a labor-intensive activity and is tied closely to the advisor's availability. Increasing the ease of access and timeliness of technical assistance enhances its effectiveness and the transfer of skills.
- Frequent and ongoing contact with a resident advisor should increase the likelihood of establishing rapport and trust, which are key ingredients in successful technical assistance provision.
- Where there is no regional language (e.g., Spanish in Latin America), being resident in country increases the ease and likelihood that the advisor will learn the language of the country, another element deemed important in successful provision of technical assistance.

## ASSESSMENT OF THE IMPACT OF TECHNICAL ASSISTANCE

All of the views described above recognize the critical role technical assistance plays in achieving any of the ends sought through OR, whether it be the production of findings or the fostering of institutional capability and self-sufficiency. We can best estimate the value of the presence of technical assistance by contemplating the outcomes in its absence. Few of the projects would be likely to have achieved their actual level of sophistication or success. However, measuring the impact of a given quantum of technical assistance is not feasible; technical assistance is an incremental process made obvious only by its absence. The establishment of operating family planning programs where none existed previously, the quality and rigor of the research endeavor in programs aimed at improving delivery systems, the introduction and testing of new ideas and options, all attest to the benefits of technical assistance.

Another problem in identifying and measuring the output benefits of technical assistance is disparate perceptions of the technical assistance provided as reported by the advisor and her/his counterpart. Many interviewed technical assistance recipients see themselves as having needed/received less technical assistance than the advisors feel they required/were provided. We may ask, "Without the technical assistance, how different would the defined problem of interest be; how different the mix of solution options; how different the research design, data collection procedures, and process; how different the analysis and findings, the conclusions reached, and the recommendations made?"

A corollary of this issue relates to technical assistance effectiveness. It was suggested earlier that good advisor traits include having a limited need to take credit for achievements and having a desire to obtain goals by working through others. In attempting to document the output of technical assistance, especially that which is provided apart from studies, advisors are being asked to do just the opposite: to identify their specific contributions to making the program more successful. In circumstances such as these, technical assistance contributions may continue to go unrecognized.

## MODELS FOR INSTITUTIONALIZING OR

Another major point of philosophical divergence among OR contractors focuses on what should be institutionalized and where that capacity should be located. Here, there is less of a continuum and more a series of discrete views and models of organization. In considering institutionalization of OR, what should the goal be?

**A research capability within the family planning provider agency that can continue to undertake OR projects?** This model would probably place the OR activity in the service agency's evaluation unit, with one or more research staff members qualified to design and execute all aspects of a study, and to hire short-term consultants for special tasks (e.g., training and supervision of interviewers, conduct of focus groups).

**A provider agency with organizational expertise capable of "purchasing"/contracting for the research it needs conducted?** In this model, someone on staff at the family planning agency, perhaps the administrator, would have sufficient understanding of research and the research needs of the agency that s/he would be able to hire and guide an external research group in completing studies the agency might need. In sophisticated circumstances, the process might include developing a Request for Proposals (RFP) and creating an internal review group to critique and select the best proposal.

**A research group, knowledgeable about family planning, that is capable of undertaking appropriate research for a variety of family planning providers from both the public and private sectors?** If this is the choice, does it matter whether the research group is private or university-based? This model focuses on researchers and research organizations, rather than on family planning provider agencies. It implies that OR contractors would work with non-family planning groups more than with service providers to achieve institutionalization of OR capability. The contractor would work with known marketing and/or social science researchers in university or private organization settings to teach them the essentials of OR so that they could market this capability to a variety of family planning providers, both public and private.

**Service-providing agencies whose MIS has been improved and made sufficiently useful through OR projects that data flowing from the system allow managers to identify problems and/or assess the merits and cost-effectiveness of new delivery strategies being tested?** This model focuses the institutionalization on managers and improving their capabilities to use data, both quantitative and qualitative, effectively, emphasizing the simplification and streamlining of OR to make it an integral part of the workaday operations of the family planning provider. It differs from the first model in that it implies less gearing up to undertake a study; the need/opportunity for studies would come from problems identified through routine data monitoring, and the effects of changes/interventions would be monitored similarly through the MIS.

A variety of contextual factors affect the appropriateness/inappropriateness of each of these models. Several that come to mind immediately are program maturity--the readiness for multiple studies on varying themes; absorptive capacity--the current staffing and skill level of the target agency; how much of the "need for change" generated by studies the agency is prepared to handle; diversity of family planning providers in the country (if there are few, a free-standing research group may not be able to stay in business); and current status of social science research in the country (if there is neither a university nor private research institutions, that option is eliminated). Clearly, no one model will fit every circumstance, and the models are not mutually exclusive; several could appropriately function side-by-side. The important issue is where OR contractors will focus resources to achieve some level of institutionalization of OR capability.

Some OR advisors believe that major family planning provider organizations need to have OR capability on staff, and favor a model of locating the activity within the context of the provider's evaluation unit. "The country needs a group of research people who know how to address family planning issues; a recognized institution in family planning needs to house them," said one OR advisor. "OR belongs in the program--public or private sector. The trick is to find research resources for the service provider," said another. Proponents of this view argue that, given employee turnover, outside researchers cannot hope to have sufficient familiarity with and understanding of the nuances of family planning, service delivery, and organizational politics to be able to propose useful solutions/interventions for testing, that their approach to the issues will lack sophistication. This view holds that an in-house staff has the best potential for developing competence and insight by undertaking an ongoing series of projects that build on previous experience; moreover, an in-house staff is an easier target on which to focus technical assistance and the transfer of skills. An in-house research staff, it is argued, will be closer to organizational managers, and will be able to influence and assist with the wider implementation of strategies proven successful.

While arguing that an in-house staff reduces the risk perceived by managers of having identified operational weaknesses divulged outside the agency, advocates of this model acknowledge that this perceived benefit is also a potential weakness in that the real issues needing to be addressed through OR may be submerged by managers reluctant, or lacking authority, to raise them. Those who argue against this model observe that research capabilities within service-providing organizations are historically weak, especially in the public sector, and are not readily strengthened through technical assistance; improving them depends on allocating greater

resources, giving them a more central role in working with management, and giving management greater control over research staff selection.

Other OR advisors believe that it is not feasible for family planning agencies to bring together in-house the diverse kinds of expertise required to undertake high-quality OR. They recognize that typically low-paying positions in family planning programs, especially governmental programs, are not attractive to highly skilled researchers, who prefer either international, university, or private sector settings in which to offer their services for higher remuneration; some of these positions obviously offer more security, and often greater benefits, than those dependent on external funding sources. Proponents of this view also point to the frequent inability of managers to replace unqualified or incompetent (research) staff because of bureaucratic regulations and prohibitions.

Thus, holders of this view favor a model in which the research requirements of the family planning organization are addressed through contracted research. They argue that the types of research to be conducted are widely diverse, and the appropriate research methods will vary accordingly. They suggest that contracts can be arranged with the best available source, whether it be qualitative or quantitative, for market research, feasibility studies, pre-post intervention studies, or major prevalence surveys. They argue further that contracting for such research reduces the likelihood that internal organizational politics or managerial bias will influence the outcomes and findings. Some forward-thinking family planning executives also argue that this approach is the only way to obtain a fresh and objective perspective on the work of the agency. Proponents of this view believe as well that contracted research is most cost-effective since a full-time staff is not required at the family planning agency; research is conducted only when needed, and not just to keep researchers busy.

Finally, there are those OR advisors who believe that attempting to institutionalize family planning OR *per se* in developing countries would be the biggest mistake of all. They argue that the business of research is a major overhead burden for family planning organizations, one that presently is being supported artificially by external funding sources. In their view, the prospects for institutionalizing and sustaining a decent research program for improving family planning service delivery, absent donor support, are nil. They do not deny the benefits of decision making based on the results of studies and the use of data. However, they believe it is unrealistic to expect that, given declining international resources, the collaborating agencies can and will afford the kinds of research currently coming out of A.I.D.'s OR Program at a time when service providers are so keenly concerned about funding their delivery of services. As a viable and

useful alternative, they argue for the improvement and streamlining of MIS within family planning organizations, helping to develop the kinds of quantitative and qualitative data systems that allow for decision making informed through routine collection of relevant statistics, as well as qualitative information from field notes, observational checklists, and related mechanisms.

In the long term, every family planning agency needs to reach the point where the streamlined MIS model is in place. One way or another, the effort to generalize findings and recommendations from a given study to other structures and settings implies some sort of replication to ensure that the findings apply in the new setting. Only when such a model is in place will it be possible to adapt the findings from OR studies done elsewhere to local circumstances, to undertake local validation studies, and to measure the effects and supposed benefits of the adaptation. This is almost a prerequisite if A.I.D. is to achieve its long-term goal of speeding up the adoption of innovative, cost-effective service delivery mechanisms based on its years of investment in such research. With a suitable MIS, such replications will be easier, quicker, and less costly.

#### **THE MAJOR PROBLEM AREAS IN THE TECHNICAL ASSISTANCE EFFORT: LIMITATIONS AND CONSTRAINTS**

Technical assistance efforts have had both structural and practical constraints. One principal structural constraint has been that, until recently, OR contracts did not provide for or give recognition to technical assistance outside of that provided to subprojects; contractors felt they could ill afford to give time to general technical assistance for the collaborating agencies. Another constraint has been that advisor teams on OR contracts have been staffed predominantly by social scientists and demographers; managers, especially family planning program managers, have been rare, as have those with business or public health administration training.

