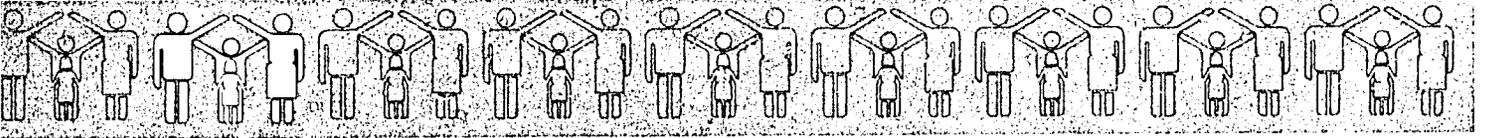


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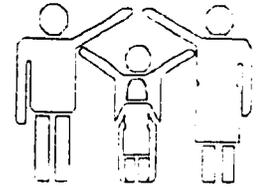


INSTITUTE FOR INTERNATIONAL STUDIES IN NATURAL FAMILY PLANNING

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Institute Issues Report

Cost-Effectiveness Analysis: Natural Family Planning and Breastfeeding Programs



**Institute Issues Report #2:
Cost-Effectiveness Analysis: Natural Family Planning
and Breastfeeding Programs.**

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**Workshop
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Hosted by: The Graduate School of Public Health
University of Pittsburgh
Pittsburgh, Pennsylvania
April 11 and 12, 1988

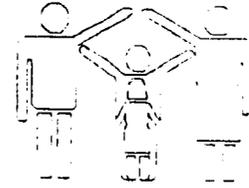
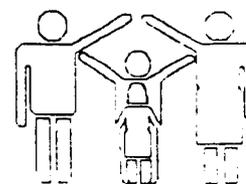


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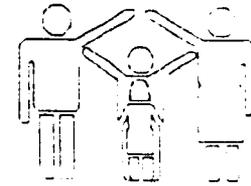
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Foreword

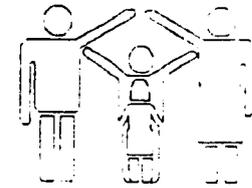
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One of the major goals of the Institute for International Studies in Natural Family Planning is to increase the availability of the natural methods of fertility regulation. The availability of a method is often dependent on the program planner's perception that the method is effective and programmatically affordable. Few studies, however, have assessed the cost-effectiveness of either natural family planning (NFP) or breastfeeding as a natural method of family planning.

Cost-effectiveness analysis (CEA) is a well established tool for decision making in family planning; however, the techniques used had not previously been adapted to use in NFP and breastfeeding—with the special needs and problems inherent in these fields.

A workshop, convened by the Institute and held at the University of Pittsburgh on April 11-12, 1988, was held to review existing studies and to develop a framework for cost-effectiveness analysis for these two intervention areas. Our hope is that this document will encourage operations researchers and program evaluators to include these methods in their assessments. We also believe the information in these proceedings will be useful to directors of NFP and breastfeeding programs who are interested in establishing the cost-effectiveness of NFP relative to other family planning methods, comparing the relative cost-effectiveness of various strategies for providing NFP services, comparing the relative cost-effectiveness of different breastfeeding promotion and support strategies, and assessing the cost of breastfeeding promotion and support vs. the cost of family planning and other social/medical services required in the absence of breastfeeding.



Executive Summary

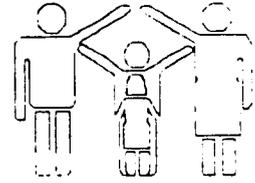
Cost-effectiveness analysis (CEA) has been used extensively to study family planning and other health care programs. However, there have been few occasions when CEA methods have been used in the evaluation of natural family planning (NFP)[‡] or breastfeeding promotion programs. As part of its effort to promote the study and acceptance of NFP and breastfeeding, the Institute for International Studies in Natural Family Planning has identified as a priority the initiation of cost-effectiveness studies to assist in developing and implementing the most efficient interventions in both NFP service delivery and breastfeeding promotion.

Prior to the Institute workshop, two workshops to explore CEA and family planning/population programming had been held under the auspices of the United States Agency for International Development (A.I.D.). The first, hosted by the Johns Hopkins University School of Hygiene and Public Health in 1981, resulted in the volume *Evaluating Population Programs* (28), which presents background and examples of CEA and cost-benefit analysis (CBA) in the population field. It has been summarized by the Population Reference Bureau as *Third World Family Planning Programs: Measuring the Costs* (32).

The second workshop, sponsored by Tulane University in 1986, more specifically addressed CEA in the family planning project context, emphasizing operations research and approaches to programmatic CEA problems. Proceedings of that workshop addressed NFP as a "special case"; however, the fertility suppressive impact of breastfeeding was not considered (16).

Discussion of NFP at the Tulane workshop focused on the availability and quality of data within NFP programs, appropriate measurement and

[‡] See Appendix F for definitions of terms used in this document.



attribution of costs, and appropriate measurement of output or effect. This limited approach reportedly was due to the lack of a consistent definition of an “acceptor” of NFP, and lack of comparability of CEA studies of NFP with those of other family planning methods because of the presumption of a lower use-effectiveness of NFP[‡]. The results of the discussions emanating from these two workshops became the starting point for a more focused dialogue at this workshop.

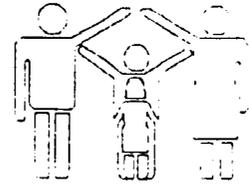
The workshop sponsored by IISNFP in April, 1988, was convened to address issues in the application of CEA methodologies to the study of NFP and breastfeeding support programs, and to propose appropriate actions for Institute staff. A reference list of background materials used during the workshop is appended along with an agenda and list of participants.

The major recommendations and points of agreement that came from the two days of working group meetings are presented separately for NFP services and breastfeeding promotion or support programs. For the working group on NFP programs, these were:

1. The computation of costs and the measurement of effectiveness can be somewhat more problematic in CEA of NFP programs than in CEA of other commodity-based family planning programs; however, the group endorsed the use of CEA for NFP programs, based, in part, on discussion from the IFFLP/FIDAF meeting in Ottawa (7).

2. Indicators of effectiveness recommended by the group for NFP programs include: a) couple years of protection (CYP), the theoretical number of years of use of the method by an acceptor couple; b) percent of NFP clients using the method for child spacing who achieve adequate spacing; and, c) a choice of intermediate indicators of program effect (i.e. knowledge, action,

[‡] Use-effectiveness rates of NFP are usually equal to, or better than, those reported for spermicides, condoms, and other barrier methods.

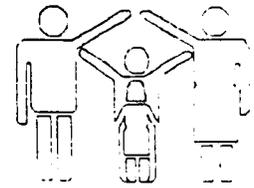


autonomy, continuation). This “chain of effects” approach, highlighting possible measures of output or effectiveness for use in CEA in NFP programs, was developed by the working group and is included as Figure 1 in this report.

3. Since acceptors of NFP may include those using the method to achieve pregnancy as well as those who use NFP to avoid or delay pregnancy, it is important to include only limiters and spacers in calculating the cost of services and the effectiveness of NFP as a family planning method.
4. Researchers should recognize that NFP program personnel may be more interested in the qualitative aspects of NFP than in its impact on fertility reduction.
5. There was general agreement that the present costing and budgeting approaches of many NFP programs could be improved with limited but focused technical assistance. It was suggested that the Institute support technical assistance and workshops in cost-related management where appropriate, and actively disseminate existing CEA research findings through presentations at meetings and dissemination of this report.

The working group on CEA use in breastfeeding programs reached the following recommendations and points of agreement:

1. Very few CEAs of breastfeeding support or promotion programs and their fertility impact have been attempted. The studies that have been done suggest that breastfeeding support and promotion programs are extremely cost effective compared to the infant feeding alternatives. The working group agreed that CEA could be very useful in highlighting the advantages of breastfeeding program efforts to policy makers and program managers in developed and developing countries.
2. Since breastfeeding support and promotion programs vary widely in their objectives and implementation, depending on sec-



toral support and regional/cultural needs, it is particularly important that indicators of effectiveness chosen for evaluation purposes should be relevant to program objectives.

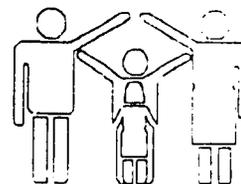
3. The group noted that most evaluations of breastfeeding programs have focused on the period immediately postpartum. Few have concentrated on the subsequent postneonatal months of breastfeeding. The group stressed that indicators of the effect of breastfeeding programs during 24 postpartum months should be of primary concern to those interested in the child spacing effects of breastfeeding.

