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MONITORING AND EVALUATION  
OF  
CHILD SURVIVAL PROJECTS:  
  
A GUIDE FOR PVO MANAGERS

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## TABLE OF CONTENTS

SUMMARY	1
I. INTRODUCTION	3
How To Use This Manual	4
II. MONITORING AND EVALUATION: TOOLS FOR MANAGEMENT AND IMPROVED PROGRAM PERFORMANCE	5
Linkages Between Monitoring and Evaluation	8
III. INDICATORS	11
Figure I: Monitoring and Evaluation System	12
Leading Indicators	13
IV. HOW TO DESIGN AND USE A MONITORING AND EVALUATION SYSTEM	15
Figure II: Decision Making Flow Chart	34
V. DATA COLLECTION: METHODOLOGIES AND CRITERIA FOR SELECTION	37
Introduction	37
Figure III: The Decision Making Process for Data Collection	39
The Guiding Questions: Criteria for Methodology Selection	40
Methodologies	43
Figure IV: Recommended Alternative Data-Collection Methodologies	51
Figure V: Recommended Indicators - ORT	53
Figure VI: Recommended Indicators - IMMUNIZATION	55
Figure VII: Recommended Indicators - NUTRITION	57
Figure VIII: Alternative Data Collection Methodologies	59
VI. EXAMPLE OF A MONITORING AND EVALUATION SYSTEM: TRAINING	67
APPENDIX: Child Survival Grants: Required Documentation	81

# MONITORING AND EVALUATION OF CHILD SURVIVAL PROJECTS

## A GUIDE FOR PVO MANAGERS

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### SUMMARY:

This guide is written to augment the Child Survival Monitoring and Evaluation Workshop which took place at Airlie, Virginia, September 9-12, 1985. Our objective is to provide the PVO community with a concise, "user-friendly" guide to the development and use of a monitoring and evaluation system. It is intended to provide managers and field staff with a clear explanation of what type of system will be required for documentation of the Child Survival Grant projects and the linkages between implementation plans, evaluation plans, and a management information system.

This guide will deal primarily with the development of monitoring and evaluation systems responsive to each project's needs, environment, and constraints. A well designed monitoring and evaluation system should allow PVO's to generate reports which will both meet their own internal reporting requirements and satisfy A.I.D requirements.

This guide is divided into 6 sections:

- I. INTRODUCTION is a brief introduction to the development of a monitoring and evaluation system.
- II. MONITORING AND EVALUATION will present the key concepts and uses of monitoring and evaluation, and the linkages to Management Information Systems.
- III. INDICATORS will discuss the characteristics of indicators and their use in a Monitoring and Evaluation System.
- IV. HOW TO DESIGN AND USE A MONITORING AND EVALUATION SYSTEM will discuss the mechanics of actually putting such a system in place and using it both for internal monitoring and for generation of annual reports and periodic evaluations.
- V. DATA COLLECTION: METHODOLOGIES AND CRITERIA FOR SELECTION will discuss various methods commonly used for data collection and how to choose an appropriate method for a particular indicator.
- VI. EXAMPLE OF A MONITORING AND EVALUATION SYSTEM: TRAINING will present an example of a monitoring and evaluation system and how it might be used.

## SECTION I: INTRODUCTION

Project monitoring is an integral part of project management. Managers, in their effort to attain some goal or objective, often ask for information about where they are and where they are going to know whether they will be successful in their efforts. The information they need is provided by a monitoring and evaluation system. The development of such a system, while not difficult, is a time consuming task involving the definition of project outputs and effectiveness measures and a methodology for collecting that data.

This manual is a step by step guide for developing a monitoring and evaluation system. It begins with setting objectives and listing critical activities. It proceeds through indicator selection, target setting, data collection, and data analysis and reporting. Finally, it discusses the use of information in making decisions and taking appropriate actions. While it is not the only possible method for the development of such a system, it provides a logical sequence to make understanding and training easier.

Among the areas which will be discussed are:

- o The types of data which provide useful information to the manager;
- o The use of both monitoring and evaluation information and the differences between them;
- o The selection of data collection methodologies and the balance between data quality and cost;
- o The formatting of reports using both manual and computer based techniques to provide a higher level of understanding of complex information;
- o Decision making models for use by project managers in interpreting and acting on information.

## HOW TO USE THIS MANUAL

Because it is expected that this manual will be used by many different people with different levels of expertise in the design of monitoring and evaluation systems, it is written in a format which allows one to select those sections of the manual which will be most useful to the user. It is primarily intended as a training document to be utilized by headquarters staff in helping their field staff develop monitoring and evaluation systems for their projects, although some PVO's may find it useful for other purposes as well.

The manual is divided into 6 sections. The first section presents a brief introduction and guide to this manual. Sections 2 & 3 present the conceptual background and terminology used throughout the manual. Those of you who attended the workshop and are familiar with the concepts of MIS and monitoring and evaluation may find that a brief review of this material is sufficient, while others less familiar with this area may wish to spend more time on these sections.

Sections 4 and 6 go into detail about how to design a monitoring and evaluation system. These sections follow a step by step process which can be followed in designing your own systems. Section 4 is a general discussion of the method while Section 6 uses the specific example of a VHW training program to illustrate how this process is used in practice.

Section 5 is a detailed discussion of data collection methodologies useful in designing and using a monitoring and evaluation system. It is intended as a reference section for reviewing or researching specific methodologies which you intend to use. It may also be helpful in suggesting other methodologies with which you are not familiar but which may be suitable to all or parts of your programs.

The appendix presents a brief overview of the child survival grant documentation requirements including the evaluation plan discussed in this manual.

## II. MONITORING AND EVALUATION : TOOLS FOR MANAGEMENT AND IMPROVED PROGRAM PERFORMANCE

Monitoring and evaluation are fundamental management tools, based on the proposition that accurate and relevant information collected, analyzed and presented in a timely manner to decision makers will improve decision making and project performance. Decision makers in any project may include the community health worker, his/her supervisors, PVO country director, PVO headquarters project managers, etc. All of these people need certain information at various times for improving their own performance, helping to improve the performance of others, making changes in critical activities (ie. drug supplies or training curriculum), and at the top levels of PVO headquarters and donor organizations, making resource allocation decisions between projects. Defining critical decision making points and information needs is the first step in developing monitoring and evaluation plans and designing a management information system (MIS).

An MIS is the system for collecting, analyzing, and presenting information used for monitoring and evaluating purposes. It should provide all the necessary information for program monitoring and daily management. It should provide the majority of information for evaluation purposes, although additional information may be necessary to supplement data generated from the MIS.

This guide will focus on three primary purposes of a monitoring and evaluation system:

1. Understanding the status of a project at any given time;
2. Planning program changes or corrections necessary to attain one's stated objectives; and
3. Documenting project performance accurately and completely for reporting to external agencies (e.g. A.I.D.) or internally (e.g. to headquarters or to the Board of Directors).

## UNDERSTANDING THE PRESENT STATUS:

One is usually aware of the use of a monitoring and evaluation system for reporting information to donor agencies, boards of directors, or individual contributors of an organization. However, the most important use of a monitoring and evaluation system is in providing internal information to project managers so that they can understand the project status and make informed management decisions. This is true for both field staff and headquarters personnel.

In general, a monitoring and evaluation system is a method for collecting information from the periphery (i.e. the village health worker, clinic, or womens group) to the center (national or international headquarters), and then distributing it back out again to the field. It is a way to let central decision makers know what field staff is doing and letting field staff know what headquarters staff is doing. While this goal is not always attained, it should be the basis of any monitoring and evaluation system plan.

In many instances, the information required by headquarters will be similar to that needed for external reporting requirements. Headquarters usually wants to know about budgeted versus actual expenditures; planned versus actual outputs; and effectiveness and impact of the program on the target population. Indeed, because reporting information is so similar to headquarters needs, top level personnel will often satisfy themselves with only that information actually required by funding agencies. While this may in some cases be sufficient, often information not required for external reporting will be vital to decision making at the headquarters level.

For example, in an immunization program where a PVO is importing vaccines into the country, funding agencies may not care about turnaround times for ordering vaccines, inventory levels or usage rates for each region, while for headquarters personnel, this may be a crucial factor in maintaining an uninterrupted vaccination program. In designing an information system, headquarters staff will need not only external reporting information, but as well, information from the field which supports the tasks and activities expected of headquarters. Information must be supplied to headquarters so that they can understand what is going on in the periphery and make decisions which will help accomplish the work.

Thus far, we have talked about information which flows from field to headquarters. Equally important is the information which flows the other way. Just as a monitoring and evaluation system provides headquarters staff with an understanding of what is happening in the field, it should provide field staff with an understanding of why decisions at headquarters are made and of how the work in one field location fits into the overall program. For example, headquarters' denial of a request for additional funds for a

worthwhile project may seem arbitrary and shortsighted to disappointed field staff unless they are made aware of headquarters' own budgetary constraints; or busy field staff may resent requests for monthly inventory levels unless they understand that this information is used to order supplies and provide uninterrupted stocks. Information which flows from headquarters to the field can be a powerful incentive for field staff to continue on in the often difficult environment in which they work and to provide accurate information for monitoring and evaluation. It may also provide them with information about their own activities allowing them to make better management decisions at the field level.

#### PLANNING MIDCOURSE CORRECTIONS:

Few projects, no matter how well planned, are completed without needing some changes in the initial design once they are underway. There are always unforeseen problems or changes in the operating environment which require flexibility on the part of managers to react to these challenges and change course midstream in order to reach the final objective. A monitoring and evaluation system tells the manager when changes need to be made. An ORT program relying on government supplies of ORS may not have anticipated frequent stockouts in government facilities. A program based on training village health workers in nutrition may not have anticipated a government's refusal to have village health workers participate. A technological breakthrough in developing oral measles vaccine might require radical changes in a vaccination program. In general, it will be a manager's ability to react to unexpected changes which determines the success of a project. Thus a monitoring and evaluation system must be developed which gives early warning of these unexpected changes and allows timely shifts in strategy to achieve one's objectives. Monitoring and evaluation are part of an iterative process which involves collecting and using information to modify those project activities necessary to improve project performance, recommending specific changes, monitoring the effects of these changes and feeding back the results to project managers and implementors. This should be one lesson which all workshop participants experienced firsthand.

#### REPORTING:

Monitoring and evaluation systems are used to generate reporting information about what a project is doing and whether it is likely to reach its stated goals and objectives. The most familiar report of this type is financial reporting where reports on expenditures are submitted and compared with budgeted expenses to see whether projects are on target for their original estimations of costs. This information is used by agencies like A.I.D. for three purposes. The first is to make sure that grantees are satisfying the terms of a contract. If a PVO planned to have an immunization program and instead is using the money for diabetes clinics, A.I.D. would like to know that the program was changed and the reasons for the change. The second reason donors need this type of information

is for their own future planning. If A.I.D. had estimated that a nutrition program for 8,000 children would cost \$ 100,000 over 3 years, and in fact cost \$ 150,000, they would know that in the future they need to budget more money for these programs. The third reason A.I.D. needs this reporting system is to report to their donors: Congress. A.I.D. needs information about the accomplishments of the projects they fund in order to convince higher levels of government to spend money on these types of projects. When Congress is deciding whether to spend money on vaccines or guns, we would like to have the information which shows that vaccines are the better investment.

However, funding agencies are not the only recipients of reporting information. Boards of directors are also interested in what the PVO is doing and most want periodic reports about financial and program activities. At present, many boards of directors receive only ad hoc reports to specific inquiries, but would welcome a reporting system which provides them with information about the PVO in a systematic and easily understandable format. Boards would then be in a better position to make informed judgements about projects, and support management personnel in their decisions. Individual donors are another group who benefit from improved reporting systems. Fundraising is made easier by having good information about funded activities. A monitoring and evaluation system provides this sort of information.

#### LINKAGES BETWEEN MONITORING AND EVALUATION

Thus far, "monitoring" and "evaluation" have been considered together; however, there are a number of significant differences between them both in frequency of collection, level of detail, and use. Whereas, monitoring is a routine part of project management at all levels of decision making, evaluations are formalized episodes of collection and analysis of information and feedback to the project managers and implementors. A.I.D. views evaluation not only as a final formal statement about what the project achieved or did not achieve, but as a yearly or mid-course tool for project review and possible modification. Accordingly, there are some considerations to keep in mind when designing a monitoring and evaluation system:

1. The same information used for monitoring will also provide the basis for evaluations. Information collected for monitoring purposes should guide the need for and focus evaluations.
2. Monitoring information is reported frequently and at various levels of aggregation to meet the decision-making needs of various project staff actively implementing and managing the project in the field. Their needs may be daily, weekly or monthly.

3. Evaluation information is reported less frequently and at a higher level of aggregation so that the evaluators will have some perspective on whether the project has or will accomplish its stated objectives.

You should design an evaluation framework and annual report format that will tell your project story most completely. While indicators used for monitoring should be reported, they are only one part of the story. Internal or external evaluations (reviews) are necessary to investigate why targets were reached or not reached, what constraints are faced by the project, and how they can be overcome.

Questions which should be answered by annual reports include:

- 1) What has happened in your project during the last 12/24/36 months - and why?
  - a) status of inputs compared to targets set,
  - b) status of outputs/activities compared to targets set,
  - c) indications of effectiveness as specified in your evaluation plan. How has your target population been affected?
- 2) What progress has been made towards reaching stated objectives?
- 3) What corrective actions should be taken to improve project performance?

If you have chosen sensitive indicators, you should see relationships between inputs, outputs and effectiveness.

Information generated through monitoring should tell you at any given time the status of your project components: i.e., numbers of health workers trained; numbers of doses of vaccines used; and should raise red flags or green flags at timely intervals to tell you if you are on course. Evaluations provide a more intensive and comprehensive form of documentation for your annual and final reports describing not only what happened, but why.

### SECTION III: INDICATORS:

In developing a monitoring and evaluation system, selection of the most important information for routine collection and analysis is a critical activity. An indicator should provide this useful information. To do this, an indicator must have the following characteristics:

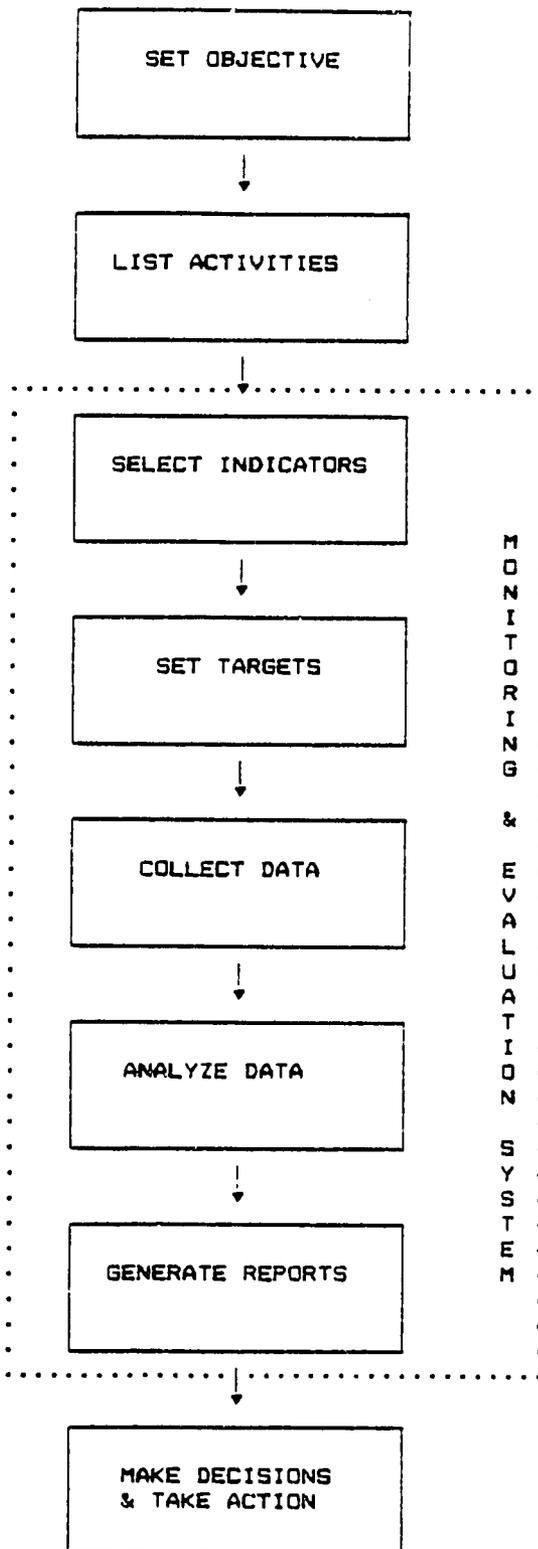
- o It must indicate something; that is it must be representative of something about a project or program which we want to know. For example, the indicator: "Number of health workers trained" tells us something about the outputs of our training program.
- o It must be useful; an indicator is worth collecting only if it tells us something which will allow someone to make better decisions or change some behavior. Thus, if one finds that the "number of health workers trained" is not going up sufficiently to meet the program needs, one would need to expand the training program.
- o It must be measureable; since we will use an indicator to measure our status with regard to achieving an objective, it must be possible to know whether we have made any progress since the last time we collected the information. In many cases this may mean that an indicator should be quantifiable, but some indicators may need to be qualitative rather than quantitative. "Number of health workers trained" is easily quantified, while a measure of the effectiveness of the training may be more appropriately qualitative.
- o It must be worth collecting; every indicator takes resources of time and money to collect. It is important that we balance the cost of collecting an indicator with the value that we will get out of the information. "Number of health workers trained" should be easy and cheap to collect and give us important information; "Number of children never weighed" will be very difficult and expensive to collect and will probably not provide any useful information.

