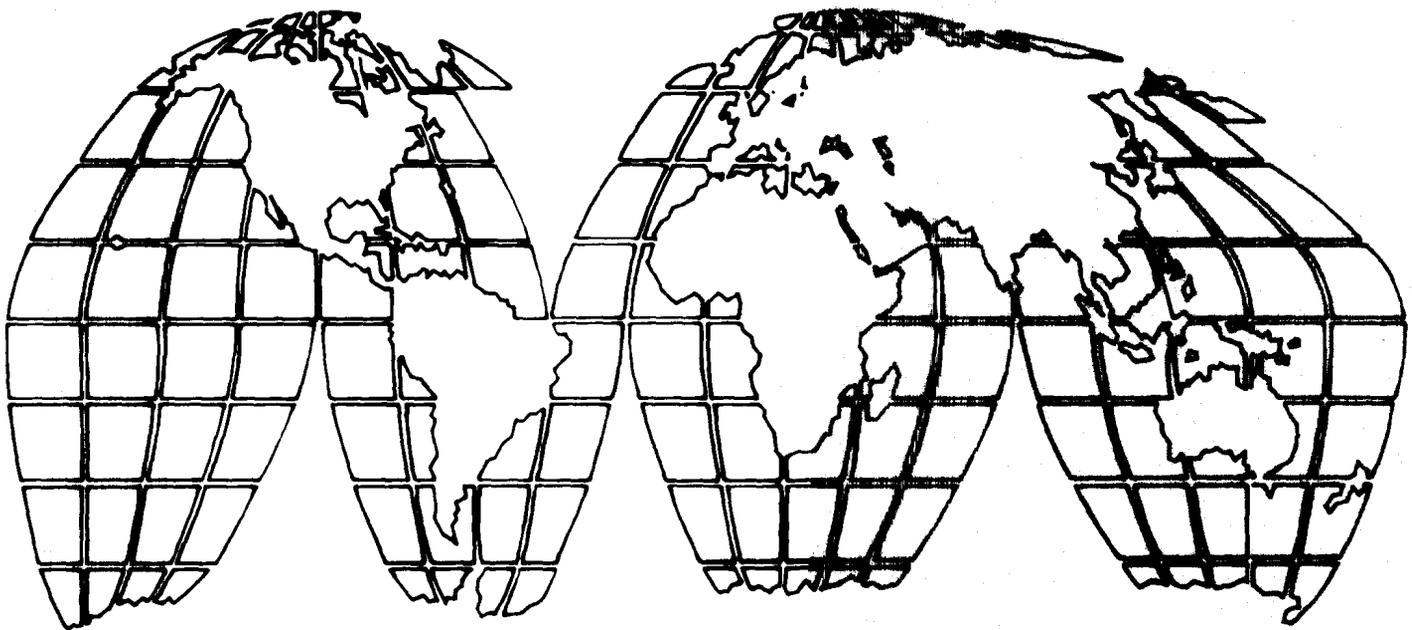


A.I.D. Evaluation Special Study No. 8

Toward A Health Project Evaluation Framework

BEST AVAILABLE



June 1982

U.S. Agency for International Development (AID)

TOWARD A HEALTH
PROJECT EVALUATION FRAMEWORK

A.I.D. Evaluation Special Study No. 8

by

David W. Dunlop
with the assistance of
The Health Evaluation Working Group of AID 1/

U.S. Agency for International Development

June 1982

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CONTENTS

List of Figures

	Page
Foreword.....	vii
Preface	ix
I. Introduction.....	1
A. AID Commitment to Health.....	1
B. AID Commitment to Evaluation.....	1
C. Purpose of This Paper.....	2
II. Problems of Current Approaches to Health Project/Program Evaluation.....	4
A. The Linear Evaluation Model.....	4
B. Other Linear-Model Problems.....	6
1. Attribution.....	6
2. Feedback and Indirect Impacts.....	6
C. Time.....	7
III. Concepts for Incorporation Into Health Project Evaluation.....	8
A. The Economic Rationale for Choosing Health Project/ Program Evaluation Measures.....	8
1. Health Impact Measures and Economic Benefits.....	8
2. The Role of Utilization and Other Indicators.....	11
3. Social Valuation of Consumption and Investment Benefits.....	13
B. Health Project Context.....	14
1. Intraprogrammatic Context.....	14
2. Nonprogrammatic or Situational Context.....	15
C. Cost and Financial Analysis (Economic Sustainability).....	17
D. Equity Considerations.....	18
E. A Systems Approach to Health Project Evaluation.....	19
1. Conceptual Rationale.....	19
2. Towards a Systems Design.....	20
3. Why These Indicators?.....	22
IV. Other Evaluation Considerations.....	24
A. Audience Appropriateness.....	24
B. Data Availability.....	25
C. Cost of Information.....	26
V. Summary and Recommendations.....	27
A. Summary.....	27
B. Recommendations.....	27

References

Appendices

- A. Generic Questions for an Economic Evaluation of Primary Health Care Projects
- B. A Proposed Set of Measures/Indicators for Health Project/Program Evaluation

LIST OF FIGURES

Figure	Title
1	Health Project Linear Evaluation Model
2	Relationships Between Economic Benefits and Health Impact Measures
3	Health Sector Intervention Evaluation System

Foreword

The unanimous agreement of one's colleagues would be desirable to obtain prior to final publication of such a methodological statement as is represented by this document. The lack of such complete agreement is indicative of rapidly evolving conceptual and methodological approaches to evaluating health activities in developing countries. This statement has attempted to capture many of these ideas over its 2-year evolutionary life, but undoubtedly still represents only a partial statement. As a consequence, either a more complete revised version or an entirely "new" approach is still likely to emerge.

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...r version, as its title implies, makes no claim to completeness. Nonetheless, it has moved from "draft" to "published" status to stimulate a broader audience to "do better" and to improve the present rate of new knowledge development about the impact and operation of health projects. To appeal to the practicalities of life and to paraphrase a well worn dictum, "the best paper is the done paper." By definition this paper is now "done."

The author acknowledges the many who reviewed, commented on, or argued with prior drafts of this paper. The present version has improved materially as a result of these many previous comments. The secretarial assistance from the Office of Health (S&T), Nutrition (S&T) and PPC is acknowledged with gratitude and appreciation. If health care interventions improve as a consequence of this effort to systematize collective thoughts and perceptions about a complex human process, the present effort will have been worthwhile.

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Preface

Over the last two and one-half years, an informal working group of interested AID professionals has been addressing the issue of health project evaluation. This paper, written and revised by David W. Dunlop of this AID working group, provides a constructive establishment of an evaluation framework for primary health care activities in developing countries.

This paper is presented via the Office of Evaluation's discussion paper series to enhance the focus of ideas under consideration in this important area of human service program evaluation. It is the office's view that the paper will provide considerable guidance to many who will work in this area.

Richard Blue
AAA/PRC/E

I. Introduction

With the introduction of the United Nations second development decade in 1970, increased emphasis was focused on improving the health and basic human needs of people residing in poor countries. ^{1/} Throughout the 1970s, this emphasis has been gradually translated into specific actions by countries and international donors. Many developing countries, for example, have expanded their development expenditures for improvements in health care programs. The World Bank explicitly debated the merits of such activities through (a) an articulation of a human resource approach to development, ^{2/} (b) the expressed recognition of the inherent logic of income equity as an imperative for development, ^{3/} and (c) its internal discussions about the rationale for direct health sector lending. ^{4/}

The official U.S. position toward these winds of change is manifested in the 1974 amendments to the Foreign Assistance Act that gave the Agency for International Development (AID) the mandate to improve the quality of life of the most disenfranchised members of society. ^{5/} The recently held World Health Organization (WHO)-UNICEF conference on Primary Health Care at Alma Ata, USSR, represented an attempt by the world's health community to more specifically address the broad strategic steps required to make a significant improvement in an entire population's health. ^{6/}

AID Commitment to Health

Based on AID's changed congressional mandate as expressed in the 1974 amendments, human needs programming, including health, has expanded. Since that time, AID has been a cooperating partner with and a pioneer among countries and donors in promoting health programs. Since the mandate changes, AID and its regional bureaus have systematically addressed numerous issues in order to define their health sector policy. ^{7/} AID's support for health activities has increased significantly during the past 7 years. It is now supporting health activities in 68 countries in four basic areas: (a) primary health care delivery; (b) control of tropical diseases; (c) improvements in water and sanitation; and (d) health planning and management.

AID Commitment to Evaluation

Despite the increasing acceptance of health programs, there is little hard evidence that they lead to improved health status. In particular, it is unclear whether primary health care delivery systems involving outreach workers, paraprofessionals, and triage are more effective in improving the health status of larger numbers of people or in assuring more effective use of limited resources allocated to health than are urban-based, highly specialized hospital systems. It seems that this should be so; however, the evidence to date is inconclusive at best.