A practical constraint occurs when in the process of undertaking an OR project, the advisor identifies a need for technical assistance beyond the scope of the study, for example, in working the bugs out of the provider's logistical system. The contractor may not be able to bring the needed resources to bear under the terms of the OR contract. This constraint suggests the need for coordination of technical assistance to the family planning service provider from other cooperating agencies. While the list of desirable advisor traits is long, it does not include expertise in every aspect of family planning operations. The critical issue is who will be responsible for coordinating the technical assistance provided.

Which operational problems get identified and selected for study, which solution options get considered, and which variables of interest get addressed all are influenced by the advisor's background and experience. The fact that every OR study has not attempted to measure the cost and cost-effectiveness of the interventions being tested is evidence of differences in what is considered to be important. The first thing a manager wants to know is how much the new procedure will cost (relative to current procedures), or how much it will save to provide the service under study in the manner suggested by the research. If the cost-effectiveness of alternative intervention options is not known, what is the criterion function? What will the manager optimize? The OR study may have found that the experimental or treatment group had higher method acceptance or continuation rates, but if the manager/administrator does not know how much it has cost to achieve those increases relative to current practices, s/he will not know whether the service program would be better off adopting the procedures suggested by the treatment. That is, can the agency afford to select the procedures or system suggested? (See Jensen, in this volume.)

Another practical problem has been that there is not a large pool of knowledgeable experts available from which to select technical assistance providers; this will become an increasingly significant problem in the future. A corollary is that international institutions, including OR contractors, are hiring away some of the best talent in host countries. This practice has both its up side and its down side. These advisors have first-hand knowledge of the language and cultures in which they work, and often, though not always, find it easier to gain *entrée* with organizations than do American or European expatriates. Moreover, the cost of hiring and maintaining advisors from developing countries is usually less. On the down side, this practice contributes to the "brain drain," taking away some of the best talent, people who could be contributing to operating programs or undertaking research in their own countries. It is thus counter to the intent of scholarship programs under which these individuals have obtained the training that makes them candidates for advisor positions; they were sent for advanced training to make their contribution to development efforts in their own countries, not to work for international organizations.

## DIRECTIONS FOR THE FUTURE

### Some Opportunities for Technical Assistance in the OR Program

Until recently, A.I.D. has been concerned predominantly with what contractors are able to tell them about findings from OR projects, and has expressed an eagerness for findings to be published in journals with inter-

national standards so that the findings will be considered credible. A.I.D. should be equally or more concerned about the changes in process under which collaborating agencies function as a consequence of having participated in an OR project. The Maximizing Results of Operations Research (MORE) Project begins to address this issue. We do not institutionalize a collection of factoids; we institutionalize a process/an approach to doing the business of the organization. So long as subprojects have the contractors' highest priority, there is little hope of reapplication of what is known from OR research without introducing a study or pilot/demonstration project in a new setting, and this is neither a timely nor cost-effective method for the diffusion of innovations in improved service delivery.

The OR Program needs to work toward creating sustainable OR as much as it works toward creating self-sustaining service programs. Most current models of OR carry with them a large overhead burden on the organization, a burden currently supported through donor funding. To be institutionalized, OR needs to be a minimal burden. As one representative from a Ministry of Health observed, "We will continue to undertake OR studies [when donor funding is withdrawn], but they will have to be on a much smaller scale." Sustainable OR can best be achieved through improving the quality of MIS, broadly defined, and demonstrating the utility of the MIS in OR research. Trends toward simplified research methods, reflected in rapid survey methodology, for instance, also have the potential for reducing both cost and delays in obtaining results.

The timeliness of results determines their usefulness. When queried on the acceptable length of time before obtaining results from an OR study, one agency director quickly replied, "Twelve months, max! Three months is ideal!" We need to promote the concept of "quick and clean" OR studies. Even if they do not provide final answers in early phases, studies should begin to produce data that detect trends, strengths, and deficiencies well before the last crosstab is generated. If the change brought about by the "treatment" is so small that it cannot be observed on a graph, then it probably is not programmatically significant, whether it has statistical significance or not. (See Hendricks, in this volume.)

Every management error has a cost. The size of the investment in an OR project should be based on the cost of being wrong to the organization, its mission, and the people it serves. The A.I.D. investment in OR may have a different payoff mix, especially in secondary returns such as improved MIS, counterpart training, experience in OR management, and specific skill transfer, among other things; nevertheless, once an agency has the capacity to undertake OR on its own, the payoff has to be in primary gains for the program. If one considers the total amount of resources an

agency/country can put into the family planning service effort relative to the cost of many OR projects, it becomes apparent how little can be put into research over the long term unless the payoff ratio, the value of the results relative to the investment, gives back enormous dividends in cost-effectiveness and efficiency. In the words of Shannon (1978, p. 811), "If an OR study has not resulted in better decisions by the manager, it has failed, no matter how elegant its approach or technique. The end goal and criterion by which OR must always be judged is results." Even if this level of sustainability is achieved, there may be some OR projects of such magnitude and importance that external funding may be required to undertake them. In such situations, a joint funding arrangement might be established, or A.I.D. might contract directly for such research from the provider agency and its research group.

An important goal of the technical assistance effort should be to develop family planning managers who recognize the potential benefits of making decisions informed by program/research data, and who routinely experiment with service delivery systems and track the outcomes through the agency's MIS. To achieve this goal, the technical assistance effort of the OR Program should:

- Focus more on program managers and how they use data; show them how good data can be used to make them function more effectively and improve the quality of their decision making.
- Focus heavily on MIS and the quality and usefulness of routinely collected data; work on improving, refining, and simplifying data systems.
- Use OR projects to demonstrate how OR can be undertaken using a good MIS as the data source for diagnosing/identifying problems and testing solutions; make a concerted effort to develop OR projects that are generated through the (improved) MIS. This is the best hope for creating a sustainable OR program without dependence on special external funding.
- Emphasize trend data in future studies. These data will be meaningful and helpful to managers; in addition, they are likely to be more useful than cross-sectional, pre-post, or survey data for good management decision making. In the long run, trend analysis is more important than cross-sectional analysis because without the former, the organization cannot be certain it is continuing to produce program results as productively and cost-effectively as might be demonstrated in a specific OR project.

- Use graphic presentation to monitor the effects of experimental interventions. Managers need to see how programs improve/deteriorate over time so they become sensitive to fluctuations and can identify and focus on "the important stuff."
- Make sure that cost-effectiveness is a central measure/feature of all OR activities. Even managers of emergent programs need to begin thinking in terms of cost per unit of service.
- Expand the use of qualitative data as a source of insight into problem identification and solution. Help program staff learn the benefits of qualitative analysis as a way of understanding and improving their own work, and as a rich source for problem identification and solution generation.

### **A Goal Statement for Technical Assistance in OR**

The following is a proposed goal for the provision of technical assistance to service-providing organizations in the OR context.

The goal of technical assistance is the development of family planning administrators/managers who are able to:

- Use quantitative and qualitative program data from MIS to diagnose problem areas.
- Conceptualize alternative interventions and program modifications.
- Implement and monitor interventions intended to correct problems and improve the quality and cost-effectiveness of service delivery, using information flowing through the MIS.

### **Data Analysis Skills**

One OR problem area that arose in many interviews was the difficulty counterparts have in analyzing and interpreting data, and drawing valid conclusions. Analytical skills are clearly one of the more perplexing sets of research skills to transfer, and often prove to be a daunting challenge to advisors, especially as they work against a reporting requirement deadline. There has been a temptation to avoid grappling with this difficult issue, with the advisor taking the data back to her/his office (if no longer back to a U.S. university) for analysis. This action was not lost on some interviewed counterparts, who wanted the OR advisors to "transfer all of their skills"; advisors who "took over" the data analysis activity were seen as

withholding a critical component of their OR expertise. Other advisors, however, operated from the philosophical position that "no data leaves the project agency for analysis; analysis will be undertaken in-house." This meant that technical assistance had to be provided on site, as tedious as that might become as deadlines drew near.

As a future activity in countries where the appropriate counterpart pool is sufficiently large, a seminar series on data interpretation could be offered, first using some progressively more complex external (advisor-provided) data, then data provided by participants from their OR projects. Among other things, such seminars would encourage counterparts to become more reliant on each other and encourage professional networking, while at the same time addressing real issues of OR studies. Moreover, such seminars should prove to be a cost-efficient way of increasing counterpart skills in this difficult area.

### **Implementation/Dissemination/Application of OR Results**

What is the technical assistance role of the OR contractor in the implementation of findings? In some instances, OR projects can be criticized legitimately for not having achieved the proper placement to accomplish desired goals. That is, a failure to address the implementation issue prior to starting the project resulted in selecting the wrong counterparts (or an incomplete set of counterparts), or the wrong model or strategy for bringing about the changes suggested by the study. In some instances, if OR activities had been integrated appropriately into the agency and deemed valuable by managers, the implementation of findings would have been automatic, if not immediate and obvious. In some instances, the failure to implement is in part the problem of the isolation of OR activity from the ongoing work of the provider. But there are other reasons useful findings are not implemented.