Having now looked at the critical attributes of indicators, we can see what we mean by "useful information." Since we have defined our indicators as measureable, representative information which will be used to improve decision making or actions and which is worth the cost of collection, there is little doubt that they are useful. However, a monitoring and evaluation system is more than a series of indicators. It is a plan for collecting and using indicators in project management. This can be seen in FIGURE I.

This figure shows that a monitoring and evaluation system is really the plan for a logical process one goes through in deciding what one needs to know to manage a program.

FIGURE I:

MONITORING AND EVALUATION SYSTEM



It is a methodology for selecting, collecting, analyzing and using information: information which is useful to someone making management decisions about the course a project should take. In the next section (IV), we will look at how to design such a system. Before moving on to the next section, however, there is one more characteristic of indicators that we should discuss -- the relation of different indicators to the program maturity.

#### LEADING INDICATORS:

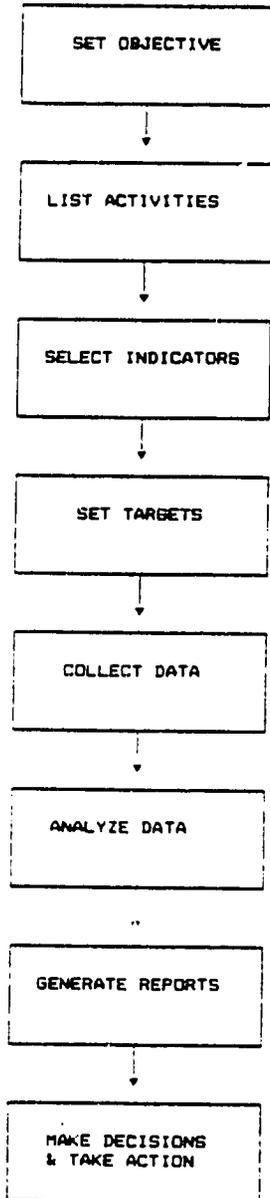
We have discussed projects and indicators as though they do not change over time. However, we know that projects do in fact change, and might vary considerably from the beginning of the project to the final completion both in the activities which are taking place and in the changes we might expect to see in the target population. It is reasonable, therefore, that the indicators which are most useful for the project manager might also change over time.

In an immunization program, for example, the early stages of a project might focus primarily on the ordering and transportation of vaccines and an education program for the target population while the next stage might focus primarily on the actual vaccinations. In the early part of the program, we would not expect to see changes in either immunization coverage or morbidity & mortality data. In the middle of the project we might expect changes in immunization coverage, but it is only late in the program that we would usually expect to see changes in morbidity or mortality rates. Thus, over the life of the project we will be focusing on different indicators for monitoring and evaluation depending on the maturity of the project. This is important to consider in designing a monitoring and evaluation system since we would like to design a system which will serve us throughout the life of the project. While impact data (morbidity & mortality) may be the best indicator of how well a program is doing late in the project cycle, in the earlier stages we will need to watch information about inputs (No. vaccine doses imported or locally produced), outputs (No. health workers trained, or No. individuals taught about immunizations), and effectiveness (No. service units with vaccines on hand or with effective cold chains). Information about the initial progress of the project must be collected if we are to have an early indication of whether we are likely to achieve our objectives later in the project cycle.

These early indicators are often called LEADING INDICATORS. Leading indicators are an early measure of the projects' effectiveness or impact and should be monitored in order to predict whether other indicators will be expected to change. Thus, we might use the indicator "Number of children vaccinated with DPT #1" as a leading indicator of vaccination coverage even though we know that full vaccination coverage is the better indicator of the success of our program. However, we might expect that we are able to see a rise in this indicator before we are able to see a rise in the more important indicator "number of children fully immunized." The indicator "number of children vaccinated with DPT #1" is a leading indicator of our vaccination program and one which we might want to follow early in the project.

SECTION IV: HOW TO DESIGN AND USE A MONITORING AND EVALUATION SYSTEM

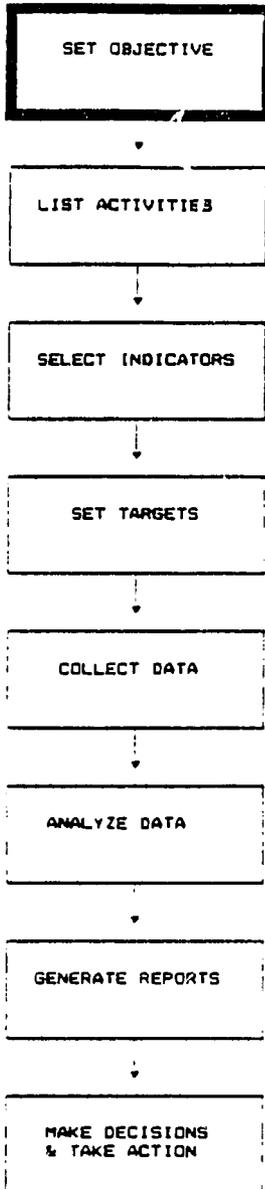
This section discusses the mechanics of designing and using a monitoring and evaluation system for child survival projects. It will present in a step by step format a way that PVO's might proceed with the task of designing such a system. While this is not the only way such a system might be developed, it does provide a logical and systematic framework for the construction of a satisfactory monitoring and evaluation system that may be helpful both in training field staff to work with it, and in actually using it for project management.



The design of the system begins with the flow chart on the left which was used earlier in figure I. The process starts at the top (SET OBJECTIVES) and goes down the chart one step at a time until the monitoring and evaluation system is complete, and plans for its use (MAKE DECISIONS & TAKE ACTION) are in place. Each step will be discussed in turn and will be highlighted on the chart for easy reference. It is important at each step to remember where you are headed since the outputs of each step become the inputs of the following step.

16

## SET OBJECTIVE



We can see from the flow chart on the left that the first step in the process is SET OBJECTIVE. You must first know where you are going before you decide how to measure your progress along the way. Objective setting is not an easy process, since one must pick an objective which actually represents what one hopes to accomplish in a limited period of time. It might be helpful to review the definition of an objective which was used at the workshop:

**OBJECTIVE:** A specific statement of the quantifiable, time-limited outcomes expected of a project or program. An objective should be sufficiently limited in scope and definition so that one could logically expect it to be reached within the stated time period. A program will typically have many objectives, and it is these objectives against which the success of the program should be ultimately judged. Example: "Within our target group, 30% of all mothers of children under 5 years old will correctly use oral rehydration solution for each episode of childhood diarrhea by the end of the third year of the program." Note that this objective is both measurable and time-limited, so that at the end of three years one is able to test whether the objective has actually been met.

It is important to remember that each project will have multiple objectives. The objective above about ORT use might be combined with another about immunizations or nutrition, and yet another about the training of VHW's. Each project manager will need to decide for themselves how many and which objectives are appropriate for their particular program.

While the process of setting objectives is not technically part of the monitoring and evaluation system it is a necessary step in the design process since it is the progress toward reaching a stated objective that we want to monitor and evaluate.

The mechanics of choosing appropriate objectives are straightforward.

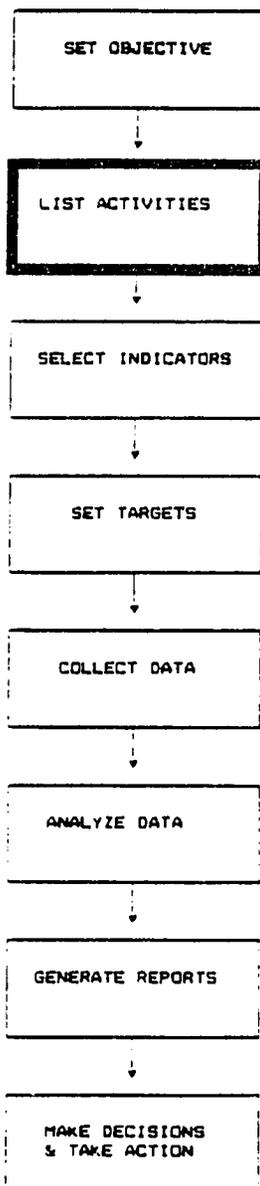
- o First, decide what it is that one hopes to accomplish in a specific project or program. In the example above, we are trying to teach mothers to use ORS correctly, so a logical outcome is correct use of ORS by mothers.
- o Second, ask how much can realistically be done in a given time period (3 years for the Child Survival grants). Again using the above example, 30% was chosen as a target based on current levels of use, past experience in other areas, and any other relevant information.

- o Finally, choose how you will measure the outcome. Again, using the above example, we might use a survey method which asked mothers of children who had diarrhea in the past 2 weeks whether they used ORS for that episode, and if so, to ask them to demonstrate how it was mixed.

Obviously, it is a lot harder in reality to set objectives since often the data on past experience, target population or achievable goals is impossible to obtain. This is precisely the reason that a monitoring and evaluation system is important; to enable managers to know when original estimates are inaccurate and must be corrected. Remember, however, that it is important to take the time to select good objectives since they determine the direction that a project and staff will take and since the rest of the monitoring and evaluation process flows from this first step.

## LIST ACTIVITIES

The second step in the process of developing a monitoring and evaluation system is listing activities. This step represents the programming of activities in a project or program and is one with which you are all familiar. While the selection and listing of activities will obviously vary considerably according to the specific project that each PVO has chosen, there are a few guidelines which may be helpful in stating those activities for the monitoring and evaluation system. These guidelines are discussed in the definition of activity which was used at the workshop.



**ACTIVITY:** A description of what must be done in order to insure the attainment of a given objective. An objective will normally have many activities which must be accomplished before it can be met. The activities will often be ordered in time so that one activity will need to be completed before the next one will begin. The activities for a given objective should be sufficiently inclusive that the successful achievement of all activities will necessarily lead to the achievement of one's objective. Activities, like objectives, should be measurable. Example: "Train village health workers to teach mothers the appropriate and correct use of oral rehydration solution such that 90% of VHW's are able to pass a competency based performance test 6 months after they have completed their training course."

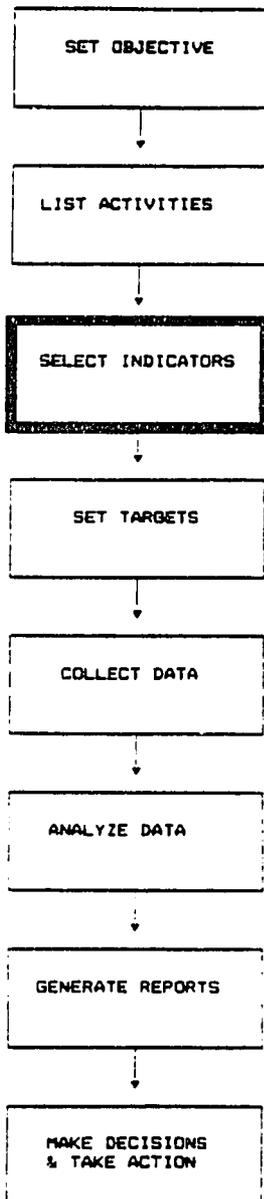
A few things are worth noting here. First is the importance of having measurable activities. Since activities represent the operationalizing of the objective which we are measuring in our monitoring and evaluation system, it is critical that we understand how we will actually measure our activities. While the next step SELECT INDICATORS will define the milestones we will use along the way, it is also necessary to have a clear statement of when we have finished an activity. This means that each activity must be measurable.

A second important characteristic of an ACTIVITIES LIST is that it include all the activities necessary to accomplish a given objective. If important activities are left out, and not monitored, we might think we are progressing satisfactorily towards achieving an objective when, in fact, we are not. For example, if we do not include an activity such as "Gaining the written support of the Minister of Health for the project" we may find after many months of work that the project will never succeed due to political interference.

Finally, one should note that each objective will have a separate activities list. While some activities may overlap among several objectives (such as recruit VHW's for both ORT and immunization objectives) all activities should be included for each objective to avoid confusion.

## SELECT INDICATORS

The third step in this process, the selection of INDICATORS, is seen by many as the core of designing a monitoring and evaluation system, since it is the process of defining what it is that will actually be measured during the course of a project's implementation. Readers should refer to section III : INDICATORS for a definition and more complete discussion of indicators.



While some people feel that indicators are something which are selected by outside agencies (such as A.I.D.), indicators should in fact evolve internally from the activities list. INDICATORS should represent the way that each organization will measure its own progress toward accomplishing the stated activities and objectives. They should not simply be a response to external reporting requirements. While it is true that many indicators have been defined by the child survival task force as required for reporting purposes by Child Survival grantees, each PVO must design its own monitoring and evaluation system with its own indicators in addition to reporting on those which are required. In many cases, PVO's will wish to use the indicators chosen by the child survival task force for their internal monitoring and evaluation system, but they should first decide what information they need for their own purposes, and only then decide whether some of the A.I.D. indicators will serve for both reporting and internal monitoring requirements.

The process for selecting indicators is difficult since there are many considerations which must be kept in mind for each indicator. The first step in the process is to answer the following questions for each activity:

1. What are the questions we need to answer to know whether we will accomplish our activity?
2. What information do we need to answer these questions? (indicators)

As we found at the workshop, answering these questions is not a simple task since it requires an understanding of the relationships between the activity we hope to accomplish, the information collection system, and the feasibility of collecting certain kinds of information.

Probably the easiest place to start is to look at the activities you have listed, and consider the unit of measurement you will need to use. For example, if one of the activities is to train 40 village health workers per year in immunization activities, the unit of measurement is the number of health workers trained. From this, it is clear that a good indicator might be "The number of health workers trained in immunizations for each year."

Of course, many indicators will not be so easy to select. It may be very difficult to design an indicator for a nutrition monitoring activity such as "Growth monitoring of all children seen in clinic with appropriate intervention for any child who is either malnourished or not growing along his or her growth curve" as we all found out at the workshop. Obviously an indicator such as number of children seen in clinic will not adequately follow this activity. We need to look further into what we want to measure for monitoring this activity. For this, we have two alternate routes. The first, and perhaps easiest route is to see what other similar programs use for indicators. This method was used at the workshop to share information amongst PVO's about how they measure similar activities. One good place to look for this type of information is the indicators which were developed at the workshop and which have now been circulated to all workshop participants. Since many of these indicators have been developed for use in the Child Survival grant program, they will often be appropriate for your projects.

Another place to look for appropriate indicators is within the host government projects where you are working. In many cases, an information system will have already been developed by the government who will often want you to participate in their system. Indeed, by voluntarily working with the government in using their information system you may be in a good position to win their support for other parts of your project. For example, a government which is supplying a PVO with vaccines may be eager (even insistent) that you use their information system for reporting on your immunization program. Your life may be made much simpler by using the government system for your internal monitoring if the indicators used in that system are suitable for reporting on your project activities.

If you find that indicators for your activities are not obvious, and you are unable to use someone else's indicator for monitoring your activities, what should you do? Probably the best method for selecting an indicator in these circumstances is to break an activity into tasks that will be required to accomplish an activity and list them according to their order of priority. In many cases an indicator for the highest priority task will be more apparent. For example, taking the activity above: "Growth monitoring of all children seen in clinic with appropriate intervention for any child who is either malnourished or not growing along his or her growth curve" we can see that this will be broken down into: -growth monitoring; -picking out children "at risk;" -appropriate intervention; and remonitoring growth of the "at risk" children. The highest priority item here is probably the intervention, so we want as our indicator some measure of the intervention component of the activity. An indicator such as "Number and % children identified as high risk who received appropriate intervention since last weighing" might be suitable. (Of course in this instance, we might have selected "Number and % children identified as high risk who received followup since last weighing" from the Child Survival task force set of indicators.)

The point is that by breaking a complicated activity down into its component tasks, we will often be able to find a suitable indicator for that activity.

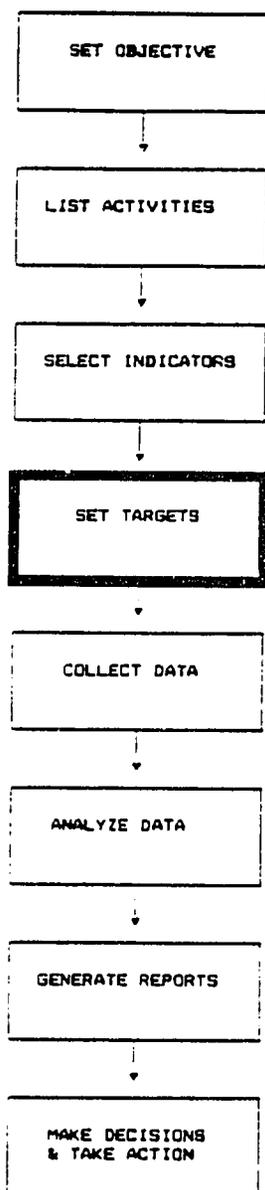
Having selected indicators either by choosing our own or "borrowing" them from another program, we should check to make sure that they satisfy the requirements for indicators discussed in section III:

- o It must be representative of what we are trying to measure;
- o It must be useful to us in making management decisions;
- o It must be measureable; and
- o It must be worth the time and money spent in collecting the necessary data.

If our indicator meets all these requirements, it is probably a good indicator and one that we will want to use in our monitoring and evaluation system.

## SET TARGETS

The process of setting targets is one of the most important and yet least often performed steps in program planning. The reason for this is that many managers have great difficulty in setting realistic targets. Without good baseline data on which to set appropriate targets, managers often prefer to use vague descriptive targets rather than quantitative ones so they can not be held accountable for interim results. While this may make sense from the managers point of view, the result is that it is often impossible to tell when a program is getting off track until it is too late to correct it. This lack of explicit targets also makes it difficult to set priorities and coordinate the efforts of different groups working on the same project since mixed and sometimes contradictory messages may be given about where to focus resources next. Thus, target setting for project indicators is an important if somewhat difficult activity to be performed.



