

Monitoring and Evaluating Reproductive Health/Family Planning Programs

by

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Introduction

Over the past half century a number of shifts have occurred in global paradigms for organizing and justifying resource allocations to health-related interventions. These interventions have been aimed at improving the health of women, men and children in the developing world. From efforts aimed at the eradication of communicable and infectious diseases, to population growth stabilization, to food and malnutrition crises, to family planning, to child survival, and to toxic waste disposal, the international community has confronted and quickly responded to an expanding list of health needs that over time has led to remarkable reductions in worldwide levels of morbidity and mortality.

With the 1994 International Conference on Population and Development, occurring "at a defining moment in the history of international cooperation" (ICPD, 1994: Preamble), a new paradigm and challenge have been set before governments, nongovernmental organizations, and civic groups to address needs in reproductive health. The oft-quoted paragraph of the ICPD Programme of Action defines a new area for social investment:

"Reproductive health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity, in all matters relating to the reproductive system and to its functions and processes." (ICPD, 1994: Chapter 7)

The challenge to the international community lies less in the acceptance of the human rights philosophy embedded in this definition than in the operationalization of the reproductive health concept through existing and new health and social programs. For this conference, a primary existing health program upon which to build and incorporate reproductive health care is the family planning program.

Defining reproductive health. Many definitions of reproductive health have been proposed both prior to and following the ICPD; and while there is some convergence, there is no full consensus on what constitutes reproductive health. The ICPD definition itself is broad, encompassing physical, social and mental well-being. Other definitions stress the importance of health investments over the life cycle in order to enjoy reproductive well-being in adulthood (Tinker et al., 1993). Fathalla (1988) and Germain and Ordway (1989) adopt a micro-oriented definition of reproductive health,

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emphasizing an individual's, particularly a woman's, ability to remain free of unwanted pregnancy, coercive sexual activity, and sexually transmitted disease (STD). Still other definitions seek to disassociate reproductive health from a singular focus on reproduction and expand it to include the physical health of the reproductive system (Wasserheit and Holmes, 1992).

Consensus in defining reproductive health will evolve slowly across cultures, nation states, and communities (Lane, 1994; Garcia-Moreno and Tomris, 1995); but the public health imperative behind initiating appropriate interventions in key domains of reproductive health confronts most governments and communities now. Significant levels of unwanted or unintended pregnancies, substandard pregnancy and delivery care, and rising rates of STD and HIV infection, and reproductive cancers pose major risks to the health and welfare of individuals and families, particularly in developing countries [World Bank, 1993].

To the extent that key domains of reproductive health (see Table 1) include areas for which current interventions exist, such as family planning, pregnancy care, and STD control, many national health programs already offer reproductive health services. These may not be everywhere efficiently organized, client-oriented, or of uniformly good quality; however, it should be recognized that the mobilization of a reproductive health agenda, launched in Cairo, does not necessarily start from a zero base. Most health ministries of developing country governments offer maternal and child health services that include family planning and pregnancy care and delivery. Most also have infectious disease control programs that include STD/HIV prevention and treatment, where the latter are not under a separate AIDS program. Thus, the present rapid expansion of reproductive health programs globally may involve as much a re-organization, as supplementation, of existing programs and services (Cates and Stone, 1992).

The individual definition of reproductive health programs and their goals and objectives by health ministries, nongovernmental service organizations, and health providers remains a priority issue as these will determine the scope, scale and depth of evaluation efforts. As a rule, evaluations designed early around known program descriptions and plans are eminently more likely to produce the desired information than those developed on a post-hoc basis.

Emerging challenges for monitoring and evaluating reproductive health/FP programs.

The new attention and energy focused on reproductive health programs also carries significant resource implications. The integration, linkage and coordination of relevant health services will require additional resource investments in training and augmenting health manpower, procuring, upgrading and distributing clinical equipment and supplies, and health education, information and communication programs. The United Nations has estimated it will cost (in 1993 U.S. dollars) \$17 billion in 2000, increasing to \$21.7 billion by 2015, to implement the reproductive health agenda (Sadik 1994). The World Bank, which costed a minimum package of such interventions, has estimated a per capita cost of \$22 for a middle-income country but recognized that most low-income

countries can not afford to spend beyond the \$2 to \$4 per capita invested currently (World Bank, 1993).

Accountability for the use of scarce public health funds requires that strong evaluation practices be developed early for such a major global development initiative as reproductive health. The relative costs and cost effectiveness of various interventions included in the reproductive health paradigm, and knowledge of the conditions under which their effectiveness is secured, need to be determined. The assumption that changes in health status are the result of reproductive health program efforts requires the consideration of broader issues of program evaluation, both monitoring and impact assessment. A gap presently exists between the enthusiasm to initiate new reproductive health programs and the ability to evaluate their achievements, particularly in relation to knowing what the desired or targeted outcomes are and when results are real. There are significant evaluation challenges ahead for the international community to measure services and behaviors that must change perceptibly in intended directions and show causal impact to justify the investment of resources.

As international assistance organizations and spokespersons have played a significant role in the formation of the Cairo agenda on reproductive health, this same community should consider the adoption of standardized means for evaluating reproductive health programs and interventions as a whole. Considerable funding to developing country governments for reproductive health programs, using both new and rechannelled monies, is likely to flow through international donor agencies. Governments will also contribute a major share of the necessary financial, personnel, and material resources. Coordinated use of common measures of program achievements, along with concerted tracking of resource allocations and expenditures, can help monitor progress toward improving reproductive health outcomes. Furthermore, commitment to the application of strong evaluation methods and designs increases the likelihood that scarce funds will be used for the most appropriate, effective and efficient interventions. This is particularly important given the relatively high cost of some interventions, such as STD control and emergency obstetric services. Finally, validating the mobilization of global resources in pursuit of the Cairo agenda on reproductive health will require implementing strong evaluation systems. Predecessor movements of child survival, family planning, and primary health care programs have all undergone extensive scrutiny in terms of demonstrating their impacts. The Cairo agenda is seen by some (e.g., Finkle and McIntosh, 1995, Tsui, 1995) to be politically motivated. Without a scientific rationale, achieved through strong evaluation and research, it becomes vulnerable to later replacement by other more politically motivated causes.

Four specific challenges then confront the systematic evaluation of reproductive health interventions and programs in the developing world:

- (1) identifying the goals and objectives of the programs to establish the desired outcomes, a task that should be assisted by a conceptual framework,

- (2) constructing and measuring appropriate indicators for monitoring program performance and achievements,
- (3) establishing the data systems to measure reproductive health outcomes and services regularly, and
- (4) implementing evaluation designs that enable causal attribution of reproductive health improvements to the programs or interventions.

Each of these is discussed below.

Methods and approaches

The role of conceptual frameworks for specifying goals and outcomes. A conceptual framework can be thought of as a "theoretical" map that assists a user to find his or her way from one point in the geography of influences to another. Just as a map lays out roadways between cities and towns and guides the traveler to his or her destination, a conceptual framework links causal paths between key components and helps the user explain the occurrence of an outcome of interest. Perspectives will vary on which aspects of reproductive health and its milieu of influences to emphasize (e.g., Pauchari, 1995; Maine and McCarthy, 1993; Fortney, 1995). Often these perspectives are informed by the philosophy, professional training, and international experiences of the framework's developer(s). Also the eventual purpose of the framework--whether for strategic planning, monitoring, or analysis--will draw different components into focus. While the dynamics of reproductive health behaviors and the multiplicity of relevant interventions make it difficult to capture all the influential components in one framework, it is for this reason that such a mapping is indispensable.

An important objective of a conceptual framework for program evaluation is to depict clearly the desired program and population outcomes targeted by interventions and the main paths of influence that connect the pertinent actions of donors, programs, clients and populations to the achievement of those outcomes. A conceptual framework for reproductive health is therefore a necessary aid to those involved in program design, management, implementation and evaluation. It aids understanding how their package of interventions can reduce targeted outcomes, e.g., the incidence of sexually transmitted diseases (STDs), unwanted pregnancy, unsafe abortion, pregnancy-related nutritional deficiencies, gynecologic and obstetric morbidities, and maternal and perinatal mortality. Confusion regarding what constitutes reproductive health will confound the definition of a program's objectives and goals and the evaluation of its effectiveness and impact. Situations to avoid are programmatic goals that address ambiguous outcomes (such as "improved reproductive health") and overly ambitious objectives relative to the intervention inputs (such as a health education program on pregnancy risks that aims to cut the maternal mortality ratio in half in two years).

Although conceptual frameworks can be very elaborate and dense with hypothesized components, they can also be very simple, tying together only the broadest of concepts.

Figure 1 offers a "supply-demand" perspective, where the supply of health services and the demand for health care are seen to affect the use of those services jointly and subsequently produce the desired improvements in health status. A conceptual framework that captures the causal process properly will link the influences of **supply of reproductive health services, demand for reproductive health care, and service utilization** on changes in morbidity and mortality **outcomes**. These linkages are the basis for hypothesizing that increasing the availability, quality and acceptability of reproductive health services, in a context of political support and individual demand for them, will lead to improvements in reproductive health status.

The actual service ingredients of reproductive health/family planning programs will vary depending on how each sponsoring organization defines them. Generally a range of diverse and multiple health interventions, either clinical or non-clinical in nature, will be "packaged" or "bundled" as a comprehensive reproductive health program. The WHO "Mother-Baby" Package is one example of a bundled set of interventions to address needs in the RH sub-area of safe motherhood (WHO, 1992).

Figure 2² elaborates the **supply-side** of program effort by identifying the various stages of program implementation. It has been developed with a nationally-scaled program in mind and can be applied at a lower, sub-program or project, scale. Some programs are scaled to serve the entire country, some framed for the community level, and others defined for subpopulations at risk (e.g., pregnant women and adolescents). It is important to be clear in identifying the geographic scale and target population(s) when defining the outcomes to be influenced by the reproductive health program or intervention.³

Conceptual frameworks are then useful organizing paradigms when (1) their ultimate purpose is known and clear; (2) they identify the levels of influences (program, population or both) consistent with the framework's purpose and underlying causal dynamics; (3) they identify components that can be operationally defined and measured through indicators; and (4) they represent a shared perspective among stakeholders. "Any good system of indicators rests on some understanding of underlying dynamics. The better this understanding, the more focused and economical the indicator set can be, and the easier it is to interpret the indicators" (Bulatao, 1995). Appendix A contains

²Not shown in Figure 2 is the significant role played by contextual factors of a biological, social, cultural, or political nature. Because these are not directly or usually manipulable by health programs, they have not been explicitly included in this evaluation framework.