4. The workshop participants endorsed the use of "return of menses" as a standard index of effect to be used in CEA even when the fertility aspect of breastfeeding is not the major program objective. Other possible indicators of program intermediate effects that were recommended included indicators based on breastfeeding behaviors (i.e., percent initiating, duration in months of exclusive breastfeeding (MEB), longest interval between feeds, cumulative months exclusive breastfeeding).

5. In a cost benefit analysis of breastfeeding or breastfeeding promotion programs, opportunity costs must be included and given a monetary value, since these costs are particularly important for breastfeeding women. The working group also stressed that the time and financial savings realized from the reduction in infant morbidity must also be included in cost calculations.

6. Because of the dynamic nature of breastfeeding behaviors and the number of possible external influences on these behaviors, the use of appropriate control groups or multivariate techniques were recommended for CEA of breastfeeding promotion programs.

One recommendation clearly includes both NFP and breastfeeding programs.



- National programs where NFP is available or where breastfeeding is promoted as a family planning method should include NFP and breastfeeding before menses return between months 2 and 6 in estimates of CYP. The recommended formula is:

$$CCYP = 0.01 C_n E_c + 0.0769 O_n E_o + 7.5 (V_n + TL_n) + 2.5 I_n E_i + X_p P_n E_p + 0.083 B_n$$

where:

CCYP = calculated couple years of protection

C_n = condoms used

O_n = oral contraceptive cycles used

V_n = vasectomies performed

TL_n = tubal ligations performed

I_n = IUDs inserted

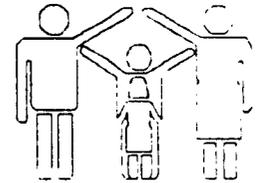
X_p = average number of years of use achieved by average acceptor

P_n = periodic abstinence "graduates"

E = efficacy for each method

B_n = number of women 2-6 months postpartum in full lactation and amenorrhea on a monthly assessment

This Institute Issues Report will be widely distributed to members of the A.I.D. ad hoc Operations Research Committee and to Natural Family Planning and breastfeeding program managers interested in strengthening management cost decision-making. The Institute will provide technical assistance, where possible, to enhance the use of this report.

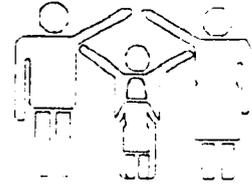


Introduction: CEA In Health Services

Costs are an ever-increasing concern for decision makers and program planners in public health. Both cost-benefit and cost-effectiveness analyses have been used in assessing family planning and health programs in developing countries. Cost-benefit analysis (CBA) is used primarily to make policy planning decisions about major interventions. In CBA, both the costs and the benefits must be given a monetary value, and a decision is made on the basis of calculated direct savings (19,28). Cost-effectiveness analysis (CEA) is used to assess the relative efficiency of program efforts against given, non-monetary output measures. From the perspective of project managers and those charged with program evaluation, CEA is the more relevant tool because it allows direct comparison of costs between alternate means of attaining the same predetermined desirable output (4, 23, 28).

The best use of CEA is to compare different project approaches with similar outputs to determine which is the more reasonable choice based on cost. Determination of the cost-effectiveness of a single program at a single point in time has little meaning. The utility of CEA is in the comparison of alternative service delivery options. CEA can help answer such questions as: "Which intervention is less expensive if we want the same level of output?", or, "What aspect of our program is consuming most of the funds and what management change might improve the situation?" For program managers, the use of CEA can help in decision making about resource allocation and service delivery; for policy makers it can aid in system-wide planning.

CEAs typically determine a cost (in monetary terms) per unit of output or effect (in non-monetary terms). In the family planning field, these ratios have been cost per family planning acceptor, cost per couple year of protection, or cost per birth averted. In child survival programs, cost per case of diarrhea treated, cost per child immunized or cost per death averted have been used. The cost-effectiveness ratio of one service



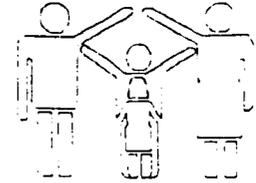
delivery option can then be compared against that of other service delivery options.

The two main components of a CEA are the measurement of costs and measurement of effectiveness. In order to carry out a CEA, program managers must at least be able to:

- Identify the program objectives such that they include an indicator of effect;
- Assign a monetary value to all program resources: personnel (volunteer and paid), materials (purchased or donated), and conversion of international funds to a single selected currency;
- Record how, when, and where resources are used;
- Collect the necessary information to measure the chosen indicators of effectiveness.

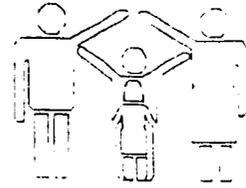
Effectiveness refers to the degree to which a program achieves its objectives. The objective used in CEA is usually an objective that was set as part of the original program. Most CEAs in primary health care and family planning are concerned with immediate program outputs (e.g., education sessions held or individuals served) and effects (e.g., cases treated, enrollees, family planning acceptors) rather than long term impacts (e.g., fertility and mortality rates) (28). This is not to say that programs are not concerned with long term impacts; however, CEA is usually employed to help decision makers and project managers answer the immediate management questions about alternative means of delivering goods and services.

The major *cost categories* used in existing analyses of these programs are: salaries and per diem of personnel (including outside technical assistance), travel costs, commodities—purchased or donated (e.g., oral rehydration, immunization and/or contraceptive supplies), staff training, client education, vehicles and equipment, buildings and fixed equipment, administration, research and evaluation, client support/materials,



and costs of donated materials. A list of program costs to be included in CEA of health service programs is included in Table 1 (see page 37). A simple guide to CEA is also included in Appendix D.

CEA should not be viewed as the only mechanism for evaluation. It is but one part of a comprehensive program analysis. Other assessment methods should also be used, since cost-effectiveness does not address many important issues such as quality of care, equity or need for services, or a program's ability to satisfy individual's sense of health, well-being or family size and spacing desires, etc. In the present era of financial constraints, however, programmatic decisions may very well depend on the results of CEA.



CEA In NFP Programs: Key Issues

The Institute-sponsored working group meeting on cost-effectiveness analysis of NFP programs focused on five areas:

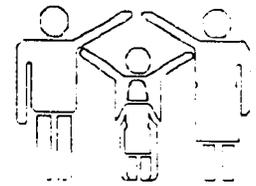
1. The applicability of CEA to NFP programs and its uses;
2. Review of available CEA studies;
3. Identification of effectiveness measures;
4. Identification of appropriate costing strategies; and,
5. Development of recommendations for Institute activities.

Conclusions and general recommendations for CEA in NFP programs were also discussed.

Uses Of CEA In NFP Programs

There was general agreement among workshop participants that CEA is an appropriate strategy for studying NFP services. This agreement stemmed from the perception of increasing demand for financial accountability and more efficient operation of NFP programs. The need to compare NFP to other family planning methods, as expressed in an article by Paul Gross (7), makes the use of CEA for NFP programs particularly salient. Workshop participants offered several examples illustrating the usefulness of CEA for program decisions in NFP. These included comparison of: 1) the cost-effectiveness of group vs. individual instruction in NFP, 2) full-time vs. part-time staffing of an NFP program, 3) volunteer vs. paid staffing, 4) clinic based vs. community based instruction, and 5) NFP integrated into existing family planning or MCH programs vs. NFP only services.

In any study of cost-effectiveness, the challenge is to determine accurately both program costs and reliable indicators of output (or effectiveness). Workshop participants agreed that both the computation of costs and the measurement of effectiveness can be more problematic in



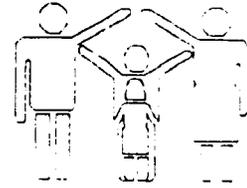
NFP programs than with other family planning methods. For example, calculation of costs is somewhat different from other family planning programs in that education of potential acceptors is usually the major cost of the program. For CEA of other methods of family planning, education and counselling is often considered a common cost for all methods, and is thus ignored in making a decision between alternative methods. Measurement of output, or effect, of NFP programs is also less straightforward than with other family planning methods. The definition of an acceptor or user of NFP is by no means standardized across NFP programs. Some programs consider all persons who fill out an entry form to be acceptors of NFP, while others only consider a person who has been practicing the method for "x" months an acceptor. Other programs use these same definitions of acceptors to describe users of NFP, while still others only consider individuals users if they have completed a course of instruction. The workshop participants agreed that these issues of definition need to be resolved in order to promote more systematic CEA in NFP programs.

It was also noted that, at this time, NFP programs may be less sophisticated in their data collection and accounting procedures than other family planning programs. In many circumstances it may be necessary to employ relatively simple CEA models that are appropriate to the level of administrative and bookkeeping sophistication of the NFP organization.