Given the increasingly difficult economic situation in the United States, the Congress has become more interested in the success, effectiveness, and efficiency of the programs that it funds, including those in the foreign assistance area. Independently of, though in agreement with, congressional concerns, a number of AID health professionals have addressed these issues in an intra-agency health evaluation working group. In conjunction with AID's own response to congressional inquiry (the Bennett and now McPherson impact evaluation study initiative), they are interested in determining if primary health care is working as efficiently as has been anticipated. The practical measurement difficulties in discerning changes in final health indicators in the short time periods over which AID normally funds projects (irrespective of the problems of theoretical implausibility and misspecified attribution) have provided the impetus for this reexamination. Perhaps this individual and collective concern by health professionals in AID is the single greatest indicator of its commitment to health project evaluation.

Purpose of This Paper

Much can be written from a conceptual and technical perspective about health project evaluation. Each group of evaluation users has differing needs and requirements for information. However, this paper addresses several topics of concern to those most directly involved in the design, implementation, and evaluation of health projects/programs.^{8/} These topics, in their order of presentation, are briefly described below. First are the problems related to current health project or program evaluation, including: (a) the assumed linear flow of impacts (the concept of system); (b) attribution; (c) feedback and indirect impacts; and (d) time as an important variable in evaluation.

The paper then considers five concepts for inclusion in health project evaluation. (1) Given the present congressional mandate to provide for the basic human needs of the poorest people in poor countries, it is important to reconsider the relevancy of such often enunciated final impact measures as mortality or morbidity decline. In conducting such a reconsideration, an alternative conceptualization of impacts, using the taxonomy of economics in the form of investment and consumption impact measures, is developed. (2) The importance of context and constraint analysis is developed. (3) Health program/project costs have become an increasingly important issue, particularly in countries that have traditionally financed a large proportion of recurrent costs from central government resources. (4) Equity considerations are reviewed for inclusion in evaluation activities. (5) A dynamic systems framework is deemed essential for evaluation, and systematic treatment of the problems and issues involved in implementing such a framework are reviewed. The framework incorporates the ideas presented above.

Finally, the paper addresses a series of practical issues that must be resolved before any evaluation strategy or set of measures is defined for

use in ascertaining impact. These issues include the problems of attribution of impact, timing of impact measurement, audience differences, data availability, and cost of information considerations. A summary and a set of recommendations conclude the paper.

II. Problems of Current Approaches to Health Project/Program Evaluation

The Linear Evaluation Model

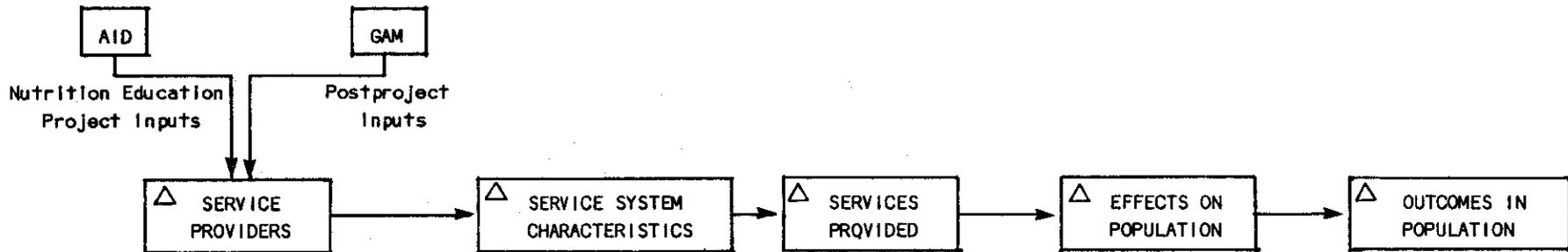
Most evaluation exercises are conducted using a linear mental construct as follows: combining a set of resources (inputs "i") in a particular manner (technology "j") leads to a series of changes in measures of impact (output/outcome "k") that are ascertainable at various points in the future. This approach represents a standard production model as exemplified by the assembly line or by the standard project appraisal methods undertaken by for-profit enterprises. A schematic representation of this model is shown in Figure 1. In this figure, the assumed process of activity suggests that inputs are combined to produce services that are "consumed" by the target population whose health status is improved as a consequence of consuming these services.

Although such an analytical construct may be appropriate for use in certain situations, it can often misspecify the nature of the evaluation problem in health. To best understand the health evaluation problem, consider the following statement. A positive state of good health results from a complex interweaving of many factors (inputs). The acquisition of health care services is only one of these factors. Other factors include agricultural production, family income, and sanitation. This is not to say that the availability of health services is not important to a population but rather to point out that such services operate in a context and as part of a complex system.

At the present time in developing countries, many of the inputs that can improve the health of a population are provided by categorical delivery systems, for example, through separate immunization campaigns for individual diseases. Health planners are attempting to reshape the concept of primary health care by welding the present disparate delivery systems with outreach and education services into a unified and more productive strategy for health improvement.

Many of the services embodied in this broader primary health care approach are not limited directly to the health sector and may not traditionally have been considered part of that sector at all. Among these are food production and distribution, safer and more freely available water for household use, sanitation, education and housing. Even though a particular health program may choose not to tackle all these multifaceted problems, it is valuable to incorporate them into the broad concept of primary health care. Knowledge of these broad-ranging components assists policy makers in (a) accounting for the large number of variables influencing the health status of any given population, (b) understanding the wide range of options available for improving that status, and (c) focusing on the possible complementarities or synergisms between those options.

Figure 1. An Example of a Linear Evaluation Model



Examples of Measurable Output Indicators For Each Change

<u>Personnel Trained</u>	<u>Supportive Supervisory System</u>	<u>Monthly Education</u>	<u>Maternal Knowledge</u>	<u>Malnutrition</u>
National director School director School professors Provincial monitor Monitrices - selected - trained	Regular visiting Problem solving Educational focus	39 lessons Active participation Systematic coverage Repetition Initiative encouraged	Vaccination Weaning Cheap nutrition Home R _x diarrhea	<u>% Underweight for Age</u>
	<u>Upflowing Information System</u>		<u>Maternal Capacity</u>	
	<u>In-Service/Continuing Education/Training</u>	<u>Advice</u>	To weigh food choices To use social services To gain information	
<u>School Created</u>	<u>Decentralization</u>	<u>Weighings</u>		
<u>Curricula Developed</u>	Peripheral financing of education Flexibility Encourage peripheral initiative	<u>Referrals</u>		
School curricular CSE fiches techn.	<u>Coverage</u>			
	<u>Accessibility</u>			

Note: Δ = change in

Source: Adapted from The World Health Organization, The Evaluation of Family Planning Activities Conducted In Health Services, Technical Report Series No. 569 (Geneva: WHO, 1975).

Other Linear-Model Problems

Attribution

If a change of "y" in measure "x" is achieved, but if "a," "b," "c," and "d"--"h" have also been changing, to what is the change in measure "x" attributable: to changes in "a," or in "b," or in "h," or in all of them; and, in what proportion?

It is also important to distinguish between statistical correlation and ascribed causality. In many instances, particularly when simultaneous activities are underway in the same area or locale, it is not clear whether the efforts made by one program or intervention are attributable in an indirect way to another intervention or set of interventions in the same locale. While the occurrence of such multiple effects can potentially be statistically disentangled, the program or the project information system is generally not designed to accumulate the information about the larger environment and the changes in that environment that may be the actual reason for the success of the program.

In two countries where infant mortality and subsequent birth rate declines have been studied--Kerala state of India and Sri Lanka--the observed declines have generally been attributed to a commitment by both governments to minimize fluctuations in food consumption, and not solely to health program intervention. ^{9/} At the same time, these countries (or parts thereof) have made a political commitment to address explicitly the distribution of wealth and income. Thus, to attribute causality or direct impact to a particular program intervention such as health may not be valid given the larger context in which the program operates.

Feedback and Indirect Impacts

Another linear-model problem is that of indirect effects. The term "program impact" generally denotes a change in a direct outcome measure that is attributable to a particular intervention. As in most human resource programs, however, the direct effects are often not the only effects. There are many indirect effects as well, and these may be either desirable or undesirable. ^{10/} The two following examples are suggestive of the multiple impacts attributable to improved education. For example, increased education has generally been assumed to improve labor productivity. However, the benefits of increased labor productivity not only may accrue to specific individuals but also to society (assuming a demand for labor).

Increased education is also associated statistically with household decisions to limit family size. At the same time, there is a high correlation between educational status and the probability of migration from rural

to urban areas that, in certain situations, may yield negative externalities. In areas where economic growth is slow or stagnating, such migration patterns often exacerbate living conditions for both urban and rural dwellers.