³Also in Figure 2 there are no "feedback loops" shown as the model depicts the causal process in a "freeze frame," that is, at one point in time. Because social engineering is by definition a dynamic strategy and health is an evolving and changing state for individuals and societies, there is every expectation that certain intermediate-outcome indicators, such as "contraceptive use" or "immunization rates," will influence subsequent program planning and resource allocations.

conceptual frameworks adopted by USAID, the World Bank, and the WHO for their reproductive health agenda.

Indicators. A vast literature exists on the utility of social, health and economic indicators and their validity and reliability over time, across space, and among different units, e.g., the Human Development Index (U.N., 1995), child health status (UNICEF, 1995), and leading economic indicators (ref). Indicators are operational measures of the components in a conceptual framework. For example, in Figure 2, the service utilization component for safe pregnancy may be monitored by an indicator such as "average annual caseload for emergency obstetric patients in facility type A". Once a baseline value has been fixed for the indicator, it can be tracked over time to see how well program services are being supplied and used. WHO (1994) has identified desirable features of a good indicator; specifically it should (1) actually measure the phenomenon it is intended to measure (validity); (2) produce the same results when used more than once to measure precisely the same phenomenon (reliability); (3) measure only the phenomenon it is intended to measure (specificity); (4) reflect changes in the state of the phenomenon under study (sensitivity); and (5) be measurable or quantifiable with developed and tested definitions and reference standards (operational).

These criteria should be kept in mind when constructing or selecting indicators for different aspects of reproductive health services or outcomes to avoid selecting inappropriate ones. Also indicators should be readily available from existing data sources or obtained on a regular basis at low cost. Indicators become problematic when they are difficult to measure, unmanageable, irrelevant to the main health issues at hand, or measured too infrequently to be helpful.

Figure 2 has diagrammed a path of causal influences. The stream of action is traced out among components related to "inputs", "process", "outputs" and "outcomes". These four types of indicators are based on a generic evaluation terminology that classifies types of indicators (see Bertrand et al., 1994; Veney and Gorbach, 1992; Reynolds, 1990). They are defined below:

- (1) **Input** refers to the resources invested in a program and include financial, technological, and human manpower.
- (2) **Process** refers to activities carried out to achieve the program's objectives; they show what is done and how well it is done.
- (3) **Output** refers to the results achieved at the program level. There are three types of outputs:

Functional outputs which measure the number of activities conducted in each functional area, such as training or information-education-communication;

Service outputs which measure the adequacy of the service delivery system in terms of access, quality of care, and program image; and

Service utilization which measures the extent to which the services are used.

- (4) **Outcome** refers to changes observed at the **population level** among members of the target population as a result of a given program or intervention. There are two types of outcomes:

Effects or changes in the short- to medium-range (e.g., 2-5 years) in a behavior promoted by the program (e.g., use of condoms, birth delivery in a supervised setting).

Impacts or changes that occur over the long-term in fertility, morbidity, or mortality rates (e.g., age-specific fertility rates for young adults, prevalence of STDs, maternal mortality rate).

Table 2 provides a set of example input, output, and outcome indicators for the reproductive health domains. These indicators are extracted from a "short list" prepared through The EVALUATION Project's Reproductive Health Indicators Working Group (see Bertrand and Tsui, 1995) for the areas of safe pregnancy (including safe abortion), STD/HIV, women's nutrition, breastfeeding, and adolescents.

At a minimum, programs electing to monitor their performance with the use of indicators that measure program inputs and outputs, individual behavioral change, and/or aggregate morbidity or mortality levels, not only must identify these indicators in measurable terms but must also plan to establish data collection systems to evaluate them at regular intervals. Moreover, reproductive health programs, inclusive of their family planning components, should be planning on obtaining a reliable and valid baseline on the levels and patterns of sexual and reproductive morbidities to be addressed by their interventions. Repeated use of well-designed instruments and assessment tools is key to tracking accurately the desired improvements in health services and behaviors. It is also desirable to include in a baseline service assessment the level of access, quality, and expenditure by the public sector, by the private organized health sector, and by private individuals.

Expanding research experience on reproductive health issues is a further necessity. In particular, qualitative studies of individual perceptions of STD symptoms, pregnancy risks, or obstacles to adequate health care are needed to assess current and likely levels of demand. Also necessary are studies testing the sensitivity and specificity of symptom algorithms or diagnostic question sets for certain reproductive health problems that have been traditionally measured clinically will illuminate how well surveys involving inter-personal interviews measure reproductive health needs. Because reproductive health is programmatically a new concept, many indicators for monitoring the performance of

relevant programs have not been tested in the sense that their measurement reliability and validity are well established.

Data systems. Reproductive health indicators will require data from a wide variety of sources. Because several types of data sources are likely to be involved in any set of indicators chosen to monitor and evaluate program progress, their compilation and linkages early in a project evaluation design should be considered. Two contexts are relevant to measurement and evaluation of reproductive health interventions: (1) the service or program environments that provide the interventions and (2) the prevalence of the reproductive health conditions in the population. For each of these, many information gathering procedures can be used, each with its own advantages and disadvantages. At least six main types of data should be considered. Examples are given below to illustrate the utility of each type.

1) *Assessing the service and program environment.*

Health programs serving the population provide a critical source of information about what is available to prevent or control disease. Any baseline measurement of reproductive health status used to evaluate targeted programs should also include a parallel assessment of those programs' services. The provision of reproductive health services can be assessed through periodic facility surveys or health information systems collecting the needed data. Programs must demonstrate that their interventions are implemented as planned, that the quality of services is improving, that targeted populations are being reached, and that the program is cost effective. If there is no evidence that the service environment has improved with the added interventions, then it is unlikely that any observed change in reproductive health outcomes can be attributed to the new care systems.

Probability surveys of facilities. These are surveys of health facilities using probability sampling procedures. Facilities are usually visited to assess the actual provision of different health services, staffing, and the on-site availability of necessary drugs, medical equipment, supplies and the like. Many reproductive health indicators use data about service delivery points (SDPs)', such as percent of health facilities providing essential obstetric care, percent of SDPs stocked with condoms and educational materials, percent that offer post-abortion care, or percent with adequate supplies of iron supplements. To ensure the reproductive health indicators have real values and that services are improving, facility-level sample surveys should be conducted regularly where reproductive health programs are being implemented.

"Throughout the paper, the term "service delivery point" (SDP) is used to refer to any location where program services are provided. The type of locations will differ by type of reproductive health service but may include clinics, health posts, community centers, kiosks, community-based distribution points, youth clubs, and home-visiting service providers. SDPs are not limited to clinical settings.

Established and wellknown, multiple-country facility survey programs are the Service Availability Module (SAM) of the Demographic and Health Surveys (DHS) (Wilkinson et al. 1993) and the Situation Analysis of the Population Council (Fisher et al, 1992; Sloan et al, 1995). The SAM provides data on access to and the infrastructure of health services. An audit can be taken of reproductive health services in facilities sampled through the SAM or SA to measure SDP-level indicators. For program quality assessment, some SAs collect information on interactions between clients and providers with regard to reproductive health counseling; this component requires on-site observation and assessment.

Clinic records and service statistics. Client records and clinic reports are generally initiated at the field-level SDPs and sometimes maintained by a central-level statistical unit. They can be examined on a full or sample basis, such as using delivery room records, operating theatre records or hospital maternity registers to calculate indicators based on caseload statistics. General counts of services provided are often obtained from these records. However, because such records exist primarily for clinical purposes, their accuracy can vary substantially, limiting their utility for program evaluations. Records of services are sometimes kept on cards held by clients (e.g., antenatal cards or child immunization cards) and can be examined during a household survey interview or when clients return for services during a specified period of time.

The benefits of a clinic-based assessment can not be overlooked, though. The collection of prevalence data on reproductive health problems is possible if disease surveillance information systems based on a broad sample of health facilities can be established or upgraded. This approach has been used to monitor the epidemiology of STD infection and maternal morbidity in developing countries and is more cost effective than population surveys.

Laboratory data. The tools for assessing reproductive health status through self-reporting of symptoms in an interview are not sufficiently refined to exclude the need for clinical data. For most of the reproductive health conditions, obtaining accurate clinical data requires both a physical examination and laboratory tests. The collection of clinical data poses a range of complex measurement issues. The first challenge is obtaining currently acceptable validated measurements on a large scale, without resorting to small community studies or selective clinic patient samples. A second challenge is to ensure quality control in lab-testing to avoid measurement error (e.g., false positives or negatives). Deciding what lab test to use is dependent on the specificity and sensitivity rates of the different available tests for sexually transmitted diseases (STDs) and other infections or conditions. A related issue is where to conduct the tests (in-country, which often requires upgrading indigenous lab facilities, or transporting them to a lab in another/developed country, for example). A third issue is cost; at present some STD tests cost in excess of \$15 per sample. A fourth issue is subject compliance to avoid measurement bias. To confirm STDs or obstetrically related impairments, it can be logistically difficult but necessary to have vaginal examinations to collect specimens and to record the presence of genital lesions, vaginal discharge, or ulcers. An important question is whether the reproductive health agenda should impose such a burden on

women (and men), expecting millions of them to contribute one to two hours of their time as well as tolerate the discomfort of being physically examined. In some cultures, the question is moot, because women are unwilling to submit to such examinations.

Administrative records. This source of data can be of a financial, material or human (personnel) resource nature and is usually maintained manually or electronically in a management information system (MIS). Financial data, when comprehensive and well maintained, are invaluable for tracking RH/FP costs and expenditures to monitor cost-efficiency and cost-effectiveness. Data from commodity inventories and logistics are often helpful for indicators relating to supply availability at SDPs. Personnel data can provide information for indicators relating to staff training and deployment.

2) *Assessing the reproductive health status of individuals and their use of services.*

Collecting information from individuals or households about their health status and their knowledge and use of reproductive health services is a necessary part of a comprehensive evaluation system to assess the impact of reproductive health interventions. If data are not forthcoming on whether programs are reaching the targeted clients, then any change in their health status cannot be attributed to the intervention and may well be due to other factors.

Client and staff surveys. Program beneficiaries (clients) can be interviewed in follow-up surveys to obtain information on indicators related to service utilization and quality of care, such as client satisfaction, outreaching and counseling experiences. Surveys of clinic clients are less expensive than a population-based survey. However, clients tend to be a self-selected group of individuals who have sought services, may be less healthy, may be more engaged in the health care system, have better access to services, or are better able to afford services. As a result, clients are not representative of the general population. The primary benefit of follow-up surveys of clients is understanding the dynamics of service delivery from the client perspective,

Staff providers and managers are another program subpopulation that can be surveyed periodically to monitor the delivery of services and performance of staff tasks and functions. Their responses can reveal how standards for service quality, e.g., national service protocols, are practiced at the SDP level. Similarly this subpopulation can be assessed for its technical competencies with various key reproductive health technologies, e.g., contraceptive side effects, knowledge of RTI symptoms and treatment, or emergency obstetric conditions.