In large organizational structures, especially public bureaucracies, many preparatory steps are required to implement operational changes. These steps can affect everything from logistical support systems, to preparation of instructional materials for training of staff and fieldworkers, to modification of supervision protocols, to forms creation and data management. Technical assistance may be needed to complete each of these tasks. In the future, upon completion of OR studies undertaken in large organizations, a scope of work or plan detailing technical assistance requirements for implementation, jointly developed by the contractor and the collaborating agency, might be made a deliverable output.

Several steps might increase the likelihood that OR results will feed into program service agencies: (1) dissemination workshops for staff of other cooperating agencies, such as Pathfinder, Family Planning International Assistance (FPIA), and the Association for Voluntary Surgical Contraception (AVSC); (2) regional seminars on OR program achievements and recent OR findings for A.I.D. population officers ("We'd be well off if [population officers] knew what the current OR findings were," said one advisor.); and (3) publication of succinct, one-page reports on individual studies, translated into local languages, and written to address different target audiences (e.g., politicians, policy makers, administrators/managers).

## SUMMARY OBSERVATIONS

There is an ongoing tension in the OR Program between a concern for organizational development and the institutionalization of OR capability on the one hand, and the need for having measurable outputs and contractor accountability as measured by completion of studies on the other. Until there is a system for crediting contractors for their technical assistance work, this tension is likely to persist and be a barrier to increasing the OR Program's focus on institutionalization. Streamlined reporting requirements for technical assistance provision should be developed/formalized.

The staffing mix of OR contractors has tended to consist principally, though not exclusively, of social scientists. Staff with family planning management or health program administration backgrounds have been a missing element. Professional backgrounds of staff have some (even critical) influence on the topics and approaches chosen for study.

There is a need for greater programmatic concern about the linkages between the emerging OR capacity and the family planning program administrators and policy makers, and the way these linkages can be made more secure and effective. Establishing these linkages may be less difficult in smaller organizations, such as Family Planning Associations. However, in larger government organizations, especially where OR is contracted out, there needs to be an effort to secure management commitment to implementing changes that may be suggested by subproject findings before studies are undertaken.

Efforts to ensure that OR continues to function as a management tool require a conceptual move by OR contractors toward sustainable OR. To this end, an increased emphasis needs to be placed on developing MIS that can accommodate/integrate OR-type studies.

Many studies have operated in time frames that are unrealistically long given the requirements of management to make timely decisions. There should be an effort to create or adapt research methodologies that have shorter turnaround times, with an effort to provide data suitable for decision making within 12 months of initiation of the study.

Dissemination of OR study findings and impacts has not been satisfactory. Study findings are not being made available in forms that readily reach important audiences beyond the immediate research community, such as policy makers, opinion leaders, and high-level program administrators. The presentation of data and findings needs to be made more accessible to nonresearchers; succinct (one-page), local language translations of executive summaries of study findings and recommendations should be produced for every significant study undertaken in a given country.

Uniform success has not been achieved in moving family planning organizations from undertaking OR studies and using an OR approach for problem solution, to modification/expansion of organizational programs based on study results. A plan for technical assistance for the implementation of activities/procedures that flow from OR study findings and recommendations should be developed with collaborating agencies at the conclusion of a study.

The ranks of the experienced OR advisor pool are growing thin. Steps need to be taken now to prepare the next generation of advisors to meet the future demand for OR technical assistance. Cooperating agencies might be surveyed to determine their perceptions of the nature of the problem, the skills that need to be brought to bear, and the mechanisms that could be used to develop future personnel resources. One approach might be a special fellowship program for returned Peace Corps volunteers. While it may not be possible to train future technical assistance providers in skills that can be learned only on the job, efforts should be made by public health, social science, and other training institutions to ensure that cross-cultural sensitivity training is part of the curriculum for anyone with a career ambition to work internationally in family planning.

## NOTES

<sup>1</sup>In the future, no OR study, even demonstration projects in low-prevalence countries, should fail to measure cost-effectiveness, directly (by using actual or estimated cost figures relative to units of service output) or by inference (by showing that changes in procedures that have no attendant cost increases, such as increasing the number of method distributors supervised by a mid-level manager, produce the same or better results). Even in government programs where obtaining cost (especially overhead) figures is often difficult, it is worth the effort to use crude estimates or measures. As someone noted long ago, a crude measure of the right thing is much more valuable than a precise measure of the wrong thing.

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## 22. THE INSTITUTIONALIZATION OF OPERATIONS RESEARCH

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### INTRODUCTION

Operations research (OR) in family planning is motivated by concerns about the problem of rapid population growth in developing countries and the need to improve programs for resolving this critical social problem. Key actors in OR--research agencies, donors, and social scientists--share the perspective that action research can provide managers with timely and useful information to guide program development, and provide insights into which program strategies work and which do not. However, although efforts to improve the performance of family planning programs in developing countries have benefitted from such research, the sustaining of OR continues to depend on extensive foreign financial and technical assistance, particularly in settings where OR is needed most. Given the practical value of OR, there is thus an apparent need to foster its institutionalization; to identify policies and actions beyond project funding and technical assistance that will sustain the process of organizational research, change, and development that OR is designed to achieve.

### Definitions

**Operations Research.** Although definitions of OR differ, various perspectives on OR emphasize its role as applied research directed at management issues, or, as Ross et al. (1987, p. 128) put it, OR refers to "the application of research methods to improve action programs." A widely used guideline for OR states:

Operations research is concerned with the day to day operations of programs. It is intended to provide managers, administrators, and policy-makers with the information they need to improve service delivery activities and plan future ones. It seeks practical solutions to problem situations and viable al-

ternatives to unsatisfactory operating methods. (Fisher et al., 1983, p. 1)

OR in family planning has concentrated on field trials of alternative service strategies. According to Fisher et al. (1983, p. 1), this approach involves testing the contraceptive use effects of employing "a new category of fieldworker, a new approach to communications, a new community participation strategy, or a new decentralized system of administration." Although some OR studies have focused on cost and resource questions, most use indicators of family planning behavior as dependent variables and variance in service strategies as predictors.

OR methods vary, nonetheless: some studies use qualitative methods, while others use quantitative methods; some studies examine organizational elements, while others focus more specifically on the client population; some studies are lengthy because they address general systemic issues, while others address questions that can be answered in a small, focused study. Despite this diversity, however, all OR is specifically oriented to the research needs of programs. Even in the most constrained settings, OR often contributes insights into what works, and this demonstration function of the research has been valuable to several important family planning programs in developing countries (see Ross et al., 1972; Gallen and Rinehart, 1986; Osborn and Reinke, 1981; Freedman, 1987; Wawer et al., 1985; and McGuire, 1984).

**Institutionalization.** Institutionalization is difficult to define because the term has different connotations in various programmatic contexts. Broadly, "institutionalization" connotes a process of converting an ad hoc activity into an entity with structures, goals, and purposes that characterize an established organization. In other words, institutionalization describes a process by which a temporary activity becomes a regular and expected part of an institution's functioning. Institutionalization can be said to exist if OR is an established activity with indigenous technical, organizational, and financial resources, and if the research provides credible information on strategic issues in family planning that programs use continually for decision making and planning.

There are certain countries where OR has been institutionalized<sup>1</sup> successfully and where principles emerge from this experience. This paper examines that experience, as well as lessons from the literature on organizational change and development, and presents eight propositions on factors that facilitate the institutionalization of OR. Lending coherence and permanence to OR involves a variety of factors concerning research strategy, functional setting, and other internal and external influences on

organizations. In identifying these factors we do not wish to imply that all must be operative for institutionalization to occur, but rather, to describe factors that foster institutionalization. The more attention is paid to these factors in the OR institutionalization process, the stronger will be the prospects for establishing OR as a sustained component of family planning program decision making.

The discussion here focuses on what institutionalization ought to represent, rather than dysfunctions that institutionalization can sometimes imply. Establishing the permanence of OR, for example, does not mean advocating its bureaucratization. For OR to succeed, research must be dynamic, flexible, and responsive to program needs. The features of OR that are widely acclaimed as contributing to its success are criteria to consider in assessing whether institutionalization is occurring.

### **Organization of This Paper**

The eight propositions mentioned above are presented in three sections: on institutionalization and the nature of OR; on institutionalization and the need for research capabilities; and on institutionalization, the demand for research, and strategies for research utilization. The paper ends with a summary and conclusion.

## **INSTITUTIONALIZATION AND THE NATURE OF OR**

**Proposition 1: The institutionalization of OR is facilitated if research strategies are appropriate to the societal and programmatic context.**

*The institutionalization of OR is facilitated if OR is appropriate to the climate of demand for family planning.* To succeed, family planning services must be as acceptable and appropriate as possible for the population served. Since it is often unclear what this means in practice, OR is frequently addressed to clarifying what will and will not work in a particular societal context. Less recognized, however, is the notion that OR priorities should be influenced to a significant extent by the climate of demand for family planning. Consider, for example, two general types of OR--"component" versus "systemic." The former is designed to identify ways in which incremental change in strategies can improve performance. Salaries, supervisory schemes, service strategies, and the like represent components of programs, each of which can be varied in ways that influence overall system performance. OR can be useful in testing alternative strategic components in an otherwise functioning system. Systemic OR focuses on examining relationships among components, or on identifying the appropriate

configuration of components for a program (see the papers by Hendricks and J. Townsend in this volume).

The component approach to OR works well when programs are serving an unmet demand for family planning. In Asia, for example, OR has been a valuable resource in improving the performance and efficiency of rapidly expanding programs.