Three methods are commonly used for setting interim targets. The first is to take the final objective or activity output and divide by the number of years in the project for the annual estimate. Thus if an immunization program has as an objective the vaccination of 30,000 children with measles vaccine during the next 3 years, a target of 10,000 children per year is set. This method, while mathematically correct is not usually accurate since a new program should expect to immunize fewer children in the first year when logistics have to be arranged than the third year when the vaccination program is running smoothly. Since the targets are unrealistic, we do not know after one year whether we are in fact on schedule for meeting our final objective or not.

The second method is to take the previous years result and add 10% for this year's estimate. If a project has been performing well in the past, this method may give us a sensible target, but we never really know whether a program is performing well; only if it is performing as well as last year. If there are correctable problems which occur year after year, we will not know about them since our targets are based on past performance, rather than normative standards. This method also does not take into consideration either more mature logistics systems or more experienced personnel in setting targets in each subsequent year. Finally, this method does not really help us to know whether we are likely to reach our final objective since targets relate only to past performance, not future expectations. Note, however, that this method does have the advantage of relying on a functioning monitoring and evaluation system since it is this system which provides data on last years performance. This method does, therefore, stimulate the manager to develop and use a monitoring and evaluation system.

The third method, which is by far the most difficult, but also the most useful, is to set targets according to some normative standard which is developed either from comparative data of other similar programs or from a review of program capabilities. An example of this type of target is the standards used in growth monitoring cards where average weight-for-age values are used to compare a child's actual growth with expected growth. Another example is in selecting target populations. We must combine population estimates with program capabilities to state the population that we are likely to reach in a given project. A third example is in estimating how many households a village health worker can see in a week. In all these examples, we combine past performance data, project objective targets and a thorough understanding of the program activities to make estimates of likely performance targets. While this may be a difficult and time consuming activity, it allows us to make better use of the data collected through the monitoring and evaluation system to make decisions.

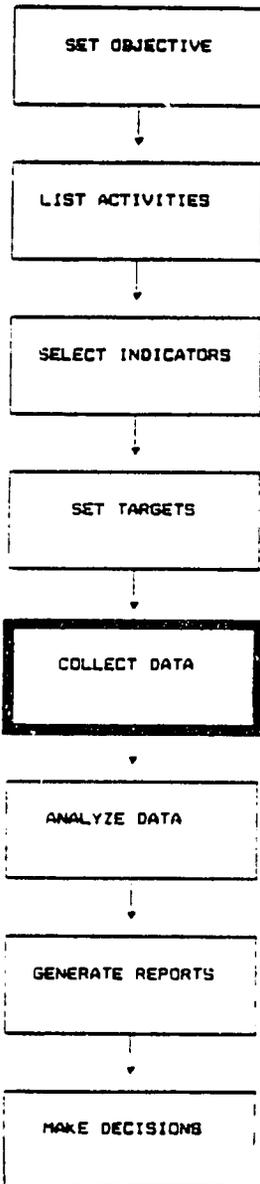
There is unfortunately no simple method for the mechanics of setting targets since this will vary with the type of indicator being considered. However, in general, the closer a person is to the work being performed for a particular indicator, the better able that person is to set a realistic target. Thus, village health workers and their supervisors are in a better position to set targets for number of households visited in a week than headquarters personnel, while headquarters supply managers will make better estimates of the target number of vaccine doses to have available for immunization programs. By involving the personnel doing the work in the setting of targets, they are more likely to "buy into" the targets which are set and try to match their performance to these expectations. This is the basis of "MANAGEMENT BY OBJECTIVE," a widely used and often successful management protocol.

In summary, we see that the setting of realistic targets for each indicator is an integral part of the monitoring and evaluation system and one which allows us to use our monitoring information to its fullest use.

## COLLECT DATA

The issue of HOW, WHEN, and FROM WHOM to collect data is a difficult one for the project planner and manager since one is constantly forced to balance the desire for more and better data with the cost in time, and money of collecting that data.

Because of the complexity of decisions regarding data collection, the discussion of this topic is presented in some detail in the following SECTION V: DATA COLLECTION: METHODOLOGIES AND CRITERIA FOR SELECTION.



While the discussion of data collection is somewhat lengthy in order to include the wide spectrum of methodologies and issues which the decision maker will face, for most indicators, the choice of data collection methodology will be apparent and will consist of either system surveys (collection of routine service statistics) or population based surveys. On the other hand, since each PVO has different project designs and different data needs, a more complete description of alternate methodologies is presented.

There are several key issues which should be considered in selecting a data collection method.

**Value vs. cost:** All data costs time and money to collect, and some data collection methods, especially surveys are very expensive. It is important to balance the cost of data collection with the value of the information it will provide. Obviously we do not want to collect anything which will cost a program more than it is worth.

**Health workers workload:** Almost all data will be provided by health workers who are already busy providing services for their populations. It is essential that systems be designed which do not overload these workers with the filling out of forms and other reporting requirements. We are all familiar with MCH clinics where the nurse spends 90% of her time filling out records and only 10% seeing mothers and children.

**Data Quality:** It is easy to collect data; it is not so easy to collect data which is representative and accurate. Biases are often inherent in data collection systems and must be considered in designing what data to collect and how to collect it. If health workers are rewarded for treating patients, we can expect an upward bias in the reported numbers of cases treated. Some method of independently assessing the accuracy of reported data must be built into the system to insure data quality.

## ANALYZE DATA

Having decided what data we will need to collect (indicators), what we will compare the data against (targets) and how to collect it, we are now in a position to think about what we want to learn from this data. We must turn the "data" which we have collected into "information" which we can use to make decisions.<sup>1</sup> To understand this process and to choose appropriate methods of analysis, we will need to answer 4 questions:

- o For what decisions will we need the information ?
- o What data will be needed ?
- o What level of aggregation will be most useful ?
- o What method of presentation will be most effective ?

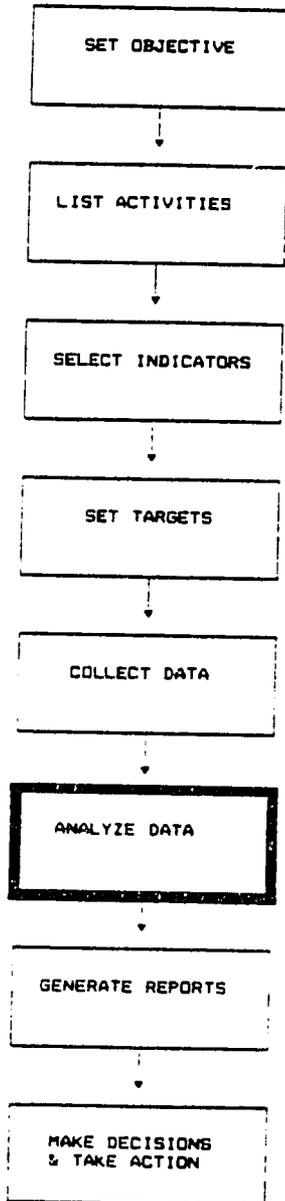
The answers to the first 2 questions will have already been considered in designing the data collection system since one would prefer to collect only data which is needed for future decision making rather than wasting everyone's time collecting data which will never be used. It should be noted, however, that unfortunately we often take the latter route of collecting first and selecting second. The linkage between data collection and management decision making in the design of a monitoring and information system should be stressed once again.

In considering LEVEL OF AGGREGATION<sup>2</sup> our first thought should be "who is the information for?"; that is, "who is the decision maker for this decision?" In most cases, the appropriate level of aggregation will correspond to the

---

<sup>1</sup> DEFINITIONS: Data is what we collect before it is processed or analyzed. It comprises the raw material of analysis. Information is the data selected for use in the search for a solution to a particular problem which has been transformed for easier understanding by the manager. We collect data and through analysis change it into useful information.

<sup>2</sup> Level of Aggregation is a term used to describe whether data is presented for each individual data collection unit (for example, for each village health worker) or whether it is summarized into larger categories or units (for example, regional or national figures which include the data for all village health worker in that category). The more summarized is the data, the higher the level of aggregation. Note that data can be aggregated by geographical location, by time (annual reports rather than daily), or by function (data on all nurses rather than each health worker).



level of management where the decision will be made. For example, a decision about whether more intensive in-service training be given to village health workers in a particular district might be made by the district manager. He or she would need information on how well each village health worker in the area is performing in his or her job. The data would be at a low level of aggregation. On the other hand, a decision about whether the centrally developed curriculum and training materials are satisfactory would be made by a national manager, and would generally require information which is summarized to national or perhaps regional level. This would be a higher level of aggregation. Note that the data used in each case is the same: competency of each village health worker to perform the job for which he or she was trained. However, this data will be transformed into different information for different uses depending on the level of aggregation.

While it is usually true that district managers will want data aggregated on a district level and national managers will want data aggregated on a national level, there are some circumstances where managers will want data summarized at different levels of aggregation. For example, a national manager deciding where to allocate funds may want regional comparison data to know which region is more in need of further support. In this case, data for the national manager would be aggregated on a regional level. On the other hand, a regional manager who wants to know how his or her region compares with other regions might want national data or data from each region with which to compare progress. Thus, no simple rule will always predict what level of aggregation will be necessary for a particular decision maker. One always needs to consider the decision being made.

The METHOD OF PRESENTATION is an important consideration in the analysis of data since different presentations of the same data can make the difference between useful information and meaningless data. An example of this is a national immunization manager trying to predict what types of vaccine to order for the coming year. He is presented with the daily logs from each immunization center of all the immunizations given in the past year. This data, which is 30 pages long is not very helpful to a busy manager. On the other hand, the following table tells him what he needs to know in 1/2 page:

\*\*\*\*\*

IMMUNIZATION SUMMARY  
ALL REGIONS : PAST 12 MONTHS

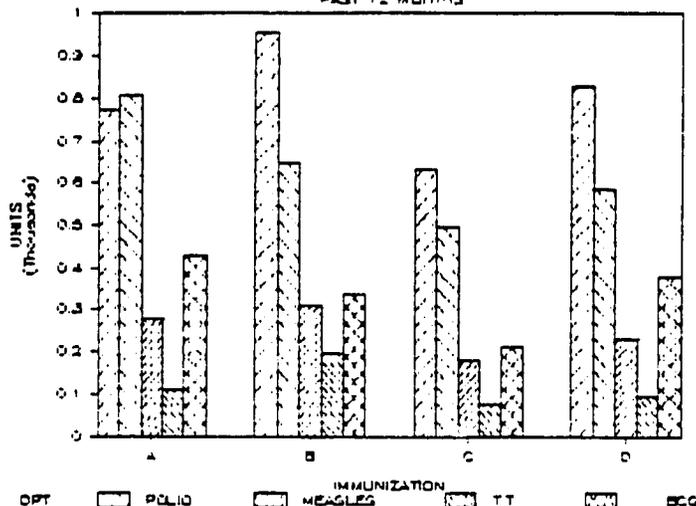
TYPE	TOTAL	BY REGION:			
		A	B	C	D
DPT	3186	773	955	632	826
POLIO	2538	807	649	498	584
MEASLES	1000	278	310	180	232
TETANUS TOX.	480	112	196	75	97
BCG	1359	431	335	214	379

\*\*\*\*\*

This type of summary report, which is laid out in a clear, concise way, provides the manager with immediate access to the information which he needs to know for ordering next years stock of vaccines. This does not, of course, mean that he will order the amounts used this year; only that this information combined with other information, such as the expected growth of the program and the size of present stocks of vaccine, will allow him to make sensible and informed decisions about ordering supplies.

Some information is best presented in a summary table such as that presented above. However, some information is better presented in graphic representations. This is particularly true when some of the data will be compared with some other data or with the targets discussed earlier. Graphic presentations give us a good way to see comparisons clearly. Thus, in using the data presented above for the purpose of comparing different region's performance we might want to create the following graphical report:

REGIONAL COMPARISONS: IMMUNIZATIONS  
PAST 12 MONTHS



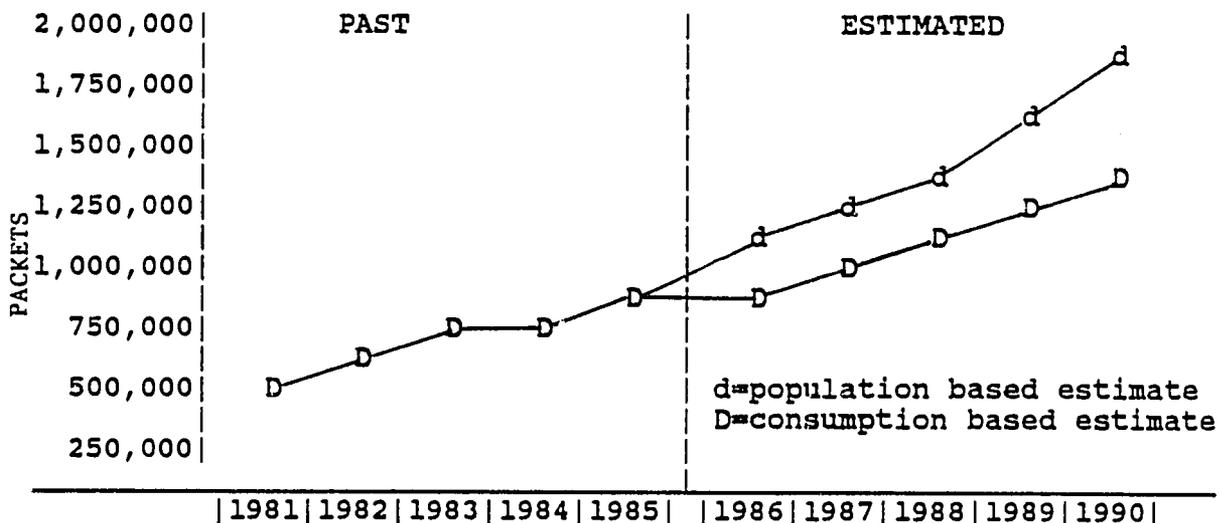
28

While the above graph was done using a micro-computer, it is easy to do similar graphs by hand if PVO's do not wish to computerize their information systems.

A third format for presenting information (besides tables and comparative graphs) is to present the trend of data over time so that managers can see where they have been and where they are headed in some component of the program. Trends are particularly useful in planning future activities. For example, an ORT program might want to predict the future demand for ORS over the next 5 years of the program to predict their resource needs for this period. They might make estimates of future demand based on either past consumption (consumption-based) or total population (population-based). A trend report might look like this:

\*\*\*\*\*

TREND REPORT:  
PAST AND ESTIMATED YEARLY DEMAND FOR ORS PACKETS



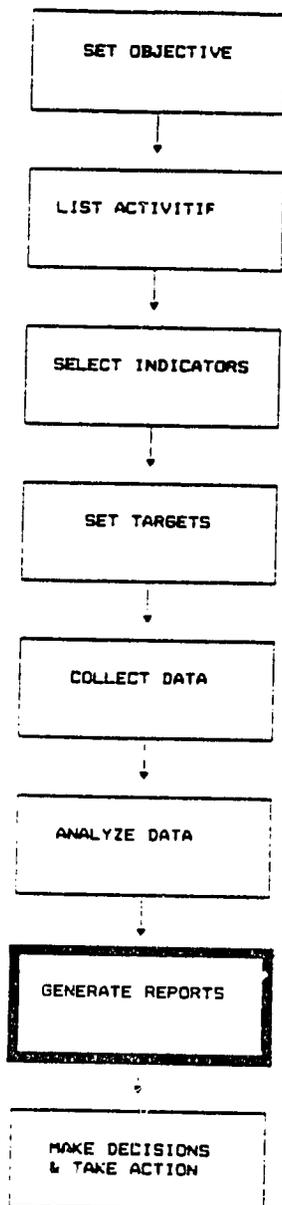
\*\*\*\*\*

This type of trend report can be used for following the progress of any program component as well as predicting future levels. Thus, field staff might be encouraged to chart the trends in immunization coverage, nutrition programs, or morbidity of diarrheal disease for their own use as well as for reporting purposes. We obviously do this already in monitoring a child's growth on a weight chart. It is now time to monitor programs on program growth charts.

29

## GENERATE REPORTS

Every manager is familiar with the problem of having stacks of reports on his or her desk which took hours for field staff to fill out and require hours to read only to find out that they do not really tell us what we wanted to know about the project. It is very important that indicators be displayed in a format which facilitates their use for decision making and gives the reader an immediate picture of the project status. There are several considerations in designing such a format.