Population-based surveys, censuses and vital registration systems.

Population surveys generally use a probability sample of households wherein individuals meeting certain eligibility criteria are selected for interviews, as in the DHS program. Decennial censuses and vital registration systems can provide values for most demographic rates (e.g., fertility, mortality and migration). However, census data are infrequently collected and limited in their health service relevance; and vital registration

systems in developing countries tend to suffer from high levels of incomplete coverage and inaccuracy⁵.

As the integration of family planning, STD, and pregnancy services increases, the measurement of the latter two RH domains are likely to be drawn into the operative data collection system for the population/family planning community, i.e., the household survey. This increases the probability that evaluation efforts in these areas will primarily involve population-, as opposed to clinic-, based assessment. While clinic-based client studies offer many advantages for case-control designs and multi-center intervention trials, population-based surveys may help expand reproductive health issues beyond the medical arena by introducing factors from the social context of health care-seeking behaviors.

Measurement issues. Measuring progress in reproductive health constitutes a major challenge, not just because the area broadly encompasses so many health needs and behaviors but also because it requires significant clinical resources and technical skills to obtain accurate values for indicators that are biomarkers. Multidisciplinary expertise from the fields of medicine, epidemiology, social and behavioral sciences, statistics and ethics ought to be recruited to assist in developing evaluation indicators and designs for reproductive health interventions. Systematic use of rigorous evaluation design and methods, institutionalization of data collection systems, and appropriately measured indicators will strengthen the information base upon which program design and resource allocation decisions are made.

Among the many measurement challenges set forth by the reproductive health agenda, two issues predominate for the immediate term. The first relates to sample size requirements implied for population-based surveys, if the latter become the "workhorse" for assessing reproductive health behaviors. The second issue pertains to measuring the prevalence of reproductive morbidities through self-reports compared to clinical assessments. A third issue, not discussed or belabored here, is the obvious need for longitudinal or panel measures in order to document changes in the same units over time. The traditional reliance on cross-sectional data in family planning evaluation has limited the acceptance and credibility of the findings. Surveillance of facility or client samples contribute results with a statistical power not enjoyed by one-time measurement of units.

The assessment of reproductive health status according to indicators identified by some donor and national strategies will require large survey samples. For example, because maternal mortality is a relatively rare event, the maternal mortality ratio (MMR) is difficult to measure reliably through a population-based survey unless the sample size is sufficiently large and/or indirect estimation techniques, such as the sisterhood method for MMRs are considered for use (see Graham and Filippi, 1994). National governments

⁵In some countries, sample registration systems have been used to overcome some of the coverage problems.

(and donors) need to think carefully about the requirements for reporting MMRs or similar data because of the onerous demands on measurement resources and current problems in precise identification of maternal deaths. The constant number of births used for MMRs (100,000) compared to the constant for fertility rates (1,000) illustrates the differential probability for a maternal death versus a birth. Therefore, a large number of births (or pregnancies) over a recent period will have to be included to obtain reliable estimates of many low-incidence reproductive health risks. Relying on maternal experience with recent pregnancies does not seem advisable for at least two reasons: (1) there will be insufficient pregnancies among which to observe risky events, and (2) recent pregnancies occur to fecund women, thereby by-passing the measurement of unique reproductive health needs of older women. Recall bias is also present in respondent perceptions of experiences related to earlier pregnancies occurring over a longer (five-year) than shorter (three-year) time period.

Other indicators, such as for specific STDs, have prevalence levels of 0.01 percent to 50 percent, with median prevalence in the 6 percent (gonorrhea) to 12 percent (trichomoniasis) for low-risk populations (Wasserheit and Holmes 1992). Estimated prevalences of these infections require sufficiently large samples to have acceptable confidence intervals. With these prevalences, for a population-based sample of 500,000 people, it would take from 500 to over 9000 subjects to determine the true prevalence of the infection, assuming a 95 percent confidence interval. For evaluation purposes, if programs are monitoring their performance in terms of such indicators and the confidence intervals are large, then changes over time are less clearly discernible. This is especially true if indicators must be categorized by subgroups.

For some reproductive health behaviors, it is unlikely that reproductive health content can be easily and adequately incorporated into a standard demographic and health survey. A consequence of requiring female respondents to review their obstetric experiences with each pregnancy, not just live births, in the recent past is the risk of significantly increasing interview times. Their review of dates and conditions associated with antenatal, natal, and postnatal care of each pregnancy can involve a substantial number of questions. Thus, reproductive health surveys of individuals may need to be carried out as special purpose or follow-on surveys (Turner, 1995). This would mean identifying eligible women or men from the main household survey for follow-up interviews in a reproductive health one.

Additional issues of measurement further compound collecting these data within surveys. While the fieldwork logistics for various physical measurements for women and children (e.g., height, weight, head and arm circumference) have been gradually integrated into national population-based surveys, it is not yet clear how easily STD diagnostic tests or physical examinations can be. Inter-physician variance in detecting and diagnosing STDs or obstetric morbidities can be considerable. Some training effort to standardize physician diagnosis will be necessary to assure measurement accuracy. The state of the art in clinical testing is continually changing and improving. Laboratory advances in the use of specimens that require less or non-invasive collection procedures are being developed and promoted, such as urine assays that have sufficient sensitivity

and specificity to detect some STDs (Nowak 1995). This would allow one to avoid vaginal exams, enhancing the use of such tests in population surveys. If these tests prove reliable and affordable, their use in establishing baseline and subsequent measurements will occur. Being able to evaluate and compare newly developed lab technologies adds to the overall challenges for the reproductive health program evaluator.

The second issue raises the question of whether self reports of perceived morbidities are acceptable measures of true morbidity without clinical validation. That is, can symptoms of STD or obstetric complications reported in a survey serve as the sole source for measuring the actual prevalence of these problems? There appear to be a number of reasons suggesting they cannot. While ideally one would like to avoid clinical exams, many obstetric problems can only be detected via vaginal examinations. STD symptoms, e.g., vaginal discharge or lower abdominal pain, are often not recognized as being unusual by women in some developing country contexts. Women may report different symptoms because of the cultural settings, diets, personal hygiene, work exposures, vectors, and epidemiological conditions that may alter the presentation of infections. Multiple infections can produce similar symptoms that may confound the identification of specific agents by a woman and her clinician. Furthermore, many infected persons, particularly males, are asymptomatic or no longer symptomatic. Similarly, persons reporting symptoms may not be infected but may reflect a compliance bias and deference to the interviewer, especially if the interviewer is a clinician. Whether symptoms are under-reported or over-reported may be specific to different contexts.

It can be argued that perceptions of health problems are adequate and can motivate necessary health care-seeking behavior. A systematic effort should be undertaken to conduct a series of large-scale studies wherein perceived morbidities elicited through symptom algorithms in surveys are simultaneously validated with clinical data. Present laboratory tests may limit these assessments to small community settings because of the protocols required to ensure protection of human subjects, especially where women must consent to vaginal examinations. Furthermore, follow-up medical treatment must be provided when infections are detected. While much can be learned about factors involved in differential perceptions of health problems, clinical validation appears to be essential at some level to establish or confirm actual prevalence and incidence levels and ensure that reproductive health interventions are effectively addressing them.

Without clinically valid measures for outcome indicators, it is questionable how well the achievement of reproductive health improvements can be known. For example, with respect to the prevalence of severe obstetric complications among recent births, it is very possible that individual recognition and reporting of symptoms of obstetric complications will rise with women's increasing awareness of their risks. This rise can be the result of broad-scaled, mass media educational programs on the symptoms of unsafe pregnancy. If reported symptoms are the exclusive basis for measurement, an apparent "increase" in obstetric morbidity may be observed although actual rates may not be rising. Such a situation is common to family planning, where the measured contraceptive prevalence

level artificially increases with growing popular recognition of traditional practices, such as withdrawal, rhythm and abstinence, as legitimate birth control behaviors.

Evaluation design. This section raises three points regarding the importance of and needs for strong evaluation design for reproductive health programs: first, that reproductive health programs stand to benefit from the lessons learned from evaluation of other health programs, in particular family planning; second, that strong evaluation requires the early design of evaluation strategies and data collection, at the project development stage; and third, that a distinction is to be made between monitoring programs and evaluating their impact. The section concludes with a prescription of the elements of a good evaluation strategy.

As discussed at the beginning of this paper, the international and national sponsors of reproductive health policies and programs have a responsibility to demonstrate value-for-money with rechanneling and expansion of resource investments toward reproductive health services. In some quarters, the reproductive health service package will build upon the present family planning service infrastructure; in other cases, a recombination of pertinent services will be bundled into a reproductive health program. One persisting issue will be what one, two or three principal outcomes will be targeted and which indicators will be adopted to judge program progress? How will the social and health benefits of reproductive health programs be quantified so as to be relatable to their costs for subsequent determination of cost-effectiveness levels? Family planning programs have, in the past, sought justification for their existence in effects on contraceptive prevalence and fertility levels. The average annual cost per contraceptive user in developing countries averages between U.S. \$10-15. What will be the desired equivalent to this measure and what will be the value for a reproductive health client?

Family planning program evaluation has a long history, as do the evaluations of child survival and primary health care programs. Attention during the past decade on interventions to reduce HIV/AIDS infection and increase cancer screening and diagnosis also reveal much about both the various methods and design approaches used and the effects of the interventions themselves. These lessons are all relevant to reproductive health programming and the types of services likely to be involved. At a minimum, the extensive knowledge base on health program evaluation should be exploited for the reproductive health agenda. It would be a near tragedy to find the RH agenda in ten or twenty years unable to respond definitively to basic questions about its impact and costs. Developing strong evaluation capacity within countries and across donor agencies, particularly for those most energetically advocating the change, is an essential measure of insurance.

Evaluation systems should be developed at the beginning of program design. This allows for evaluation efforts to serve most successfully their fundamental purposes of information and feedback by identifying the necessary approaches, establishing data systems, and defining performance indicators. However, evaluation efforts ought to be closely partnered as well with strategic planning and management efforts during program implementation. Often, and inevitably, program design shifts over time. As a

result, goals may be redefined or new objectives added. Monitoring the progress of programs with changing conditions, components and emphases and evaluating their impact at the end of a cycle is difficult where evaluation is not integrated with program management, as well as where data information systems are not flexible enough to adapt to changing circumstances.