In the case of health, program outcomes may manifest themselves in numerous ways both in direct improvements in health status (irrespective of the measure used) and in human resource measures (such as rates of learning, attentiveness, anthropometric measures, and changes in desired family size). Clearly the impact of a particular health intervention factor may spread in many directions and take many forms. Thus, a person's creativity in setting up a program and the ability to monitor it, acknowledging budget constraints, may be the only reins on the possible outcome indicators.

Time

There are two important ways in which time is significant in the evaluation process. First, time is often an important variable in the dynamics of the diffusion of an intervention throughout a given population, in the way indirect impacts and feedback processes operate on desired outcomes within a household or a community. In the health care delivery context, time is also an important resource that individuals attempt to conserve. In many societies, time-use considerations are more important factors in health care utilization choices (where and whether to utilize and if so, ^{how} much) than are other resource use considerations such as user changes. ^{11/}

Second, time is critical in determining when to conduct an evaluation. Some outcome measures such as the vital events of a population may not be affected during the initial intervention period. Programs may require a long gestation period before any measured change occurs. The impact may be cumulative and may peak subsequent to the assessment. In such a case, when the evaluation occurs before the peak impact, the evidence may indicate "failure," yet had the assessment been conducted after the peak impact of a particular intervention, the program would have been considered successful. The opposite can also occur. A program in the short run may appear more successful than its longer term effects would warrant. ^{12/}

Current project design standards imply that an evaluation be conducted within 4 years of project inception and that projects are rarely evaluated for impact after termination and, thus, the impacts are not documented. In addition, because the impact may be greater or less than they were at the point of evaluation, the evaluation results may also be biased.

III. Concepts for Incorporation into Health Project Evaluation

The Economic Rationale for Choosing Health Project/Program Evaluation Measures

While changes in vital event measures are important indicators of a health program's effectiveness, in the present development context other health impact indicators must also be used. The Alma Ata conference imperative, "health for all by the year 2000," is only interpretable in the broader context of basic human needs and the quality of life rather than in the context of economic growth maximization. The present human needs context stresses consumption imperatives, whereas the growth maximization approach has tended to stress investment activities necessary to attain that growth objective.

Because benefit-cost analysis, one of the most often used analytical frameworks, has traditionally measured social investment flows in the form of lost or reduced labor productivity due to high mortality and morbidity (the classic human capital approach), consumption benefits measured by utilization, willingness to pay, and revealed preferences have not generally been incorporated into the analysis. Thus, the human capital approach to measuring the benefits of health programs is considered to be an overly circumscribed approach for evaluating health activities.^{13/} This approach is also weak in its considerations of the synergistic, demographic externalities of health activities where such impacts can have a rather long gestation period, can feedback on themselves, and can alter an entire society's demographic structure.^{14/}

Health Impact Measures and Economic Benefits

Health has both investment and consumption attributes. Individuals and households demand medical care when they perceive a reasonable probability of alleviating pain and suffering either by themselves or by significant others. Households commonly attempt to avert the death of their members to the extent their knowledge and resources allow, not simply for human capital investment reasons, but also for the consumption reason of improved quality of family life.

More formally stated, impact evaluation activities have suggested that changes in vital events rates, such as infant mortality or crude death rates, are the only appropriate final outcome measures on which to focus attention. Changes in these rates have been used as the criteria for an intervention's success, largely because the traditional rationale for donor involvement in development activities focused on the extent to which measured economic output was or would be increased as a consequence of the intervention. Considerations of consumer satisfaction or quality of life

in such instances have been deemed an incidental benefit. However, measures of health services consumption benefits and their valuation are increasingly important. Figure 2 summarizes these ideas and concepts.

For example, the information presented in Figure 2 shows that a change in a vital event rate such as infant mortality can lead to a series of consumption as well as investment benefits. Similarly, other measures such as health service utilization rates and indications of consumer satisfaction have both investment and consumption benefits.^{15/} The timing of benefit onset magnitudes and duration is yet to be empirically determined for virtually all of these measures. A substantive case can thus be made for future empirical work that focuses on these issues.^{16/}

Given that different types of investment and consumption benefits are derived from health projects/programs when various project impact measures change (as indicated in Figure 2), it is important that more than one impact indicator be used in health project evaluation. Further, to the extent that basic human needs and quality of life considerations are believed to be important development goals, health impact measures, such as utilization, and indicators of consumer satisfaction will warrant increased attention in terms of measurement and analysis. Because all indicators presented in Figure 2 have investment benefits, there is a further rationale for engaging in improved measurement and analysis of indicators. These changes would improve the standard benefit-cost analyses by including a more complete set of benefits in the analysis.

In recent years considerable progress has been made in measuring health status. The work of Katz et al. (1963),^{17/} Chen and Bush (1975),^{18/} Gibson et al. (1975),^{19/} Densen (1979),^{20/} Mushkin (1979),^{21/} and WHO (1979),^{22/} among others, has charted a clear path through the theoretical measurement problems and has established practical solutions for functional health status indexes. Survey research techniques have been developed and tested for monitoring the changes in social, psychological, and physical measures of functioning. These measures have been scaled and tested for reliability and discriminatory power on a number of different populations and have become generally accepted. While most of the instruments have only recently been developed, their use has been increasing in health program evaluation in the United States in such diverse areas as ambulatory, nursing home, and home-based health care.

While conceptual and measurement development has greatly enhanced the feasibility of improving the monitoring of morbidity and debility changes in the developing country context, mortality impact continues to be an important component of a health intervention program. In many countries, one of the primary objectives of health program interventions is to improve maternal and child health. One primary measure of such improvement is a reduction in infant mortality, irrespective of the reason for the reduction. Thus, for certain selected intervention purposes, the use of simple surveys or vital event registration continues to be an important part of health status measurement and outcome determination.^{23/}

Figure 2. Relationships Between Economic Benefits and Health Impact Measures

Economic Benefits	Health Impact Measures				
	(1) Vital Event Rates			(2) Other Measures	
	Infant mortality	Life expectancy (death rates)	Morbidity	Utilization rates	Consumer satisfaction
Investment	<ol style="list-style-type: none"> 1. productivity/human capital rationale 2. demographic impact 	<ol style="list-style-type: none"> 1. productivity/human capital rationale 2. demographic impact 	<ol style="list-style-type: none"> 1. productivity/human capital rationale 	<ol style="list-style-type: none"> 1. arrest declines in health states 	<ol style="list-style-type: none"> 1. greater willingness to engage in normal activities 2. less interest in socially disruptive activities.
Consumption	<ol style="list-style-type: none"> 1. Increased household stability (also investment benefit) 2. reduced household pain and suffering 3. Improved social and leisure quality 4. avoidance of burial and other cultural responsibility costs 5. medical care cost avoidance 	<ol style="list-style-type: none"> 1. Increased household stability (also investment benefit) 2. reduced household pain and suffering 3. Improved social and leisure quality 4. avoidance of burial and other cultural responsibility costs 5. medical care cost avoidance 	<ol style="list-style-type: none"> 1. Increased household stability (also investment benefit) 2. reduced household pain and suffering 3. Improved social and leisure quality 4. avoidance of burial and other cultural responsibility costs 5. medical care cost avoidance 	<ol style="list-style-type: none"> 1. revealed preferences, given alternatives and relative prices 	<ol style="list-style-type: none"> 1. demand pattern shifts 2. quality considerations

In order to measure a health outcome, whether in terms of the mortality, a functional health status index, or via maternal and child health measures such as infant mortality, a survey of the target population is required. Program utilization data are not sufficient for this purpose. Where intervention programs have not been designed with baseline surveys, or where some monitoring of the target population is not included in the project design, a great deal of analytical power is lost for ascribing certain impacts to the intervention program. Thus, an important general recommendation is that if a program is to be evaluated on final outcome measures, an appropriate information collection system must be designed and used throughout the life of the project.

The Role of Utilization and Other Indicators

Utilization rates and other indicators of consumer satisfaction can provide insight into the problem of the nonsustainability of initiated programs. Without sustainability, other desired or anticipated impacts cannot be obtained. Utilization pattern shifts are not uncommon in health programs. They are understandable given the often competitive forces that exist in health care markets, despite the general lack of perception of such forces by international design teams. ^{24/} Traditional as well as "modern" providers of health care are very jealous of their patients and often react in individual and collective ways to new health interventions that are antithetical to the long-run sustainability of their efforts. The reasons underlying consumer choice of alternative service providers is an important area for continued study.