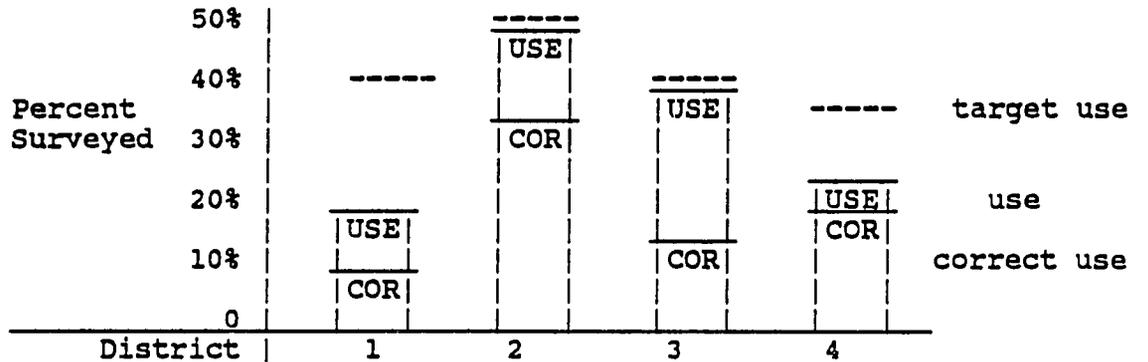


- o Most people are only able to think about seven items of information at one time. A report which simply lists columns of figures will be very difficult for most of us to interpret.
- o The problem most managers have is not too little information but too much. Faced with a 20 page document from each of 15 projects, few of us have the time or energy to go through and pick out the relevant information. Thus, reports should be designed to present only what a manager needs to know rather than every piece of information which has ever been collected.
- o Whenever possible, information collected on indicators should be presented alongside of the targets for those indicators so that a manager can see at a glance whether a project is on schedule with its plans.
- o Data should be grouped in combination with other indicators before it is presented so that the picture makes sense to someone scanning a report. For example, information about families using ORS for an episode of diarrhea might be grouped with information about the proportion of these families who used it correctly. In the same way, trend lines which show present data compared to past performance or comparative data which compares different regions, or even different health workers, can present a good picture of where the problem areas lie.
- o A picture is worth a thousand words; nowhere is this more true than in reporting data. Information which is reported graphically is faster to read, easier to understand, and often shows relationships which were not apparent in tables or written reports. While the use of microcomputers is helpful in presenting graphic representations of data, they are by no means the only method, and field staff can and should be taught to graph trend lines and comparative data by hand for their own use and for reporting purposes.

A sample report is presented below showing ORT use vs. correct use by district for 1985. This is a COMPARATIVE REPORT which shows different districts at one time period. It is helpful in judging the performance of each district unit and for seeing whether problems encountered in a project are present in all service units or only in a few locations.

\*\*\*\*\*

ORT USE VERSUS CORRECT USE  
BY DISTRICT  
1985



\*\*\*\*\*

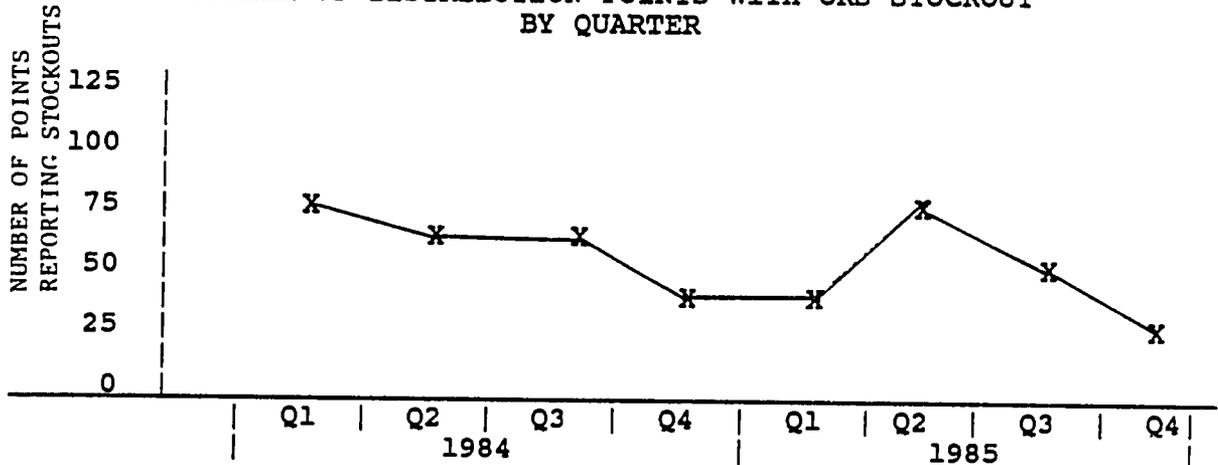
**DISCUSSION:** This report shows the proportion of children who have ever been given ORT, the proportion of families who can effectively use it, and the ratio of effective use to use in a sample of the population which was surveyed. It also shows this in relation to a target for each district. The target is both for children ever given ORS and for correct use since we would like all families using ORS to use it correctly. This report shows the variations between districts and highlights those areas where mothers are using ORS incorrectly. We see that in District 2 they have reached their target for "ever used" and 2/3 used it correctly. In District 4 most (3/4) mothers used it correctly but they are still a long way from reaching their target. In District 3 they have reached their target, but over half use it incorrectly; perhaps they were too concerned about use rates without taking the time to teach how to use ORT correctly. However, it is District 1 where we need to focus most attention since District 1 has both low use rates and most people use it incorrectly.

This report dramatically presents this information which might have been lost in a long table of figures.

This second report is called a TREND REPORT since it shows the trend over time of data for one location. In this case, the report shows the trend report for number of stockouts of ORS in the distribution system. This information would be used by the project manager or person in charge of ORS supply to monitor the adequacy of the supply of ORS packets to village health workers, womens' groups or clinics.

\*\*\*\*\*

PVO: ABCDEF- INDONESIA  
 NUMBER OF DISTRIBUTION POINTS WITH ORS STOCKOUT  
 BY QUARTER



NO. DISTRIB.	<u>130</u>	<u>128</u>	<u>131</u>	<u>130</u>	<u>129</u>	<u>138</u>	<u>136</u>	<u>121</u>
POINTS REPORTING								

\*\*\*\*\*

DISCUSSION: This report shows the number of distribution points (village health workers or womens' groups or clinics) in the country experiencing stockouts for each quarter. It is primarily used by the project manager for monitoring the adequacy of the ORS distribution channels. One would like the number of stockouts to decrease as the program matures and the supply channels to become less erratic. However, as the program matures, it also grows and the maintenance of an adequate distribution network becomes more complex.

Note that in the report above, the distribution was generally improving until the second quarter of 1985 when the program expanded and the number of distribution points experiencing stockouts increased. After that quarter, the number of stockouts went down, but so did the number of centers reporting. The manager would need to find out if the centers who are not reporting are in fact experiencing stockouts (which may be why they do not bother to report) or simply not reporting. The system will need to both increase the number of points reporting and decrease the number of stockouts.

32

Of course, not all reports will be graphs. Most PVO's will also want to collect information about the project status in a more open ended format such as the one that follows:

\*\*\*\*\*

PVO XYZ - HAITI  
QUARTERLY REPORT: NARRATIVE SUMMARY  
1st QUARTER - 1985

Planned Activities last quarter: \_\_\_\_\_  
\_\_\_\_\_

Problems encountered with planned activities: \_\_\_\_\_  
\_\_\_\_\_

Planned Activities next quarter: \_\_\_\_\_  
\_\_\_\_\_

Activities targets next quarter: \_\_\_\_\_  
\_\_\_\_\_

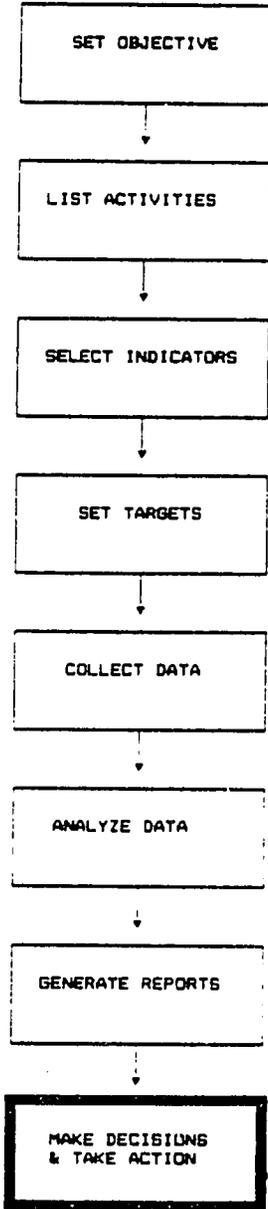
etc.

\*\*\*\*\*

It is not possible to suggest a reporting format which will suit all PVO's or all projects. What is suggested is that several different formats be used depending on the type of information in each section of the report, and that for the reporting of specific monitoring and evaluation indicators, a graphic presentation may be more suitable than a more traditional table or written form.

## MAKE DECISIONS & TAKE ACTIONS

We have now reached our final step in the process of designing a monitoring and evaluation plan: make decisions and take actions. This is the step which fills the management literature with articles and books on decision making, leadership, and how to take decisive action. Most of this can be summarized as: find out where the problems are and fix them. This is easier said than done, as most managers have found out, but there are some guidelines which may help the manager to at least locate the problem and suggest areas to correct. This might be summarized in the following steps:



- o Look at reports. Where are you going beyond or not reaching your targets?
- o Look at trends. Are you consistently above or below targets?
- o If you are consistently above or below targets, are the targets realistic or should they be changed?
- o If the targets are OK, is the problem present in all locations or just in a few?
- o If present in all locations, is it a headquarters problem? Is it recent or ongoing?
- o If present in a few locations only, are there similarities in these locations causing the problem or is it a unique problem for each location? Is it something about the target population or environment in these locations, or is it the personnel?

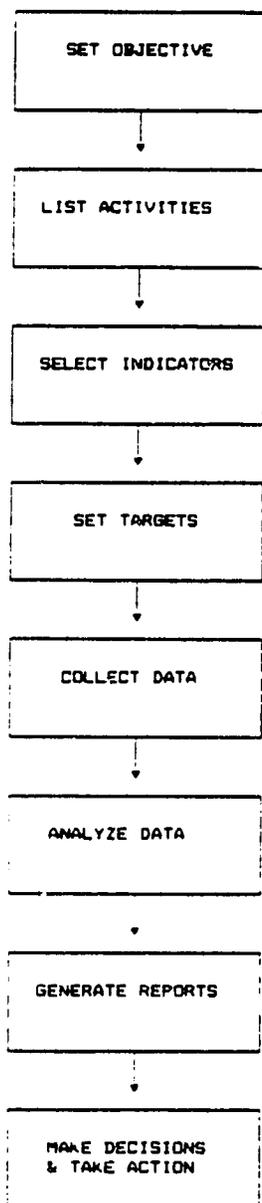
While these questions will not always tell you what is the problem, they will often tell you where to look further to find the problem. This will often save time, and allow the manager to focus energy on areas which need attention rather than just searching blindly for problem areas.

This decision making and action taking process can be presented as a decision tree/flow chart presented in FIGURE IV on the next page.



## SUMMARY OF SECTION IV

Having gone through the eight steps summarized on the left we have now developed a monitoring and evaluation system for our first objective. Note that the same process will be required for each objective in the child survival grant projects. While the design of a monitoring and evaluation system is a long and at times tedious task, it will, in the long run, simplify the task of managing these and other projects both at the headquarters level and in the field, while at the same time providing funding agencies with information suitable for their own purposes. The rigor which such a system imposes on the manager for defining, collecting, and using management information is often very useful when managing diverse projects in difficult environments.



## SECTION V: DATA COLLECTION:

### METHODOLOGIES AND THE CRITERIA FOR THEIR SELECTION

#### INTRODUCTION

The two basic issues for data collection are:

1. The nature of the inquiry, including the types of answers needed and how we intend to use them. These will fall into three general categories: description, explanation and prediction.

2. The quality of the data needed including the ways in which quality is defined and can be controlled. Information\* quality is usually characterized in terms of:

a. Validity. Does the information measure what it is intended to measure, and what is important for decision-making?

b. Reliability. To what degree does repeated use of a measurement procedure produce the same results?

c. Precision. With what degree of specification does repeated use of a measurement procedure produce the same results?

d. Bias. To what extent do human factors of an unplanned and/or non-random sort operate to distort information by intervening in the measurement process?

e. Representativeness. To what extent does our information characterize all of the units in a study population?\*

These issues have to be addressed before any reasonable, trustworthy, or economical decisions can be made about research, about monitoring, about evaluation in order to produce information that is parsimonious, appropriate, relevant, timely, adequately accurate, and accessible to needful and interested parties.

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\*It is useful to define our terms. 'Data,' whether collected and recorded or not, comprise the raw material of analysis. 'Information' is the data selected for use in the search for a solution to a particular problem, that is, information is data in use. 'Knowledge' is the stock of collected data retained as valuable for future use.

\*\*The reader is referred to the source of these definitions. (M. Hageboeck. Manager's Guide to Data Collection. Washington, D.C.: Practical Concepts Inc., for the Agency for International Development (PPC). November, 1979) as a useful general handbook which expands on a number of dimensions of data collection which we can only touch on in this document.

They are neither academic nor mechanical; they are functional, practical, and essential.

Yet, as the AID Manager's Guide to Data Collection points out, the process of addressing these issues and making data-collection decisions is often left undescribed (and certainly undiscussed) in typical research proposals and accounts, left to "invisibility" and thereby creating an aura of mystery.

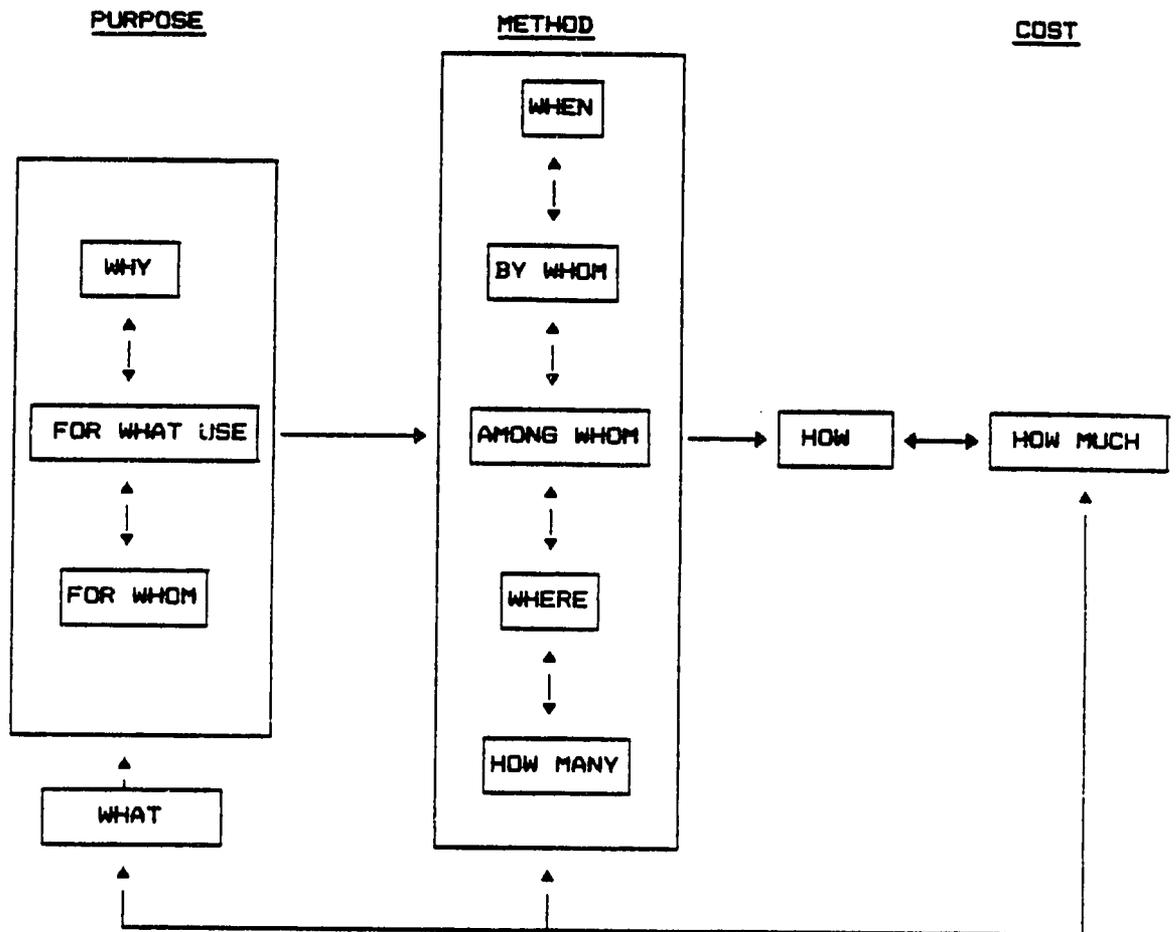
There is no mystery if the right preparatory questions are asked and if the questioning leads in fairly straightforward fashion to decisions about data collection. These basic questions, are really very simple and subsume the issues of use and quality mentioned at the outset. They are:

1. Why (Purpose)
2. For Whom (Users)
3. What (Data/Information to be Collected)
4. When (Frequency, Timing, Duration)
5. By Whom (Collectors)
6. Among Whom (Population(s))
7. Where (Coverage Desired)
8. How Many (Sample Selection and Type)
9. How (Methodology)
10. How Much (Cost).

It is helpful to view these questions as having an organic, systematic, interrelationship which, in turn, defines the process of decision-making about data collection. We present our view of this interrelationship in Figure 1. The cardinal, leading question is, of course, "Why?," and the process is essentially a deterministic one.

In other words, the questions related to purpose (why, for what use, for whom) will determine the 'what.' All of these taken together will determine the answers to questions related to method type (when, by whom, among whom, where, how many and, finally, how). There will, however, be an iterative relationship among cost, method, and purpose, as managers and researchers attempt to adjust data needs to the costs of time, money, and human resources.

FIGURE 3.: THE DECISION-MAKING PROCESS FOR DATA COLLECTION



## THE GUIDING QUESTIONS: CRITERIA FOR METHODOLOGY SELECTION

This section presents, in outline form, the criteria that managers can use to make discriminations as each of the guiding questions is applied to the issue of what methodology to use, to collect what data.