Impact evaluations are generally scheduled at the end of a cycle of program implementation when there has been sufficient lag time for program interventions to show effects. (Impact evaluations will also occur when they are politically necessary.) For reproductive health, such evaluations address the key question of "Did the reproductive health outcome change in the intended direction, given the presence of the program?" Answering this question is different from the one posed by monitoring efforts, "Is the program progressing in its intended direction?"

Monitoring indicator values over time does not provide full proof that the service interventions have been responsible for any observed improvements in reproductive health. Trend data on indicator values will only show whether or not program effort and population-level outcomes are moving together in the expected directions. To establish the independent impact of reproductive health programs requires either the application of a randomized controlled experiments or statistical modelling using multivariate analysis techniques with longitudinal data.

The operating precepts to establish program impact are basic and fundamental. Answering this question requires collection of data over time on **both** the status of reproductive health services and the reproductive health of populations exposed and unexposed to the services. With the measurements taken over time, we can be more confident in attributing observed change to the implemented service interventions. For example, a broad-based community-level effort to assure safe pregnancies for women can have a demonstrable impact if the maternal morbidity levels among women exposed to the community programs differ from those not exposed.

With surveys currently being the dominant modality for demographic and health measurement--although qualitative assessments should not be discounted--strategies can be developed to exploit their information potential for reproductive health program evaluation. The two measurement contexts noted earlier, those for service environment and potential client population, offer an opportunity to design sampling strategies that measure change in both. This would involve integrating data collection procedures for the health facility as well as for individuals. The result would be a linked sample design simultaneously surveying individuals and the services and facilities surrounding them (see Singh et al., 1996; Said et al., 1996).

This linked design can generate an independent sample of facilities and service providers, much as the Situation Analyses do, and an independent sample of individuals in selected households. Geographically linking an SDP-level assessment of reproductive health services to a population-based survey enables the evaluator to attribute future

improvements in reproductive health status to strengthened programmatic inputs by repeating the linked survey design over time in the same sample clusters.

In sum, our prescription for a strong evaluation system to serve reproductive health programs (including those built on family planning service infrastructures) includes the following components:

- (1) Clearly defined goals and objectives such that the desired changes in services and health outcomes translate into measurable indicators for monitoring;
- (2) An evaluation plan or strategy designed at the start, not end, of the program that includes both monitoring and impact assessment
- (3) Available data systems to measure the indicators regularly and accurately
- (4) Adequate programmatic commitment, resources and authority to implement the evaluation strategy
- (5) A well-functioning system for reporting results quickly to program and financial managers

As some new ideas and methods are being raised here, it may be helpful to illustrate them with relevant findings from two recent evaluation efforts of The EVALUATION Project. These are presented next.

Illustrative case studies

Material from two case studies⁶ will be presented briefly, to illustrate how indicators measured from different data sources and impact evaluations can be strengthened by a stronger base of evaluation data.

Tanzania 1991-1994. The Tanzania Family Planning Services Support (FPSS) Project is a seven-year (1990-1997), \$20 million project with a goal of "improving the health and wellbeing of women and children by enhancing the opportunity to choose freely the number and spacing of children." The project's purpose is to increase contraceptive prevalence and use by investing in the following main areas: training health providers in family planning; providing logistical support for the provision of supplies; and developing an IEC program that would promote family planning. To monitor and evaluate the project, the Tanzania Demographic and Health Survey was carried out in 1991/92 which covered 357 sample clusters, of which 327 clusters were on the Tanzania mainland. For a mid-term evaluation in 1994, a "mini-DHS" (TKAP94) was conducted in 203 of the 1991 mainland clusters. Both the TDHS91 and TKAP94 interviewed a

⁶These case studies are drawn from work carried out by The EVALUATION Project, a USAID-funded contract on "Evaluating Family Planning Program Impact on Fertility".

nationally representative sample of women 15 to 49 years of age at the time of the survey. The Tanzania Service Availability Module (TSAM91) was also carried out with the TDHS91 in the 357 clusters and repeated in 1994 in all 327 of the 1991 mainland clusters. The SAMs collected information on family planning services available in hospitals, health centers, dispensaries and pharmacies in these clusters. (More detail is available in the survey reports and in Aboud et al. 1996.) Figure 3 shows that contraceptive prevalence indeed increased in the three years from 9.5 to 17.7 percent of eligible women for any method and from 5.9 to 11.3 for modern methods of contraception.

The importance of panel measures on facilities can be seen in the following figures. First, of 81 hospitals, 89 health centers and 218 dispensaries successfully interviewed in 1991, 80, 85 and 201 respectively were followed up in 1994. The FPSS project monitored its progress in terms of the number and percent of facilities offering family planning services, which in Table 3 shows a steady expansion of contraceptive service availability in the government sector. Of the 80 hospitals revisited in 1994, 5 more--all government ones--offered family planning than 3 years earlier (69 to 74). The number of health centers able to offer family planning also increased from 74 to 108, or proportionately from 84 to 92 percent. Similarly dispensaries providing contraception increased from 131 to 184. The growth in the availability of contraceptive methods is seen in Figure 4 for dispensaries, where pill, injectable, IUD and foam methods became more accessible over the three years.

The increased availability of methods documented that program inputs were appearing at the SDP level, but more important was to show that service utilization was also growing. The average monthly volume of new and resupply clients was measured in each main facility type during the TSAM91 and TSAM94 and the results are seen in Table 4. The average output of new clients seen monthly at hospitals and health centers grew from 37 to 75 and from 12 to 27 respectively but declined slightly at dispensaries from 17 to 15⁷. Monthly resupply averages increased at all facilities, most dramatically at hospitals. These results gave credence to the likelihood that the FPSS project's inputs were having an influence and were encouraging of continued effort along the project's original lines of design.

To determine whether FPSS inputs indeed were effective in increasing contraceptive prevalence, the evaluators carried out a multivariate analysis of program and individual factors that influence contraceptive method choice. They selected program factors related to those targeted for expansion by FPSS (access to facilities offering family planning, community outreach programs, and IEC exposure) and individual factors commonly expected to determine contraceptive use and method preference (woman's age, education, urban-rural residence, household assets and construction quality, and religion). The objective was to isolate the independent effect of program factors, in

⁷This may be a function of clients increasingly seeking contraceptives from health centers and hospitals rather than dispensaries over the period.

particular the indicator of service output--contraceptive availability. Once the analysis was completed, simulations were carried out to see what levels of contraceptive method acceptance would be obtained with and without the program interventions.

Figure 5 provides an example of the simulation result for accessibility of family planning services at hospitals (no access, hospital access within 5 kms, and hospital access within 6-10 kms). The observed or actual use levels are represented by the dashed lines for comparison against the simulated changes. These simulations are based on data in the cross-section (for 1994) and show the difference in modern contraceptive use between what would be predicted with no hospital FP access and what would be predicted with close access. Just under 10 percent modern use is predicted if all women had no access to hospitals with family planning and almost 13 percent use is predicted if they all had access within 5 kms. However, access at 6-10 kms shows an even stronger effect (16 percent) suggesting that the recent availability of contraceptive methods at hospitals may have drawn in many couples with latent contraceptive demand, irrespective of travel distance. Considering that these results are "net", or independent of the influences of other factors included in the model, the positive increase in use is significant. As global estimates indicate that a rise of 15 percentage points in contraceptive prevalence reduce the total fertility rate by an average of one child, a program effect in the range of three percentage points in modern contraceptive use (from 9.5 to 12.8) is not an insignificant contribution (20 percent, if it represented the only effect).

The above findings demonstrate how facility and household surveys can strengthen the evaluation of family planning programs and require the use of the linked sample design noted earlier. The programmatic consequence of the results has been to move ahead with the expansion of FPSS' design with increased confidence that the expected outcomes will be achieved based on the mid-term evaluation results.

Uttar Pradesh, 1995. This case study illustrates the utility of a more complex survey design for monitoring and evaluating reproductive health services and behaviors. The Innovations in Family Planning Services (IFPS) Project is a ten-year (1992-2002), \$325 million project located in Uttar Pradesh, India, with a similar goal of improved health for women and children through increased contraceptive prevalence, particularly of spacing methods, and reduced fertility. Three specific objectives of the IFPS project are to increase access, quality and promotion of family planning and reproductive health services. The main project inputs are in training, expansion of private sector involvement, logistics support of commodity distribution, and IEC. A unique feature of the IFPS project is that it is administratively and financially driven by a set of benchmarks. Benchmark indicators have target levels and values; when the levels are met, disbursements occur.

To establish baseline levels for the benchmark indicators requires measurement of service capacity in eligible facilities and providers in the public and private sector, as well as of contraceptive demand, fertility intentions and reproductive health status of individuals, both women and men. A major survey called PERFORM (EVALUATION Project, 1996) was undertaken from June-September of 1995, covering a sample of 28 districts, 1539

villages and 738 urban blocks, 45,277 eligible women, 2,428 health facilities, 6,320 staff, and 22,335 individual service agents . The survey design employed a linked facility and household sample, wherein all service delivery points within the sampled clusters (villages and blocks) were visited and a systematic sample of households was selected for interviews with eligible women. Eligibility was defined as being currently married and between the ages of 15 and 49.

We highlight here the results related to reproductive health only. All women pregnant in the three years prior to the survey were asked about health care during their pregnancies and current reproductive tract infections. The provision of reproductive health services was assessed in five of the 28 districts at all facilities selected into the sample. A survey of currently married males between 15 to 59 years of age in the same households selected in the main PERFORM survey is being carried out presently in these five districts.

Figure 6 provides results for three of the five districts where reproductive health services have been assessed. The percent offering different types of RH services varies somewhat from one district to the next. Generally speaking, conventional maternal and child health (MCH) services, such as pregnancy and delivery care, breastfeeding and nutrition counseling, and immunizations, are offered in the majority of facilities. However, STD diagnosis and treatment, along with emergency obstetric care (EOC), are not frequently found in most health facilities. This is due to requirements of technical and medical skills and equipment costs to treat such cases. The higher level of availability of STD services in one district (Nainital) reflects the higher number of STD cases there. Figure 6 illustrates that RH indicators at the facility level can be monitored once the IFPS project determines which inputs to emphasize in this area. A follow-up of the facilities and clusters is planned in 1997, like the panel carried out in Tanzania, and is expected to reveal service and behavioral improvements targeted by the project.

Table 5 illustrates data reported at the facility level on reproductive morbidity cases in the six months prior to the survey. A first observation is that few maternal and perinatal deaths are reported and may be selective of those mothers able to reach facilities for emergency care. Care extended to clients of reproductive health services tend to be largely for birth delivery, including abortion and pregnancy complications. Such caseload statistics are emphasized in safe motherhood indicators and gathered usually from registers maintained at the SDP. To evaluate whether appropriate treatment was provided, these cases can be followed up for further study.