When demand for family planning is weak, however, the room for operational lapses is minimal, and there is a correspondingly acute challenge to OR to identify a configuration of services that works. In such settings, a premature focus on testing alternative components of service systems will undermine prospects for institutionalizing OR. When operational problems are systemic, a focus on operational component problem solving can lead to unproductive tinkering with fundamentally interconnected problems. Consider the following illustrative parable:

#### The Parable of the African Postmen

There are two postmen, each assigned to respective villages and charged with daily delivery of the mail.

Postman A is a conscientious civil servant who follows the traditions of the British colonial civil service: mail is delivered door to door. But households lack systematic addresses, and the system of delivery is never understood in the village. Coverage is incomplete, and delivery is usually late. Postman A eventually stops working. The mail is not delivered.

Postman B also has little inclination to deliver mail, but he is a kindred head with strong obligations to family and society. Men of equivalent social rank send their children to his house. They sort through the mail and carry letters home to heads of extended families. The family heads, in turn, distribute mail to family members without fail.

There are two respected social scientists who analyze the failure of Postman A. The first, an analyst of social institutions, concludes that there is no demand for mail. The second, an OR scientist, researches the relative merit of alternative service strategies--job descriptions, different uniforms, incentives, and the like.

Both scientists miss the point: Postman B delivers the mail in a manner that fits the institutional context.

Failure to address the regimen of OR to larger questions of context can lead to research that is perpetually tangential to real problems--the paradigm pursued by the OR scientist in village A. Inappropriate OR undermines the goal of establishing research as a sustainable indigenous process.

*OR is facilitated if strategies are appropriate for the stage of development of the program and are tailored to institutional needs.* Programs at different developmental stages have contrasting OR needs. New programs require diagnosis and demonstrations of systems of care that work (see Freedman and Takeshita, 1969). In expanding and demand-driven programs, component OR studies can identify incremental improvements in the way things are done.<sup>2</sup> Still another approach involving systems analysis and change agency is required for large and poorly functioning programs with serious systemic problems.<sup>3</sup> Organization theory can be applied in selecting approaches to OR that are appropriate for the institutional context. Where the approach to OR is incompatible with the programmatic context, the institutionalization process is weakened.

**Proposition 2: The institutionalization of OR is facilitated by balancing the research agenda. While OR should be utilitarian, it should also be scientifically sound.**

*The institutionalization of OR is facilitated by putting theory to practical use.* The utilitarian focus of OR has sometimes assumed the character of minimizing the role of theory. Theory refers to abstract statements characterizing complex relationships in terms that are simple to understand. It has had immense value in the organizational sciences, guiding both the research process and strategies for instituting planned change.<sup>4</sup> There are numerous examples of how atheoretical anecdotes, small case studies, or problem-solving exercises have contributed insight into what works best and how services can be improved. These approaches have their place, and their value should not be underestimated. However, if this is all OR does, the goal of institutionalization is compromised. If there is no accumulation of experience beyond a particular discrete research outcome, OR will always be the handmaiden of existing program policy, administrators, or donors, and broader perspectives and indigenous needs will not be entertained. Endless repetition of research can ensue, without derivation of general principles and insights, or institutionalization of the research process.<sup>5</sup>

*Where demand for family planning is weak, the importance of theory is particularly acute; conversely, where programs are demand-driven, the role of atheoretical problem-solving studies is defensible.* We know from OR in Africa about several program strategies that may hold some promise. In

Nigeria, for example, one study showed that market women are effective contraceptive sales agents (see Ladipo et al., 1987); another showed that paid community workers can distribute contraceptives (see Ojofeitimi et al., 1985); and a third demonstrated that traditional birth attendants can be effective family planning educators (see Ladipo et al., 1985). No serious analyst of Nigerian programs, however, would recommend that family planning services be restricted to any one of these strategies. Rather, some package of such services is needed, and challenging operational planning questions arise in deciding what that package ought to be, how to administer it in practice, and what its impact will be in practical field situations. Social and organizational theory is likely to be useful in configuring services to address prevailing constraints and opportunities. Failure to use theory for this task deprives OR of a key scientific resource and undermines the goal of institutionalization; research done on piecemeal components never resembles what organizations should look like or what administrators must actually do.

Where demand is weak and there is no evidence that services as presently designed can work, experimental OR should be designed to resemble the organization studied, or at least some model of what the researcher believes the organization ought to be. A planning process is required, in which components appropriate for the setting are identified, assembled into an experimental system, and tested as a package. This process of packaging and strategic planning of what goes into the package is quite different from the approach typically used in OR, where service components are studied individually, much as if the rest of the organization did not exist. Institutionalization of OR is enhanced by attending to systemic issues if the appropriate system of services is unknown (see, for example, Paul, 1982).

The role of theory and OR strategies in high-demand settings is quite different from that in weak-demand settings. In Indonesia, for example, where the design for the program is well developed and successful, exploratory OR on alternative packages of services makes little sense. Small, discrete, and quickly implemented OR studies can contribute much to problem solving and strategic planning in such settings. The role of theory in OR is less critical in such settings since the system of service delivery is already well developed.

*OR should not be narrowly restricted to assessing the impact of family planning service strategies on contraceptive behavior.* Institutionalization is enhanced if organizational issues are included in the OR regimen. At least some of the OR conducted in a given setting should be focused on program structure, design, and organization. OR often focuses almost exclu-

sively on strategies for improving family planning output--an obviously important priority for family planning research. However, if the focus of research is something over which administrators have no direct control, OR will be peripheral to operations and slow to be institutionalized. Focusing exclusively on family planning dependent variables (acceptors, prevalence, and the dynamics of contraceptive use) means neglecting aspects of the work system routinely addressed by managers in the course of their work--organizational efficiency, worker motivation and morale, job knowledge, service quality, and the like. When family planning behavioral dependent variables are used, it is appropriate to include operational independent variables as well.

Conventional human service organizational research analyzes outputs in a framework that also focuses attention on internal organizational structures, processes, strategies, and environments, and the interaction of these elements. Various labels are assigned to this approach, such as "systems analysis" or "organization development." Rather than identifying some strategy that research demonstrates as needed, systems analysis addresses the means by which strategic changes can be instituted, generally by managers. OR comprises the diagnosis of dysfunctions in the work system; the identification of feasible strategies for organizational change and renewal; and the identification of strategies for instituting desired changes in organizational plans, structures, and design. To be effectively institutionalized, OR should incorporate studies of programs as systems, and in a manner that is useful to program managers.

*Research that is flawed will lack credibility. If OR is not scientifically sound, efforts to institutionalize it in the management process will be weakened.* OR is sometimes criticized for what it does best: produce results quickly that are unencumbered with sophistication. Such criticism can be ignored, for the most part, if OR is scientifically sound. Quite obviously, weak research, producing spurious results, should not be institutionalized as a mechanism for making decisions, nor should the applied research goals of OR provide a rationale for weak research or a predilection for "quick and dirty" techniques. The need for balance and rigor should be addressed if OR is to attain long-term relevance. OR is most conducive to institutionalization if it is "quick and clean" (see, for example, Miller et al., 1990).

**Proposition 3: Institutionalization is facilitated by organizing research as a continuous process rather than as a series of unrelated and disjointed activities.**

*If OR is conducted as a series of discrete studies, its institutionalization can be facilitated by mechanisms that communicate research to administrators and policy makers continually.* Much can be said for conducting OR as a series of as many applied research studies as possible, even if the strategy for its institutionalization has not been fully developed. It may be argued that a sustained regimen of efforts to diagnose management problems, test alternative solutions, and contribute to internal decision making is inherently "institutionalized." Taking action that informs policy makers is preferable to waiting for the research establishment to be fully developed before OR is attempted; the process of learning by doing becomes internal to programs, part of their institutional culture, and intrinsically useful. Institutionalization of OR can thus occur as a diffusion process. Research review committees, management-research steering committees, and briefing papers are useful mechanisms to facilitate this process. Initially established to communicate research, such mechanisms can eventually develop patrons for research, research resources, and institutional support that would not otherwise emerge.<sup>6</sup>

*OR studies designed to provide a continual flow of information into a decision-making process are more conducive to institutionalization than studies that begin and end with no conceptual link to previous or subsequent studies.* OR that provides a continual flow of information can parallel organizational decision-making processes,<sup>7</sup> particularly if the cycle of research planning corresponds to the cycle of major donor or government planning. Periodic reviews of discrete studies are therefore useful, and mechanisms involving researchers and decision makers, such as action research committees and dissemination committees, should be established to interpret existing research and build continuity. Decision-making mechanisms of this sort are more important to the institutionalization of OR than specific research outcomes. To foster this continual process, OR should be designed to generate sustained links between research outcomes and management processes. This is more readily accomplished if the research design calls for such mechanisms than if each OR study ends the process of communication.

*Strategic attention to scaling up findings to large-scale action leads directly to the institutionalization of OR. Research often fails to address issues of scale.* Findings presented from a small-scale study do not necessarily address the question of how recommendations are to be scaled

up. Research that persistently fails to address questions of large-scale feasibility, scaling up, and implementation will not be institutionalized (see, for example, G. Simmons, 1983 and Pyle, 1981). The issues raised in pilot projects and demonstration activities are often quite different from those pertinent to full-scale projects. Even the transition process itself entails a separate and distinct body of concerns, and mechanisms for fostering planned change that complement the role of research. Illustrating feasibility in a unique and short-term situation serves no long-term purpose to managers and decision makers. Research that applies only to the initial stages of project development and ignores the issues of scaling-up and institutionalization may well suffer the same fate.