1. Why (Purpose)
  - a. Use
    - description/explanation/prediction
    - targeting/measuring
    - management/monitoring/reporting/evaluation/planning/"flagging"
    - political/fund-raising/both
    - to improve current program operations
    - to plan new directions
    - to document program achievement
    - for leading, coincident or concurrent, or lagging indicators\*
2. For Whom (Users)
  - a. Own institution
    - field posts/field headquarters/national headquarters
    - trainers of trainers/trainers/trainees
    - supervisors
    - managers
    - clients
  - b. Other institution
    - donor (which)
    - host country
  - c. Some combination of above.

---

\*An important distinguishing dimension for indicators is their timing in relation to program activities. Some measures precede program activities; what they measure occurs prior to program services. They are leading indicators. An example is the amount budgeted for measles immunizations. Other measures are coincident with or concurrent with program activities; what they measure occurs at the same time as the program itself. An example is the number of immunizations given for protection against measles. A third type of indicator is a lagging indicator. An example is the impact indicator: change in measles-associated mortality for children under five years of age. Any change in measles-associated mortality is likely to occur after immunization activities, i.e., change is likely to lag program activities. Most measures of impact are lagging indicators. Looked at from the standpoint of methodologies, in the first project year managers would be gathering input and output indicator data and some kind of baseline data; in the second year using methods such as surveys, including KAP surveys, and focus groups, to look both at outputs and at preliminary indicators of effectiveness; and in the third year at additional signs of effectiveness (changing behavior and attitudes) and at impact.

3. What (Data/Information To Be Collected)
  - a. Input/output/effectiveness/impact
  - b. Quantitative/qualitative/quantitative-qualitative
  - c. Indicator-related/not related to indicators
  - d. Requirements, for rigor (validity, reliability, precision, representativeness control for bias: much/moderate/little.
4. When (Frequency/Timing/Duration x Level and Type of Use and Users)
  - a. End-of-project/annually/semi-annually/quarterly/monthly/weekly/daily
  - b. Regular/irregular or ad hoc
  - c. Baseline/ad interim/ex-post
  - d. Tied to project requirements/not tied to project timing
  - e. First project year/second project year/third project year
5. By Whom (Collectors)
  - a. Inside project/inside organization/outside organization (donor, host)
  - b. Paid/volunteer/"incentived"
  - c. At level of use/not at level of use
  - d. Deliverers/clients
  - e. Field personnel (level)/management/trainer-supervisors
6. Among Whom (Population (s))
  - a. Entire Populations
    - in space
    - in kind
    - in number
  - b. Parts of populations
    - in space
    - in kind
    - in number
  - c. Clients/potential clients/deliverers
7. Where (Coverage Desired)
  - a. Program size/complexity/components/degree of integration
  - b. Population density:catchment area:target population/service access: service utilization (intensity)
8. How Many (Sample Selection and Type)\*.
  - a. Entire populations (complete coverage)
  - b. Parts of populations (partial coverage)
    - Stratified
    - Cluster
    - Stratified/cluster
    - Lot Quality Assurance Sampling (LQAS)
    - Market sample
    - Small-sample ethnographic
  - c. Approach
    - Random
    - Purposive

- . How (Methodology) \*
    - a. Records Analysis
      - Service Statistics
      - Accounting Systems
      - National Data
      - Project Data
    - b. Sentinell Posts
      - Active
      - Passive
    - c. Surveys
      - Large-scale/small-scale
      - Single-round/multi-round
      - Cluster
      - LQAS
      - System Survey
      - Census/vital registration/baseline x quantitative/qualitative (numbers/KAP)
    - d. Growth Monitoring
      - Whole populations/partial populations
    - e. Targeted Interviewing(marketing/anthropological-ethnographic)
      - performance assessments
      - key informant interviewing
      - participant observation
      - mother-testing
      - "sondeo"
      - focus groups
      - home visits
      - site visits
  
  - 10. How Much (Cost)
    - a. Money
    - b. Time
    - c. Human resources
- 

\*These are dealt with in more detail in the following section on Methodologies.

## METHODOLOGIES

Figure 4 (figures 4,5,6,7,8 are at the end of section V.) presents a listing, by tiers, of the data-collection methodologies recommended as alternative ways of responding to the requirements of the Child Survival Reporting System (CSRS). They will, of course, also serve as opportunities for projects needing management and monitoring data; this is particularly the case with regard to the methodologies we lump under the category of "Targeted Interviewing."

Figures 5, 6, and 7 list the indicators required for the CSRS, by tier, with each indicator keyed to the data-collection methodology(ies) recommended as most reasonable and appropriate, varying according to the levels of rigor needed and the availability of data. For instance, for Tier 1, if Project Documentation Data are thorough and up to date, including the Accounting System, then there is no need for a Systems Survey. Or, if a project does not need to gather very rigorous survey data because it is not in Tier 2 or Tier 3, but does want a sense of how well its ORT and health education project is going, for management and monitoring purposes, the less costly Targeted Interviewing procedures will be adequate. And, there is flexibility among the various survey sampling methods which permits savings if surveys are necessary, e.g., cluster or Lot Quality Assurance sampling.

The sections which follow present a brief discussion of selected methodologies with which there may be less familiarity. The section is not meant to serve as a handbook on how to carry out any specific methodology but, rather, to present their cardinal characteristics and their utility. Figure 8 displays selected methodologies and their relative advantages and disadvantages, in terms of ease of collection, rigor and costs.

For projects in which there are substantial information system problems not easily remediable in the near future, or when an existing system cannot be modified to include the necessary CSRS data, there are two alternative methodologies that can be used. One is the Systems Survey; the other is a passive, lowest-cost version of the Sentinel Post System.

### 1. Systems Survey (SS)

A survey at the different levels of the health delivery system, sampled so as to account for institutional, ethnic, and geographic/ecological representativeness, which will gather such data as "number of ORT packets distributed," "number of service units with effective cold chain," or "number of service units with regular growth monitoring." If a high level of confidence is deemed important, random selection of service units can be applied after the health regions or areas have been pre-selected according to empirical criteria of representativeness. The data-gathering protocol for this survey activity need be no larger than the set of standard CSRS indicators. The actual surveying can be done by mail, where this is feasible; by project staff; or by individuals who can be hired locally; none of these approaches need be costly.

## 2. Sentinel Post System (SPS)

Sentinel posts, as defined here, are sample collection points selected to represent the entire project area; they may or may not be sited in an existing health facility, though simple economy suggests that as their best location. A current project in Indonesia has found a 1% sample of all health facilities to be affordable and sufficient to the task of providing enough information for project assessment and adaptation. Ideally, sentinel posts are staffed by specially-trained personnel not encumbered with service delivery responsibilities. Such staff may be expected to be more independent and objective than regular service staff, can be better trained and supervised, and can expend time and effort in more concentrated, purposeful fashion. Thus, they are more likely to collect more complete, more timely, or more accurate service statistics. The advantages of a Sentinel Post System are that one can obtain high-quality, credible data at relatively low cost without disrupting service activities. For some indicators derived from service statistics for which a total count is required, the sentinel post system is inadequate, but for other service delivery or output indicators and for effectiveness indicators (see Tier 2 discussion below), the Sentinel Post System may be a good choice.

Sentinel posts are basically of two types: passive and active. The former is less intensive and less costly than the latter. In the passive model, one person with basic statistical/clerical skills is added to a sample of service delivery units; that person is responsible for reporting service statistics information. The active model is effectively a Surveillance System, which typically uses more systematic and more intensive data-collection methods and incorporates prospective data-collection techniques (which may or may not be randomized), to gather data in some communities in some relatively small, defined area served by the service delivery unit. For example, a community surveillance system may function as a Population-Based Registration System and, as one example, might use community health workers to number all dwelling units in the surveillance area; to identify families with women of reproductive age or with children under five; and to systematically visit all or a sample (ideally a probability sample) of those families over time, to tabulate births, deaths, illness rates, causes of morbidity and mortality, and treatment patterns. Examples include the Khanna Study, INCAP in Guatemala, Narangwal, and Matlab, to name but a few of the major projects.

Another method might be to carry out random "spot" surveys, with small Ns and well-disciplined data universes, in different villages on a routine basis to gather similar information. This model has been used effectively in Haiti, using a five-day survey technique in which community health agents, within the framework of their routine duties, assay a random sample of households on a small set of questions on diarrhea-related mortality, morbidity, treatment, and reasons for non-use of ORS. These approaches are discussed in more detail below under Tier 2.

It is possible to choose one or both types of Sentinel Post System and to vary the number of sentinel sites depending on resource availability, program size, population density, and the program components involved. For example, high-density countries with high health unit utilization may require minimal community-based data, while low-density and/or low-utilization countries may require more such data and, correspondingly, require a better-developed sentinel system. In any event, the same set of standard indicators should be collected. Training of personnel is usually required to set up this type of system. Techniques for determination of sample size and household selection will be discussed briefly below and in more instructive detail in a later document.

### Tier Two

In addition to these methodologies, the Task Force highly recommends that project managers have recourse to a category of research approaches which are the characteristic stuff of field anthropology and, more recently, health communications: key informant interviewing, participant observation, mother-testing, "soundings" (sondeos), and focus groups. All these approaches not only fall under the rubric of "anthropology," but under the concept of "rapid rural appraisal," generated at a 1979 conference at the University of Sussex. The Sussex meetings, and related subsequent publications, examined the relative merits of rapid and informal -- in contrast to comprehensive and scientifically impeccable -- methods of data-gathering. The underlying concept is that not only is statistical rigor not really essential for effective project fine-tuning, but that data that cannot even be counted may provide extremely useful consumer or client feedback for important project modifications. For instance, focus groups can help project managers understand why mothers do not bring their children for second and third doses of vaccines. Or, if out of ten home visits in which a field workers asks mothers to demonstrate ability to mix ORS, only one mother is capable of so doing, a project manager will know that something is wrong, long before numbers will provide such information, if at all.

All of the approaches can be accomplished in systematic fashion either as part of home or clinic visits; they can also be integrated into the work and schedules of Sentinel Post staff. Even passive posts can incorporate into the job description of the "statistical clerk" a second responsibility for pursuing these approaches to data. While there is always the risk of overburdening polyvalent workers, it is also possible to train such workers to administer a mother's test on ORT knowledge or to systematically observe key features of domestic hygiene.

The following sections describe these methodologies. In so doing, they make it clear that they are neither difficult nor mysterious. In fact, many project personnel may already be using such methodologies, without so naming them.

## 1. Key informant interviewing

Key informant interviewing can be carried out with individuals or groups selected according to different criteria for different purposes. In the broadest sense, key informants are members of the study population (in the case of Child Survival, these could be representative policy-makers, program managers, lower-level workers, and/or clients) who, because of their locations in some institution or community, are assumed to have special insights and understandings of local situations, power structures, and problems, and who may be in strategic positions of communication and interaction.

Key informant interviewing can be made more rigorous in two ways: through the selection process and through the structure of the interview instrument itself. Interviewees can be chosen purposively as, in effect, "sociometric informants," by applying specific research criteria, e.g., addressing informants who are particularly knowledgeable about a certain problem, known to be innovative adopters of new ideas, especially esteemed and respected in the community, and so forth.

Key informant interview instruments can also introduce more rigor into the research process when they are consistently structured around a given topic or set of topics; both individual questions and the accumulated body of data can be made quantitative. One example is the sort of interviewing that might be gathered in Tier 1 projects to supplement a Systems Survey; individuals at different levels of a health delivery system can be interviewed to probe such prickly but crucial issues as commitment, relationships between the amount of funds allocated vis-a-vis actual expenditures, and effectiveness of outputs, e.g., training. Key informant interviewing is particularly important during the baseline and systems development/improvement period, the former because it is the point at which descriptive information about the program setting needs to be gathered, the latter because it is the period when there needs to be understanding about what must occur in a system before real program changes can occur. Such interviewing is also crucial for monitoring and evaluation, not only as a control on quantitative data gotten through other methodologies, but as a source of ongoing information about how a project is going. The key informant method is actually the basic model for the focus group approach discussed below.

## 2. Participant observation

Participant observation, as intended here, is simply the activity engaged in by an observer, for example, a supervisor, field worker, or Sentinel Post staff, who is taught to use an observation guide to determine whether a desired behavior or behavior change is really occurring among either the client or deliverer population. Such observation may occur informally as part of a home visit, or more formally as part of some survey activity.

### 3. Mother-testing

Mother-testing is based on a small, standard set of questions, some of which can be responded to by demonstration, administered to mothers either during home visits or at a clinic site; one example is knowledge of how to prepare ORS. Such testing also can, and should, be incorporated into the training of trainers and service-deliverers.

### 4. "Sondeo"

The sondeo method, used quite literally for taking "soundings," is based on having pairs of interviewers working together; in the case of agriculture usually one is an agriculturist, the other a social scientist or economist. In health project formulation, the technique has been used to identify obstacles confronting health services in achieving their targets, and to find ways of overcoming them. The procedure involves interviewing a wide variety of people, ranging from health ministry officials to health workers and members of the public, asking all of them how they think particular aspects of health services should be organized, and what may be currently wrong with them. Interviews are conducted like dialogues rather than interrogations, and questions are posed in a positive way (e.g., "what would you do to achieve 100 percent coverage next year?"). Interviews are carried out by teams of three to four, typically comprising a physician, nurse, and midwife. In the evening following each day of interviews, the team, or several such teams, meet to exchange ideas and write up notes; a report can be produced in six to ten days, dealing with health issues in an area of perhaps 100 km<sup>2</sup>.

### 5. Focus group

The focus group is a research method borrowed from commercial marketing and is really just a guided group interview or meeting whose purpose is to gain insight into some aspect of a (usually rural situation). The results of focus group sessions are qualitative -- an exploration of feelings rather than quantitative tabulation of yes-no answers to limited questions. A focus group is usually formed with six to ten persons from homogeneous backgrounds or interests. Under the guidance of a moderator, topics related to the subject matter of the research are discussed. Focus group discussions are conducted as an open-ended conversation, usually one to two hours in length, in which all participants are encouraged to interact with one another, to respond to others' comments. The sessions enable the investigators to hear and observe the groups' reactions toward the topics (e.g., reasons for non-participation in immunization activities) and to gain insight into the participants' knowledge, beliefs, and concerns. The focus group may be appropriately used before a larger study (either quantitative or qualitative) in order to explore research or information areas not previously identified or contemplated, prior to more extensive or intensive study; after a quantitative study, for interpretation of study findings and for developing a vocabulary for educational materials; or to elicit reactions and

impressions related to new products, ideas, and/or concepts. It is also possible to use focus groups to cross-validate other individual opinions and claims, e.g., availability of ORS at clinic sites.

Tier 2 also comprises indicators that both measure system effectiveness and serve as quality control for outputs, for example, "number of families with growth charts on hand," "% of women having received T.T. during last pregnancy," and "% of children with diarrhea in last 2 weeks given ORT." These indicators will provide both quantitative and qualitative information about the project(s) and will require population-based data-gathering efforts, either through Population-Based Registration Systems (PBR) or Population-Based Surveys (PBS). Thus, Tier 2 reporting activities will require more financial and technical resources than Tier 1.

#### 6. Population-Based Registration Systems (PBR)

An example of a Population-Based Registration System was provided above, in the description of Sentinel Post Systems. It is only necessary to add here that such universal registration techniques, of which any kind of census or routinized vital statistics reporting are examples, are not uncommon; a number of PVOs and some regional or pilot projects in the public sector are already using such techniques and the appropriate indicators for the CSRS could be grafted on to such systems easily enough. These methodologies all have their technical vulnerabilities. For example, routine data may be biased by substantial under-registration of deaths, particularly in newborns, or no registrations at all; extensive misreporting of the age at death or excessive proportion of 'age not stated' in death reports; inaccurate estimates of the population under five years old; and/or limited availability and variable quality of information from different areas of the country.

#### 7. Population-Based Surveys (PBS)

In the absence of a Population-Based Registration System, or the disposition to create one, data for Tier 2 will have to be derived through some kind of population-based data-collection technique or coverage survey.

There is a range of sampling techniques that can be used for coverage surveys, the completeness or randomness of which will depend on the degree of precision wanted or needed, as well as on the nature of the data to be collected. The larger the sample, the greater the precision, so that, if a particular rate in a population is low, a large sample is required to obtain a precise estimate. Therefore, selection of the sample size required depends on the rate and the level of precision required. Since less precision is asked of Tier 2 projects, sample sizes can be smaller than for Tier 3 projects, which will be asked to provide data on cause-specific mortality and morbidity. Similarly, insistence on total randomness can be less rigorous. The WHO "Manual for the

Planning and Evaluation of National Diarrhoeal Diseases Control Programmes" (Geneva 1984) states the nature of the range: "There are two basic types of survey: complete surveys and sample surveys. In a complete survey all persons or households in the area are surveyed. In a sample survey only some of the specified units in the area are selected to be surveyed. In general, the sample survey is preferred because it is less difficult, less time-consuming, and less costly than a complete survey and, if carefully designed and carried out, can be as reliable as a complete survey." One end of the range, then, is to do full coverage, i.e., all households in a given sample (e.g., a single community or health area) are covered, an approach akin to Population-Based Registration Systems and Censuses.