Review Of Cost-Effectiveness Studies Of NFP Programs

Several cost-effectiveness analyses of NFP programs have recently been completed and others are in design stages. The following examples were presented and discussed at the meeting:

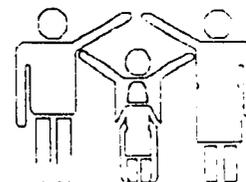
- Liberia and Zambia program CEA by R. Kambic and R. Wong from Johns Hopkins University (12), presented by R. Kambic.
- Proposed prospective CEA for Zambia program by The Development Group (20), presented by D. Pedersen.



- Kenya: Johns Hopkins Family Planning Operations Research NFP project in Nyahururu by M. Labbok, et al.(13), and an alternative approach by G. Brown (1), presented by M. Labbok.
- CENPLAFAM (Colombia) NFP program CEA reported in *International Family Planning Perspectives* by R. Vernon, K. Rocuts and J. Medina (31), presented by K. Jaros.

The cost-effectiveness of NFP was determined in A.I.D.-funded NFP demonstration programs in Zambia and Liberia. Because there was little NFP service in these countries prior to the introduction of these programs, the first two years of the program were spent primarily in program development. From 1983-1988, Zambia served over 5000 clients, half of whom were pregnancy avoiders, and Liberia served 1472 clients, 1055 of whom were avoiding pregnancy. Research and start up costs, estimated to be 40% of total project costs, were not included in the cost calculations. Effectiveness was measured by CYP, which was calculated by multiplying method users by mean years of use. Cost and CYP for only women avoiding pregnancy were estimated, using the average CYP from 1985-1988 as a realistic program estimate. The adjusted cost per CYP in Zambia was \$44 and in Liberia was \$51. The difference in cost-effectiveness between the two country programs was attributed to the devaluation of the Zambian Kwacha. Although costs per CYP were initially high, as more couples practiced the method for longer term and became autonomous, cost per CYP declined(12).

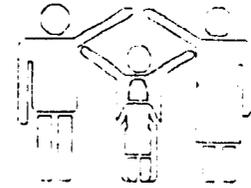
The proposed prospective CEA for Zambia by the Development Group focused on the importance of building a management information system into the program from the beginning in order to capture all costs and effects of the program. In principle, the CEA was to be designed primarily to assist the service delivery provider in making decisions. Costs of research and technical support were not to be included in the calculation of the cost-effectiveness ratio, and costs were to be expressed in constant U.S. dollars. The use of volunteer labor was only to be included as a cost when the program would have otherwise hired staff to fill the same role. The effectiveness measure chosen was



autonomous user because: 1) this was felt to best represent the production of an NFP program, and 2) few costs are incurred by the provider after users become autonomous (20).

A study of the cost-effectiveness of an NFP program in Nyahururu, Kenya collected data on capital costs, running costs and proportion of costs attributable to research. Several assumptions were made in the determination of the cost-effectiveness of the program. A proportion of staff salary and transport were attributed to research and not included in the CEA. Vehicles, office construction and equipment/furniture were included as capital costs. Salaries, disposable materials, and transport maintenance were included as recurrent costs. All costs of initial training were considered capital costs while refresher training was considered a running cost. Each couple who learned NFP was estimated to use the method for an average of two years, based on average usage during the project period. The authors found a cost per autonomous user year of approximately \$36 by the fourth year of the program. The cost-effectiveness of the program improved with time and was projected to continue to improve as the duration of use per average acceptor couple increased. This cost per CYP was comparable to that found in other community based family planning programs operating concurrently in Kenya (13).

CEA was used in Colombia to compare the use of two NFP service delivery options: special NFP trainers vs. nurses in clinics who provided NFP information as well as other contraceptive information. The cost-effectiveness of NFP was also compared to that of other family planning methods. In this study, it was assumed that all developmental support/management costs were the same in each clinic. The amount of staff time necessary for NFP delivery was found to be much greater than that for other family planning methods. Cost per month of NFP protection was approximately five times as high as the cost per month of protection from IUD use, and three times the cost per month from use of oral contraceptives or barrier methods. When costs were calculated on the basis of minutes of staff time used for service delivery plus supplies, the cost per acceptor of NFP was \$13 and the cost per CYP



was \$17—regardless of whether the nurse or special NFP trainer was used (30).

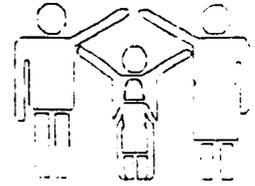
Several similarities in the examples were noted. Each CEA was conducted with an NFP organization that had a fairly mature administrative and service structure *or* had considerable research oversight. All studies had direct collaboration with an external funding source, and each CEA was carried out as part of a larger operations research/program development activity.

These presentations also illustrated the variety of approaches that can be taken with cost-effectiveness analysis in NFP programs. The research question of interest to the majority of the studies was either “What is the cost effectiveness of the NFP program approach?”, or “Did the cost-effectiveness change over time?” Two of the studies compared NFP to other family planning methods. Approaches to definitions and to measurement of outputs and costing strategies varied. The major portion of the subsequent working group discussion focussed on appropriate definitions of cost and of effectiveness in NFP based on the programs presented and other experiences in NFP.

Effectiveness

Discussion of effectiveness focused on three issues: 1) the definition of a user (of when use begins) and of “autonomy”; 2) the duration of use provided by NFP training; and, 3) measures of effectiveness used in NFP which may not be comparable to other family planning methods. The first issue absorbed the majority of the working group’s attention and is discussed in detail in the remainder of this section.

It was noted that NFP providers do not use a consistent definition of an NFP acceptor or user. In some programs, a person is considered an acceptor when counseling begins; in others it is only after “x” months of counseling or “x” months of autonomous use. Achievement of autonomy is also defined in a variety of ways: by a test, by chart review, by length of training, etc. The group agreed that the length of training necessary to be considered an acceptor of the method, or to be considered autonomous, is variable. Another problem is that those who

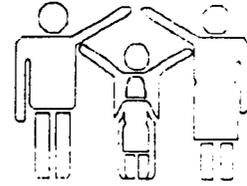


accept NFP may include those using the method to achieve pregnancy as well as the limiters and spacers who use NFP to avoid or delay pregnancy. In determining the cost-effectiveness for the family planning impact of NFP it would be inappropriate to include either costs or outputs for those clients using the method to become pregnant. This issue is compounded by the fact that follow-up contact after training in NFP is often limited, and this restricts the availability of information about current reason for use, the occurrence of unplanned pregnancy and continuation rates.

The working group reached a consensus that couple years of protection (CYP) should be used as the ultimate measure of program effectiveness of NFP among those using NFP to limit or space, because: a) this indicator is an accepted measure of effectiveness that is commonly used in the family planning field, b) CYP is an indicator that family planning managers are familiar with, and c) CYP can be easily calculated by NFP programs as well as by providers of other methods.

Client follow-up is important for NFP providers so that they have ongoing feedback on their own program effort. In order to calculate CYP, a program must be able to follow-up clients to determine continuation for limiting and spacing and pregnancy rates (4, 7, 27). There is also a growing consensus in the natural family planning community that some measure of comparability would be healthy for the field and would assist in approaching donor agencies (7).

The group also recognized that CYP may not be adequate as the exclusive outcome measure for NFP programs. Most NFP service providers do not presently identify CYP as an important output measure for individual programs. Most programs use number of acceptors or autonomous users as a primary program goal. Other effects, such as psychosocial and spiritual elements, may be of even greater importance to NFP service providers; thus, defining measurable outputs that are important to individual NFP providers and related to their organization's specific goals and objectives is essential.

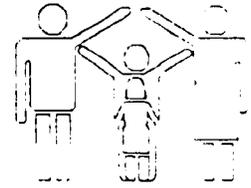


Based on these discussions, the working group agreed that indicators of effect of NFP programs must: 1) emphasize continuing use, 2) allow for comparability between NFP and other family planning programs, and 3) be relevant to individual NFP programs. The remainder of the discussion of this stage of the workshop was spent developing a set of related indicators of program effectiveness for NFP which met these three needs. This schema is based on a “chain of effects” model of program achievement, which is summarized in Figure 1 (see page 16).

Figure 1 shows how indicators of program effect can be related to client behavior at different stages of a program’s progress. The progress of an NFP program is broken down into a series of program intermediate outputs that lead to certain client status, or landmarks which may be less definition dependent. Measurable indicators of client status (landmarks) are assigned to each program intermediate output. Such program intermediate outputs are discussed in the CEA literature (28, 32). Indicators of landmarks might include: number of registrants for training (enrollees), number of clients returning to training or charting for a certain duration without dropping out (e.g., 3, 6, 9, 12 months), or number of follow-up contacts. While these landmarks can be viewed as intermediate measures of achievement, the ultimate family planning goal is assumed to be reduction in fertility as estimated by couple years of protection.