**Proposition 4: Institutionalization will be fostered if OR is designed to induce organizational change rather than to produce research outcomes.**

*Research on operations should incorporate strategies for instituting change in the way organizations function* (see, for example, Bennis, 1969; Bowers, 1982; Chin and Benne, 1969; Zaltman and Duncan, 1977). It is not sufficient to study what works; it is also important to research the process of introducing and sustaining change. Change strategies can be complex, but efforts to introduce change typically involve a diagnostic phase, a collaborative problem-solving phase involving research, a period of implementation guided by change agents, and scaling up according to plans developed in the course of the research. An organizational change perspective is conducive to the institutionalization of OR (see, for example, Glaser et al., 1983). Much OR is organizational diagnosis or problem-solving research, without strategies for organizational development incorporated in the study design. OR remains diffuse, and fails to impact on the way programs function.

*Where there is an extensive breakdown in the functioning of a program or no clear model of what will work in a setting, systemic research is more likely to result in organizational change than component studies.* Systemic research, in turn, facilitates the institutionalization of OR. Research organized to reflect the way the focal organization is structured stands a better chance of institutionalization than research that is totally independent of established structures.<sup>8</sup> Results of systems analyses can be readily interpreted by managers, since insights are organized in a familiar structure and deal with issues that are relevant to decision making. Similarly, if research communication mechanisms are systemic, sustaining them can lead to institutionalization.<sup>9</sup>

*Change agents can be used to foster the utilization of research and the institutionalization of OR.* Organizational consulting in private businesses often follows a pattern of diagnosis, technical assistance, and change that is referred to as organizational development. In this approach, technical assistance is addressed to implementing change rather than to conducting research.<sup>10</sup> Change agents provide continuity to the OR process by participating in identifying OR findings, developing collaborative study designs, and participating in the process of translating research into operational change.<sup>11</sup> In the organization development field, change agents have often been critical to the institutionalization of research (see French and Bell, 1978).

## INSTITUTIONALIZATION AND THE NEED FOR RESEARCH CAPABILITIES

**Proposition 5: The institutionalization of OR is facilitated by developing collaborative links among relevant research institutions--private research firms, academic centers, and research and evaluation units.**

*Research conducted by nongovernmental organizations (NGOs) has been critical to innovation in OR and to its institutionalization.* Support to NGO-based research has facilitated institutionalization. Where research has been institutionalized, NGOs have been established and encouraged to conduct OR. Small research firms and NGO service organizations have the flexibility to pose questions about operational issues, seek solutions, and innovate.<sup>12</sup> They have often played a catalytic role in program development that also facilitates OR institutionalization. Where research has been based completely in the public sector, the institutionalization of OR has languished.

*Where OR has been institutionalized, academic institutions have been actively involved in programmatic research.* Academic research is sometimes criticized as inordinately focused on abstract issues of little practical use to programs. Where OR has been institutionalized, however, it has acquired a respected place in the applied research agenda of social science faculties.

*Program-based research and evaluation units have facilitated OR institutionalization.* Where OR was institutionalized in Asia, there was early attention to developing research and evaluation units as an internal capability of programs.<sup>13</sup> Although program evaluation units are not the most effective agencies for conducting OR, they are a crucial audience for OR,

legitimizing the research process and providing a mechanism for translating research into action.

*Where multiple agencies have been involved in OR, research coordination mechanisms have facilitated the institutionalization of OR.* Institutionalization is fostered by balancing the strengths and weaknesses of various types of OR agencies through institutional collaboration. Academic institutions often lack an applied research focus, but play a critical role in training OR scientists. NGO research agencies conduct useful external OR, but typically lack adequate links to the public sector policy- and decision-making process. Program research and evaluation units are administratively proximate to the decision-making process, but lack the flexibility to innovate. The institutionalization of OR has been facilitated by mechanisms that foster interagency collaboration in research planning, training, implementation, and dissemination.<sup>14</sup> Collaboration among different types of agencies offsets the limitations of each with complementary strengths that lead to the institutionalization of OR more generally (see the discussion of partnerships by M. Townsend in this volume).

Institutionalization of research does not necessarily imply that research is conducted by bureaucracies that provide services, but rather that research is conducted in a framework that fosters its utilization. This outcome, in turn, requires a system for OR that is broader than the institutions that conduct studies. As Ross et al. (1987) have noted:

...operations research is a fundamental component of a comprehensive family planning program grounded in the public sector. Although certain research functions can continue to be performed effectively by universities and other institutions in the private sector, such functions should be embraced in a coherent overall plan that achieves mutual reinforcement among its parts. Within such a plan, the major need is to create a capacity for basic operations research in the public sector. (p. 135)

## INSTITUTIONALIZATION, THE DEMAND FOR RESEARCH, AND STRATEGIES FOR RESEARCH UTILIZATION

**Proposition 6:** Institutionalization of OR is facilitated by efforts to develop research training centers, collaborative links, and social science research capacities.

*Academic institutions can play a critical role in the institutionalization of OR.* OR is a specialized subdiscipline of social science research; the fields

of sociology, statistics, public health, public administration, and economics provide the technical expertise for OR programs. Where OR has been institutionalized, other social science capabilities have also been established.<sup>15</sup> Compartmentalizing OR as a specialized activity, without the development of other social science capabilities, undermines the goal of institutionalization.

In less developed social science settings, the pool of technical talent for conducting research will remain permanently constrained if university programs, where social scientists are trained, remain weak. The goal of institutionalizing OR thus depends on establishing training centers where social research can flourish and aspiring OR scientists can be trained. Since OR is a specialized area of social science, ignoring the development needs of the social sciences undermines prospects that OR will be institutionalized in the long run.<sup>16</sup> Emphasizing the role of OR in providing answers to the programmatic questions of administrators and donors should not exclude academics from the OR system. Since institutionalization depends on research training, academics should have a stake in OR, and their interests should be acknowledged in OR assistance programs.

*Focusing foreign assistance on institutional development has been more conducive to OR institutionalization than focusing prematurely on OR itself.* In the 1960s, foreign assistance for population research in Asia was focused on institution strengthening. Programs were established for resident advisory support to universities, fellowships in the population sciences, and collaborative links among developed country universities and Asian counterpart institutions. These programs, although not focused on OR, fostered careers in research, prestigious national institutes, and a role for research in the decision-making system at large.<sup>17</sup> Donor priorities in Asia eventually shifted from institution strengthening to categorical research programs, such as OR. This change seems appropriate in retrospect, but only because institutions for research and action had been created that could absorb such support.

It can be argued that efforts to develop OR in Africa have prematurely emphasized the funding of research on OR questions, rather than the development of capacities to address such questions. A continuing focus on OR without attention to antecedent institutional needs can inadvertently weaken the climate for OR by focusing research on imported rather than indigenous themes.<sup>18</sup>

**Proposition 7: Institutionalization of OR is facilitated by fostering demand for research in the policy community to guide planned organizational change.**

Where political commitment to family planning is strong, there has been a correspondingly strong demand for research and sustained institutional development in OR.<sup>19</sup> OR often follows, rather than precedes, policy initiatives (see, for example, case studies from Mexico and China in Mundigo, 1989). Nonetheless, there are several themes in the organization literature regarding ways in which policy and administrative commitment to research can be developed at the research planning stage.

*Where programs are new and political commitment is weak, it has been useful to combine OR with consequences research.* Research addressed to building commitment to family planning should be coordinated with OR when study designs permit such research.<sup>20</sup> Even if OR does not incorporate consequences research, it is useful to disseminate findings in conjunction with research on consequences issues.

*The institutionalization of OR is facilitated if research on broader policy issues is flourishing, and family planning strategies are not the sole focus of research.* As noted earlier, OR is a subspecialty of social and organizational research that is institutionalized when academic organizations have been involved in OR and contribute to its institutionalization through training. Thus it follows that the nonapplied research done by academics can also strengthen the climate for OR. Even if the products of academic research have no obvious link with family planning program activities, a strong general research climate is vital to OR institutionalization. While the primary focus of OR should be managers, the community of donors, policy makers, and academicians should also have a stake in OR and take an interest in what is being learned.<sup>21</sup> Research that is appropriate for one audience may not be appropriate for another. Institutionalization means developing various mechanisms and capabilities that facilitate research in the disciplines that produce OR.

*Where OR attends to research on economic issues, commitment to OR has been nurtured.* Cost-effectiveness research can lend credibility to arguments that research results are relevant to large-scale operations (for a relevant example of cost-effectiveness research, see Rahardjo and Reese, 1972). Research itself should be inexpensive and efficient. Research that is expensive to conduct and sustain is likely to be dismissed as irrelevant to policy or an unjustifiable luxury. Operational models that are not replicable or sustainable are not likely to be utilized. Similarly, research that

focuses on economically irrelevant issues undermines the credibility of research itself and the goal of institutionalizing OR.

**Proposition 8: Institutionalization of OR will be enhanced if there are mechanisms for coordinating research with the decision-making process so that the research is serving a routine function for management.**

If the planning, execution, and utilization of research are directed by programs as a routine management function, they are not isolated activities. Rather, they involve coordination between managers and research units within programs; links between academics and social science researchers in universities, and policy makers; and partnerships between researchers and action agencies outside of government. These relationships among decision makers and researchers necessarily benefit from a broad institutional base for research and action.