If a health intervention is intended to increase awareness and adoption of prevention health practices (family planning represents one special subset), it may be appropriate to monitor changes in the knowledge, attitudes, and practices that underlie acceptance of that particular type of service (as is done in the KAP surveys by the Office of Population). Examples using this approach in the health area are the evaluation of the Tanzanian mass health education program conducted in 1973 ^{25/} and, more recently, the evaluation of health education activities initiated in Honduras and the Gambia. ^{26/}

Several approaches used in the United States to measure changes in satisfaction resulting from changes in the use (consumption) of health services can be adapted for use in developing countries. One is the household-based health interview survey that has been conducted in the United States since 1957 to obtain population-based health service utilization rates. ^{27/} More precise estimates of utilization rates are possible when the numerical information is related either to changes in consumer satisfaction that are established through survey instruments such as those developed by John Ware, Jim Bush, and others, ^{28/} or to changes in willingness-to-pay responses that are elicited through methods suggested by Ed Clarke, Joseph Lipscomb, and others. ^{29/}

Other inferential information about changes in consumer satisfaction that reveal changes in the quality of life can be obtained by monitoring the allocation of time to consumption, production, and leisure activities at the household level. ^{30/} Analyses of time allocation can reveal health program investment benefits as well. For instance, in agriculture, it is possible to obtain information about household members' allocation of time among various activities when the demand for farm labor is the greatest--at planting, weeding, and harvesting. In fact, there have been a number of farm management studies that have obtained such information about the allocation of time from season to season for various activities. ^{31/} Furthermore, information available from primary health care facilities in other countries confirms a utilization pattern that is inversely related to peak agriculture demands for labor. ^{32/} As farming system research develops, information regarding the time allocations of rural household members to specific agricultural tasks over the production cycle, given the functional health status of each member, will provide further insight into the nature of the opportunity costs involved. Whether they be foregone agricultural output or additional nonhousehold labor costs incurred to obtain the same production level, they could be avoided if successfully implemented and sustainable health projects were in operation. ^{33/}

Seasonality factors provide other useful health impact measures. In many rural areas, patterns of abundance or scarcity of time, money, or barter goods may also follow agricultural production patterns. The number of people suffering certain health problems, such as seasonal malnutrition, could be used to predict labor productivity changes, especially during periods of scarcity. ^{34/} Further, if traditional health practices are employed or "modern" health services are sought based on a seasonal pattern, such a pattern might manifest changes in the pattern of disease and in how people perceive the relative therapeutic value of one provider type or another. By knowing the total utilization pattern for all providers in an area over time, trends in total impact are more likely to be uncovered.

The above discussion indicates the value in giving such measures as utilization more priority in project evaluation than they have been given in the past. The purpose of AID and other donor development programs is not to provide unending support to countries solely to increase their consumption of goods and services. However, evidence from developing countries increasingly suggests that unless a minimum level of consumption of basic goods and services is reached, investment returns in the form of productivity gains will not be forthcoming due to mental and physical capacity and motivational reasons. Because human resource augmentation through education and health programs is occurring, such measures as utilization indicators to monitor short-run consumption can provide an initial determination of whether programs may yield equitable, longer run investment benefits, which are self-sustaining, and address basic human needs. ^{35/} It may be important in selected projects to monitor the relationship between a utilization indicator and vital events measures to reconfirm the partially supported hypothesis discussed above concerning consumption levels and investment returns.

Social Valuation of Consumption and Investment Benefits

Assuming the availability of an appropriate measure of the outcome of health program activities such as those suggested above, a valuation of the outcomes that allows comparisons across program activities within and external to the health field is also needed. Traditionally, the main economic benefit included in benefit-cost analyses of social services programs has been the discounted present value of foregone output. In health, the foregone output has been due to either premature death or a lower level of productivity resulting from illness. In industrialized societies with negligible unemployment rates, the assumed measure of valuation has been the wage rate, with education, occupation, age, and sex all held constant.

While a number of authors have been critical of the above approach to valuation of benefits on theoretical as well as empirical grounds, little has been undertaken to alter the situation. Jan Acton reviewed a number of alternative methods of valuation from a conceptual and theoretical perspective.^{36/} He not only pointed out the deficiencies in the "human capital" approach mentioned above but also described the inherent problems of other valuation approaches as well. Perhaps the most serious problem with the human capital valuation approach is that, to date, it has not incorporated the possibility that other people may value an individual's contribution quite independently of the value of the items which that individual produces for the market.

Other valuation approaches also have measurement difficulties. For example, judicial awards and financial allocations by legislative bodies to prevent the death of various subsets of the population facing a risk of death have revealed a range of social values on human life. The ranges obtained are often quite substantial and are not consistent over time relative either to themselves or to other subsets in the population, based on age, race, sex, or occupational grounds.

More recently, Ed Clarke, and Tideman and Tullock,^{37/} have developed a methodological approach for operationalizing the willingness-to-pay concept. This approach, the demand-revealing process, uses survey research techniques of populations or their representatives to elicit "true" willingness-to-pay statements. Thus, the "free-rider" problem is handled theoretically by a tax on an individual or group that is "equal to the net benefits sacrificed by others as a result of taking that person's [or group's] preferences into account. [This amount is] in contrast to the compensating variation, which measures net benefits sacrificed by each individual at the margin..."^{38/} This demand-revealing process further penalizes those individuals or groups who "misrepresent their preferences by the amount of the lost benefit that would occur if a solution other than his preferred choice were selected."^{39/} Thus, this approach not only captures the value to someone who is a direct beneficiary of a health intervention or program, but also the value of a positive health outcome that accrues to secondary beneficiaries due to individual or collective action.

Efforts are being made to build upon the initial work conducted by Jan Acton (1973) ⁴⁰⁷ to improve the empirical methodology that will elicit appropriate willingness-to-pay responses from the public. A multidisciplinary research effort is obviously implied because of the psychological and sociological implications to the measurement problem.

Given the present empirical difficulties of attaching values to the benefit streams of health programs, the continued use of benefit-cost analysis in program evaluation and planning is seriously constrained. A more tractable position for program evaluation purposes is to detail the set of benefits, effects, or impacts that arise out of a particular health program intervention and compare them to the costs incurred; that is, conduct an ex-post cost-effectiveness analysis. The primary problem with such an approach is the general lack of comparative situations. Without reasonable comparative situations, it is difficult to determine the relative cost-effectiveness of the intervention under review.

Health Project Context

A serious flaw of many evaluations is their lack of context analysis, the context being the environment in which the project "lives and breathes." The context can often be the source of many difficulties, but it can also be the reason behind the success of a particular intervention. To improve the likelihood of achieving the intended outcome of a project, a comprehensive understanding is necessary of the relationship between a project's environment and each of the particular activities undertaken.

For analytical purposes, it is useful to classify the contextual or environmental variables into two categories, intraprogrammatic and extraprogrammatic or nonprogrammatic, i.e., situational. These terms coincide with the endogenous and exogenous variables of systems terminology.

Intraprogrammatic Context

The programmatic context is defined as those variables that are within the administrative or managerial control of a health sector or project decision maker. There are a number of such contextual factors that warrant discussion. These factors include (a) the design and choice of health sector technology; (b) the management of personnel, logistics, and supply maintenance; and (c) the timing of service delivery.

An example of a relevant choice of technology in a developing country is what type of nonelectric-powered refrigeration unit should be purchased for use in rural facilities for maintaining the freshness of live measles vaccine. If refrigeration is unavailable, then either alternative storage technologies must be considered or an improved logistics supply network developed in order to launch an effective measles immunization program.

The initial refrigeration technology choice made by the decision maker represents an intraprogrammatic contextual variable that defines the capacity of that health care system to provide efficacious measles immunizations at a given cost.

The immunization example can be extended one step further to deal with the issue of the importance of timing of service delivery. Often, multiple vaccine doses are required to build up the appropriate immunity levels in the population. If the timing of the repeat doses does not adhere strictly to the required schedule, the positive externalities accruing to a population from the immunization program will not be forthcoming. Similarly when a drug supply and distribution program is not successfully implemented within a health care delivery system, fluctuating utilization patterns occur; in the longer run, total utilization levels fall.

Nonprogrammatic or Situational Context

There are many nonprogrammatic or situational contextual factors affecting a particular intervention. These factors, more often than intraprogrammatic ones, determine the character and impact of a particular project. A brief enumeration of some types of nonprogrammatic factors provides ample indication of the scope of potential "slips between the cup and the lip." These many factors can be categorized in the following ways: (a) macroeconomic, (b) political, (c) biological, (d) environmental, (e) demographic, (f) cultural, and (g) individual socioeconomic and health status characteristics, including education, household dependency patterns, income sources, and level of physical and mental functioning.