The use of this “chain of effects” approach allows for comparability between programs in spite of varying program approaches. It also solves the problem of reliance on “autonomous users” as the single outcome measure by which to compare NFP programs. The use of the “chain of effects” scheme solves the problem by specifying a set of client behaviors that can be used as indicators of autonomous use of NFP and by offering other possible measures of program effect.

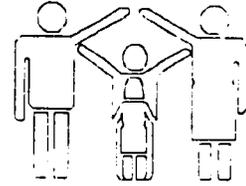
It is of particular importance that the variables that are selected as measures of effect should not be subject to “observational bias”. Observational bias is the tendency of the observer, or recorder of events, to subconsciously desire a certain output and unwittingly have a tendency



NFP Program Activities	Client Status (Landmark or Effect)	Measures of Effect (Individuals, or Percent of the Target Group, who:)
Information Dissemination ↓ Motivation	Knowledge Action	<ul style="list-style-type: none"> ◦ Attend first session ◦ Heard radio spots ◦ Read a flyer ◦ Show knowledge in interview survey ◦ Register (became a "Registrant") ◦ Take a chart home ◦ Agree to a learning program ◦ Chart "x" cycles, attend "x" teaching sessions ◦ Remain in program for "x" months
↓ Teaching and Client Practice	"Autonomy"	<ul style="list-style-type: none"> ◦ Complete a course of instruction ◦ Pass a "test": checklist of knowledge and practice ◦ Have studied/practiced the method for "x" months without instruction: "Survivorship" ◦ Have a set of properly interpreted charts
↓ Client Follow-up	Continuation	<ul style="list-style-type: none"> ◦ Keep monthly records ◦ Achieve adequate child spacing (for spacers) ◦ Achieve "x" years of non-pregnancy among limiters

Figure 1
Chain Of Effects And Possible Measures Of Effectiveness For Use In CEA Of An NFP Program

to interpret outcomes in a manner that is not entirely valid. This is of particular concern in defining autonomous users, since the observers (program personnel) are the same people who assess success (autonomous use). Indicators must be verifiable, objective,



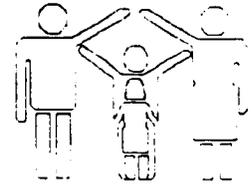
and have direct relevance and utility for the program. These indicators, or measures, may be recorded a) as a description of an individual's progress, b) in raw form as numbers, or c) expressed as percentages of a target population (e.g., of all registrants, 90% become autonomous). Inclusion of multiple measures as part of an overall CEA may make the study more meaningful and potentially useful to NFP program managers. These measures may be assessed from NFP program records or by regular or one-time surveys.

Costs

The major focus of the working group discussions was on effectiveness, rather than cost, because costing for NFP programs is, in theory, no different than that for other family planning methods. (See Table 1 on page 37.) The main issues discussed were proportions of cost attributable to specific program elements, special cost considerations, and the sophistication of NFP programs in collecting cost data.

In NFP programs, training of clients and counselling usually account for a large proportion of costs. The costs of training teachers and acceptors may be difficult to determine, especially since NFP programs are often nested within larger Family Life Education, health care or Church development programs. Logistics and commodity costs may be less than for other family planning methods, although NFP is not necessarily commodity free. NFP programs may require such items as books, charts, thermometers, slides, etc., that are relatively expensive to purchase and replace in a developing country setting (16). Cost of volunteer time and other contributed resources, which are often difficult to monitor, may also account for a greater share of the cost of an NFP program than of other method programs.

Two special considerations in calculating costs of NFP programs were discussed: the scale of operations and multi-objective programs. Scale of operations refers to the idea that comparisons between alternatives in CEA should be made in the context of the same size or scale of operations. For example, if a CEA is performed to compare the cost per autonomous user in a program using a paid teacher to cost per autonomous user in a program using volunteer one-to-one teaching, it



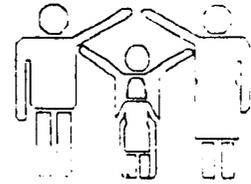
would be inappropriate to strictly compare the two if one model were in a large hospital and the other model were in a small rural clinic or in a country of different economic development. In cases where NFP or periodic abstinence is part of a multimethod family planning program, it may be difficult to isolate the costs of the NFP operations, especially regarding use of facilities, communications, equipment (vehicles), and personnel. A decision needs to be made regarding the technique to estimate the NFP program costs only. A general practice has been to allocate a fixed proportion of the total program costs to NFP, which represents only a rough approximation.

The third cost issue for NFP programs, discussed in the workshop, was the lack of experience with bookkeeping in NFP programs. The establishment of valid and accurate mechanisms for identifying and comparing costs is essential to the useful interpretation of CEA. Organizations must have the ability to determine capital (start-up and building costs) and recurrent (salaries, electricity, rentals, petrol, etc.) costs, and to assign values to donated goods or services and volunteer staff time. Since most NFP programs have had no experience with costing there was general agreement that they will require technical assistance in the area of budgeting and accounting. It was suggested that this could be accomplished through direct work with individual organizations or through seminars and workshops for multiple programs.

It was determined that various costing approaches should be considered in different program situations, with the simplest methods being adopted wherever possible. These should be selected based on accepted costing procedures employed in other family planning studies (4, 23). Any technical assistance in the development of management information systems (MIS) for NFP should be sensitive to the data needs of CEA when designing the system.

Recommendations For Institute Activities

Implementation of CEA in NFP seems to be directly related to the level of professionalism and administrative sophistication of the organization. The Institute should adopt a commitment to technical assistance efforts designed to strengthen the capabilities of NFP organizations in

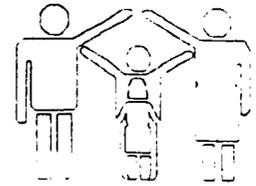


CEA and other management procedures. Information useful to CEA should be integrated into current and future management information systems (MIS) of Institute supported projects.

A major challenge is to help organizations recognize the potential benefits of using cost-effectiveness analysis to compare program approaches. Most organizations are willing to accept the value of improving their bookkeeping and accounting procedures but may be less prepared to start examining actual program elements to improve efficiency. One strategy would be to take the organization through an exercise of identifying and operationalizing goals and objectives, and then matching resources and efforts to the objectives. This may help highlight the importance of addressing critical outcome measures, i.e., client dropout and numbers of acceptors. Quantifiable objectives help managers monitor progress. The specification of the measures of these objectives must precede the use of CEA for decision making.

Besides direct consultation, four other strategies were identified to promote CEA:

1. Regional workshops should be held, preferably in conjunction with other conferences that bring together NFP providers.
2. Development and dissemination of a guidebook on management skills was suggested as a mechanism to increase the use of CEA in NFP. The group emphasized that the guidebook should be written in direct, non-technical language, with judicious use of examples. The Institute's *Data Management Guide* was suggested as a model as well as other materials developed in Institute management seminars.
3. Existing programs should be made aware of cost-effectiveness and other operational research studies that address NFP programs. An aggressive policy of information dissemination should be pursued. Information dissemination should emphasize the rationale for such studies, as well as the potential utility of the results.



4. The publication of a brief position paper or “Commentary” based on the discussions of this ad hoc group was suggested as an additional avenue for dissemination/promotion. This paper should address the usefulness of CEA for NFP and highlight the Institute’s strategy for promoting research in this area.

**Recommendations
Regarding The
Use Of CEA
In NFP Programs**

The following recommendations were made by the working group:

- Couple years of protection (CYP) should be considered as a valid measure of effectiveness for NFP programs. Intermediate indicators of program effect (e.g., knowledge, action, autonomy, continuation) can also be used in a “chain of effects” approach. Costs and effects may be limited to the limiter/spacer proportion of the program.
- National calculations of CYP should include NFP and other methods that include periodic abstinence (PA) where they are part of services available. The following formula should include efficacy factors for each method, and be computed as follows ‡:

$$CCYP = 0.01 C_n E_c + 0.0769 O_n E_o + 7.5 (V_n + TL_n) + 2.5 I_n E_i + X_p P_n E_p$$

where:

CCYP = calculated couple years of protection

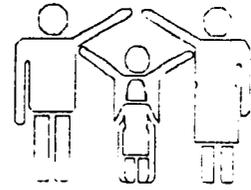
C_n = condoms used

O_n = oral contraceptive cycles used

V_n = vasectomies performed

TL_n = tubal ligations performed

‡ Adapted from the formula by W. Robinson, 1976.