*Efforts to establish OR should address mechanisms for fostering research utilization, which are likely to lead to the institutionalization of OR where mechanisms are established to foster research as a management tool.*<sup>22</sup> The sections above have summarized themes from the literature on research utilization that can be applied to the institutionalization of OR--the role of theory, the systems perspective, the need for a focus on organizational change, and other issues. Some additional themes from the research utilization literature are relevant to the institutionalization of OR:

- Research is more likely to be utilized if joint ownership of the research process is established before research is launched. It has been shown consistently that collaboration between the researcher and the consumer of research is crucial to the utilization of research results (see Fairweather, 1967; Mackie, 1974). OR is not valuable if it remains solely the province of social scientists and researchers. Furthermore, tensions over operational control of the research process can undermine its effectiveness. Institutionalization is facilitated when responsibilities and relationships are clearly delineated from the outset of the OR process through routine and established procedures and policies.
- The manner in which research is communicated affects prospects for its utilization. In particular, OR can build commitment to action through demonstration. Where the demonstration value of research has been well developed, the institutionalization of OR has been supported. OR often produces experience that is not effectively communicated in writing. Simply showing what can be

done or what does not work implicitly establishes the value of research to the policy-planning community.<sup>23</sup>

- Research is more likely to be utilized if OR places a strong emphasis on topics that are operationally relevant. Research having some obvious link to existing operations is more likely to be utilized than research focused on external issues. OR is unlikely to be institutionalized if it focuses on issues viewed as external, imported, or irrelevant to matters administrators can control. If organizations are structured completely differently from the design implied by the research, results will not be utilized unless research also addresses questions about how the proposed restructuring is to take place (see Glaser, 1973; Lippitt et al., 1958; Miles, 1964; Rubin et al., 1974).
- The communication of research outcomes should involve multiple media sources and channels that are familiar to administrators. Research communicated through established internal mechanisms is more likely to impact on the way things are done than research documented in scientific reports. Consensus building is important: the assembling of groups to discuss research results is more likely to generate commitment to change than research that is set apart and not reviewed. Research should be established openly as having a role and discussed as a routine management component (see Glock, 1961; Glaser, 1973). Demonstration of a finding is more productive than presentation of abstract results.<sup>24</sup>

OR that addresses the above themes is more likely to be institutionalized than OR that is a final product in itself, rather than a decision-making tool or part of a system for planned change.

## SUMMARY AND CONCLUSION

When the conceptualization of OR is inappropriate, institutionalization will not take place. For this reason, the discussion here has focused as much on the pitfalls in OR design as on factors that facilitate institutionalization. Research that is inappropriately adapted to the societal or programmatic context will not be institutionalized, nor will OR lead to institutionalized research capabilities if theory is ignored or the research lacks credibility.

The institutionalization of credible and scientifically sound OR requires well-trained social scientists who can carry out this task. Career opportunities must persist in OR so that well-trained scientists will find it an attractive and rewarding pursuit. Long-term projects facilitate institutionalization by providing a setting where work teams can be developed and career tracks defined. Academics and universities institutionalize OR by sponsoring training in applied research and developing high-level research leadership. For this reason, institutional linkages and mechanisms that nurture collaboration facilitate the institutionalization of OR.

Finally, institutionalization of OR implies that research is being utilized for action by program management and the policy community. There is extensive literature on the determinants of research utilization, much of which is relevant to the question of how OR can be institutionalized.

## NOTES

<sup>1</sup>For over 20 years, the family planning programs of East Asia have had well-established internal evaluation units, external research organizations, and university-based researchers that conduct OR and disseminate results (see, for example, Kim et al., 1972; Cernada, 1970).

<sup>2</sup>The numerous OR studies from Taiwan in the 1970s illustrate this perspective (see, for example, Cernada, 1970).

<sup>3</sup>See a discussion of this issue for a program in Bangladesh in Phillips, 1988 and Phillips et al., 1984. In Africa, contrasting environments have posed challenges to OR that required careful strategic planning (Tapsoba et al., 1990).

<sup>4</sup>Classical studies of the relationship of management systems to their environment have consistently shown that organizations that are adapted appropriately to their environment and technological conditions are more effective than organizations that are not (Burns and Stalker, 1961; Lawrence and Lorsch, 1967). This is particularly true of human service organizations since effectiveness is determined by the behavior of clients who are external to the organization (see, for example, Zwerman, 1970; Negandhi and Reimann, 1973). Research on how operational strategies can be informed by social organization and structure represents a type of study under the open systems research approach to OR (Freedman and Takeshita, 1969). More typically, this perspective is used in organizational development activities in commercial organizations (see, for example,

studies of the effect of social and cultural environments on organizational behavior by Boddewyn and Nath, 1970).

<sup>5</sup>OR has been much criticized for its lack of independence from the patrons of family planning programs (see, for example, Demeny, 1988).

<sup>6</sup>Such mechanisms were successfully developed in Taiwan (Cernada, 1970, 1982; Cernada and Sun, 1974) and were effective components of the Bangladesh Extension Project (Phillips et al., 1987; Koenig, 1990; Yunus et al., 1984).

<sup>7</sup>The Bangladesh Extension Project is an example of this design. Although fielded as a long-term experiment addressed to a single research question, the project has produced a continual flow of OR studies and findings. OR is focused on discrete operational issues, but conducted in a long-term framework for research and organizational change (Phillips, 1988; Phillips et al., 1984, 1987). Much of the current agenda of the Bangladesh Extension Project concerns issues that were not anticipated when the project was originally designed. The long-term sustained activity generates insights about operational problems, and a mechanism for collaboration between researchers and administrators. This collaboration is conducive to the institutionalization of OR (Koenig, 1990).

<sup>8</sup>In Bangladesh, for example, a successful family planning project was not used by the national program to guide strategic planning until a subsequent project was implemented that involved various levels of the hierarchy in a decision-making process. Results not only addressed OR questions, but also identified problems associated with the structure of the program, the system of work, and barriers to organizational change and development (Phillips, 1988; Simmons et al., 1987).

<sup>9</sup>If OR is based at different levels of operations, with communication of results across organizational levels, the system of research and communication resembles the structure of the organization. Such designs have been productively employed in the organizational research field to institutionalize OR (see Havelock, 1973; Lippitt et al., 1985; Glaser et al., 1983; Chin and Benne, 1969; Bowers, 1982).

<sup>10</sup>Change agent is a term used to characterize individuals temporarily assigned to an organization to foster planned change. Change agents are usually involved in OR and link research to action (Cartano and Rogers, 1963; Havelock and Havelock, 1973; Simmons et al., 1984). The term contrasts with technical assistance, which is usually aimed at fostering the conduct of research rather than its utilization. In the absence of change

agency, changes introduced in organizational subsystems often do not last (see, for example, Warwick, 1975).

<sup>11</sup>See the discussion of change agent training in Havelock and Havelock (1973). Although this approach has not been widely used in family planning OR, it represents a potentially promising strategy. For example, when Bangladesh Extension Project research showed that the staffing pattern of the national program was inappropriate, change agents were assigned to the Ministry of Health and Family Planning to facilitate planning and implementation of plans. Teams of change agents are assigned the task of translating research findings into action by working with government counterparts (Phillips et al., 1984).

<sup>12</sup>Examples of such NGOs conducting important independent OR include the Indian Institute of Management in Ahmedabad, India; PROFAMILIA in Colombia; and Yayasan Buana in Indonesia.

<sup>13</sup>As the Taiwan National Family Planning Program was introduced and subsequently brought to scale, numerous OR studies and articles were generated by the Taiwan Institute of Family Planning and the Taiwan Population Studies Center, both directly supporting the government program (see Chinese Center for International Training in Family Planning, 1974).

<sup>14</sup>An example of such a mechanism was a schedule of monthly meetings established through the Bangladesh national program to bring together all members of the OR community to informally share experiences and findings (Koenig, 1990).

<sup>15</sup>In Korea, for example, early planning activities focused on demographic assessment, economic-demographic interrelationships, assessment of levels of demand for family planning, and other issues that are not OR. Researchers also addressed OR issues, however, and institutes that became active centers for OR were active as well in other aspects of population research (see, for example, Kim et al., 1972). A similar tendency to conduct OR in conjunction with other social research is evident in early planning documents from Malaysia (Johari, 1969) and Taiwan (Chow, 1969; Sun, 1968).

<sup>16</sup>In East Asia, early efforts to organize family planning programs assigned high priority to higher education and fellowships. Asian social science dissertations have an applied research focus that reflects their authors' participation in applied research projects at a formative time in their career (see, for example, Sun, 1968; Bang, 1968; Han, 1974; and Alauddin, 1979).

<sup>17</sup>Best known from this experience are the links established among universities in Indonesia, Thailand, Korea, the Philippines, and Taiwan, with collaborating centers at Australian National University, Brown University, the East-West Center, the University of Chicago, and the University of Michigan. Fellowship programs sponsored by the Ford Foundation, A.I.D., and the Population Council provided funds for students to be trained, and grant funds supported collaborative research. Sustained programs of training, resident assistance, and collaboration led to the transfer of institutional capacities for research that contributed to the institutionalization of OR.