Some examples of situational factors that can affect the design, implementation, and impact of health projects are sketched out below. Within the economic context, the distribution of income, the rate of economic growth and its distribution across sectors and to individual beneficiaries, the foreign exchange situation, including price trends of principle export commodities, import quotas, the level of food production, agricultural price policy, international energy price and production, and distribution policies, all affect the health care sector and the implementation of a given health activity.

From a political perspective, a variety of factors could help to explain the relative success of a particular project. For example, a health program with a fee-for-service medical care policy would not be appropriate for a country that has determined that medical care is a "merit want" or basic "right" of citizenship. In another case, if a project requires political leadership and commitment to implement a larger rural primary health care program, an analysis of the likelihood of this commitment, particularly with respect to the government's willingness to allocate scarce recurrent costs in its annual budget to this activity, is necessary. Finally, if the project requires mutual cooperation from several implementing ministries, as is generally true for nutrition interventions, it is

important to determine what types of organizational mechanisms most facilitate the cooperation required for successful intervention.

With respect to potential biological and environmental considerations, seasonal and other weather differences can influence the prevalence of a disease vector, as in the case of malaria or schistosomiasis. The initial physical health status of the population, another biological variable, can facilitate or impede a mass immunization campaign. Further, cultural and religious considerations often affect the implementation of projects.

The demographic context of the country, especially at the local level, can also be an important situational variable to be considered. A program launched where there are 10 people per square kilometer rather than 1,000 has different demographic factors to address. Similarly, different age structures, fertility, and mortality patterns and migration flows can alter the implementation strategy and final outcome of a health project.

Finally, education, income, and ethnic differences of the target population can influence the success of project implementation as has been demonstrated on many occasions in the family planning field.^{42/} Finally, for donor-funded programs, it is important to distinguish between contextual factors found in the particular country where the program is being implemented and those intrinsic to the bureaucracy of the donor agency or its larger social context.

Today, most projects considered for funding by AID undergo a social soundness analysis in which some of the constraints outlined above are investigated. However, most data systems are based on a need for evaluation and managerial control and rarely gather information on the above-described program or situational constraints. Furthermore, the reasons for choosing certain strategies or incorporating certain technologies into a project are rarely well documented. This lack of documentation is particularly true when design changes occur in a project over time. As a consequence, "success" or lack thereof is difficult to attribute clearly to either the management of a project or the environmental variables outside the control of the project.

One implication of this discussion is the importance of a well articulated, applied research agenda that can monitor these potential constraints or facilitating variables and improve the knowledge base upon which future projects can be developed. Some operational research has been conducted on health care programs in developing countries and additional studies are now being initiated.^{43/} Continued and systematic experimentation with alternative health care programs in different countries and regions is necessary to determine how a given intervention will perform in a given environment.

Cost and Financial Analysis (Economic Sustainability)

It has become increasingly clear that one of the most serious constraints to the achievement of health project impact has been the problem of longterm economic sustainability. An increasing number of countries are facing severe balance of payments and recurrent budget deficit problems, which have become larger during the 1970's. ^{44/} These economic problems have necessitated more careful attention to the cost of health care provision and to alternative mechanisms other than traditional government budgetary sources for financial support. Because WHO's primary health care strategy for achieving health for all by the year 2000 has been initiated in an era of increasingly scarce resources, WHO has given increased attention to the cost and financing issues of primary health care. ^{45/} In this present milieu, more consideration is being given to seeking financial resources from individual patients through fee-for-service or prepaid insurance schemes and from local community sources through such social mechanisms as local taxes or cooperative social welfare funds which are developed via charges ^{46/} imposed on agricultural input and output prices paid by and to farmers.

Today, in developing countries, few if any exemplary primary health care delivery systems exist that are self-financing. All systems require some government financial support, either directly or indirectly (for example, through subsidized insurance premiums). The important issue today is to ascertain how much government support is necessary to sustain a health care system at given utilization, quality, and cost levels and what kind of alternative self-financing mechanism mixes are required to provide any remaining portion of support.

A careful analysis of the microeconomic situation of the health care system includes an analysis of (a) recurrent cost flows, (b) incentive structures of all provider and consumer constituents including other health care providers not being assisted by the particular project, (c) real opportunity costs of resources used in the provision of health care services, (d) charges in resource use in relation to utilization charges, and (e) costs and benefits of the alternative financing mechanisms employed. Without such an analysis, knowledge concerning the long-run sustainability of the project or intervention, including its presumed beneficial impacts, will be incomplete. An analysis of each component as outlined above must be conducted to determine sustainability. ^{47/} The answer to the question of sustainability is not immediately obvious and requires analyses of the relative importance of specific demand and supply factors in each country and perhaps in each region. The impact evaluation studies in Senegal and Korea as well as a recent health financing study conducted in Nepal emphasize this point. ^{48/}

Equity Considerations

The present legislative mandate under which AID operates defines a clear objective for all of its projects. It clearly requires that projects be designed to focus attention on the most disenfranchised members of society to achieve self-sustained growth that is equitably distributed throughout the population. ^{49/} Most of AID's project portfolio is so focused. The implicit assumption underlying this mandate is that by targeting projects to improve the welfare of the poorest subset of society, equity will be enhanced.

Since 1974, however, there has been considerable frustration among those in the health and other social and economic sectors charged with implementing and sustaining activities that address the basic human needs of the poorest groups in a given society. Given the nobility of an equity objective, how can one ascertain the relative attainment of such an objective during an ex post evaluation of a health project? To the extent that equity has been explicitly considered by health project planners, it has generally been assumed that equity of access to health care services as measured by the distribution of health care providing resources (input equity), would lead, over time, to a more equitable health status distribution in the population (outcome equity). ^{50/} Unfortunately, the assumed linkage between input and outcome equity has not been empirically substantiated, particularly given the lag in response time between the attainment of one objective and another.

There are other difficult issues to consider as well in analyses of equity. For example, to the extent that any one subset of the population has a poorer health status than another group at the beginning of a program, is it equitable to distribute health care-providing or health-augmenting resources from an access or input equity perspective? In this case, if one seeks eventual improvements in outcome equity subsequent to a particular intervention, unequal distribution of resources during the life of the project in favor of the relatively disadvantaged group may be required.

It is important also to consider the time dimension of the equity issue, particularly with respect to the economic sustainability of a given health intervention. Two equity issues arise in this context. First, what is the distribution of cost bearing across groups in relation to the distribution of the benefits, or, to what extent do those who benefit from the project sustain the costs of the project? Secondly, an equity issue is involved when a given health activity is initiated without prior consideration being devoted to the development of a plan of economic sustainability to maintain the progress initiated with development of the project. ^{51/}

Finally, it is important that information on resource distribution and measures of intervention impact be disaggregated for purposes of equity analysis. Geographic, age, sex, and income characteristics of the population constitute the minimum disaggregation necessary for conducting such an analysis within an evaluation study.

A Systems Approach to Health Project Evaluation

Conceptual Rationale

In the past, an ex-post benefit cost model has been used implicitly in project evaluation. The goals of a project as defined, for example, in the "log-frame" of an AID project paper, were considered as the appropriate set of benefit measures to be used for comparison with the costs. However, both theoretical and practical reasons exist for not using such a framework for health project evaluation. From a theoretical perspective, benefit-cost analysis is basically a micro-oriented tool.^{52/} To the extent that it is used to analyze programs or interventions with marginal impacts on the entire economic, social, and demographic structure of society, it may yield analytically sound conclusions. Benefit-cost analysis assumes no changes in prices, in quantities of the factors of production, or in the pattern of demand as a consequence of a particular health program. Unfortunately, this basic microstructural assumption makes benefit-cost analysis particularly vulnerable when used to analyze health-related interventions that may alter a number of social variables including demographic structure. In developing countries, where health interventions are often aimed at significantly reducing the incidence of major health problems such as malaria or schistosomiasis, supply and demand relationships in a number of markets are likely to be altered over time.

Equally important from the perspective of health program planners and managers is the fact that the technology of primary health care is still in an early evolutionary state, where similar input combinations may yield different results in different locations. For example, volunteer workers in some countries have been more effective than in others. Community participation, that keystone to the success of primary health care programs, has occurred in some countries and not in others. Propharmacies have worked as planned in some contexts and not in others. Referral systems have operated with varying success across programs. These examples provide but a partial listing of the technology design issues confronting primary health care programs.

A further question regarding the variable success of the technology of primary health care is whether contextual or environmental variables lead to the relative failure of the technology or some aspects of it, or whether there is a basic technology design problem. As an analogy, consider the many possible reasons for the nonstarting of a motor in the Arctic. Environmental reasons, such as the cold weather, could be responsible for its failure to start, or, it may be that an engine in cold climates must have a slightly different structural configuration or fuel mixture, or both. These latter problems represent technological design problems.