The influences of program and individual factors on a key reproductive health outcome--the level of attended deliveries--was modelled to determine their net impact. Again this evaluation is based on only cross-sectional data. Overall only 25 percent of the women in the two districts covered by this analysis have attended deliveries. Figure 7 shows the odds ratios for an attended delivery for just the significant program factors. If the woman had prenatal care from an allopathic (Western medicine) health provider, her odds of having an attended delivery were 5.88 times greater than the woman who had no prenatal care whatsoever. If she had prenatal care from another provider (usually a

trained birth attendant), her odds of an attended delivery were 3.2 times higher than where no care was received. We further examined whether the availability of reproductive health services in the woman's area (accumulated across those shown in Figure 5) affected the likelihood she would have an attended birth. An upward shift of one in the average number of services would increase her probability of an attended delivery 2.08 times. The availability of essential delivery equipment (such as forceps, scissors, or needles) at the health facilities did not show a strong influence.

Again, the knowledge gained through such types of evaluations of intervention effectiveness is important for guiding the implementation of reproductive health programs in many countries. Not shown in Figure 7 is the greater effect of social class factors on chances for an attended delivery, suggesting that even if considerable investments were made to raise the adequacy of service environments for women, the affordability of delivery care may still inhibit the level of achievements. Similarly since three quarters of women deliver at home currently, extensive educational and promotional effort will be needed to persuade women to have institutional deliveries where trained attendants are available.

Conclusions and future prospects

The points raised in this paper have centered on the emerging challenges to newly organized and designed reproductive health/family planning programs and how to improve upon monitoring and evaluation efforts applied for family planning in the past. Expectations that it will be easy to transfer and apply evaluation methods from one program area, such as family planning, to a broadly defined one, such as reproductive health, may be unrealistic, if only because whereas primarily one health technology was being delivered for family planning, a range of them will be for reproductive health. Reproductive tract infections, sexually transmitted diseases, obstetric complications, reproductive cancers, nutritional deficiencies, and gender malpractices represent such a diverse set of health and social morbidities, with complex biochemical and epidemiologic pathways, that evaluating the impacts of intervention packages may be hard-pressed to reveal the underlying structure of influences.

Ethical issues must also be considered when infections or serious morbidities are detected during evaluation research. Given the need for biomedical detection of infections and obstetric morbidities, programs and donors should address their ethical responsibilities for counselling and providing treatment or referral for treatment for infected subjects identified for prevalence estimates. These must be factored into decisions about population-based data collection efforts.

The observations above are not meant to discourage but rather to alert us all to the evaluation challenges that lie ahead in relation to ensuring that implementing the reproductive health agenda achieves the desired results.

Table 1. Key Reproductive Health Domains and Conditions

Reproductive Health Domain	Key Conditions
Safe pregnancy: obstetric and perinatal	<ul style="list-style-type: none"> • hemorrhage • fever, infection • obstructed labor • sepsis • eclampsia • malpresentation • low birthweight • miscarriages and stillbirths • preterm • small for gestational age • congenital anomalies • legal or illegal induced abortion
Gynecologic	<ul style="list-style-type: none"> • sexually transmitted diseases <ul style="list-style-type: none"> • gonorrhea • syphilis • chlamydia • trichomoniasis • bacterial vaginosis • candida • human papilloma virus • HIV, AIDS • other reproductive tract infections • cancers: breast, cervical, ovarian
Family planning	<ul style="list-style-type: none"> • unwanted or mistimed conception or pregnancy • lower fertility demand • adverse contraceptive side effects • treatment composition (method mix) • unmet need for services
Male reproductive systems	<ul style="list-style-type: none"> • sexually transmitted diseases (see above) • prostate cancer
Other reproductive health issues	<ul style="list-style-type: none"> • violence • female genital mutilation • infertility • nutrition • breast feeding • general reproductive health services to adolescents

Table 2. Selected reproductive health indicators for safe pregnancy and gynecologic health

Reproductive Health Domain	Indicators
Safe pregnancy: obstetric and perinatal	<p>OUTCOME (IMPACT)</p> <ul style="list-style-type: none"> • perinatal mortality rate • maternal mortality ratio/rate • percentage of perinatal deaths contributed by stillbirth and early neonatal death
	<p>OUTCOME (EFFECT)</p> <ul style="list-style-type: none"> • percent of all adults knowledgeable about: maternal complications of pregnancy and childbirth; neonatal complications • percent of pregnant women with at least two doses of tetanus toxoid immunization • proportion of women who was attended at least once by medically trained personnel for reasons related to pregnancy
	<p>OUTPUT</p> <ul style="list-style-type: none"> • met need for emergency obstetric care • case fatality rate (all complications) • number of facilities providing essential obstetric functions per 500,000 population • percentage of women with obstetrical complications treated within 1-2 hours at a health facility • percentage of post-abortion care clients who receive counselling and referral or acceptance of family planning method at the time of the service • percentage of SDPs having adequate number of staff competent in post-abortion care • number, type, and geographic distribution of SDPs that have commodities, equipment, and transport for post-abortion care • total number of admissions for abortion-related complications • number and percent of women suffering from abortion-related reproductive morbidities such as chronic abdominal pain or infertility
	<p>INPUT</p> <ul style="list-style-type: none"> • existence and implementation of a safe pregnancy strategic or operational plan • existence of service and administrative policy on the elements of post-abortion care

Reproductive Health Domain	Indicators
Gynecologic	OUTCOME (IMPACT) <ul style="list-style-type: none"> • STD prevalence in a defined target population
	OUTCOME (EFFECT) <ul style="list-style-type: none"> • percent of family planning clients who accept condoms • percent of adults practicing care-seeking behaviors that reduce STD/RTI infection • percent of target population with an unmet need for protection • percent of adults at low risk of STD/HIV • percent of women screened for breast cancer • percent of women screened for cervical cancer
	OUTPUT <ul style="list-style-type: none"> • percent of SDPs stocked with condoms and educational material • percent of clients correctly managed for STDs • percent of clients screened appropriately for RTIs before IUD insertion • number of condoms distributed • percent of clients treated for breast cancer at early stages of the disease • percent of clients treated for cervical cancer at early stages of the disease
	INPUT <ul style="list-style-type: none"> • existence and implementation of a strategic or operational plan for STD or cervical/breast cancer screening
Family planning	OUTCOME (IMPACT) <ul style="list-style-type: none"> • total fertility or crude birth rate • percent of pregnancies that are mistimed or unwanted
	OUTCOME (EFFECT) <ul style="list-style-type: none"> • contraceptive prevalence rate • contraceptive mix
	OUTPUT <ul style="list-style-type: none"> • percent of SDPs stocked with contraceptives (by method) • average distance to family planning provider
	INPUT <ul style="list-style-type: none"> • existence of an operational plan for quality family planning care • budgetary resources for family planning

Source: Bertrand and Tsui, 1995, pp. 32-35.

Table 3
 Number and percent of health facilities offering family planning:
 Tanzania 1991 and 1994

Facility type/ year		Total		Government		Nongovernment	
		N	Percent	N	Percent	N	Percent
Hospital	1991	69	85	51	94	18	67
	1994	74	83	56	95	18	60
Health centers	1991	74	84	73	87	1	25
	1994	108	92	104	95	4	50
Dispensaries	1991	131	67	123	71	8	38
	1994	184	80	172	94	12	26

Source: Aboud et al., 1996: Tables 2 to 4

Table 4

Change in Monthly Client Volume at Different Facilities
New and Resupply

Year	Hospital	Health center	Dispensary
New			
1991	37	12	17
1994	75	27	15
Resupply			
1991	122	47	33
1994	205	54	36

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Table 5
Total number of reported cases in the past six months
at health facilities surveyed in 3 Uttar Pradesh districts, 1995

Reported cases	Nainital	Aligarh	Kanpur Nagar
Deliveries	1307	1077	1454
STD clients	313	89	134
Abortion complications	85	139	327
Pregnancy complications during labor	195	208	436
Maternal deaths	0	4	15
Stillbirths	13	40	46
Perinatal deaths	2	3	7

Figure 1

A Simplified Framework for Reproductive Health

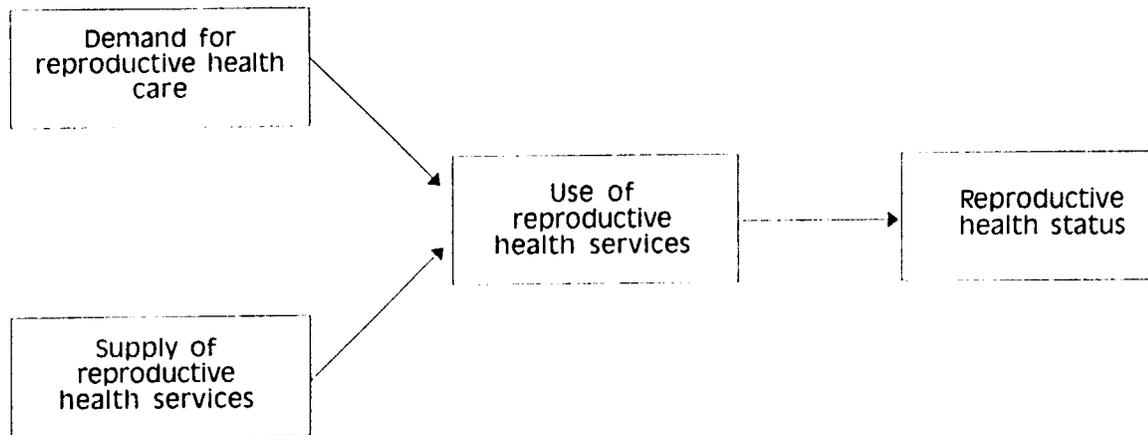
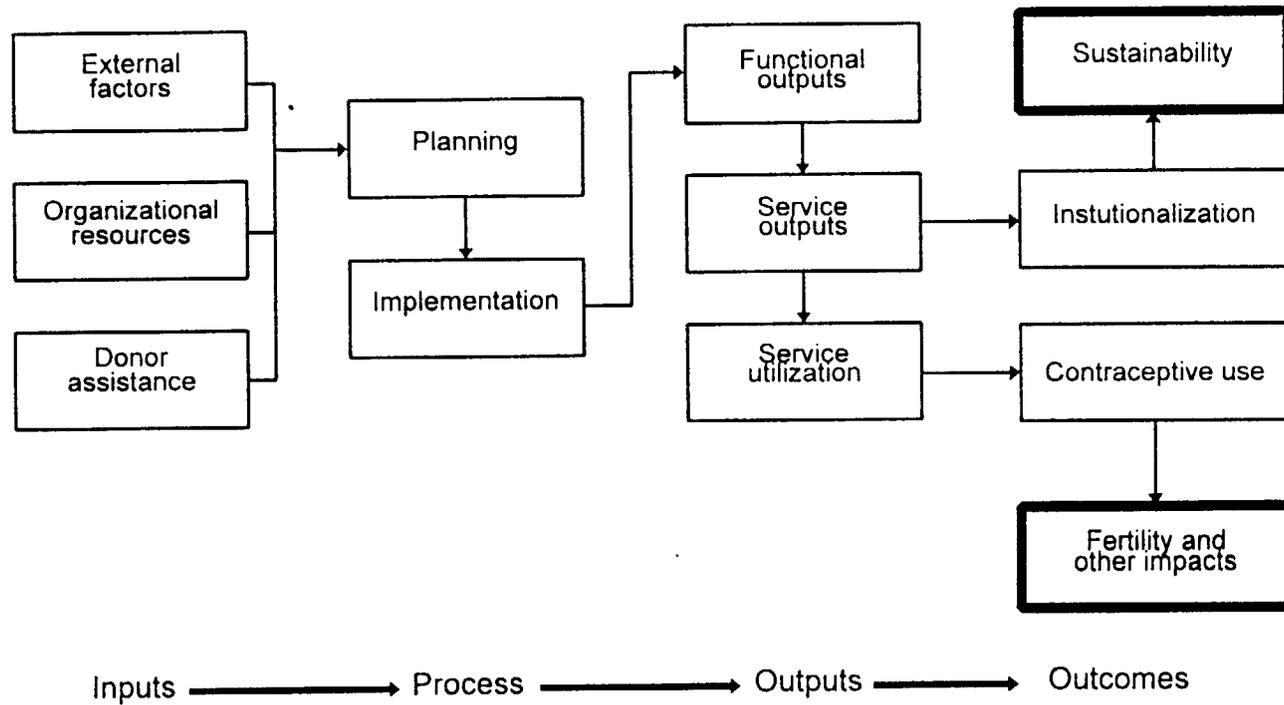