At some midpoint in the range is the cluster survey, which has its own range of variation. The WHO Manual outlines a simplified survey methodology for the measurement of diarrhea morbidity, mortality, and treatment rates which we summarize here for purposes of illustration. A cluster is defined as a randomly-selected group of households, each of which has an equal chance of being included in a cluster. The "household" is defined according to local circumstances and the number of households is calculated per formula. The households to be surveyed are then selected by a two-stage process. First, a cumulative list is prepared of all communities in the area to be surveyed; the total population of all those communities is divided by the number of clusters -- to be at least 30 for acceptable statistical reliability -- producing the "sampling interval"; a random number between 1 and the sampling interval is selected, which identifies the first community on the cumulative population list; the sampling interval is added to that random number, identifying the second community to be surveyed, a process continued until the required number of communities have been selected. Second, households to be surveyed are randomly selected according to any one of several methods, the choice of which depends on the availability of maps or current demographic data and on community size and configuration. One variation is a pie-shaped technique in which the sampling "pieces" of the pie are randomly selected; then, households within each piece are chosen with a random start and, subsequently, according to a predetermined interval, to assure coverage of peripheral as well as central households. Again, depending on the degree of precision wanted or needed, cluster samples can include more samples or more children per cluster. The WHO methodology typically involves 30 clusters of 7 children per cluster.

If carefully designed and conducted, a cluster survey has the advantages of relative speed, low cost, and low personnel requirements when compared with random selection of individual households, and yet provides accurate information, without undue bias. There also remains the possibility of totally random techniques in large samples, which are certainly possible for Tier 2 activities if project managers find them advisable. However, the Task Force's view is that these are not appropriate for Tier 2, although they will be essential for capturing the cause-specific mortality and morbidity information to be asked of Tier 3 projects.

It is important to underscore the fact that some of the effectiveness indicators to be gathered in Tier 2 projects are, effectively, qualitative indicators. These are the indicators that have to do with knowledge and skills, i.e., "number and % of health workers demonstrating ORT knowledge and skills," "number of families with knowledge of ORT," and "number and % of health workers demonstrating growth-monitoring and nutrition education skills." Others are behavioral, e.g., "% of children ever given ORT," "% of children with diarrhea in last 2 weeks given ORT" and "% of families with growth charts on hand."

An important component of data collection for these effectiveness indicators is the concept of "testing," of health facilities personnel and of mothers. The concept of mother-testing, for example, is that of a small, standard series of questions, some of which can be responded to by demonstration, for instance, how to prepare ORS. While the CSRS requires only a few indicators of this type, project managers may well want to incorporate others for their own project management purposes, for instance, knowledge of signs of dehydration, of understanding of the need for vaccination followup, or growth chart maintenance. Similarly, trainers and service-deliverers can be tested on these and similar topics, either as part of Tier 1 Systems Surveys; independently, by Sentinel Post personnel; or as subsidiary modules of some sort of Population-Based Data-Gathering activity.

### 3. Anthropological and Market Research Techniques

In order to design instruments that are adequate measures of knowledge, attitudes, and behavior, each project will need to employ anthropological and market research techniques described under tier one above. These studies will also provide valuable information for interpreting statistical and quantitative data such as establishing directionality of cause-and-effect relationships, associations versus causation to explain relationships between variables, etc.

FIGURE 4

**RECOMMENDED, ALTERNATIVE DATA-COLLECTION METHODOLOGIES**

TIER 1 (all projects; input and output data)	TIER 2 (selected projects; effectiveness and selected impact indicators plus Tier One indicators)	TIER 3 (3-4 projects; Special Studies plus Tier One and Tier Two indicators)
Project Documentation (PD)*	Population Based Registration Systems (PBR), (i.e., Census (CD), Routine Vital Registration/Vital Statistics (VR))	Population Based Registration Systems
and/or		and/or
Routine Service Statistics (RSS)		Population-Based Surveys (PBS) (with larger and more rigorous sampling approaches)
and/or	and/or	
Accounting Systems (AS)	Population Based Surveys (PBS) (i.e., coverage surveys based either on complete coverage, on cluster samples or on Lot Quality Assurance Sampling (LQAS))	and/or
and/or		Sentinel Post Systems (active surveillance) (SPS/as)
Systems Surveys (SS)	and/or	and/or
and/or	Sentinel Post Systems (passive or active) (SPS/ps, as)	Community-Wide Growth Measurement (GM) (for nutrition interventions)
Sentinel Post Systems (passive) (SPS/p)	and/or	plus
and/or	Community-Wide Growth Measurement (GM) (for nutrition interventions only)	Special Diagnostic (or Interpretive or Evaluative) Studies (SDS) of general, age- and cause-specific mortality, with selected ancillary studies such as: cost-effectiveness, cold-chain analysis, relationship between low birth weight and mortality, ksp, ethnographic analyses, market studies, (e.g., focus groups), verbal autopsies, etc.
National Data (ND) on:		
- importation/production		
- budget		
- expenditures		
<b>HIGHLY RECOMMENDED, COMPLEMENTARY DATA-COLLECTION METHODOLOGIES:</b>		
- Key Informant Interviewing		
- Participant Observation		
- Mother Testing		
- "Sondeo"		
- Focus Groups		

\*Methodology Code:

- |     |                                 |        |  |
|-----|---------------------------------|--------|--|
| AS  | = Accounting System             | PD     | = Project Documentation                    |
| CD  | = Census Data                   | RSS    | = Routine Service Statistics               |
| GM  | = Growth Measurement            | SDS    | = Special Diagnostic Studies               |
| ND  | = National Data                 | SPS/as | = Sentinel Post System/active surveillance |
| PA  | = Performance Assessment        | SPS/p  | = Sentinel Post System/passive             |
| PBR | = Population-Based Registration | SS     | = Systems Surveys                          |
| PBS | = Population Based Surveys      | VR     | = Vital Registration                       |

FIGURE 5

ORT	REQUIRED FOR ALL TIERS	TIER TWO	TIER THREE
Basic Data	Estimated no. of people in target population (PD,ND)		
	Estimated no. of children under 5 in target population (PD,ND)		
	No. of service units in project by type and total (PD,ND)		
	No. of targeted health workers in project, by type and total (PD)		
Inputs	Resources budgeted (ND,PD)		
	Annual estimated expenditures (ND/AS, PD)		
	No. ORS packets imported and locally produced by the project, by size (PD)		
Outputs	No. health workers trained (RSS,PD or SS)		
	No. individuals taught ORT (RSS,PD or SS)		
Effectiveness	No. service units and distribution points with ORS on hand (RSS,PD or SS)	No. and % health workers demonstrating ORT knowledge and skills	Cost per treated episode
		No. and % individuals with knowledge of ORT (PNS or PBR or T3)	Cost per death averted
		No. and % children ever given ORT (PBS or PBR or T3)	CD or SHS pr SPS/as)
		No. and % children with diarrhea in last two weeks given ORT (PBS or PBR or T3)	
		Diarrhea-associated severe dehydration rate among children 0-60 months (SS or PBS or PBR or T3)	Diarrhea-associated mortality rate (SS or VR or CD or SHS or SPS/as)
		Age-specific mortality rate, 0-12 and 13-60 months (PBR, (VR,CD), PBS, SS)	Diarrhea morbidity rates in 0-12, 0-60 months
		Diarrhea-associated mortality rate among children 0-60 months	% children 0-60 months malnourished by grade and below 3rd percentile wt/age
Impact	No. cases of severe dehydration per year (SS or VR)		

\*Methodology Code:

- AS = Accounting System
- CD = Census Data
- GM = Growth Measurement
- ND = National(or Regional) Data
- PA = Performance Assessment
- PBR = Population Based Registration
- PBS = Population-Based Surveys

- PD = Project Documentation
- RSS = Routine Service Statistics
- SDS = Special Diagnostic Studies
- SPS/as = Sentinel Post System/active surveillance
- SPS/p = Sentinel Post System/passive
- SS = Systems Surveys
- VR = Vital Registration
- T3 = Any Tier 3 Method (as)

applicable)

53

FIGURE 6

IMMUNIZATION

REQUIRED FOR ALL TIERS

TIER TWO

TIER THREE

Basic Data	Estimated no. of people in target population (PD,ND) Estimated no. of children under 5 in target population (PD,ND) No. of service units in project by type and total (PD, ND) No. of targeted health workers in project, by type and total (PD)		
Inputs	Resources budgeted (ND,PD) Annual estimated expenditures (ND, PD) No. vaccine doses imported and locally produced by the project, by type (PD)		
Outputs	No. health workers trained (RSS,PD or SS) No. individuals taught about immunization (RSS,PD or SS)		
Effectiveness	No. service units with planned vaccines on hand (RSS,PD or SS)  No. service units with effective cold chain (RSS,PD, or SS)	No. and % of children at 12 months having received DPT 1,3, Polio 1, Polio 3, Measles, and <u>all</u> immunizations (PBS or PBR or T3)  No. and % women aged 15-45 years having received two doses of T.T. (PBS or PBR or T3)	Cost per protected child  Cost per death averted
Impact	No. cases of NNT per year  No. cases of measles per year	Measles-associated mortality rate among children 0-60 months (SS or PBR or PBS)  Neonatal tetanus associated mortality rate among children 0-12 months  Age-specific mortality rate 0-12 and 13-60 months (PBR (VR,CD),PBS or SS)	Age-and disease-specific mortality, morbidity rates (NNT,tetanus, polio, and measles) (SS or VR or CD or PBS or SPS/as)      % children malnourished by grade and % below 3rd percentile wt/age

\*Methodology Code:

AS = Accounting System  
 CD = Census Data  
 GM = Growth Measurement  
 ND = National (or Regional) Data  
 PA = Performance Assessment  
 PBR = Population Based Registration  
 PBS = Population Based Surveys

PD = Project Documentation  
 RSS = Routine Service Statistics  
 SDS = Special Diagnostic Studies  
 SPS/as = Sentinel Post System/active surveillance  
 SPS/p = Sentinel Post System/passive  
 SS = Systems Surveys  
 VR = Vital Registration  
 T3 = Any Tier 3 Method (as applicable)

55

FIGURE 7

NUTRITION	REQUIRED FOR ALL TIERS	TIER TWO	TIER THREE
Basic Data	Estimated no. of people in target population (PD,ND)		
	Estimated no. of children under 5 in target population (PD,ND)		
	No. of service units in project by type and total (PD,D)		
	No. of targeted health workers in project, by type and total (PD)		
Inputs	Resources budgeted (ND,PD)		
	Annual estimated expenditures (ND,PD)		
Outputs	No. health workers trained (RSS,PD or SS)		
	No. individuals taught infant/child feeding (RSS,PD or SS)		
Effectiveness	No. children enrolled in growth monitoring (PD)	No. and % workers demonstrating growth monitoring and nutrition education skills (PBS or PBR or T3)	
		No. and % children breastfed and eating semisolids at 6 months (PBS or SPS/as or GM)	
		No. and % weighed in last 3 months	
		No. and % children identified as high risk who received follow-up since last weighing	
		No. and children who are severely malnourished	
		No. and % children growing as fast or faster than local or UNICEF standard at last weighing	
		Age-specific mortality rate, 0-12 and 13-60 months (PBR (VR,CD) PBS,SS)	Age-specific mortality rate, 0-12 and 13-60 months
Impact			% children malnourished by grade and % below 3rd percentile wt/age

#Methodology Code:

AS = Accounting System  
 CD = Census Data  
 GM = Growth Measurement  
 ND = National(or Regional) Data  
 PA = Performance Assessment  
 PDR = Population Based Registration  
 PBS = Population Based Surveys

PD = Project Documentation  
 RSS = Routine Service Statistics  
 SDS = Special Diagnostic Studies  
 SPS/as = Sentinel Post System/active surveillance  
 SPS/p = Sentinel Post System/passive  
 SS = Systems Surveys  
 VR = Vital Registration  
 T3 = Any Tier 3 Method (as applicable)

57

FIGURE 8. ALTERNATIVE DATA-COLLECTION METHODOLOGIES

<u>METHODOLOGY</u>	<u>DATA TYPES COLLECTED</u>	<u>STRENGTHS AND USES</u>	<u>LIMITATIONS</u>
<u>Management-Linked Approaches</u>			
Accounting Systems (AS)	- routine data on income and expenditures (money, supplies, equipment, personnel, facilities)	- essential for monitoring and for cost-effectiveness-efficiency analysis; strength derives from proper structuring of system and quality of entry	- derive from quality of system: if system is inappropriately structured or maintained, utility of data compromised; - special accounting studies may be required, to avoid risks of extrapolating from small number of facilities or too-short time periods;
Performance Assessments (PA)	- output and quality (e.g., % health workers demonstrating knowledge and skills in X)	- can be integrated with Systems Surveys (see below); - enlarges upon and validates such dubiously informative data as "numbers of workers trained"; - can be used to enhance educational and collaborative content of supervision/control, assess appropriateness of training, appraise levels of commitment; - data quality can be controlled by standard indications and corresponding standardized testing mechanisms;	- derive from role/institutional position and training of individuals carrying out assessments; if inadequate, bias may be introduced
Routine Service Statistics (RSS)	- output data: supplies, equipment, maintenance, training, commodities distribution (e.g., commodities on hand, subsystems functioning, workers trained, families taught, commodities administered or distributed, etc.)	- scrutiny of records in health facilities can yield data of what is missing (e.g., cases undiagnosed) and so permit estimates of undercounting	- cases often erroneously or vaguely diagnosed, if at all

Systems Surveys (SS)

- same as RSS plus can be designed to quantify or focus more precisely or probe more deeply; system-wide characteristics or one specific subsystem (e.g., cold chain analysis, prevalence of stock-outs, health provider KAP and retention of training material, availability of fuel and per diem for supervision, etc.)

- provides systematic, quantified understanding of functioning and quality of system, guards against risks of anecdotal interpretations; - can be expanded to include health provider performance assessments

- takes more time, usually on part of upper-level supervisory personnel, or implies cost of outside analyst

National Data (ND)

- input data: resources budgeted, annual estimated expenditures, commodities imported and/or locally produced, personnel deployed

Sentinel Post System/ passive

- service statistics information;

- relatively economical (requires addition of only one person with basic statistical/clerical skills to a sample of service delivery units

- training required of new personnel;

Sentinel Post System/ active surveillance

- active, systematic, intensive data collection, usually randomized and prospective by implication

- high-quality, creditable data at relatively low cost without disrupting service activities; good for "disciplining" quality of service delivery, output, and effectiveness indicators; since based on a sample, permits better training and supervision and more concentrated expenditures of time and effort than does a general collection system

- inadequate for indicators for which a total count is required; - training required of on-the-job or new personnel; - may not provide data representative of an entire country; - may be difficult to set up (limitations of time, personnel)

METHODOLOGY

Population-Based  
Registration Systems (PBR)

Census Data (CD)

Routine Vital  
Registration/Vital  
Statistics (VR)

DATA TYPES COLLECTED

STRENGTHS AND USES

- wide coverage; where exist,  
available at little or no cost;  
can piggy back special health  
modules onto forthcoming censuses  
or national household surveys

LIMITATIONS

- mortality data collected or  
estimated from general population  
censuses not sufficiently  
specific as a single data set  
unless additional questions  
added for a subsample; relative  
infrequency may make unsuitable  
for program impact measurement;  
slow in being processed

METHODOLOGY

Surveys

DATA TYPES COLLECTED

- KAP;
- general, age-specific, and/or cause-specific mortality and morbidity

STRENGTHS AND USES

LIMITATIONS

- generally more costly (e.g., mortality data-collection through household surveys) but can be controlled by: frequency of collection, instrument size, use of local personnel, reducing frequency of analysis and publication of results while sustaining collection frequency;
- rarely provides understanding of causality;
- do not typically involved client populations in their design, execution, or sharing of findings

Large-Scale Household Surveys (single round)

- disease (e.g., diarrhea)-related mortality data, short and simple questionnaires with large-scale probability samples;
- same for morbidity data; however, for diseases with high prevalence (e.g., diarrhea) samples can be smaller;
- time parameters 2-week recall for morbidity, 1-year for mortality

- sample design requires equal probability of selection for individual respondents or household (as opposed to a quota or convenience sample) essential to valid results;

- in order to find a sufficient number of cases, a sample of 5,000 or more households generally required

58

METHODOLOGY

Surveys, cont.

Same but multi-round  
or panel study

Combinations

DATA TYPES COLLECTED

- employs 2 or more comparable  
interviews over a specified  
time period for the same  
respondents or for samples  
defined within the same  
framework (e.g., respondents  
living within the same primary  
sample clusters)

- use of other methodologies  
in conjunction with surveys  
for cross validation,  
establishment of correction  
factors (e.g., intensive  
surveillance for a small area  
or a multi-round survey for a  
subsample used to validate or  
correct a less intensive,  
nationwide, single-round survey

STRENGTHS AND USES

- deaths of young children  
living at the time of the  
first interview unlikely to  
be missed;  
- multi-round survey using  
same questionnaire and sampling  
frame but different respondents  
is less expensive than a panel  
study

LIMITATIONS

- suffer from respondent dropout,  
sensitization of respondents to  
survey instrument and possible  
increase in refusals

METHODOLOGY

Special-Diagnostic  
or Interpretive or  
Evaluative Studies (SDS)

Home Visits

Key Informant  
Interviewing  
Participant Observation

DATA TYPES COLLECTED

- knowledge, attitudes, practices (KAP);
- cost-effectiveness;
- special clinical (e.g., low birthweight and mortality relationships, verbal autopsy of diarrhea-caused deaths, treatment histories, etc.);
- quality of service delivered (e.g., presence of packets, health education effectiveness, feeding practices, community participation);
- shelf audit data commodity distribution points, pharmacy exit survey data;
- KAP related to child survival components (e.g., learning from health education, use of commodities, self-care patterns, attributions of causality, etc.);
- growth monitoring;
- case identification

STRENGTHS AND USES

- provide controls and deeper understanding of survey data (see "Limitations" thereof above) or headquarters or "armchair" biases;
- provide understanding of causality typically absent from survey methods;
- protects programs from being provider- or system-centered and helps them become more client-centered
- permits verification of effectiveness of outputs, analysis of reasons for failure, valuable for evaluation and project management;
- often part of routine activities or can be incorporated into sentinel system;
- low cost;
- captures clientele which does not present at clinical facilities;
- can capture data in community at large, including private-sector deliverers as well as clients;
- can identify real demand and felt needs

LIMITATIONS

- generally limited to a few cases or communities; however, power can be enhanced by integration with quantitative studies in larger samples;
- not easily quantified
- not statistically randomized, although can be systematized by requesting units be made to a predetermined sample of homes or by using a small standard interview or test instrument;
- adds to burdens of existing staff if not part of regular job descriptions; collection burden can be lightened by keeping questions to a minimum, by asking questions in only every n<sup>th</sup> home visit, by requesting information on a revolving basis or from only some of the delivery personnel; may require relief from other duties and/or some incentive;
- can be biased by institutional identification of interviewer

METHODOLOGY

Cost and  
Cost-Effectiveness  
Studies

DATA TYPES COLLECTED

- total program costs;
- proportion of episodes treated, inoculations achieved plus following doses, movement upward in Gomez categories, etc.;
- Deaths averted;
- cost per episode treated, person treated, death averted

STRENGTHS AND USES

LIMITATIONS

- cost data typically difficult to obtain

SECTION VI: EXAMPLE: TRAINING VILLAGE HEALTH WORKERS IN AN  
ORT PROGRAM

This section presents an example of the step by step process used to develop and implement a monitoring and evaluation system. I have chosen as my example a project in Kenya which is funded through an A.I.D. child survival grant for a 5 year ORT project. This project will train VHW's to teach mothers to use "home mix" ORT. New Village Health Workers will be trained to use ORT as part of a more general primary health care program, and will also be trained to use a village based record system to keep track of their families. This project is quite fortunate in this endeavor since they have the full backing of the Kenyan Government.