To answer such practical issues on the working of a primary health care program, it is useful to consider an evaluation framework that incorporates analyses of the underlying causal mechanisms connecting input

resources, activities, and outcomes in an environmental context. The use of a systems approach facilitates an understanding of the reasons why a project's goals were or were not achieved. Such an understanding is also important as a basis for making initial distinctions between cases in which a set of similar inputs produces a given result in one area, but not in another that may be characterized by somewhat different circumstances. Hence, there is a need to know more about the entire system, both its components and their interactions.

Towards a Systems Design

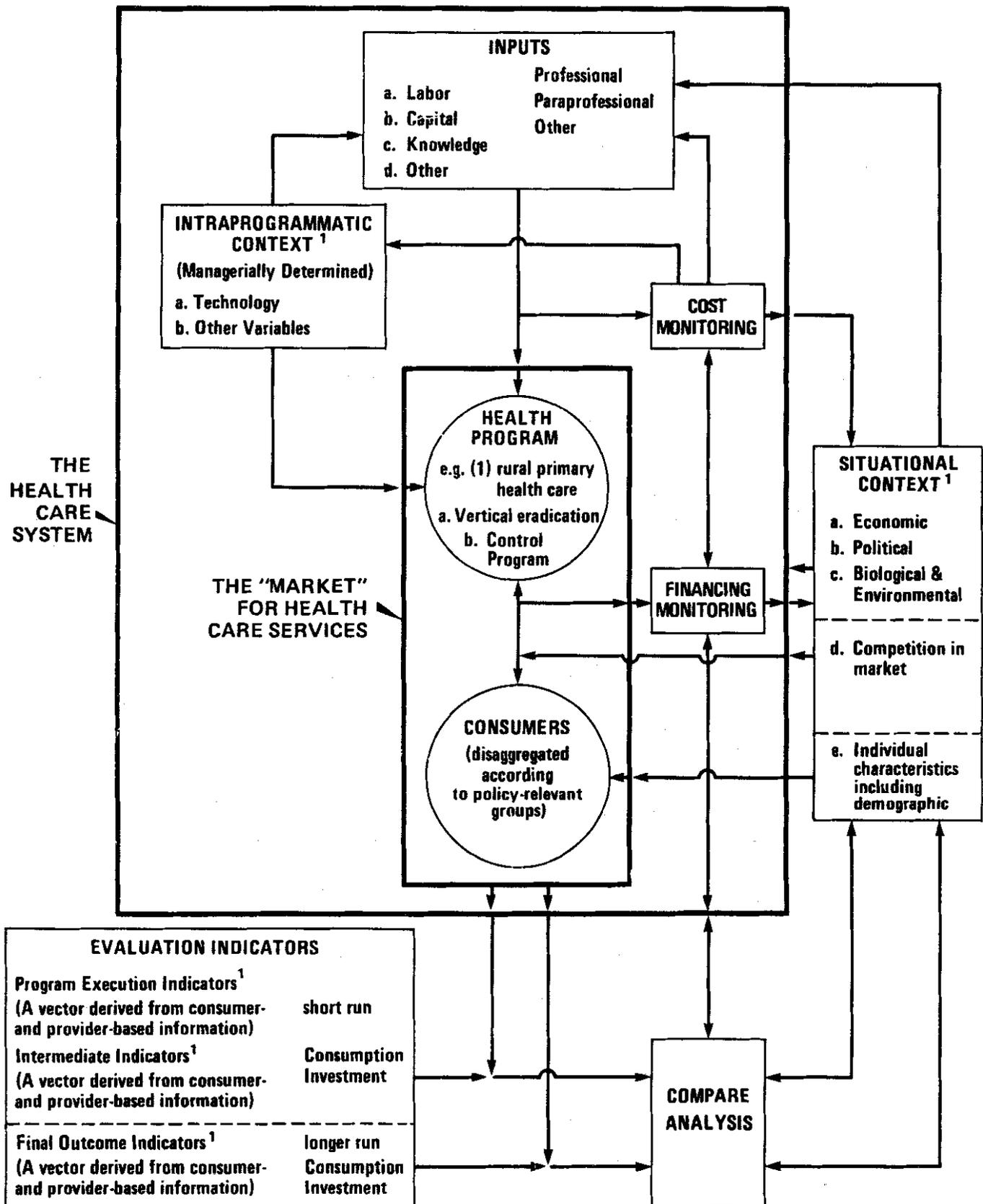
In Figure 3, a heuristic design of a health sector intervention project or program evaluation system is provided. It attempts to incorporate most of the ideas and concepts developed above. In the paragraphs that follow, the principal characteristics of the envisioned system are outlined. It is only within the context of a specific project or health sector intervention that operational definitions of the program, its technology, the situation and process and program indicators, and the resulting benefits and costs (impacts) are forthcoming. For pedagogical purposes an example follows that will provide an outline of this system.

Assume that a rural primary health care service system, which uses paraprofessionals to supervise volunteer health workers, is being established in the poorest region of a poor country. This service system requires various inputs (top of figure) combined in a particular way (later technology and design) and organized, administered, and supervised according to some defined criteria (see intraprogrammatic context).

The primary health care program has been established in a particular poor rural context that is, however, related to a local and national set of economic, political, biological, and demographic contextual variables that define the larger environment (see the right hand side of Figure 3). Further, the program has entered a particular market context for health service provision in that region. Finally, consumers have specific characteristics, preferences, and resources that order their behavior and define how they relate to the new program. The consumers are further disaggregated into policy-relevant groups for purposes of equity analysis, based on resource distribution, outcome, or cost bearing indicators. Thus, both sides of the market for health care services are defined in a contextual way. (All of these relationships are defined in Figure 3, and are marked by the arrows joining the situational context and the market interactions among consumers, the primary health care system, and the other health care providers.)

Both costs and local financing of the health care system are monitored at the appropriate points in the system and the resultant information is transmitted as indicated to other points in the system for daily decision-making purposes. This information is additionally used for periodic comparative purposes as indicated at the bottom of Figure 3.

Figure 3. Health Sector Intervention Evaluation System



¹See Appendix B for a more detailed list of indicators within each vector.

Finally, there are three classes of objective attainment indicators: program execution, intermediate outcome, and final outcome. A review of Figure 2 provides an indication of the types of benefits (consumption and/or investment) that are derived from specific indicators whose information at base is consumer or provider located. (See Appendix B for disaggregation of potential indicators.) The values of these measures also flow back to various sectors (as indicated by the flow arrows), including the health care system, and may alter the subsequent activity of the initiated health care system. The arrows for each class of indicators are also defined in such a way as to suggest, as Mohapatra has, that a

. . . heirarchy of objectives is linked together in a series of input-output chains in which lower-order outputs . . . become inputs in higher-order activities. Any program can be analyzed in terms of the large number of input-out chains of which it is composed; indeed, the soundness of a program can be judged by the realism of the assumptions . . . used to construct these linkages. 53/

To summarize, Figure 3 emphasizes the importance of integrating final outcome and intermediate or process evaluation efforts by determining the extent to which both nonprogrammatic situational and intraprogrammatic constraints have aided or impeded a project's development. Besides basic lack of program resources, other intraprogram constraints, such as managerial problems, the initial design, and the technology embodied in a program are examples of topics for "process evaluation." Evaluations that analyze political, socioeconomic, and income distribution variables assist in determining the extent to which such constraints alter the course of the program, and thus, define the extent to which the program can be expected to achieve final outcome goals.

Further, it is important to point out that Figure 3 implies a set of functional relationships between final and intermediate outcome indicators, as well as sets of relationships with inputs and constraints. These relationships are indicated by the arrow from one set to the other. For each set of indicators, it is possible to hypothesize the sign of the relationship between two variables or indicators, holding all other things constant. In practice, however, many relationships have little empirical support. Where theoretical relationships are not supported by empirical studies, additional research work is implied.

Why These Indicators?

There are several reasons for recommending the use of the taxonomy outlined in Figure 3 and delineated in greater detail in Appendix B. First, by developing and using a larger number of indicators, the subtleties of causal chains and the relative importance of constraints can be investigated more systematically. Simplistic assertions of cause and effect can be avoided.

Second, provider indicators are, for the most part, related to successful performance of administrative and managerial functions. Systematic monitoring of the administrative and managerial context can provide program decisionmakers with improved knowledge regarding program execution problems and a better understanding of their cause.

Third, each evaluation level proposes one or more indicators of consumer response. These measures give an additional set of criteria for evaluating AID activities which address basic human needs. In such instances evaluation of consumption outcomes acquires added importance.

Fourth, this set of measures enables the monitoring of programs at an earlier point using program execution and intermediate indicators. Thus, earlier adjustments in project implementation can occur. Because each set of indicators measures a number of different attributes of program activity, they can be used to more clearly ascertain where a potential problem might exist.