Figure 2

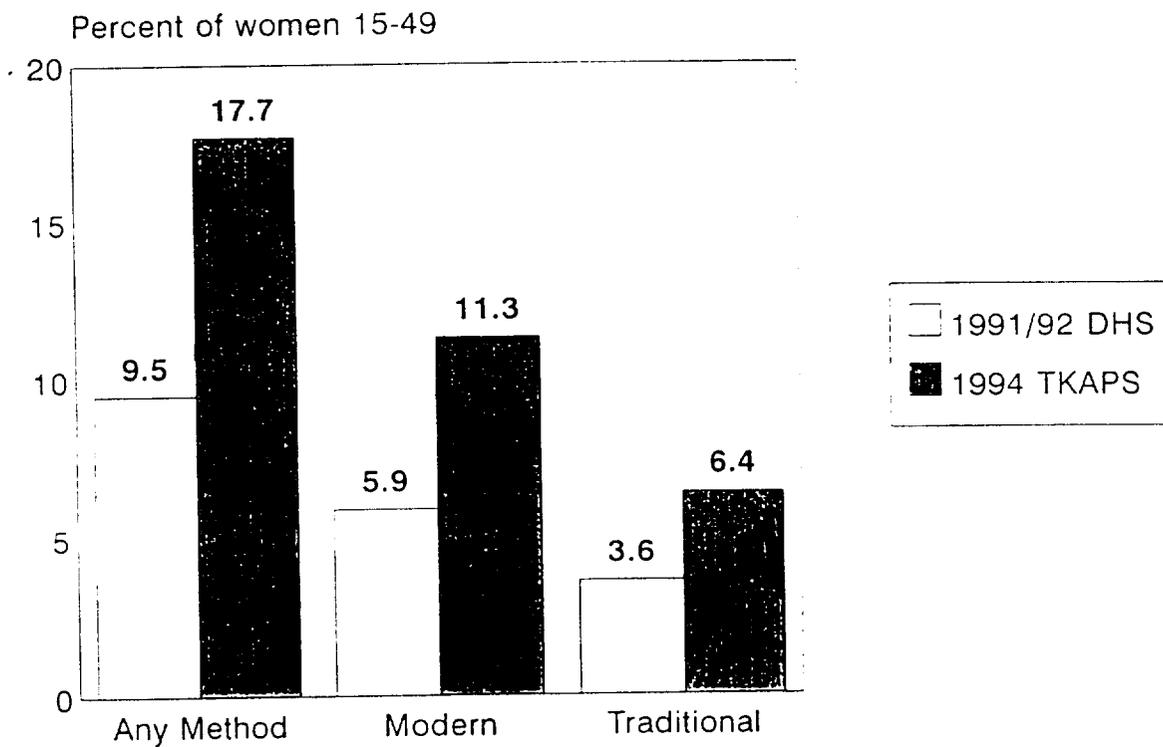
A Conceptual Model for Evaluating Reproductive Health Program Components



28

Figure 3

Trends in Contraceptive Use



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Figure 4

Contraceptive Supplies in Stock All FP Dispensaries (Percent of matched)

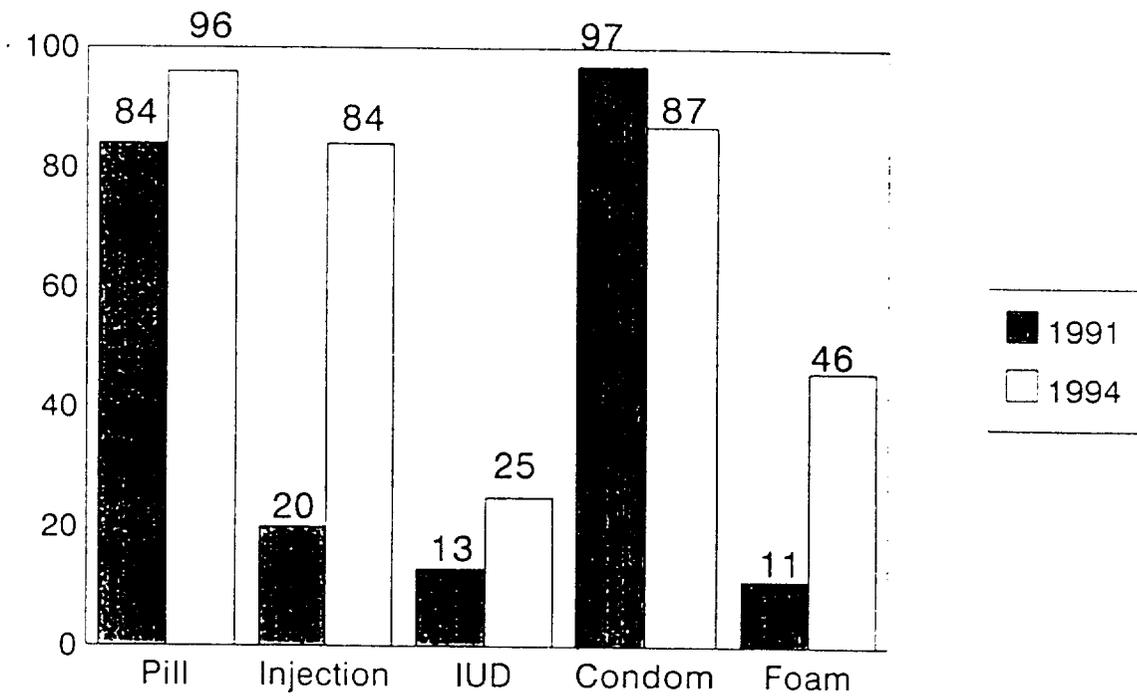


Figure 5

Predicted Current Method Use

Access to FP Hospitals 1994

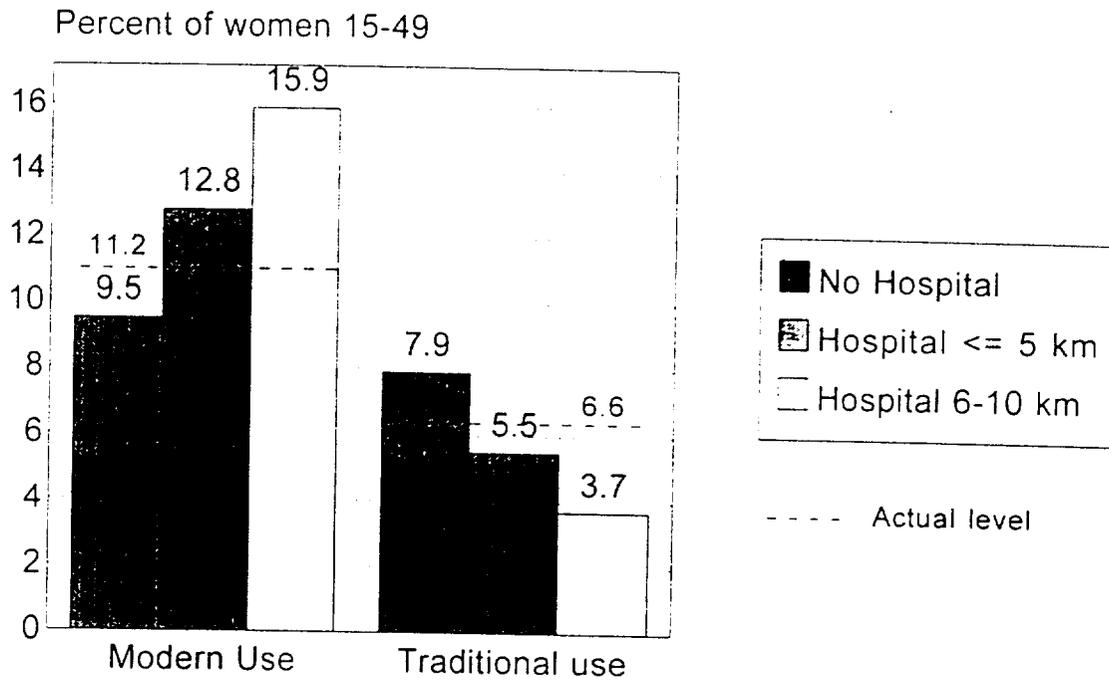
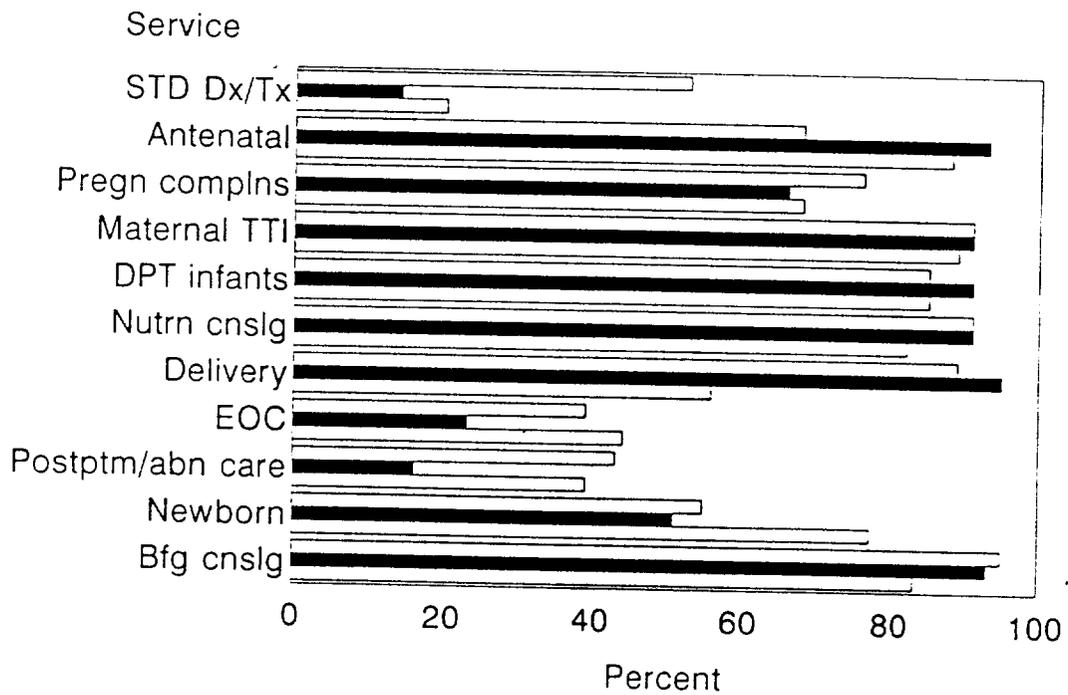