SET OBJECTIVE: TRAINING

As in all monitoring and evaluation systems, the process one must go through in designing a M & E system for a village health worker training program is deciding what it is you plan to do (objective setting), how you will do it (activities list), what measure you will use to determine your success in that activity to date (indicators), how you will collect that data, how you will analyze it, and what you will do with the information that you do collect. A flow chart of this process is on the left.

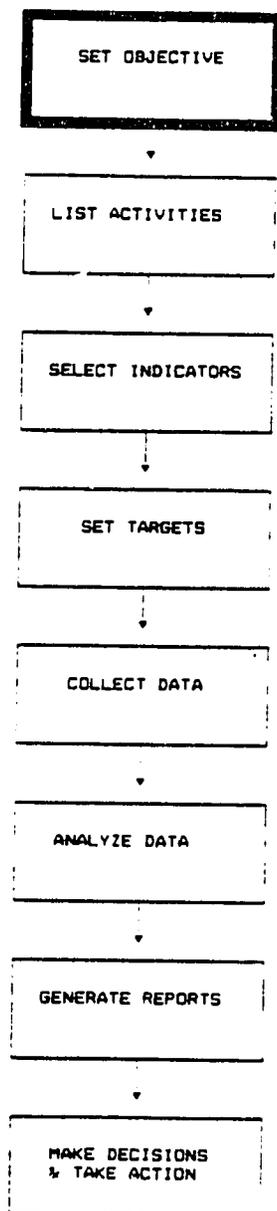
For our program of training of village health workers in an ORT program the objective is to change mothers behavior in treating their children who have diarrhea. It might be phrased as:

OBJECTIVE: TRAIN MOTHERS THROUGH VILLAGE HEALTH WORKERS SUCH THAT 40% OF ALL EPISODES OF DIARRHEA IN CHILDREN LESS THAN 5 YEARS IN THE TARGET POPULATION WILL BE TREATED WITH ORT BY THE END OF 1987.

Obviously, the choice of a target date (1987) and level (40%) depend on the specific program which we have adopted; another program might choose different targets based on baseline information, program priorities, or the relative difficulty of implementation in various regions or countries.

Note that this objective is measureable, time limited and and hopefully realistic. It is something that our program will specifically address: treating children with ORT, rather than reducing mortality, something over which we may have less control.

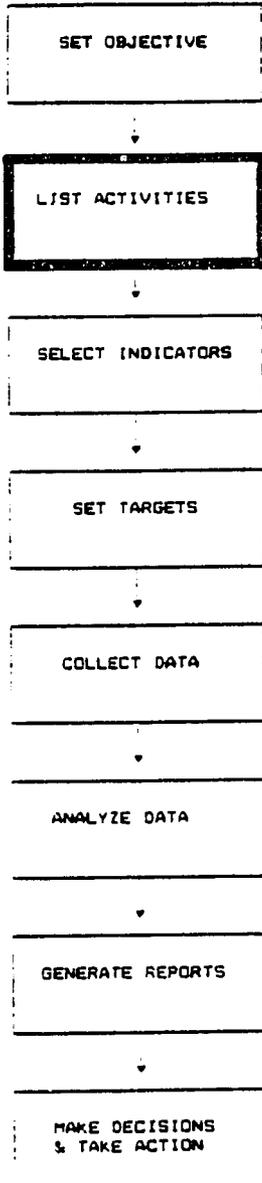
While most projects will have more than one objective, This example has been simplified so that only one objective will be discussed. However, in your own projects you might wish to define the objectives more narrowly.



62

LIST ACTIVITIES: TRAINING

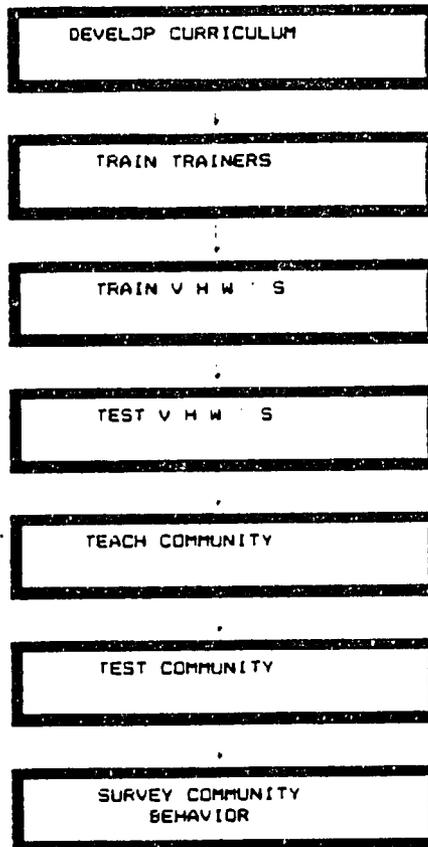
The choice of an activities list will depend on the specific needs of the program. In some cases, work such as curriculum development will already have been done. However, in this sample project, no curriculum is presently available so it will have to be developed. On the other hand, we already have existing buildings suitable for our needs, so no building program is included in the activities list.



The list was developed by thinking step by step of what had to be done to train village health workers in an ORT program. Most activities have multiple tasks. For example, before training trainers, the trainers have to be selected and brought to a training area. These tasks would all be included in "train trainers."

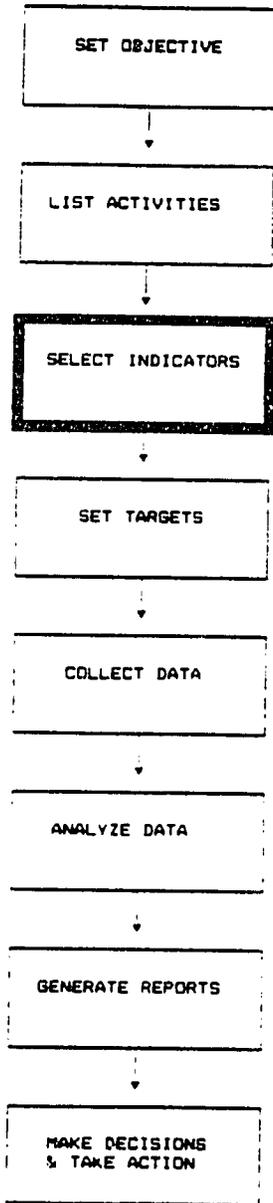
The activities list for the training program might be described by the following chart:

FIGURE 9: ACTIVITIES LIST

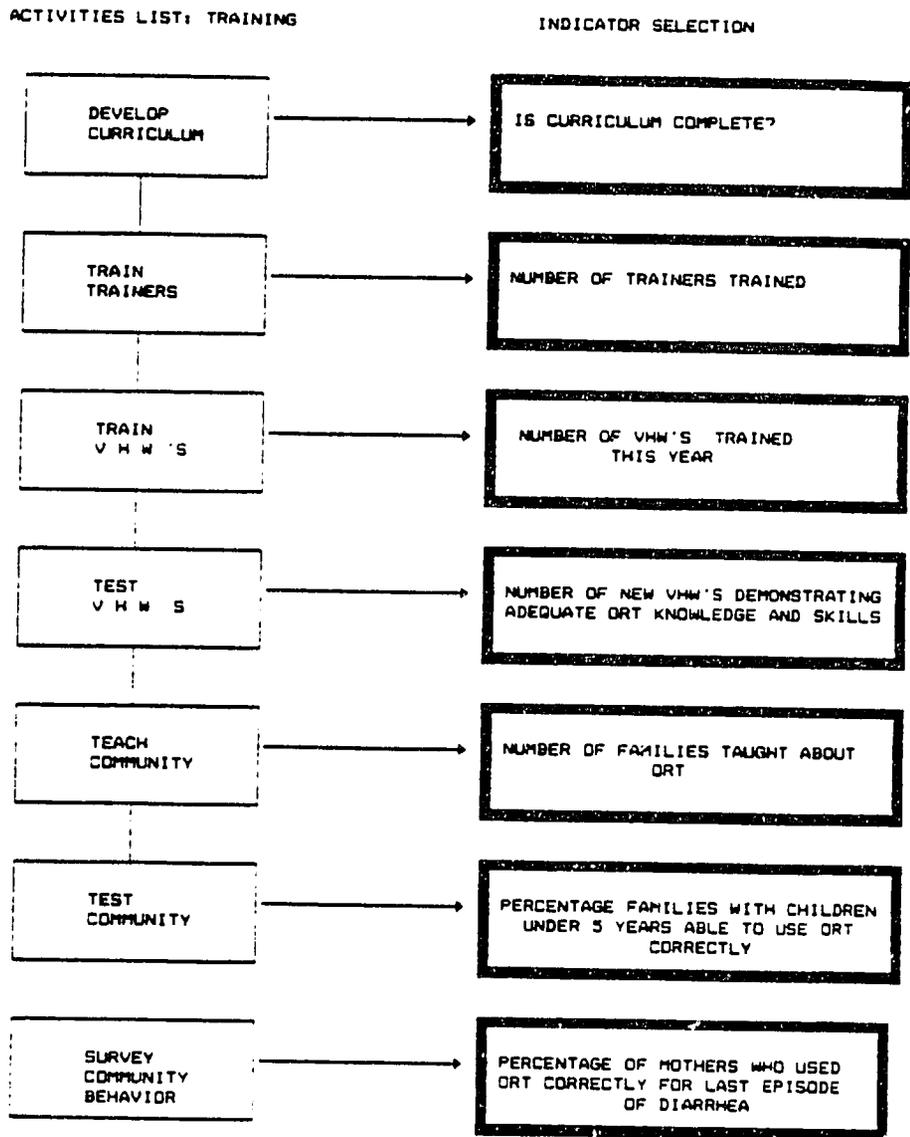


SELECT INDICATORS: TRAINING

From this activities list, we will now want to develop a set of appropriate indicators to monitor where we are along each step of the program, where we have unforeseen problems and what remedial action will be necessary to achieve our objectives. For the activities above I have chosen indicators from the Child Survival task force for most of the activities since these indicators appeared to suit my needs for this project and were in fact developed for use in monitoring and evaluating a training program such as this one. However the first two indicators are not from the Child Survival task force and were instead developed directly from the activity since the relationship between the activity and the appropriate indicator was straightforward. We see that in this particular example each activity has exactly one indicator. While this is not always the case, it does make it easier to understand the relationship between activities and indicators.



**FIGURE 10: INDICATOR SELECTION**



69

SET TARGETS: TRAINING

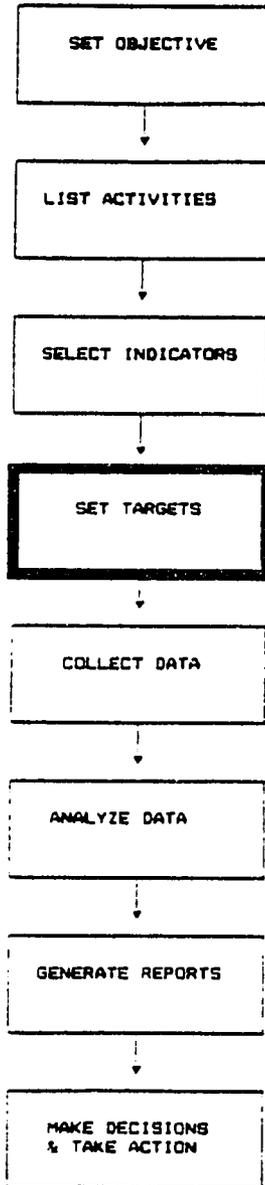
This program is a 5 year training program in 3 phases. The first year is the start-up phase in which the curriculum is developed and the first group of trainees are trained. During this period, we expect to train all our trainers and to have them train one group of VHW's. Our timing is:  
1st QTR.: develop curriculum  
2nd and 3rd QTR.: train 10 trainers  
4th QTR.: train first group of VHW's

The second two years are the growth phase during which we expand the number of trained VHW's to our target of 450 to be reached by the end of 1985. During this period we will also be expanding the number of target families from 10,000 to 25,000.

The last two years are the maintenance phase during which we try to increase the percentage of families using ORT in our target population. During this phase we will train only enough VHW's to replace those that drop out of the project and the role of the trainers will shift from training new VHW's to providing in-service training for the existing ones. We estimate a turnover rate of about 20% per year of VHW's so will need to train 90 new VHW's each year during this phase.

During the maintenance phase we estimate that each VHW will be responsible for about 50-60 families. Our experience is that this ratio is the highest that can be maintained if we want to reach our objective of 40% correct use of ORT. We also feel that if 50% mothers know how to use ORT correctly, 4/5 will actually use it.

Our baseline survey in early 1983 showed that 10,000 families had already been taught about ORT through another program, and of these 25% and 20% knew how to use and used ORT respectively.



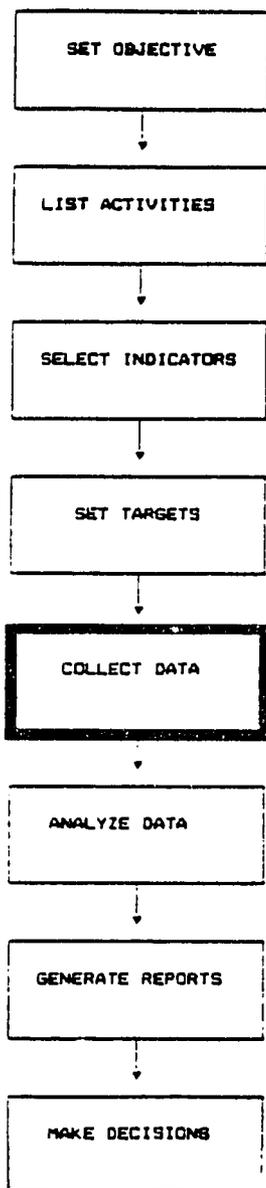
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TARGETS:

<u>INDICATOR</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Is curriculum complete	yes	-	-	-	-
Number of trainers trained	10	replacements only			
Number of VHW's trained each year	90	200	200	90	90
Number of new VHW's demonstrating adequate ORT knowledge and skills	----	90%	----		
Number of families taught about ORT	10000	20000	20000	25000	25000
% families able to use ORT correctly	25%	30%	30%	40%	50%
% mothers who used ORT correctly for last episode of diarrhea	20%	25%	25%	30%	40%

COLLECT DATA: TRAINING

The data collection system for the indicators we are using is fairly straightforward since most will come from routine service statistics. We are fortunate in our project to be using village health workers who keep a registration system of their 50-60 families since this simplifies the data collection process for us on the last two indicators. We have chosen to collect information on all indicators yearly since this poses no special problem for us and the expense of collecting this information is minimal given our population-based-record-system. However, some projects might choose to collect information less frequently if, for example, they were planning to use surveys which are more difficult and more costly.



<u>INDICATOR</u>	<u>METHOD OF COLLECTION</u>
Is curriculum complete	RSS- collected centrally
Number of trainers trained	RSS- collected centrally
Number of VHW's trained	RSS- collected regionally
Number of new VHW's demonstrating adequate ORT knowledge and skills	Performance Assessments - done by regional trainers
Number of families taught about ORT	RSS- collected by district
‡ families able to use ORT correctly	PBRS- information will be gathered by VHW supervisors in their routine visits each month. By collecting the information this way we can use the data collection system as a way to insure monthly supervision of all VHW's. We plan to do a small sample survey at the end of 1985 and 1987 in order to make sure our figures are accurate.
‡ mothers who used ORT correctly for last episode of diarrhea	PBRS- same as above

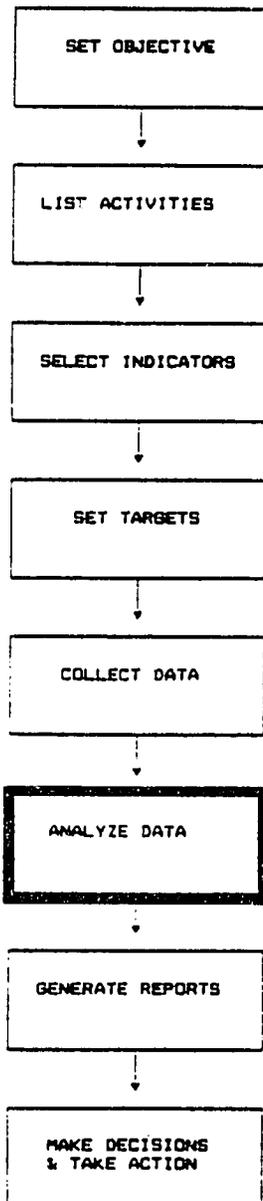
## ANALYZE DATA: TRAINING

The analysis of data for our training program has two stages. The first is planning how the analysis will be done and determining what level of aggregation and method of presentation to use for reporting. The second stage is to actually do the analysis on data as it is collected from the field.