Fifth, data gathered from household surveys are not generally required for many of the proposed measures. A well-designed, program-specific information system can be provided a significant proportion of the information required for the intermediate outcome measures as well as some of the consumer-oriented final outcome measures. Much of the constraint information can be obtained through existing documents or well designed interviews with a selected set of informants. Often, very little information requires collection using a household survey; thus, the cost of early evaluation efforts may be modest. If specific case studies are strategically picked, household-based data may already exist, as, for example, in the Bicol region in the Philippines.

Finally, the existence of a multiple set of measures and indicators that can be used in short, intermediate, or long-term evaluation contexts, means that various reporting and evaluation requirements can be met using appropriate measures without conducting exercises simply because changes in final outcome measure were established as the long-range raison d'etre of the endeavor. More focused and, therefore, less expensive evaluation efforts can take place throughout the life of the project, thus increasing the feedback usefulness of such evaluation activities.

While all suggested measures suffer from a certain amount of measurement bias and other data-gathering limitations, many problems can be circumvented or minimized earlier in the life of the project by having the program-specific information system more closely integrated into the evaluation process.

IV. Other Evaluation Considerations

There are three additional issues to address in determining the feasibility of using an analytical approach and the respective impact measures to employ in a health sector evaluation. These issues, stated in a question format include: (a) For whom (audience) is the evaluation being conducted? (b) Is data available (information quality and quantity)? (c) What does it cost to obtain and analyze the information in an evaluation study? These issues are addressed below.

Audience Appropriateness

No one impact indicator is appropriate for all audiences, nor does any one audience normally require all indicators to answer questions relevant to its interest. As one evaluator has commented, "even when there is a clear commitment to evaluation, per se, there must be clear understanding of why [a given] evaluation is being carried out . . . [T]he decisions which are to be made on the basis of information to be collected must be known for the right information to be collected." ^{54/}

There are a number of specific audiences that request evaluations of health projects. In many instances, these varying audiences define the scope of inquiry and the relevance of various indicators. There are at least seven distinct audiences who may request an evaluation report: (a) external donor organizations--for themselves (policy) or for their individual constituencies, for example, AID requesting an evaluation for presentation to Congress (justification); (b) the national government or the relevant ministry with jurisdiction over the project; (c) the regional (provincial) subset of that ministry; (d) the local administrative office or person responsible to the ministry, for example, the district medical officer; (e) the leadership of the local community; (f) the project or program director; and (g) the workers involved in the development and performance of the project.

In general, those most removed from the daily operation of the activity are interested in knowing the extent to which the project's final outcome has been achieved, for example, the extent to which infant mortality has been lowered. On the other hand, program administrators and service providers are most interested in measures of direct program activity such as utilization. They require information for supervisory purposes. Thus, it is not surprising that more than one evaluation or multipurpose evaluations may be required. Further, applied research is necessary to determine the extent to which changes in one indicator are necessary to determine the extent to which those changes are correlated with changes in other indicators that may be of interest to other audiences.

Data Availability

The data for many measures can be obtained not only from a project managerial information system, but also from other available sources. It is useful to review these sources before launching new efforts to obtain data.

Some data, such as baseline information, can be obtained only through periodic, population-based surveys. ^{55/} Baseline information is needed on the characteristics of the target population so that the "true" changes in specific impact measures over the life of a project can be ascertained. For example, research conducted in Honduras indicated a 60 percent under-registration of infant deaths. ^{56/} Since there may be considerable variance in underreporting throughout a country because of differences in ethnicity, income, and other social and cultural factors, health programs may have little choice but to derive independent estimates of vital events in the target population by using survey techniques to obtain the desired policy guidance.

One potentially cost-effective survey mechanism, the multipurpose, household-based interview, is being used in certain selected sites throughout the world. For example, a multipurpose data collection effort funded by AID in the Bicol region of the Philippines has incorporated health-status and time-allocation questions into the protocol. ^{57/}

To conclude, there are several other sources of information available to evaluators other than project-specific information systems. Many government reports and documents are available from the national, regional, and local governments. Many nongovernmental agencies and institutions have similar reports and studies available. Universities and related research institutes, bureaus, or centers have often conducted studies related to the issue under consideration. A particularly neglected source of information is student papers, theses, and dissertations. Finally, in many countries, ongoing consumer-based household-interview surveys exist. Whether new survey instruments require development, or whether existing mechanisms can be tapped for use in obtaining consumer-based program impact data, is a question requiring case by case determination.

Cost of Information

Finally, the cost of obtaining accurate information to evaluate health programs is a serious concern. Vital events data are particularly costly to obtain with accuracy for large areas. Epidemiologists and other survey research experts have pointed out that, without expensive survey research procedures and careful records maintenance, such information is virtually unobtainable.

Although it is often desirable to have as much information as possible, basic resource constraints require that every information gathering and analyzing endeavor be subject to its own benefit-cost analysis. The costs should be disaggregated into three basic categories: (a) estimates of financial resources required as a proportion of total project costs, (b) estimates of minimum manpower skills required to obtain reliable and timely information, and (c) estimates of time required to obtain the data and make them available for evaluation and decision-making uses.

When considering if collecting a particular kind of information is worth the costs, both the expected utility of that information to the program and the opportunity cost of not collecting that information must be estimated. The costs of opportunities foregone by not collecting certain information stand out more clearly than do future costs, which can only be anticipated in part. For AID, the nature of past opportunity costs is quite clear; many AID projects face evaluation obstacles that are almost insurmountable and that would not exist if more investment had been made in information collection, analysis, and storage. With more information, the ambiguity of what constitutes appropriate technology for a given service under particular conditions would be reduced.

Neither the successes nor the failures of the past will improve the chances of future success without evaluation efforts that base their interpretations on sound information. Both those within a country who make resource allocation decisions and donor agencies must be fully apprised of the need to be "willing to pay" in order to obtain the information required to assess their program portfolio development. Systems for collecting program information, both routinely and periodically, must be carefully planned and executed. Greater considerations (and special funding) should be given to designing fewer but more precise information systems to collect final outcome data that would be applicable to more than one development activity.

V. Summary and Recommendations

Summary

This paper emphasizes that the evaluation process is subtle and long term—a process that requires integration with other health and development activities. It involves the management and development of information-gathering, coordinating, analyzing, and disseminating systems. This document analyzes the past health project evaluation focus on vital-events changes and suggests a more eclectic focus, one that is more consistent with the present socioeconomic development goals as defined by the basic human needs strategy of development. It also recognizes the need to conform to the increased practical budget-constraint realities of conducting such studies. It outlines a number of evaluation activities that can provide policy-relevant information depending on time, personnel, audience, data and availability, and other constraints. These evaluation activities are integrated into a system framework that shows how partial analytical studies can be useful in addressing more general outcome issues and concerns.

Recommendations

(1) Vital-events rate changes have been overemphasized as the measure of success of health care interventions. As a consequence, many other impacts of such projects often go unnoticed. An alternative, more pluralistic approach to the definition of success is recommended. Such an approach has been developed in this paper. It suggests that both consumption and investment benefits can be derived from various indicators of change. A number of alternative indicators have been proposed as additions to, or, in some cases, as substitutes for vital-events changes. An accurate appraisal of success in the health sector requires their incorporation.

(2) Evaluative studies of past and ongoing health endeavors provide many lessons from studies of past and ongoing health endeavors to improve future activities. Recommendations to improve evaluation studies include the following:

(a) In their design phase, management information systems in health projects should be made as compatible as possible with short- and intermediate-run evaluation needs.

(b) Multipurpose, population-based survey instruments should be designed and implemented in selected primary health care delivery projects to monitor the general welfare impact of basic human needs investments as measured from various perspectives on target populations.

(c) Measurement and evaluation activity should be undertaken periodically; several repeated observations should be taken on each measure over a sufficiently long period that the dynamic nature of the changes can be ascertained.

(3) A recommendation complementary to those in (2) above is that the primary health care operations research agenda under present consideration should focus its attention on cost-effectiveness analyses of alternative technologies for low-cost, primary-health care delivery systems. It should also examine the impact of alternative financial mechanisms on the several health care systems outcome indicators discussed in this paper. The systems evaluation framework defined in this paper could be used as a general guide for overall research priority definition.

(4) Evaluation studies, analytical work, and information flow all imply that additional resources will be made available and that a long-run commitment will be forthcoming not only from AID but also from its funder, the United States Congress. If Congress wants to know what programs or program elements are successful and if research activities on health services effectiveness are to be undertaken in as systematic a way as, for example, those to find a cure for malaria, schistosomiasis, heart disease, or cancer, then there must be a willingness to pay for these activities. Because evaluation activities are cost-effective, (the redesign of the Sine Saloum Project in Senegal based on an evaluation is a case in point), it is recommended that the necessary commitments be made.