<sup>18</sup>A comprehensive view of successful efforts in research institutional development can be found in Harkavy (1988). There have been several attempts to develop African university centers, but donor commitment and collaborative links were discontinued in most instances by the 1980s because of economic and political constraints on the effectiveness of academic institutions and resource constraints on donor capabilities.

<sup>19</sup>The most notable exception is China, where demonstration projects and work conferences played a much more critical role than research (Chen, 1977).

<sup>20</sup>For example, in Taiwan careful attention was paid to developing demand for research in the policy community, and to removing barriers between the research process and the decision-making process. In Korea, research on consequences issues was conducted in conjunction with OR. In both settings, such strategies assuaged official ambivalence about the role of research in family planning. When consequences issues can be addressed in the course of OR, commitment to OR is enhanced, and prospects for the institutionalization of OR are enhanced as well. In Bangladesh, for example, research on the health consequences of fertility decline has been incorporated in OR projects on the fertility consequences of family planning (see, for example, Koenig et al., 1990 and 1988). Such research not only strengthened the health rationale for family planning, but also strengthened the rationale for research and commitment to OR.

<sup>21</sup>An expanded discussion of the relationship between broader research on policy issues and OR can be found in Demeny (1988). A similar argument has also been made in Simmons et al. (1983).

<sup>22</sup>See, for example, Haverock's (1971) review of factors leading to the utilization of social science research and the report of the Human Interaction Research Institute (1976). Where explicit attention has been paid to structuring the utilization of research, prospects for the institutionalization

of OR have been enhanced (Cernada, 1982; Phillips et al., 1984; Koenig and Whittaker, in this volume).

<sup>23</sup>In Bangladesh, for example, home-based injectable services were critical to the success of the Matlab experiment (Phillips, 1990). Deliberations on the use of domiciliary workers for injectable services did not proceed, however, despite several technical papers on the issue, until the Minister of Health visited a village and observed the procedure in person (Huque et al., 1984). Many similar anecdotes elsewhere attest to the value of demonstration in the institutionalization of OR.

<sup>24</sup>In China, very little of what is learned about the determinants of success is published--an obvious constraint to the institutionalization of OR. However, OR has been institutionalized by consigning strong political commitment to the program, and developing mechanisms for work conferences and communication of lessons from model projects (Chen, 1977).

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### **23. THE INTEGRATION OF IEC INTO FAMILY PLANNING PROGRAMS: LESSONS APPLICABLE TO OPERATIONS RESEARCH**

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Program for Appropriate Technology in Health

#### **INTRODUCTION**

This paper examines the lessons for operations research (OR) that can be learned from examining the integration of information, education, and communication (IEC) activities into family planning programs. A particular focus is on lessons related to the institutionalization of OR. The paper begins by reviewing the integration of IEC into family planning programs. It then looks at some lessons learned from IEC that apply also to OR. The next section addresses key issues faced by both IEC and OR programs. A final section presents conclusions.

#### **EVOLUTION OF FAMILY PLANNING IEC**

IEC activities were always considered an integral part of family planning service delivery programs. In the early days of most programs, IEC was used to generate the popular support and demand that would justify the establishment of services. Up to 70 percent of total resources of some family planning programs were allocated to IEC work for legitimation activities (Okunno, 1990). Before service delivery programs could even be allowed to operate, policy makers needed to be aware of proposed objectives and activities. Service providers needed to know about the various contraceptives available. Potential clients needed to understand what family planning meant and did not mean. Following this early stage of program development, many programs devoted a significant portion of their budgets and staffing to IEC, specifically for advocacy and further legitimation of the concept of family planning.

Early efforts to legitimate the concept of family planning have paid off around the world. In fact, lessons learned from family planning IEC

continue to guide the entire primary health care field in areas such as social marketing, the use of community-based distribution systems, and efforts to combat rumors and institutionalized opposition, among others. Yet the focus of family planning IEC is changing. Professionals in all regions have slowly begun to address what is known as the "knowledge-practice gap," or the discrepancy between high levels of general awareness about family planning and relatively low contraceptive prevalence. To bridge this gap, it is necessary to provide potential contraceptive users with information relevant to their particular situation that encourages them to take action. Programs need to move from broad messages such as "small families are happy families," which have generally performed their desensitizing function, to action-oriented messages that prompt the receiver to do something, such as "go to a clinic," "choose a method," "tell your friends about the contraceptive you use."

Indeed, a recent analysis of current management needs of family planning programs at different stages of development (Ross et al., 1989) underscores the continuing primary role that IEC plays in all programs. The analysis features the use of different strategies for various subgroups, such as the rural sector, postpartum women, and low-literate groups, and various IEC techniques, such as social marketing, campaigns, and the use of community-based distributors. There is also evidence to suggest (Coeytaux et al., 1987) that well-designed and well-executed outreach and IEC activities can have a greater impact on contraceptive prevalence in rural areas than the expansion of health care services through mobile clinics.

## LESSONS FROM IEC

Advertisers know well that the best way to sell a product is to target a specific group of consumers, such as couples concerned about the safety of young children or working women who have little time for cooking, with messages that appeal to them or their emotions. Segmenting audiences and tailoring behavior-related messages to each group in an appealing manner is difficult. When the message is to use a contraceptive, a preventive behavior that could have monetary and social costs for the recipient, the task can be very difficult. As family planning IEC programs shift their emphasis to encouraging the trial and sustained use of contraceptives, the skills necessary to implement these programs become more complex. The need for personnel who have been trained in effective communication methodologies is more acute than ever. Most programs are gradually working to upgrade the skills of their IEC personnel, both through hiring of trained communication specialists and through on-the-job training in counseling, interpersonal communication, and use of support materials.

Nevertheless, despite these efforts, and although IEC activities have always been a requisite element of any family planning service delivery program, IEC skills and methodologies have not been fully integrated into the programs. The reasons for this lack of integration and the means of overcoming it have direct relevance for the planning and implementation of family planning OR.

Any well-designed communication program will have the same elements as a good OR program. The communication process is cyclical and encompasses the following steps:

- Analyze
- Design a plan
- Research messages
- Develop messages and design interventions
- Pretest and revise
- Train and distribute
- Implement and evaluate

This looks a lot like an OR project, does it not? In fact, at its best, IEC is OR: testing an intervention, itself based on audience research, in order to refine and repeat it. Yet relatively few groups actually follow the above steps when implementing an IEC program. Very often, IEC is ad hoc, in response to the request of a program manager or service provider who wants "a pamphlet explaining the IUD" or "a poster of a well-planned family" immediately. Materials developed in this way are usually not based on audience research and are rarely pretested. This is because the real target audience for such materials is the person that asked for them, who is generally a supervisor or a superior to the IEC staff member. It is this person, not representatives of the stated target audience, who then reviews the materials and approves them. Materials developed like this usually end up with few illustrations, and with language levels appropriate to the professionals who participated in their development, rather than to the target audience.

Managers who do not understand that the actual production of materials is only one, relatively less important step in the communication process contribute to a detrimental program emphasis. The focus on a particular

product rather than on the communication process discourages IEC staff from planning or fitting their activities into a broader, systematic, and cyclical context. Skipping vital steps in the communication process, such as audience research or pretesting, will lead to ineffective programs. For example, a family planning project in a Middle Eastern country asked one of its best artists to develop full-color posters on the use of various contraceptive methods, which were then printed on high-quality paper. The managers felt that, given the best inputs, the products certainly had to be of high quality. The posters, which have been in use for almost two years, are sophisticated and colorful. They are also very poorly understood because no one thought it necessary to test the messages--and hence they do nothing to enhance the project.

By skipping steps in the process one also loses sight of the product's role within the program. A booklet becomes an end in itself, and insufficient attention is paid to mechanisms for getting it into the hands of clients. For example, institutionalizing a counseling procedure within a clinic may entail giving a client a booklet or leaflet on the method she accepts, and then having the nurse or social worker go through this material with the new user to be sure she understands all the instructions, plus other important points, such as side effects and when to return to the clinic.

To take another example, consider the frequently used pregnant man poster with its caption, "Would you be more careful if it were you that becomes pregnant?" The objective of such a poster is, of course, to get men thinking about their role in family planning. But this message will almost never reach its target audience if it hangs inside clinics, since men seldom attend such clinics. A communication strategy must go beyond the materials themselves to the way they complement and reinforce each other. Based on audience research, this strategy must include ways these messages can reach the targeted audience.

One factor in the success of the Indonesian national program is this long-term reinforcement of family planning messages through virtually every communication source, including civic and religious organizations, with which a villager comes in contact. The community support, and indeed pressure, to accept family planning is evident at every turn. It is important to note that such integrated support of family planning is virtually impossible without strong political backing. In areas where government is opposed or indifferent to family planning, IEC staff are often understandably unwilling to risk disapproval by launching an integrated IEC outreach effort. Activities are fragmented and low-key, and bad communication practices become institutionalized.

## ISSUES FACING IEC AND OR PROGRAMS

A problem facing both IEC and OR programs is the fact that, in many cultures where education and social position are valued, decision makers, program managers, and even program staff often doubt the importance of learning anything from their target audience, especially when that audience has less education and lower socioeconomic status than they have. This culturally induced suspicion of community decision-making abilities is a major cause for the office-bound design of communication strategies tailored to the values and experience of the educated. We find, for example, materials supposedly developed for rural women with low literacy skills that are so full of medical jargon we can barely understand them. These materials are often developed with the best of intentions: to give all women as much knowledge on the subject as the staff who prepared the materials. The best antidote to this problem is to get people out of their offices to talk with members of their intended audience. IEC and OR evaluation results are also an effective means of letting decision makers see just what impact, if any, a program has had on the community.