I_n = IUDs inserted

X_p = average number of years of use achieved by
average acceptor ‡

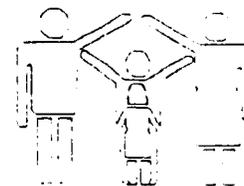
P_n = periodic abstinence “graduates”

E = efficacy for each method

- An alternative to CYP that might be a better indicator of the fertility impact of NFP programs is “percent of clients achieving adequate spacing” ‡‡.
- Researchers should recognize that NFP programs may be more interested in the qualitative and psycho-social aspects of NFP than in its impact on fertility reduction.
- The present costing and budgeting approaches of many NFP programs could be improved for better management with limited but focused technical assistance.
- The Institute will support technical assistance and workshops where appropriate in cost/management and will actively disseminate existing CEA research findings through presentations at meetings and dissemination of this proceedings.

‡ Present studies indicate this may be 2–5 years or more. The working group recommended that one should assume two years of protection, based on the experience in the studies presented, until program data are available.

‡‡ “Adequate” spacing for optimal child health is generally accepted as two years recovery prior to next pregnancy, or approximately three years between births.



CEA In Breastfeeding Programs: Key Issues

The Institute-sponsored working group meeting on the use of cost-effectiveness analysis in breastfeeding support programs included five areas:

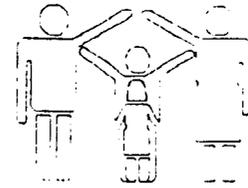
- 1) Discussion of the applicability of CEA to breastfeeding program assessment and its uses;
- 2) Review of CEA studies done in this area;
- 3) Identification of effectiveness measures;
- 4) Identification of appropriate costing strategies; and,
- 5) Development of recommendations for Institute activities.

Conclusions and general recommendations regarding the use of CEA in breastfeeding programs were also discussed.

Uses Of CEA In Breastfeeding Programs

The working group agreed that there are many management decisions in breastfeeding programs that lend themselves to CEA. A few examples include:

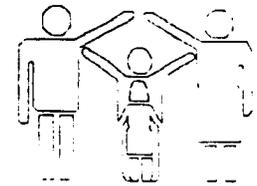
- Cost-effectiveness of “rooming-in” versus separate nurseries and postpartum wards.
- Cost-effectiveness of high technology assistance to mothers to enable their infants to be breastfed (e.g., milk banks, breast pumps) compared with the use of traditional approaches (e.g., wet nurses, hand expression).
- Cost-effectiveness of using expressed breastmilk for milk banks compared with using breastmilk substitutes.
- Comparisons of the cost-effectiveness of various training programs for health professionals.



- Comparison of the use of mass media, women's support groups, and/or household visiting as an adjunct to hospital based programs.

Five potentially problematic areas for consideration in the discussion of the use of CEA for breastfeeding programs were presented:

1. Breastfeeding is rarely a discrete program focus.
2. Breastfeeding has multiple benefits, including child spacing, maternal and child health, nutrition, and, apparently, protection against certain chronic diseases. Many different programs, therefore, have taken different approaches to breastfeeding promotion and message development.
3. There is not a consistent proportional relationship between duration of breastfeeding and duration of lactational amenorrhea, which is a proxy for fertility suppression. Since lactational amenorrhea is influenced primarily by the frequency, exclusivity and duration of suckling, different patterns of breastfeeding behavior seen among individuals and among societies have very different effects on fertility suppression. It was noted that the use of models to predict the effect of breastfeeding on fertility reduction must take into account differences in breastfeeding patterns.
4. The objectives of breastfeeding support and promotion programs are not only to introduce a new behavior (i.e., breastfeeding), but also to change the way women currently breastfeed in order to optimize its multiple benefits.
5. The effectiveness of breastfeeding support and promotion programs may be diminished by competing forces. These could include unfavorable hospital practices, the association of bottle feeding with modern or Western cultures, and competing demands for women's time.



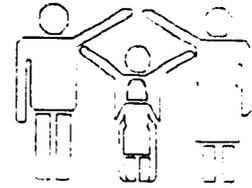
Review Of Cost-Effectiveness Studies Of Breastfeeding Programs

Empirical studies of the cost-effectiveness of breastfeeding support or promotion programs, whether they are planned for nutrition, health or family planning purposes, are rare. A number of studies discuss the real and/or potential costs of breastfeeding for the mother or the infant (8, 14, 22, 25), while others demonstrate the cost savings, both to a nation and to individuals, of using breastmilk instead of substitutes (6, 15, 21, 25). The decreased morbidity and mortality associated with breastfeeding may also lead to considerable cost savings for the health sector and for the family (2, 14, 25). These positive findings remain true even when controlling for the fact that healthier infants may be more likely to be breastfed (9, 18). Measures of effect used vary between studies.

Estimates of the cost-effectiveness of breastfeeding and supportive programming in averting diarrheal morbidity and mortality have been made by Phillips, Feachem and Mills (21). In their model, costs are attributed to educational programs needed for behavioral change and efficiency is based on the risks of mortality in a specific setting as well as the number of infants who would be affected by the changed behaviors. Thus, costs vary widely depending on the setting. They estimate that the cost per diarrheal episode averted by breastfeeding is between \$2.40-\$143, and cost per averted diarrheal death ranges from \$87-\$10,750. This model does not include the cost savings from reduced purchase of formula or diarrhea treatment medications.

A study in a high risk neonatal unit in India assessed the impact of an abrupt change from a bottle feeding norm to breastfeeding among the maternity patients. The authors reported a 22% decrease in mortality, decreased rates of diarrhea and other infections, decreased diarrheal mortality, and decreased costs for milk and medicines. Overall costs were also less than before the change to breastfeeding only, even though the lower neonatal death rates led to an increase in the average length of stay (2).

Two examples of the cost savings associated with breastfeeding promotion in hospitals were discussed at the meeting. In Honduras, the cost savings of converting a large maternity hospital (approximately 1000 deliveries per month), which serves about 70% of the low income

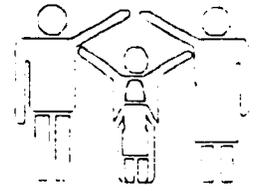


population in Tegucigalpa, to rooming-in and almost complete breastfeeding were enormous. Approximately \$6000 per year was saved in formula, \$7500 in bottles and \$1000 in oxytocin. Savings from decreased use of glucose solution, bassinets, and antiseptics to clean bassinets were also reported. These figures do not include the indirect savings associated with reductions in neonatal morbidity (5).

In Panama, similar decreased hospital costs resulted from breastfeeding promotion efforts. The breastfeeding promotion program included training of health professionals, education of the public through mass media, the establishment of milk banks at six of the 11 public maternity hospitals, and a working women's support component. Cost savings resulted from changes in hospital practices such as decreased separation time between the mother and her infant, decreased use of supplemental bottles, and increased rates of rooming-in. These changes increased the proportion of solely breastfed infants and decreased the rates of illness among those exclusively breastfed (11).

When a woman exclusively or almost exclusively breastfeeds and remains amenorrhoeic, breastfeeding is more than 98% effective in preventing pregnancy in the first six months postpartum (33). Continued breastfeeding without significant alternative feeding and with frequent suckling both day and night can contribute to much longer periods of lactational amenorrhea (33). A study in Indonesia directly addresses the cost savings in terms of the fertility impact of breastfeeding. This study found that approximately 4.5 million CYP resulted from lactational amenorrhea. At a cost per family planning-based CYP of about \$15 for the BKKBN family planning program, lactational amenorrhea was estimated to save over \$80 million in family planning resources (25). Since the cost of providing a family planning-based CYP in many programs varies from a few dollars to hundreds of dollars, it is easy to see that each additional month of lactational amenorrhea provided by breastfeeding can save enormous costs in family planning provision.

An evaluation of a project combining postpartum breastfeeding and family planning in Honduras found that even where family planning



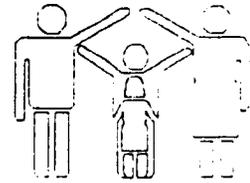
and breastfeeding are prevalent, a new intervention can have an impact. The intervention employed was designed to improve hospital practices and change postpartum services by retraining staff, providing postpartum education to mothers and partners, distributing barrier methods and pamphlets to couples, and sending couples for follow-up to a family planning clinic. After 4 months of the program, there was a higher proportion of women still breastfeeding at six months in the experimental group than in the controls, although supplementation was similar in the two groups. For every 1% increase in breastfeeding, the intervention cost \$600-\$700 and saved \$25,000 in formula costs (29).