(5) The log-frame presently used in virtually all AID projects has several important flaws as it applies to health projects. In particular it provides no means to incorporate any of the following elements: (a) intermediate measures of impact, (b) realistic expectations for achieving such changes, (c) important assumptions of or constraints on project activities, and (d) integration of effects and outcomes to define a "critical path" toward final outcome achievement. It is recommended that appropriate variations on the log-frame be developed.

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- (24) For specific analyses of sustainability problems facing primary health care programs see Richard Weber et al., Senegal: The Sine-Saloum Rural Health Project (Washington, D.C.: U.S. Agency for International Development, 1980); and David W. Dunlop et al., The Korea Health Development Project Impact Evaluation (Washington, D.C.: U.S. Agency for International Development, 1981). For a general discussion See David W. Dunlop, "Health Planning: What about Demand?" Social Science and Medicine 14C (1980): 1-3.
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- (27) For an explanation of the purpose, scope, and methodology of the U.S. National Health Interview Survey, see NCHS, Health Survey Procedure: Concepts, Questionnaire Development and Definitions in the Health Interview Survey, Series 1, No. 2, (Washington, D.C.: U.S. Department of HEW, Public Health Service, 1958) 66 pp.

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- (38) Clarke, "Social Valuation" in Mushkin and Dunlop, eds., Health, op. cit., 1979, p. 70.
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- (45) See, for example, World Health Organization, Global Strategy for Health for All by the Year 2000 (Geneva: WHO, 1981) pp. 55-71. The World Health Assembly has also requested the WHO secretariat to provide a more careful analysis of the cost and financing issues facing the primary health care strategy for its May 1982 meeting.
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- (47) See Appendix B for a proposed set of Generic Scope of Work Questions for an Economic Evaluation of Health Projects.
- (48) Weber et al., Senegal; Dunlop et al., Korea; and Dayl S. Donaldson, "An Evaluation of Health Insurance Schemes in the Lalitpur District, Nepal," unpublished M.P.H. thesis (Seattle: The University of Washington, 1981).
- (49) Refer to footnote 5, The Foreign Assistance Act of 1961 as amended in 1974, Part I, Section 102 (a), page 3.
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A similar but slightly different taxonomical distinction between what have been termed in this paper as intermediate and final outcome indicators has been developed by William Reinke. He distinguishes between output and outcome indicators, but does not further disaggregate between consumer- and provider-based measures. See William H. Reinke, "Measurement of Achievement in Primary Health Care," unpublished paper, Johns Hopkins University, 16 pp. (No date 1980). See also Rashid Faruqee, "Analyzing the Impact of Health Services: Narangwal and Other Experiences," World Bank and Human Resources Division Discussion Paper No. 81-6, (Washington, D.C.: World Bank, March 1981).

- (54) James Veney, "Health Program Evaluation in a Developing Nation: An Evaluation Methodology Case Study," unpublished paper prepared for discussion, Department of Health Administration School of Public Health, University of North Carolina, 1979, pg. 31.
- (55) To acquire information implies the use of scarce resources. The nature of the resource costs in terms of financial, manpower, and time requirements are explored below.
- (56) Larry Heligman et al., Measurement of Infant Mortality in Less Developed Countries, International Research Document No. 5 (Washington, D.C.: U.S. Department of Commerce, U.S. Bureau of the Census, August 1978), pp. 1-2.
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APPENDIX A

GENERIC QUESTIONS FOR AN ECONOMIC EVALUATION OF PRIMARY HEALTH CARE PROJECTS:

1. What and how much of each service is being received (consumed, utilized) by the "target population"?
2. What are the distribution issues involved in what is being received; for example, who are the beneficiaries of the service? Included in this question is the distinction between direct and indirect beneficiaries.
3. What is the total set of resources used in the provision (delivery) of the services? Included in this tally are resources paid and unpaid and provided by government, private groups, or individuals. (An example of such a resource would be time used in the consumption process.)
4. How are these resources mobilized? Who pays for what? (The financing question.)
5. What are the specific resource requirements to produce (make, deliver, serve) each specific service provided? (The technology definition question; for example, how much of what personnel, what equipment, and what and how much drugs? How much consumer time?)
6. What other larger, contextual issues influenced in a positive or negative way the design, development, implementation, or sustainability of the project? Included in this group are political, social, cultural, macro-economic, managerial, and administrative factors. To what extent did any or all of these factors affect the above?
7. Can the project be sustained? Of particular importance is the long-range financial viability of the proposition.
8. If a project is approaching its intended initial goal, namely, that services are being and will continue to be received (consumed, utilized) by consumers, to what extent will it "break down other development bottlenecks"? (For example, will productivity increase and if so, how and how much?)

APPENDIX B

A PROPOSED SET OF MEASURES/INDICATORS FOR
HEALTH PROJECT/PROGRAM EVALUATION

Four sets of program measures are presented below. Three of these sets of measures conform to a particular "level of evaluation," such as program execution or intermediate or final outcome. The fourth set is a proposed set of "constraint" or "environmental" indicators.

Before using any of the proposed sets of indicators--or others designed for a particular intervention--they should be evaluated according to general criteria so that the set most applicable to a given evaluation exercise can be selected. The proposed evaluation criteria for indicators are defined by the answers to the following questions: (a) Does the measure/indicator focus on the key issues of concern to the primary audiences of the evaluation study? (b) Can the measure/indicator be measured without significant bias at this point in the life of the project or must more time pass before it appears as a measurable item? (c) What data or informational sources are required to measure the indicator, and is that type of data available? and (d) How much will it cost in terms of financial resources, manpower skills, and time requirements to obtain the data necessary to develop a measure of the indicator? In certain cases one indicator may be preferred theoretically but is not selected for use in the evaluation study for reasons enumerated above.

I. Health Program Execution Measures/Indicators

- A. Consumer-Based Indicators
 - 1. Community participation in project identification design and implementation
- B. Provider-Based Indicators
 - 1. Output measures
 - a. services provided (by type)
 - 2. Input measures
 - a. inputs available for service provision
 - b. personnel trained and recruited
 - c. transport available
 - d. job tasks and technology understood by personnel
 - e. service protocols in existence
 - f. administrative and managerial systems and personnel in place

II. Intermediate Health Program Measures/Indicators

- A. Consumer-Based Indicators
 - 1. Perceived reduction in mortality and morbidity in target population
 - 2. Satisfaction measures
 - 3. Changes in health behavior
- B. Provider-Based Indicators
 - 1. Number of contacts in community by outreach workers (disaggregated by type)
 - 2. Indicators of service quality
 - 3. Access of target population to clinics
 - a. financial
 - b. distance
 - c. time
 - 4. Geographical coverage per standards
 - 5. Provider satisfaction (derived by survey and interview)

III. Final Outcome Health Program Measures/Indicators

- A. Utilization rates/indicators disaggregated by
 - 1. User charges (prices)
 - 2. Program
 - 3. Service provided
 - 4. Alternative delivery system
- B. Consumer satisfaction (via ex post survey methods)
- C. Changes in vital events
 - 1. Infant mortality

2. Death rate (perhaps disaggregated on an age and sex basis)
3. Life expectancy
4. Morbidity (general rate and possibly on a disease-specific basis)
 - a. restricted activity days
 - b. bed disability days
 - c. illness episodes
 - d. functional capacity

D. Other indicators

1. Employment status changes
2. Work impairment
3. Provider satisfaction
4. Equity-resource distribution
5. Cost per unit of change in other indicators
6. Percent of financial and other resources generated

IV. Health Program Contextual Indicators

A. Intraprogrammatic

1. Technological
 - a. capital or labor bias (recurrent cost implications)
 - b. key imported inputs
 - c. timing of input combination
2. Administrative and managerial
 - a. information system
 - b. logistics
 - c. personnel
 - d. financing and budgeting
 - e. leadership
 - f. structural organization
 - g. evaluation and planning

B. Situational

1. Economic
 - a. balance of payments
 - b. import quotas
 - c. foreign exchange
 - d. employment growth
 - e. government financial picture
 - f. distribution of income
 - g. sectoral commitments, e.g., defense
2. Political
 - a. distribution of benefits and costs
 - b. ideological consistency
 - c. political leadership capacity

- d. political commitment (budget)
 - e. government structure
3. Biological and environmental
- a. vector prevalence

 - b. initial health status of population
 - c. seasonality considerations
 - d. cultural (specify)
4. Market context
- a. nature of competition among providers
 - b. nature of competition among input producers, e.g.,
drugs, manpower
5. Community demographic contexts
6. Socioeconomic characteristics of individuals in target populations
- a. education
 - b. income
 - c. access to land
 - d. age
 - e. ethnic origin
 - f. sex

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