For this monitoring and evaluation system I have chosen to present descriptive reports on the first two indicators and graphic reports for the rest. A discussion of why this method of presentation was chosen is presented under the **GENERATE REPORTS: TRAINING** section which follows this one. The level of aggregation of data is apparent in the reports themselves.

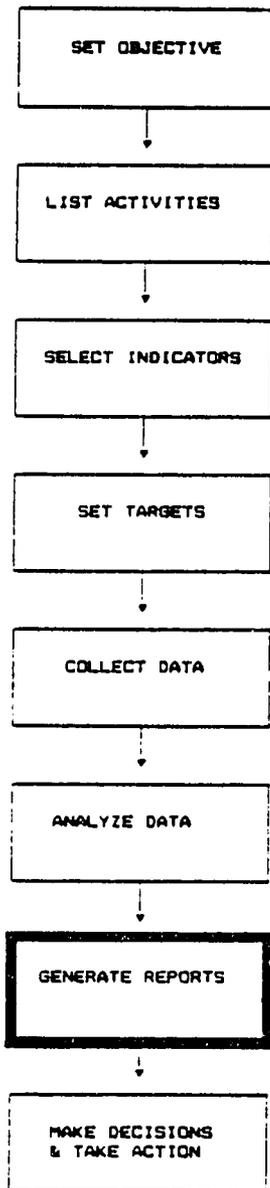
I will present the analysis of the data which is collected under the heading **DISCUSSION** following each of the 3 graphic reports.

NOTE that I have chosen 1985 as the year for which these reports are prepared to illustrate how they might look several years into the program.



## GENERATE REPORTS: TRAINING

We will want to present information on each of the 7 indicators for our ORT training program but would like to combine some of the information in a way that will make sense to the manager overlooking the information. For this purpose, I have chosen 4 reports:



- I. A descriptive report on the first two indicators: "curriculum complete?" and "no. trainers trained." The activities measured by these two indicators will be completed early in the project and thereafter will probably not change significantly unless problems are encountered. Since any changes are likely to be more qualitative than quantitative, a descriptive report seems more appropriate.
- II. A graphic trend report of the indicator "number of families taught about ORT." Both yearly and cumulative figures (the total number of mothers taught since the beginning of the program) are presented. This gives us a picture of whether we are meeting our target for this indicator and whether we are likely to meet our final objective.
- III. A graphic report of the indicators "number of VHW's trained this year," and "number of new VHW's demonstrating adequate ORT knowledge and skills compared by region." This gives us a measure of the performance of the training program which in our case is being done on a regional basis.
- IV. A graphic report of the indicators "percentage of families with children under 5 years able to use ORT correctly," and "percentage of mothers who used ORT correctly for last episode of diarrhea." Here we are looking for a measure of the effectiveness of the project in teaching and motivating mothers to use ORT, and this report gives us a picture of this by region to know where we need to focus our efforts.

These 4 reports have been chosen to give the busy manager a quick picture of how well the project is doing on a regular basis. This does not mean that this is all the manager will ever want to know about the project. If these 4 reports highlight a significant problem he or she would request further information about that problem area. The reports will not provide all the answers a manager might ever need. It will, however, help him or her decide which further questions to ask.

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CURRICULUM DEVELOPMENT AND TRAINERS  
4th QUARTER 1985

CURRICULUM DEVELOPMENT: The curriculum for training VHW's which was developed two years ago has been slightly modified to emphasize the importance of teaching mothers how to mix ORS correctly. It was found in our previous reports for 1984 that while many mothers had heard about ORT few knew how to mix it correctly. In reviewing the reasons for this, we found that our curriculum stressed reaching as many mothers as possible rather than teaching each mother correct use. We were concerned that incorrect use of ORT might be very dangerous for children with diarrhea.

NUMBER OF TRAINERS TRAINED: We originally trained 10 trainers: 4 for each region and 2 substitutes. We have tried to maintain that number throughout the project. This year 3 trainers dropped out of the program: 1 moved to another part of the country, 1 took a job with a new mining company and one became pregnant and decided to quit. We are in the process of training their replacements and should be finished by the end of the next quarter. Since part of their training is to work with experienced trainers in the field, we have been able to maintain our VHW training program at its targeted level in 3 out of 4 regions. Only region B has trained fewer VHW's than expected.

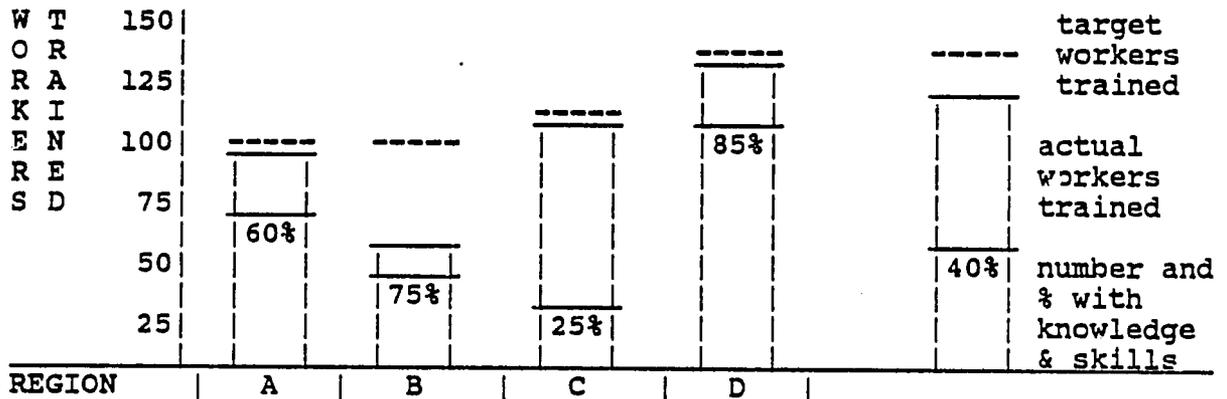
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CUMULATIVE NUMBER OF VHW's TRAINED IN ORT  
and  
PERCENTAGE DEMONSTRATING KNOWLEDGE AND SKILLS

REGIONAL COMPARISON --- 1985



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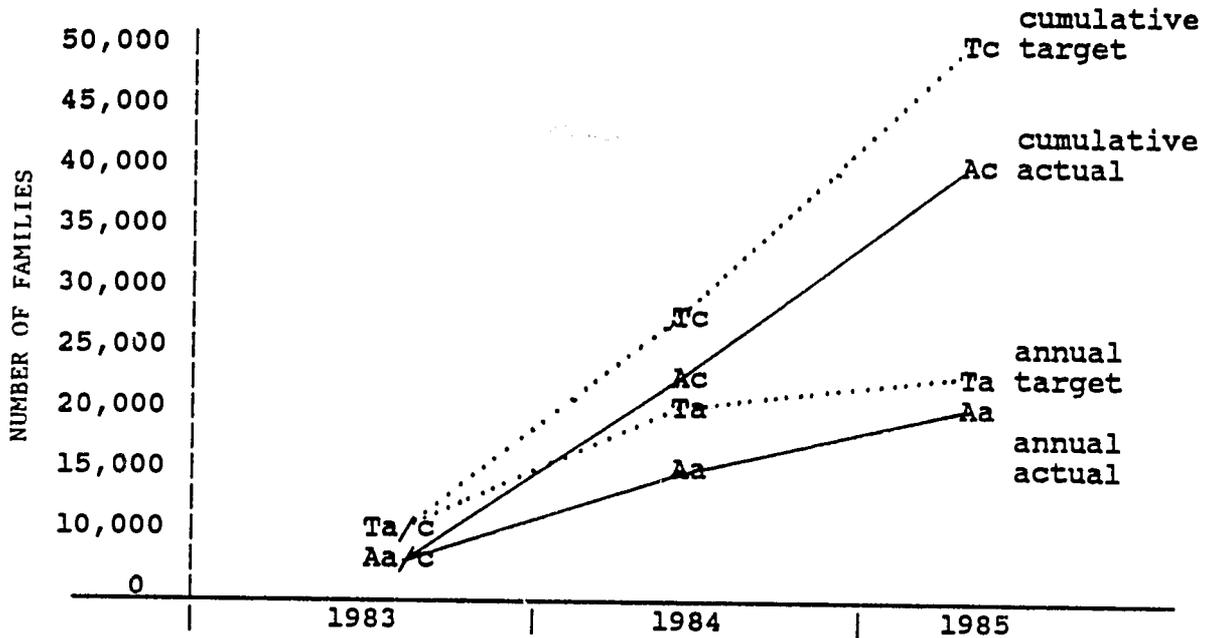
DISCUSSION: The training program is going well. In 3 out of 4 regions we are at our target for number of VHW trained. In regions A and D most of those trained demonstrate the necessary knowledge and skills so the training program in those regions is quite satisfactory. This is especially impressive in region D which is the largest; the regional director there, Mwalimu mkubwa, should be sent a special commendation.

Our problems seem to be in regions B and C. In region B, they are very short of their target for total VHW's trained, although most of these (75%) do seem to be adequately trained. I know that they had only 1 trainer for a period of time since one of their trainers took that job at the mine for twice the salary we could offer. Still, I think we need to visit them this month to see how they are doing.

I am most concerned about region C. Even though they have met their target for number of VHW's trained, most of the VHW are not able to pass the competency test. What good is training if the trainees don't learn anything! I understand one of the trainers spends most of his time going into town with his friend's. This situation needs to be investigated further.

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NUMBER OF FAMILIES TAUGHT ABOUT ORT  
ANNUAL & CUMULATIVE TRENDS  
1983-1985

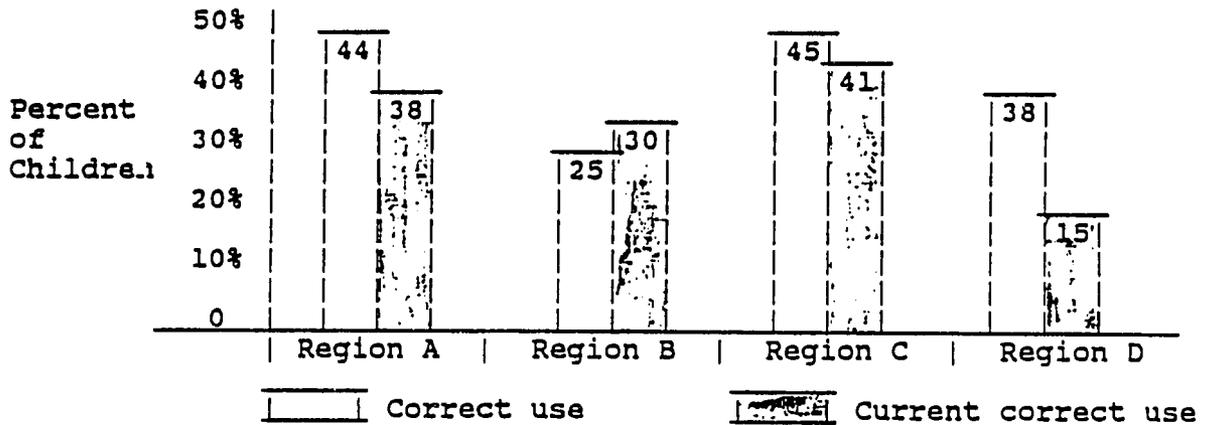


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DISCUSSION: 1983 was the first year of the project so annual and cumulative figures are the same. We were late in starting training so trained slightly fewer families than expected in 1983. In 1984 the program went smoothly but due to the expansion of the program, we again were late in training some of the VHW so fell short of our target of 20,000 families by 25%. However, in 1985 we were almost on target with 18,000 trained compared to target of 20,000. However, in order to meet our original activity target of 100,000 families by 1987 we will either have to expand the number of VHW's or ask each VHW to reach more families each year.

\*\*\*\*\*

CORRECT USE VERSUS CURRENT CORRECT USE  
REGIONAL COMPARISON  
1985



\*\*\*\*\*

**DISCUSSION:** This chart displays the proportion of the population who know how to use ORT in each region and those who both know how to use it and did use it for the last episode of childhood diarrhea in their family. It is useful in evaluating the effectiveness of the VHW's first in teaching mothers how to use ORT correctly and secondly in motivating them to use it for each episode of childhood diarrhea.

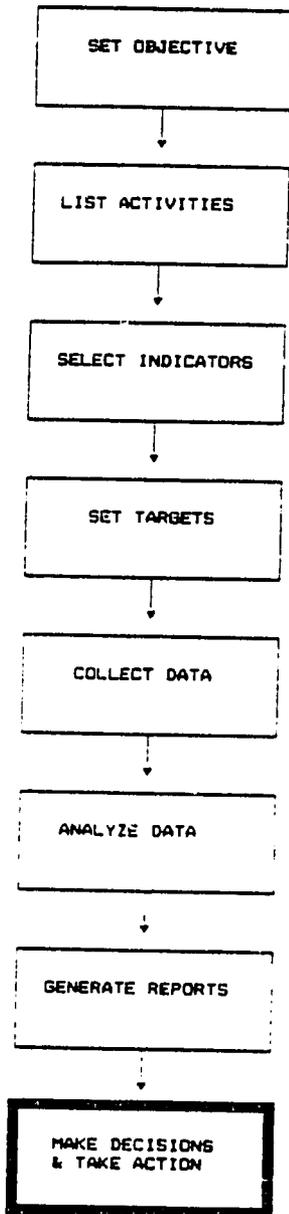
In Regions A and C almost half the population knows how to use ORT correctly and 40% of the children who have had diarrhea in the last 2 weeks have been treated correctly with ORT. In Region B, current correct use is up to 30%, whereas only 25% of the total population are able to demonstrate how to use ORT correctly. This surprising reversal might be attributed to a data collection problem. It is likely that these surveys were done at different times or on different populations. [Note how this graphic representation alerts the manager to these data discrepancies which might have been missed in a more traditional format.] In Region D, current use is much lower than knowledge of correct use suggesting that VHW's might need extra support in motivating the mothers to use ORT in this region.

## MAKE DECISIONS & TAKE ACTION: TRAINING

From our monitoring and evaluation system we have uncovered several problems which will need to be dealt with if we are to achieve our stated objective.

Probably the most significant problem is highlighted in the report of NUMBER OF FAMILIES TAUGHT ABOUT ORT. There we find that we are falling short of our target number of families taught. From this we can see that we will either need to increase the number of VHW's or ask each VHW to reach more families. We are concerned that expanding the number of families/VHW will not allow sufficient attention to each family so I prefer to slightly increase the number of VHW's, which we should be able to do comfortably. For one thing, we know that there was a temporary shortfall of trainers due to the loss of 3 trainers, but this situation is now under control. I think that region B was the most affected by this, but should now be more on target.

Our second problem is what to do about region C where most of the VHW's are not able to perform their job satisfactorily after training. This needs investigation, so I will pay an unannounced visit to them next month.



## APPENDIX

### CHILD SURVIVAL GRANTS: REQUIRED DOCUMENTATION

Those PVO's which are participating in the Child Survival grants have various reporting requirements to AID in order to satisfy the terms of the grant agreement. These requirements include the following:

#### PROGRAM ACTIVITIES: (To be done once)

1. Detailed Implementation Plan: due Dec. 31, 1985  
This report, as defined by the Standard Language memorandum, will include information on how the project will actually be implemented, including critical activities to be carried out and estimated time frames. This should be seen by the PVO's as an opportunity to clarify project objectives, define target populations and review project strategies in light of the workshop activities and any new information from the PVO field staff.

#### REPORTING SYSTEM: (To be done once)

2. Detailed Evaluation Plan: due Dec. 31, 1985  
This report, as defined by the Standard Language memorandum, will include project-specific objectives, activities, indicators for measuring achievement of objectives and activities, targets, and mechanisms for collecting data useful for monitoring and evaluation. The activities component of this will follow from the detailed implementation plan. An evaluation plan should specify the times and general scope of work for internal and external evaluations, and linkages of indicators to these evaluations.

3. Development of a Project Specific MIS: due with first annual report  
A projects Management Information System should provide the basic information for monitoring and evaluating project performance.

#### REPORTS: (To be done annually)

4. Annual Progress Reports:  
These reports will include data which has been collected through the Management Information System and any complementary evaluations activities. Annual reports will discuss the status of inputs, outputs, effectiveness and, in some cases, impact of the various projects. These reports will discuss: why certain activities and results have happened or not happened; what constraints are facing the project, plans for overcoming constraints, mid-course corrections, etc.

5. Child Survival Task Force Indicators:

This information will be required of all programs receiving child survival funding including bilateral agreement participants, indigenous PVO's, other participating organizations, and U.S. based PVO's. This information will include inputs, outputs, effectiveness, and in rare cases impact, based on standard indicators developed in cooperation with USAID, WHO, CDC, and other international organizations in an effort to begin a multipurpose, multiuser data base. A second use of this data will be to provide Congress with aggregate data on the child survival initiative which is specifically required in the funding bill. The information required for this report will in almost all cases be provided from data in the annual report.