Effectiveness

Most evaluations of breastfeeding support and promotion programs have focused on the period immediately postpartum. Few documented breastfeeding programs have concentrated on the subsequent postneonatal months of breastfeeding. The working group stressed that measures of the effect of breastfeeding efforts in the postneonatal period, and up to 24 months, is of primary concern to those interested in the child spacing effects of breastfeeding. Obvious output or effect measures that could be used for the postneonatal period include the number of mother/infant pairs reached by a program, the number of women who demonstrated behavioral change, the episodes of diarrhea prevented (3), and infant growth parameters.

The working group session on effectiveness continued with a discussion of appropriate or ideal breastfeeding behavior. It was agreed that an ideal breastfeeding program would:

1. Increase knowledge and awareness of the benefits of breastfeeding.
2. Increase the percentage of neonates breastfed.
3. Increase the duration of exclusive breastfeeding.



4. Increase the duration of partial breastfeeding.[‡]

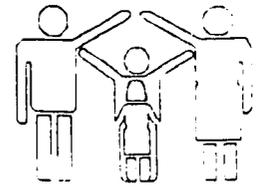
Each of these objectives is measurable and contributes to optimizing the effects of breastfeeding on health, nutrition and child spacing. Optimally, one would hope to achieve 100% knowledge and awareness, 100% initiation, exclusive breastfeeding up to 6 months, and substantial breastfeeding for up to two years.

A single indicator that could be used as a summary index of effectiveness of a breastfeeding program, similar to the role CYP plays as a summary index for family planning programs, was considered of great importance. The group agreed that this indicator needed to be related to the behaviors outlined above and take into account the multiple effects of breastfeeding. Four possible indicators became the focus of discussion: 1) return of menses, 2) growth rate of breastfed infants, 3) days of infant illness, and, 4) months exclusive breastfeeding.

The timing of return of menses has been shown to be related to the ideal behaviors outlined above through direct hormonal influences. Infant growth and infant illnesses are thought to be more strongly related to the secondary effects of breastfeeding (i.e. increased immunologic protection, proper nutrition, etc.) associated with these behaviors. Thus, return of menses may be a more proximate measure of the actual program goal of behavior change than infant growth or illness. Infant growth rate has also been shown to be associated with duration of lactation; however, its measurement is more costly and complex than that of return of menses. Because infant illness is greatly affected by seasonality, its use was considered problematic over time.

Change in the level of exclusive breastfeeding among mothers of infants 0-6 months old in a community at two points in time, or changes in the proportion ever-breastfeeding would also be useful for comparison. A "Months Exclusive Breastfeeding" (MEB) lifetable rate was also suggested as an indicator of effect of a promotional program. It

[‡] Refer to Appendix E for definitions of exclusive and partial breastfeeding.



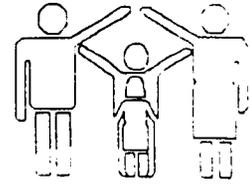
was noted that a Pearl index measure of effectiveness, although easy to calculate, would be inappropriate as an indicator of program effect. This is because the one way flow of infant feeding from breast to bottle might result in an overestimate of the effectiveness of breastfeeding, since the immediate postpartum months would tend to be the breastfeeding months. MEB, however, should not be used to measure program impact beyond 6 months postpartum, since exclusive breastfeeding is recommended through month 6 only.

After lengthy discussion, the group concluded that delay of return of menses was the best single indicator of program effectiveness of breastfeeding during the first 24 postpartum months. The group also recognized that this may pose several potential problems. A discussion ensued on the variation in menses return among normal breastfeeding women.[‡] The conclusion was that the expected variation would be random and thus was not of major concern when studying sufficiently large populations.

The definition of "return of menses" was discussed. The group concluded that any bleed, even one not associated with ovulation, indicates some type of hormonal change; hence, any bleed could be an important reflection of a disturbance in the optimal effects of breastfeeding. The working group agreed that the first bleed after 40 days postpartum was an appropriate proxy for return of menses. (Based on the conclusions of the 1988 Bellagio Consensus Meeting on Breastfeeding as a family planning method (33), the authors agree that 56 days postpartum is preferable to 40 days.)

Obviously, the selection of indicators of effectiveness should include those measures most closely related to program objectives. At the same

‡ The discussion included mention of G. Savirin's study under FHI auspices in the Philippines where no difference was seen in delay of menses return for women involved in a breastfeeding promotion program compared to controls. It was thought, however, that the reason for lack of observed difference was that optimal behavior was demonstrated in both control and experimental areas(14).



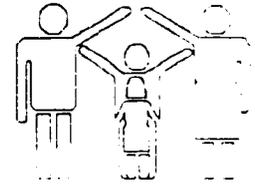
time, inclusion of at least one indicator that is easily measured, widely accepted, and widely applicable, such as return of menses, will facilitate comparison with other programs and projects.

Costs

The cost categories for breastfeeding support and promotion programs are similar to the cost categories for family planning or other programs. (See Table 1 on page 37). The costs associated with breastfeeding are the program costs and cost equivalent of volunteers' time, while the cost of additional foods the woman eats to produce breastmilk and the value of the time she spends breastfeeding may not be considered among program costs (3). The costs of bottle feeding include the costs of bottles, breastmilk substitutes, fuel, utensils to clean and sterilize the bottles, water for cleaning and preparation of breastmilk substitutes, cost of the time of the person who shops for breastmilk substitutes, prepares the bottles and feeds the infant as well as the time to learn the proper techniques of preparation and feeding, and the cost of increased morbidity and mortality from the feeding method (6). These are not generally considered program costs; however, all should be taken into account in non-program associated cost analyses and CBAs.

The group stressed that the opportunity costs may be particularly important for cost-benefit analyses of breastfeeding. The cost of the mother's time to breastfeed, including lost wages while time is taken from financially productive work, must be weighed against the financial value of the time of whoever substitute-feeds for the mother (30). Since the person who often takes over the feeding tasks from the mother is an older sibling of the infant, this apparent cost savings of bottle feeding may be particularly salient for poor women. It was stressed by the working group that there are time and financial savings to be realized from infants who are less sick because they are breastfed. To a poor mother in a developing country, however, there is likely to be a preference for current income rather than future savings.

A CEA of family planning program alternatives is generally based on comparing programmatic costs for the same unit of effectiveness; therefore, CEA of breastfeeding support and promotion programs would be costed out using the same strategies seen in Table 1 (page 37).



Recommendations For Institute Activities

The working group suggested that the Institute provide technical assistance to breastfeeding support and promotion programs that are interested in using CEA for management decisions.

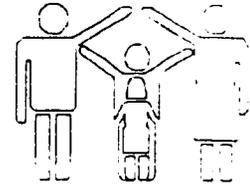
The workshop participants stressed that cost-benefit analysis of breastfeeding may have a more profound influence on high level policy makers in alerting them to the need to include breastfeeding programs in national health, nutrition, and family planning strategies. It was recommended that the Institute should support both CBA and CEA of breastfeeding and breastfeeding support and promotion programs.

It was also recommended that guidelines for the use of lactational amenorrhea as a proxy for fertility suppression should be developed and disseminated. Alternatively, the use of indicators of optimal infant feeding at different points in time postpartum (e.g., antenatal knowledge, infant growth rates, proportion initiating breastfeeding, MEB rates, proportion substantial breastfeeding after six months) should be explored.

Recommendations Regarding The Use Of CEA In Breastfeeding Programs

The following conclusions resulted from the discussion:

- Breastfeeding programs vary widely in their implementation and objectives depending on sectoral support and regional/cultural needs.
- The indicator of effectiveness chosen for evaluation purposes should be relevant to program objectives and should include measures of behavior or direct proxies for behaviors.
- "Return of menses" is recommended as a standard index of effect which can be included in CEA even when the fertility aspect of breastfeeding is not the major program objective.
- Measures of breastfeeding behaviors (i.e. percent initiating, infant growth rates, duration exclusive, longest interval between feeds, cumulative MEB rate) are also



recommended as indicators of program intermediate effects on a population.