Figure 6

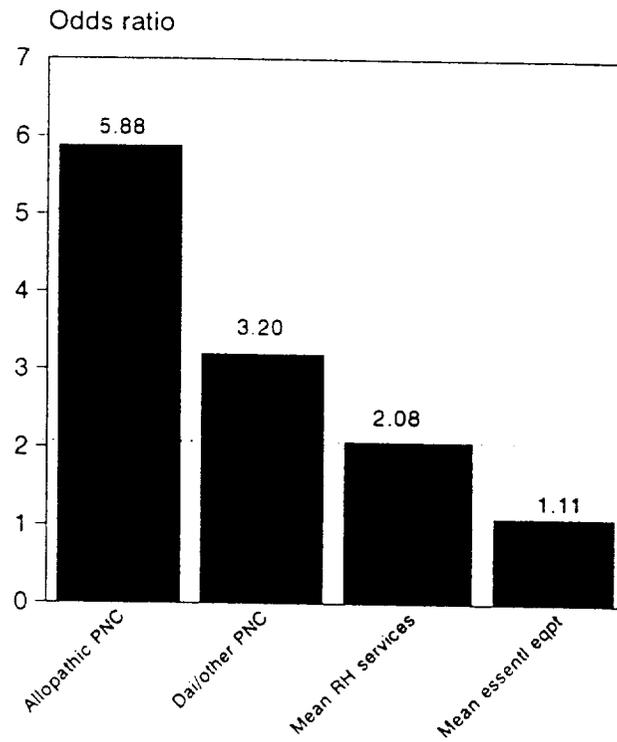
Percent of Fixed SDPs Reporting Availability of Reproductive Health Services
Nainital, Aligarh and Kanpur Nagar Districts in Uttar Pradesh, 1995



Preliminary results; lines ordered (n):
Nainital (75), Aligarh (74), Kanpur Nagar (66)

Figure 7

Selected Odds Ratios for Attended Delivery
as Predicted by Health Service Factors



Aligarh and Nainital Districts, Uttar Pradesh 1995

REFERENCES

- Aboud, S., G. Angeles, P. Bardsley, A. Bekui, A. Chuwa, D. Guilkey, A. Komba, S. Ngallaba, R. Riphahn, I. Ruyobya, and P. Riwa, "The impact of family planning programs on contraceptive use in Tanzania: An explanation of change between 1991 and 1994". Manuscript. The EVALUATION Project, Carolina Population Center, University of North Carolina, 1996.
- Bertrand, J. and A. Tsui. Indicators for reproductive health program evaluation: overview. Chapel Hill, NC: Carolina Population Center, The Evaluation Project. 1995.
- Bertrand, J., R. Magnani and N. Rutenberg. (forthcoming). *Program monitoring and impact assessment for family planning evaluation*. The EVALUATION Project, Carolina Population Center, University of North Carolina.
- Bulatao, R. (1995). *Five steps to develop indicators for sexual and reproductive health projects*. World Bank: Population, Health and Nutrition Department.
- Cates Jr. W, Stone KM. Family planning: the responsibility to prevent both pregnancy and reproductive tract infections. In Germain A, Holmes KK, Piot P, Wasserheit JN. *Reproductive tract infections*. New York: Plenum, 1992:7-33.
- Evaluation Project. 1996. Handbook of PERFORM Indicators. The EVALUATION Project, Carolina Population Center, University of North Carolina, 1996.
- Fathalla M. 1988. Research needs in human reproduction. In E. Diczfalusy, P.D. Griffin, and J. Kharlna (eds.), *Research in Human Reproduction*. Biennial Report (1986-87), Geneva: World Health Organization.
- Fisher A, Mensch B, Miller R, et al. *Guidelines and instruments for a family planning situation analysis study*. New York: The Population Council, 1992.
- Fortney, J. 1995. Reproductive morbidity: A conceptual framework. Family Health International Working Papers WP95-02. Family Health International, North Carolina.
- Garcia-Moreno C, Tomris T. International perspective on women's reproductive health. *Science*. (Aug. 11) 1995;269:790-92.
- Germain A, Ordway J. Population control and women's health: balancing the scales. New York: International Women's Health Coalition. 1989.
- Graham, W. and V. Filippi. Monitoring maternal health goals: How well do the indicators perform? London, UK: Maternal and Child Epidemiology Unit, London School of Hygiene and Tropical Medicine.
- Lane SD. From population control to reproductive health: an emerging policy agenda. *Social Science & Medicine*. 1994;39:1303-14.
- Finkle JL and A McIntosh. 1995. The new politics of population. *Population and Development Review*. Supplement to vol. 20:3-34.
- McCarthy, J. and D. Maine. 1992. A framework for analyzing the determinants of maternal

- morbidity: implications for research and programs. *Studies in family planning* 23(1); 23-33.
- Nowak R. Rockefeller's big prize for STD test. *Science*. 1995;269:782.
- Pauchari, S. 1995. Defining a reproductive health package for India: A proposed framework. Population Council Working Papers, South & East Asia No. 4. Population Council, New Delhi.
- Pachauri, S. Relationship between AIDS and family planning programmes: rationale for developing integrated reproductive health services. *Health Transition Review*. 1994; supplement to vol. 4:321-47.
- Reynolds, J. (1990). Evaluation of child survival programs. In H. Wallace & K. Giri (Eds.), *Health care of women and children in developing countries*. Oakland, CA: Third Party Publishing.
- Sadik N. The state of world population 1994: choices and responsibilities. New York: United Nations Population Fund. 1994.
- Sloan NL, Quimby C, Winikoff B, Schwalbe N. Guidelines and instruments for a situation analysis of obstetric services. Critical issues in reproductive health and population. New York: The Population Council, 1995.
- Tinker, A. and M. Koblinsky. 1993. Making motherhood safe. World Bank Discussion Papers No. 202. Washington, DC: World Bank.
- Tsui, A. 1995. Reforming population paradigms for science and action. In O. Harkavy, *Curbing population growth: An insider's perspective on the population movement*. New York: Plenum Press, pp. 237-249.
- United Nations Development Program. *Human development index 1993*. New York: Oxford University Press.
- United Nations Children's Fund. 1995. *The progress of nations*. E.95.XX.UKD.1 00695. New York: United Nations Children's Fund.
- United Nations Population Fund. Programme of Action for the International Conference on Population and Development. New York: United Nations. 1994.
- USAID. (1995). Bureau of Global Programs. Center for Population Health and Nutrition. *Strategic plan*. Washington DC: United States Agency for International Development.
- Veney, J. and P. Gorbach. 1993. Definitions for program evaluation terms. EVALUATION Project Working Paper WP-TR-01. The EVALUATION Project, Carolina Population Center, University of North Carolina at Chapel Hill.
- Wasserheit JN, Holmes KK. Reproductive tract infections: challenges for international health policy, programs, and research. In Germain A, Holmes KK, Piot P, Wasserheit JN. *Reproductive tract infections*. New York: Plenum, 1992: 7-33.

Wilkinson MI, Njogu W, Abderrahim N. The availability of family planning and material and child health services. Columbia, MD: Macro International Inc., Demographic and Health Surveys Comparative Studies no. 3. 1993.

World Bank. 1993. *World Development Report*. Washington, DC: The World Bank.

World Bank. A new agenda for women's health and nutrition. Washington: The World Bank. 1994.