Donors often contribute to similar distortions by supporting specific activities rather than an overall strategy. In both IEC and OR, there are more than a few examples of agencies' coming in and producing a product, say a video or a knowledge, attitude, and practice (KAP) survey, with minimal input from local counterparts. The product may be superior to and more effective than one developed with existing skills and resources in country, but institutionalization suffers. There is an ongoing debate in the IEC field about the relative value of developing local, and perhaps inadequate, resources and sacrificing some quality in current materials, versus producing effective materials, using foreign professionals, at the expense of local training and development.

Those planning OR programs face this dilemma as well, as they try to balance efficiency and quality against the development of local research capabilities (see Phillips et al., in this volume). OR projects sometimes exhibit the same orientation to a product rather than a process. The research loop discussed above is not completed, and a study is implemented, written up for international publication (often without local authorship), and shelved. More progress needs to be made in putting research results into a format and language appropriate to program managers so they can use OR as a management tool and feed results into their programs. Even more important, staff involved in IEC and OR activities need to stop at the various points during project implementation and ask themselves, "Why are we doing this? Who is the target audience? Are we

working with the right people?" "Ownership" is very important, and people are sensitive to the way they are treated by those outside their program.

Donor agencies need to ask themselves these same questions: "Why are we doing this? Why are we supporting the development of a flip chart in country X? What is the point of funding this survey? Why does the local program need this information? Are we allocating enough time and money to allow local staff to learn new skills?" Thinking of IEC and OR as learning processes rather than a series of specific activities, such as the production of a pamphlet, may be expensive in the short run, in terms of both time and money. Yet it certainly is more cost-effective than developing products with limited impact or running programs that depend, year after year, on external technical assistance. Perhaps more effort needs to be put into demonstrating that cutting corners just does not work. All too often we hear, "We meant to pretest, but we ran out of time. The material was needed for training or a campaign or a program launch."

A sympathetic donor agency that supports local staff as they go through all phases of the communication process, including audience research, pretesting, and evaluation, gives legitimacy to these activities, and can be instrumental in convincing both staff and managers to do the job correctly. A good example can be found in the following quote from the annual evaluation of the Johns Hopkins University Population Communication Services (JHU/PCS) project: "In Nigeria, as a result of donor efforts to help design projects with appropriate institution-building objectives and activities, local agencies today consider it standard practice to pretest materials before spending money on mass production. Five years ago, pretesting of IEC materials was a foreign concept which was often resisted or considered cumbersome and not useful" (McWilliam and Rogers, 1989, p. 13).

In another example, Peru-Mujer, a Peruvian nongovernmental organization (NGO), developed an interesting IEC program that used well-tested coloring books as the focal point for discussion groups on problems, including lack of control over fertility, facing women in rural and marginal urban neighborhoods throughout the country. The development of the coloring books and planning for the discussions took well over a year. During this time, the staff requested and received technical assistance in specific areas of need, such as the development and testing of the materials and evaluation. They also implemented the entire project themselves. Because the staff learned by doing, they saw the value of going through the entire communication process. They made and learned from their own mistakes. They have since gone on to develop, much more efficiently than

the first time, materials for the Ministry of Health, the Pan American Health Organization (PAHO), the United Nations Children's Fund (UNICEF), and other groups in Peru, as well as for other cooperating agencies funded by the Agency for International Development (A.I.D.). But more important, they have internalized the communication process.

In the same vein, program managers who have adopted OR techniques as a management tool tend to be those who have participated fully in an OR study and learned the skills by using them directly. The Oyo State community-based distribution (CBD) program in Nigeria and the national family planning program in Burkina Faso come to mind as converts to the value of cyclical OR.

Continuity of staff over the life of several studies also helps institutionalize OR skills, as is true for IEC programs, especially those in the public sector. More often than not, bright and ambitious staff members who develop new skills move on to more prestigious jobs in the private sector, leaving the IEC unit about where it started. Yet it is possible for staff to move and take skills with them. This happened in the Philippines, where IEC staff of the IEC Division of the Commission on Population now run The Family Planning Organization of the Philippines, one of the few Philippine agencies still offering a choice of contraceptive products these days. Managers with IEC training and experience will enhance the institutionalization of the communication process. In the short run, however, constant shuffling of staff is disruptive and detrimental to program continuity and effectiveness. What IEC needs here is a good OR study to look at different ways creative staff can be provided with incentives to remain within the family planning program.

## CONCLUSIONS

In summary, there are several aspects of the IEC experience that have direct relevance to the institutionalization of OR capabilities in family planning programs:

- IEC and OR, at their best, are continuing processes, not a series of discrete products. Stepping back from a current activity to see how it fits into the broader program plan will enhance program impact.
- Managers and clinicians who supervise IEC and OR staff need to understand the importance of following the full process described earlier. Including these decision makers in training and field work,

even if sporadically, can help them understand the value of each step.

- In the same vein, research results need to be packaged in a format that makes them accessible, and therefore usable, to program managers. The unease managers often feel with "scientific data" and their equal mistrust of the value of audience research can sometimes be overcome if research results are presented effectively.
- If we are serious about transferring skills, donor agencies need to center their programs around institutionalization. This will entail making sure that anyone providing technical assistance is always working with counterparts and with the counterparts who will actually be doing the work. We also need to make sure that program managers and appropriate staff members receive the following:
  - Proper training, especially for people working in the field, and also those who will be using the study results
  - Enough time/resources to allow people to make mistakes and learn by doing
  - Opportunity to share and disseminate findings and techniques in a usable format

Counterparts also need to understand the cyclical nature of OR and be empowered to be involved in the entire process. Unless the procedure is internalized by staff, from the principal investigator on down, OR will not continue once the donor returns home with its bank account and technical assistance. But once the process becomes second nature, it will also become part of the family planning problem-solving and decision-making process.

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## GLOSSARY

A.I.D.	Agency for International Development
ADIM	Asociación para el Desarrollo e Integración de la Mujer
AMICO	Assistência Médica a Indústria e Comércio Ltda.
APROFA	Asociación Chilena de Protección a la Familia
AVSC	Association for Voluntary Surgical Contraception
BEMFAM	Sociedade Civil Bem Estar Familiar
BKKBN	National Family Planning Coordinating Board, Indonesia
CA	Cooperating Agency
CBD	Community-Based Distribution
CDC	Centers for Disease Control
CEMOPLAF	Centro Medico de Orientación y Planificación Familiar
CENPROF	Centro Nor-Peruano de Capacitación y Promoción Familiar
CEPAR	Centro de Estudios de Población y Paternidad
CIES	Centro de Investigación, Educación y Servicios
CONIN	Corporación para la Nutrición Infantil
CORA	Centro de Orientación para Adolescentes, Mexico
CMP	Couple Months of Protection
CPFH	Center for Population and Family Health, Columbia University
CPR	Contraceptive Prevalence Rate
CSM	Contraceptive Social Marketing
CYP	Couple Years of Protection
EPI	Expanded Program on Immunization
FHI	Family Health International
FPA	Family Planning Association
FPIA	Family Planning International Assistance
HMO	Health Maintenance Organization
ICDDR/B	International Centre for Diarrhoeal Disease Research, Bangladesh
IEC	Information, Education, and Communication
INOPAL	Operations Research in Family Planning and Maternal-Child Health for Latin American and the Caribbean
IPPF	International Planned Parenthood Federation
IPSS	Instituto Peruano del Seguro Social
ISTI	International Science and Technology Institute
IUD	Intrauterine Device

IUSSP	International Union for the Scientific Study of Population
KAP	Knowledge, Attitudes and Practices
LDC	Less Developed Country
MCH	Maternal and Child Health
MEXFAM	Fundación Mexicana para la Planeación Familiar
MIPFAC	Materno-Infantil y Planificación Familiar
MIS	Management Information System
MOH	Ministry of Health
MORE	Maximizing Results of Operations Research
MWRA	Married Women of Reproductive Age
NGO	Nongovernmental Organization
OC	Oral Contraceptive
OR	Operations Research
ORT	Oral Rehydration Therapy
PAHO	Pan American Health Organization
PATH	Program for Appropriate Technology in Health
PCS	Population Communication Services
PIACT	Program for the Introduction and Adaptation of Contraceptive Technology
PRICOR	Primary Health Care Operations Research
PROALMA	Proyecto de Apoyo a la Lactancia Materna
PROFAM	Promotora de Planificación Familiar
PRCFAMILIA	Colombia Asociación Pro Bienestar de la Familia
PROPATER	Promocao da Paternidade Responsavel
PSFN	Pro-Superación Familiar Neolonesa, A.C.
PVO	Private Voluntary Organization
RFP	Request for Proposals
STD	Sexually Transmitted Disease
TA	Technical Assistance
TBA	Tradition Birth Attendant
TFR	Total Ferility Rate
TIPPS	Technical Information on Population for the Private Sector
UNICEF	United Nations Children's Fund
UNFPA	United Nations Fund for Population Activities
URC	University Research Corporation
WHO	World Health Organization

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