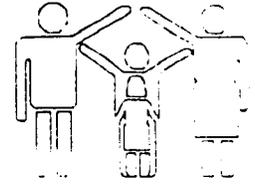
- Proportional achievement of optimal behaviors (100% knowledge and awareness of benefits, 100% initiating breastfeeding, exclusive breastfeeding to six months, and substantial breastfeeding for up to two years) is proposed as an alternative indicator of program effect.
- Some indicators may be more susceptible to confounding factors than other indicators. For example, infant weight at a certain time is not only a result of breastfeeding behaviors but is also a result of cumulative and current morbidities, other foods eaten, energy expenditure and genetic variability. These indicators should be avoided or, if utilized, the other possible contributing factors should be identified.
- Control groups or the use of multivariate techniques may be necessary in CEA of breastfeeding to reflect the dynamic nature of the behaviors and the number of possible external influences.
- Breastfeeding can be incorporated into national CYP calculations where breastfeeding support and promotion is part of the family planning effort. A conservative factor for B_n would be 1 year/12 months to yield $0.083B_n$, where B_n is the number of women 2-6 months postpartum experiencing lactational amenorrhea at monthly measurement. An efficacy factor for breastfeeding is not included since it approaches 100% for lactational amenorrhea in the first six months postpartum. Hence, the formula might read:

$$CCYP = 0.01 C_n E_c + 0.0769 O_n E_o + 7.5 (V_n + TL_n) + 2.5 I_n E_i + X_p P_n E_p + 0.083 B_n$$

where:

CCYP = calculated couple years of protection

C_n = condoms used



O_u = oral contraceptive cycles used

V_n = vasectomies performed

TL_n = tubal ligations performed

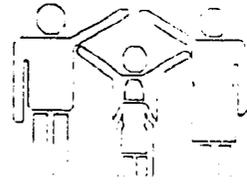
I_n = IUDs inserted

X_p = average number of years of use achieved by
average acceptor

P_n = periodic abstinence "graduates"

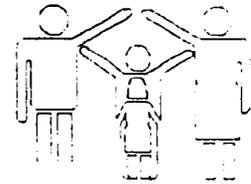
E = efficacy for each method

B_n = number of women 2-6 months postpartum in
full lactation and amenorrhea on a monthly assessment

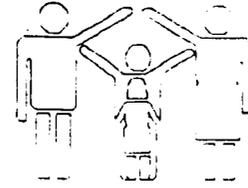


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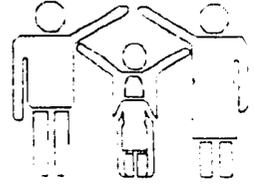
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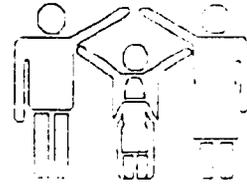
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Recurrent Costs ¹

1. Personnel Support:
 - Field Staff by category
 - Total Wages
 - Total hrs/days worked
2. Travel Costs + Per Diem of Staff
3. Supplies:
 - Number of units
 - Cost per unit
 - Total cost
 - Total revenue (sales)
4. Cost of IE&C: ⁴
 - Demand generation
 - Material
 - Media
 - Other
5. Cost of Administration
6. Cost of Analysis and Evaluation
7. Continuing Education of Field Staff:
 - Number of persons trained
 - Cost per person trained
 - Total cost of training

Capital Costs ²

1. Buildings and Fixed Equipment (by type)
2. All other Items Received Free:
 - Material
 - Equipment
 - Other
3. Cost of Research and Consultants ³
4. Initial Training of Staff
5. Vehicles and Related Equipment: ⁵
 - Number of units
 - Output units (all trips)
 - Cost per output unit
 - Total cost of unit by type
 - Replacement cost

Table 1*

Program Costs To Be Considered For Inclusion In Cost-Effectiveness Analysis

NOTES:

1/ Include the following on an annual basis at their current value. (See Appendix F.)

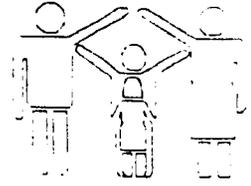
2/ All capital costs should be amortized over their useful life or the life of the project. The following items and their annualized costs should be included in cost calculations. (See Appendix F.)

3/ If one-time CEA related, may be excluded.

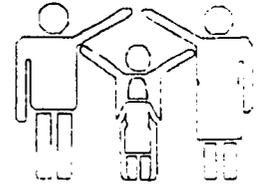
4/ Information, education, and communication.

5/ Units of equipment by type

*/ Adapted from Yinger, N. et al. 1983.

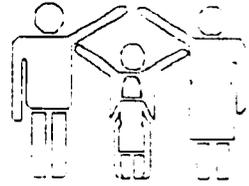


Appendix A



Workshop Participants

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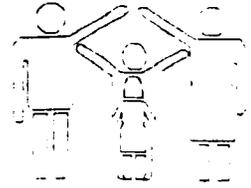


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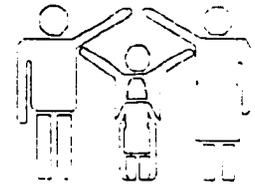
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Appendix B



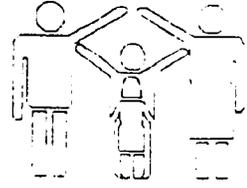
Meeting Agenda

Monday, April 11

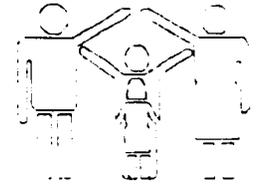
- 9:00-10:00 Arrival of participants, coffee, etc .
- 10:00-10:30 Opening remarks, goals and objectives of meetings, review and adjustment of the agenda. (Jaros, Labbok)
- 10:30-12:30 Review of Cost-Effectiveness Studies in NFP, and discussion:
1. Presentation by Bob Kambic and Rebeca Wong (Johns Hopkins University)
 2. Presentation by Darryl Pedersen, (Development Group)
 3. Presentation by Miriam Labbok (IISNFP)
 4. Presentation by Kenneth Jaros (IISNFP)
- 12:30-1:30 Lunch at William Pitt Union.
- 1:45-4:45 Discussion of Methodology:
1. Measures of Effectiveness in NFP Programs
 2. Measuring Costs in Programs
 3. Problems of Application
 4. Use of Results/Policy Issues

Tuesday, April 12

- 9:00-9:30 Goals and objectives vis-a-vis cost-effectiveness analysis related to breastfeeding promotion programs. (Labbok)
- 9:30-12:30 Discussion of CEA Methodologies (effectiveness measures, costs, application).
- 12:30-2:00 Lunch and continuing discussion.
- 2:00 Adjournment.

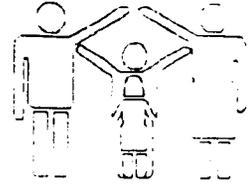


Appendix C

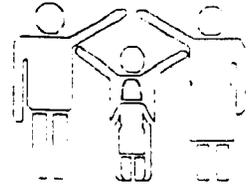


Background Materials For The Workshop

1. *A.I.D. Task Force on Standardization of Family Planning Program Performance Indicators: Summary of Task Force Discussions and Recommendations*. Draft Report, A.I.D. Washington, D.C. January, 1987.
2. *Couple Years of Protection: Report to the Senate Appropriations Committee*. March, 1988.
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Appendix D



A Simple Guide To CEA

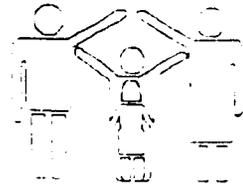
There are 6 steps to follow in a CEA (23):‡

1. Define program objectives, and, if appropriate, the service delivery problem.
2. Specify alternative solutions to meeting the objectives or solving the problem.
3. Identify and measure the costs of each alternative.
4. Identify and measure the effectiveness of each alternative.
5. Analyze and compare the costs per unit of effectiveness (cost-effectiveness) of each alternative.
6. Conduct a sensitivity analysis.

Each of these steps is described briefly below.

1. The definition of the service delivery problem and program objectives involves a determination of what the program is attempting to accomplish. This is best done by the service delivery personnel, usually the program manager. Objectives of the program must be stated in such a way that they include an indicator of effect. Indicators should be specific, measurable, appropriate, reasonable and targeted. Most CEAs in primary health care and family planning are concerned with immediate program outputs (i.e. education sessions held or individuals served) and effects (i.e. enrollees, family planning acceptors, CYP) rather than long term impacts (i.e. fertility and mortality rates). These

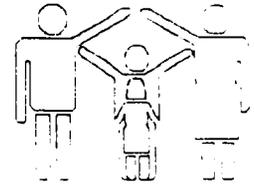
‡ See Table 1 and Appendix F for a more complete explanation of terms.



outputs or effects are then used as indicators of effectiveness and measured as part of step 4 above.

2. The next step is to identify more than one means of solving the problem so as to accomplish this objective. Determination of the cost-effectiveness of a single program at a single point in time has little meaning. The utility of CEA is in the comparison of alternative service delivery options.