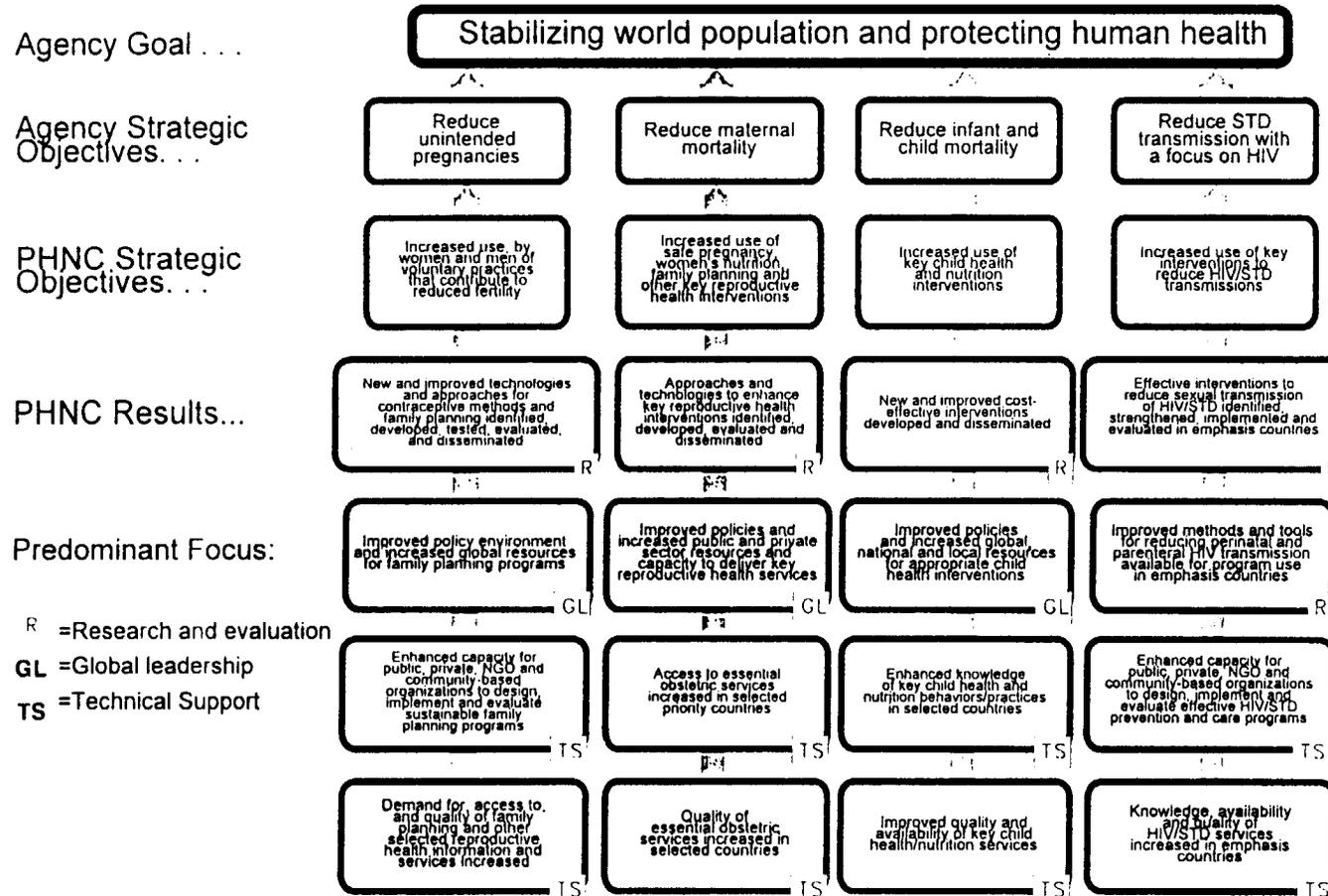
World Bank. *Social indicators of development, 1995*. Baltimore: The Johns Hopkins Univ. Press. 1995.

World Health Organization. Measuring reproductive morbidity. Report of a technical working group, Geneva, 30 August - 1 September, 1989.

_____. 1994. Indicators to monitor maternal health goals. WHO/FHE/MSM/94.1. Geneva: World Health Organization.

_____. 1994. Mother-baby package: A road map for implementation in countries. Geneva: Division of Family Health, World Health Organization.

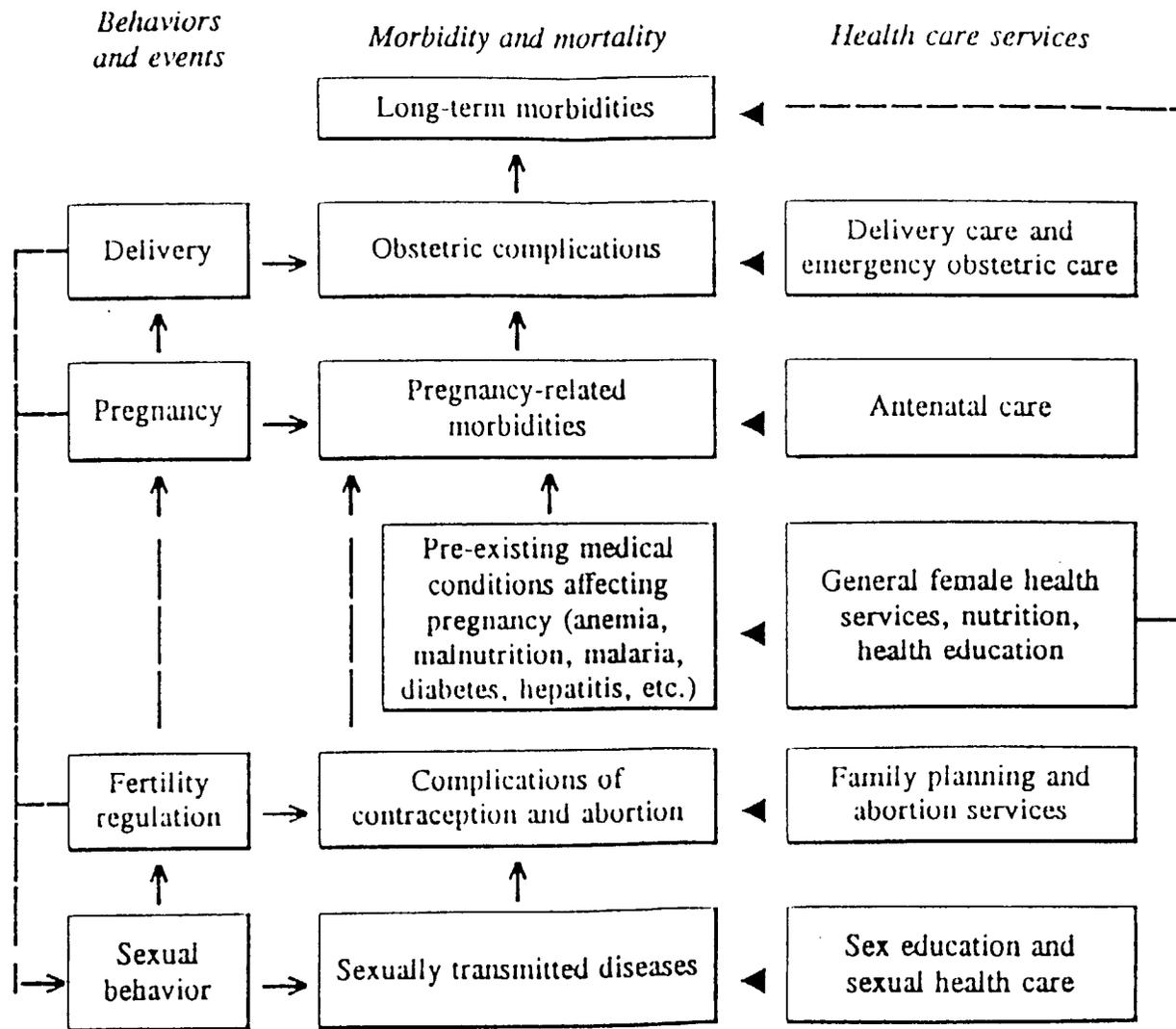
Results Framework: PHN Center



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Figure 1. A framework for reproductive health:
Events leading to morbidity, and related health services



Source: R. Buitano and L. Shrestha, "Key Indicators for Reproductive Health Projects", draft, 1995.

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Appendix 2

Shortlist of Reproductive Health Indicators

Maternal and Neonatal Health

Met need for emergency obstetric care (EmOC)

Perinatal mortality rate

Percentage of perinatal deaths contributed by stillbirth and early neonatal death

Case fatality rate (CFR) -- all complications

Percentage of all adults knowledgeable about maternal complications of pregnancy and childbirth

Percentage of all adults knowledgeable about neonatal complications

Percentage of pregnant women with at least 2 doses of tetanus toxoid immunization

Proportion of women attended at least once during pregnancy by medically trained personnel for reasons related to the pregnancy

Number of facilities providing essential obstetric functions (EOF) per 500,00 population

Admission-to-treatment time interval: percentage of women with obstetrical complications treated within 2 hours at a health facility

Existence and implementation of a safe pregnancy strategic or operational plan

Maternal mortality ratio and rate

Post-Abortion Care

Existence of service and administrative policy on the elements of post-abortion care

Percentage of post-abortion care clients who receive counseling and referral or accept a family planning method at time of service

Number, type and geographic distribution of SDPs that have commodities, equipment and transport for post-abortion care

Knowledge of and willingness to use services within the service area

Facility case fatality rate (CFR) -- post-abortion complications

Total number of admissions for abortion-related complications

39

Compliance with provisions for protecting against coercion

Compliance with provisions for maintaining confidentiality

STD/HIV

Percentage of SDPs stocked with condoms and educational materials

Percentage of clients correctly managed for STDs

Percentage of clients screened appropriately for RTIs before IUD insertion

Number of condoms distributed

Percentage of family planning clients who accept condoms

Percentage of adults practicing care-seeking behaviors that reduce STD/RTI infection

Percentage of adults practicing low risk behavior for STD/HIV

Percentage of target population with an unmet need for protection

Female empowerment for condom use: composite indicator

STD prevalence in a defined target population

Existence of women's nutrition as a policy priority

Percentage of service delivery points (SDP) with adequate supplies of mineral/vitamin supplements

Percentage of women who consume vitamin A-rich foods

Percentage of pregnant clients receiving treatment for hookworm

Percentage of program participants who practice key nutrition behaviors promoted by the program

Women's Nutrition

Percentage of malnourished women based on body mass index (BMI)

Percentage of households using iodized salt

Percentage of women with anemia

Percentage of women with low breastmilk vitamin A level

Percentage of women of low weight

Breastfeeding

National breastfeeding policy and plan

Percentage of RH/FP service providers trained to use family planning service delivery protocols for breastfeeding women

Percentage of RH/FP service providers who ascertain whether or not a woman is breastfeeding prior to providing her with contraceptive advice or methods

Percentage of RH/FP service providers trained in breastfeeding counseling

Community-based counseling

Percentage of target audience exposed to IEC messages on breastfeeding

Continued breastfeeding at 24 months

Timely complementary feeding rate

Contraception among nursing mothers

Adolescent Reproductive Health Services

Existence of government policies, programs or laws favorable to adolescent reproductive health

Number/percentage of providers who successfully complete training programs on adolescent reproductive health services

Number of SDPs serving adolescents that are located within a fixed distance or travel time of a given location

Total number of contacts with adolescents

Percentage of participants (peers, parents, teachers) competent in communication with adolescents in reproductive health issues

Percentage of adolescents who know of at least one source of information and/or services for sexual and reproductive health

Adolescent's knowledge of reproductive health: Composite indicator

Percentage of adolescents who used protection at first/most recent intercourse

(Adolescent) contraceptive user and/or non-user characteristics

Proportion of births to adolescent women that are wanted