3. Identification and measurement of costs involves a decision on the types of costs to consider as part of the calculations, defining the sources of data, measuring the costs, and adjustments to the cost figures. The decision of what types of costs to consider as part of the calculations depends on which costs are relevant in comparing the alternatives that are being evaluated with CEA. For example, if the two alternatives being compared have the same capital costs and differ only in recurrent costs, then it may make sense to consider only the recurrent costs for the calculations. Although the source of most of the costing data is the accountant (or equivalent) of the program, it is also necessary to have discussions with the manager of the program in order to understand the process through which services are delivered so that all the cost elements in the program can be identified. In the measurement of both recurrent and capital costs, it is important to consider not only those factors that are measured in monetary terms, but also to estimate the monetary value of factors which are contributions received in kind (e.g., supplies and equipment). It is particularly important in NFP and breastfeeding programs to include the value of the time donated by volunteer workers. The most common adjustments to cost figures are adjustments for inflation and the application of consistent definitions of costs through time. Both of these adjustments allow for comparability with other programs at different times. A further cost adjustment for NFP or breastfeeding programs may involve treating start-up costs as capital costs, i.e. spreading the starting costs of a particular program element



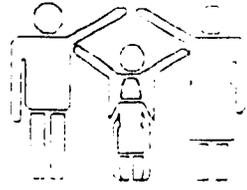
(e.g., special training) over several years. In this case, it also is necessary to analyze costs and interest over an appropriate period of time.

4. Where possible, choose one indicator as an index of effectiveness. For NFP or breastfeeding programs, it might be "CYP provided." Alternatively for NFP, a "chain of effects" approach might be used (see Figure 1). For breastfeeding programs, return of menses is an excellent proxy for optimal behaviors in the first year postpartum. Otherwise, months exclusive breastfeeding (MEB) rates, proportion of mothers exhibiting optimal behaviors (see section III. C.) in each month postpartum, infant growth rates or days free of illness might be used.

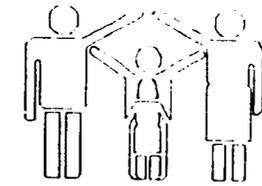
5. CEAs typically determine a cost (in monetary terms) per unit of output or effect (in non-monetary terms). In the family planning field these ratios could be cost per family planning acceptor, cost per CYP or cost per birth averted. In NFP, cost per CYP or cost (to that point in time) per landmark in the "chain of effects", and in breastfeeding, cost per month of menses delay are suggested. The cost effectiveness ratio of one service delivery option can then be compared to that of other service delivery options.

6. Finally, since the results of a CEA are dependent on the assumptions one uses to estimate costs and effectiveness, it is important to test whether varying the assumptions would give a different outcome. Sensitivity analysis is used to do this. In a sensitivity analysis, the analyst first identifies the assumptions used in the estimates of cost and effectiveness. These assumptions are then changed, and the costs, effectiveness and the cost-effectiveness ratios of each alternative are recalculated. In this manner, one can see if varying the assumptions leads to different conclusions about which alternative is the most cost-effective.

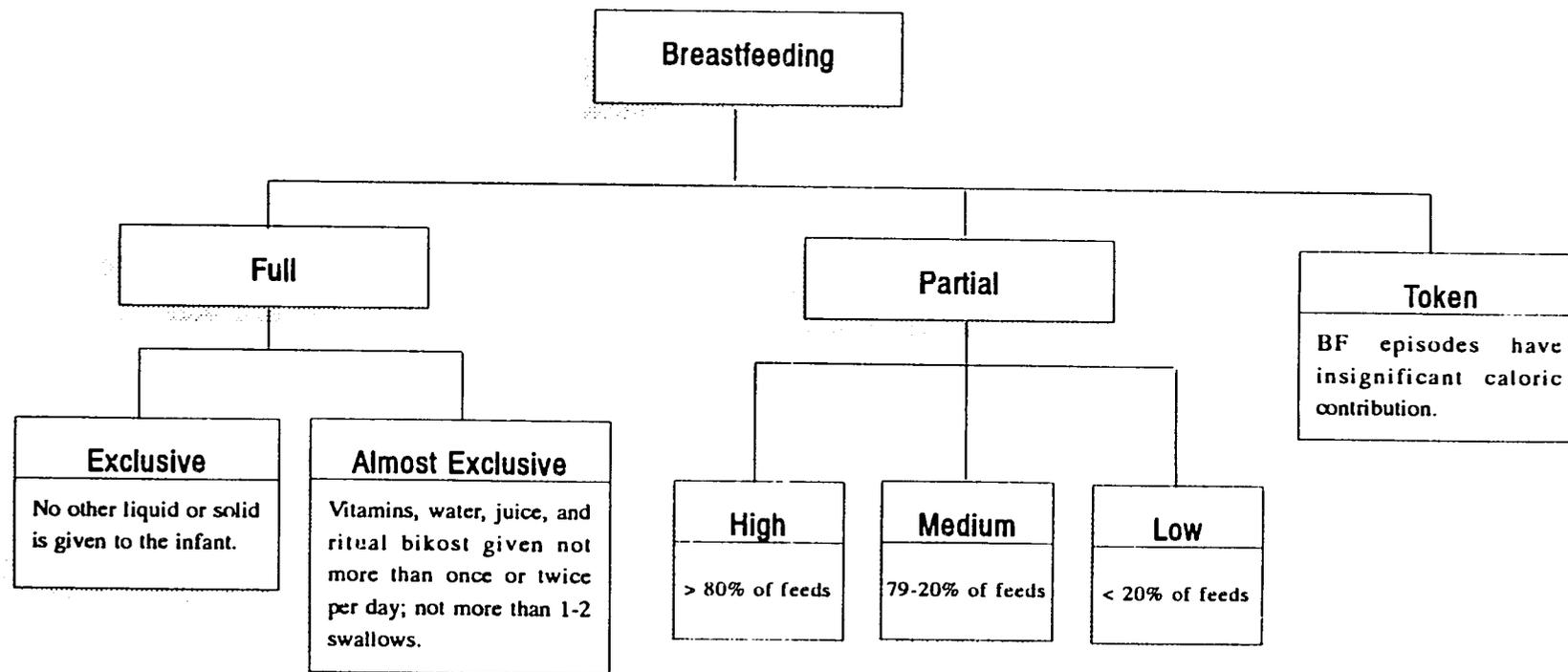
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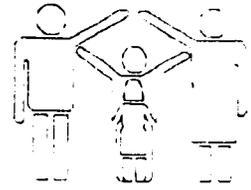
Appendix E



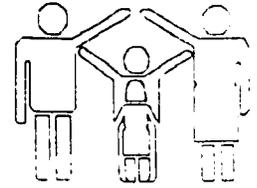
Breastfeeding Definitions*



*/ Schema developed at the Interagency Meeting on Definitions Related to Breastfeeding, April 28, 1988.



Appendix F



Glossary of Terms

Annualized Cost

The annualized cost of a capital item is determined by the formula:

$$a(r, n) = \frac{[r(1+r)^n]}{[(1+r)^n - 1]} \times CV$$

where:

a = annual cost

r = the rate of interest

n = the life expectancy of the item in years

CV = the current value of the capital item [23]

For example, the annual cost of a building with a current value of \$10,000 and a life expectancy of 10 more years, at a current rate of interest of 15%, is:

$$\begin{aligned} a(.15, 10) &= \frac{[.15(1.15)^{10}]}{[(1.15)^{10} - 1]} \times 10,000 \\ &= \$1,993 \end{aligned}$$

Therefore, \$1,993 is added to the capital costs every year for 10 years.

Capital Costs

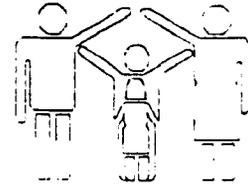
Costs of items, such as buildings, vehicles, equipment and land, that have a life expectancy of one year or more. [23]

Cost-Benefit Analysis (CBA)

A decision making process in which one examines alternative uses of resources to produce benefits. In CBA, both costs and benefits are given a monetary value, and a decision is made on the basis of calculated direct savings. [19, 28]

Cost-Effectiveness Analysis (CEA)

A Comparison between input measured in monetary terms and output measured in non-monetary terms, used



to compare alternative means of achieving a specified objective. The cost-effectiveness is usually expressed as a ratio of cost to a unit of output (or effect). [28]

Current Value

For a new item, the current value is its market price. For a used item, the current value is either the market price of comparable item or the replacement cost of the item. [23]

Natural Family Planning (NFP)

Defined by the World Health Organization as: "Methods for planning and preventing pregnancies by observation of the naturally occurring signs and symptoms of the fertile and infertile phases of the menstrual cycle, with the avoidance of intercourse during the fertile phase if pregnancy is to be avoided."

Periodic Abstinence (PA)

Abstinence timed to occur during the fertile days of the woman's menstrual cycle to avoid pregnancy. (Periodic Abstinence: How Well Do New Approaches Work?, *Population Reports*, Series 1, Number 3, September, 1981.)

Recurrent Costs

Costs of items, such as salaries, medicines and supplies, gasoline and utilities, that are purchased and used (or replaced) within a period of one year or less. [23]