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**A Simplified Costing  
Format for  
Primary Health Care Activities**

by

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for  
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## A SIMPLIFIED COSTING FORMAT FOR PRIMARY HEALTH CARE ACTIVITIES

### A. Introduction

Information on the actual cost of primary health care programs is some of the most necessary and useful data potentially available to program managers, planners, and evaluators. Cost information can be used: in benefit/cost and cost effectiveness analyses (to choose among alternatives); to monitor program implementation; to project the costs of new or expanded programs; and, to identify areas where efficiency can be improved. Despite the clear importance of cost data, little has been done to ensure that cost information is complete for any given program or consistent from program to program. Start-up costs generally include capital investments, but often lack information on the costs to administer and manage the start-up phase. In many cases recurrent cost information is completely absent or omits key inputs from host country ministries or the communities being served.

As a result, cost information often times cannot be used as a management tool. In addition, where cost data is needed for projecting the costs of new programs or for making decisions on the allocation of scarce resources to competing programs (i.e., ORT, immunizations, water supply and sanitation) specialized consultant teams are needed to conduct studies of the past program implementation records. Much of this information should be, but is not readily available -- because it was not gathered when the program was being implemented.

The purpose of this paper is to present a set of standardized costing formats for both development (start-up) and recurrent (operating) costs. The formats are intended to be used as a starting point or checklist for the costing of a wide variety of primary health care activities. Although the specific elements of any given program may vary, the standardized groupings serve as a reminder of the types of costs that are to be included and to ensure that the inputs from all sources (i.e., donors, ministries, communities) have been considered. Examples of the uses of the formats for a water supply program and an immunization program are also presented in this paper.

The standardized formats are intended for use by project managers and field personnel who are implementing child survival and/or water supply and sanitation programs. In particular, the managers of private voluntary organizations and ministry of health programs will find the guidelines helpful for establishing the output information required from cost monitoring systems and for summarizing program costs in a way that will be meaningful to others. The costing formats will also be helpful to technical assistance teams and evaluation teams for use as a summary format or for use in introducing the concepts of cost monitoring to project personnel in the field.

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<sup>(1)</sup> The WASH Project provides short-term assistance in water supply and sanitation; the REACH Project provides assistance in immunizations, health care financing and primary care system support.

(USAID). It is hoped that the presentation of this paper will promote more discussion on the importance of adequate cost data and stimulate actions to resolve outstanding issues on costing terminology and methodologies.

## B. Area of Focus

The conference at Alma Ata in 1978 defined the following activities as elements of primary health care:

- o Safe Water Supply
- o Basic Sanitation
- o Health Education
- o Maternal and Child Health Care and Family Planning
- o Immunization Against Major Infectious Diseases
- o Prevention and Control of Locally Epidemic Diseases
- o Promotion of Food Supply and Proper Nutrition
- o Appropriate Treatment of Common Diseases and Injuries
- o Provision of Essential Drugs

Each of the areas listed above presents a need for cost analysis and therefore, cost information. Not only is there a need for cost information, but several of the areas, like water supply, basic sanitation, health education, immunizations, and oral rehydration therapy (a part of the treatment of common diseases and injuries) also have similar types of field activities. These activities include training, construction of buildings or systems, community organization, program promotion, etc. In addition, the types of activities and associated costs make it possible to group the costs into general categories (personnel, materials, equipment, transportation, etc.) that are the same for each of these PHC activities.

The similarity of these activities is illustrated by the possible integration of ORT and immunization programs with a water supply program -- to promote better coordination, mutually reinforce interventions, and reduce field costs.

An example is a USAID-funded program in Bolivia. This program is being implemented by CARE and Departmental Development Corporations (DDCs). The program combines child survival funds for ORT and immunization with other funds for the construction of water supply and sanitation facilities. The program started in July 1986, and holds great promise for extending multiple benefits to the target communities at a cost that will be less than separate programs.

Integrated programs of this type are also underway in Malawi and are being planned for Zaire. In addition, more and more child survival programs are being planned or expanded, including those being implemented by private voluntary organizations. Although it is encouraging that more attention is being paid to child survival activities, it is unclear to what extent the actual costs of either integrated or separate programs will be captured and presented in a useful way for program management or for future decision-making. Without good cost information, program analysis and extrapolation to

other situations will not be possible and valuable lessons will be lost. What is needed is to insure that ongoing and future program costs are captured presented in a standardized, useful manner.

Because of the particular experience and expertise in the WASH and REACH Projects, this paper will focus on developing a standardized costing format for selected aspects of PHC: water supply and sanitation, health education, immunizations, and ORT. These PHC programs are the most similar in terms of objectives and in the types of costs usually incurred. Although the initial focus is limited, the standardized costing format that is developed for these activities should be applicable to other PHC programs as well.

### C. Need for Standardized Costing Format

A number of references were reviewed to determine the extent to which the existing literature on the costs of primary health care activities expresses the need for better cost information and presents costing formats. These references are included at the end of this report. Throughout the references that were reviewed, the need for good cost data is expressed. Typical uses are:

1. For reports to funding agencies (and Congress) on the cost of meeting program targets (for example immunization targets in Child Survival).
2. To provide part of the necessary information required for cost/benefit and cost effectiveness analyses.
3. For cost control and other managerial decisions.
4. To forecast future expenditures (for new or expanded programs).
5. To determine the mix of resources that is least costly and how the optimum mix will change with changes in wages or prices.
6. To determine the scale of operation that is least costly (economies of scale).
7. To have the information necessary for setting prices for the service received.
8. To determine the causes of variations in costs between different plans or organizational forms.
9. For long-term policy and program development in PHC and resource allocation over the short and medium terms.

Researchers note that to provide the cost information needed, much work still needs to be done. Robertson in Review of Literature on Costs of Health Services in Developing Countries(11), points out that health planners require costs in global terms (providing guidance on resource allocations for existing

and new activities) and a manual containing standardized nomenclature and techniques of cost finding and interpretation is needed. Other comments include those by D. Zschock in Health Care Financing in Latin America and the Caribbean(14), who notes that "relatively few detailed studies of costs have actually been carried out . . ." and that improvements must be attempted in defining key terms related to costs and in "designing and securing agreement on widespread use of standardized methods likely to yield comparable findings."

In a USAID publication Guidelines for Data Collection, Monitoring and Evaluation Plans for Asia and Near East Bureau Projects(7), the authors point out that most AID projects are not designed to generate management data (including costs). While guidelines for data collection are proposed, no format or methodology for the collection is proposed, and no format or methodology for the collection of cost data by field personnel or evaluators is established. Although standardized costing formats or methodologies to determine the actual costs of World Bank Inter-American Development Bank, and other donor projects have been established, the information gathered is often not incorporated into a workable program monitoring system for managers or is collected by evaluators or special teams on a "one-shot" basis.

Several of the guidelines that were reviewed present good methodologies for the collection and use of costing information. The difficulty is that these and other guidelines are very detailed in some respects, but do not provide an overall guide that will ensure that all relevant costs are included. Cost data should be collected and organized in a way that will ensure completeness and facilitate its use by program planners, analysts, and field managers.

The WASH Project is currently reviewing cost data for a number of USAID, World Bank, and Inter-American Development Bank water supply projects. The findings of the reviewers illustrate the following typical shortcomings in project cost information.

- o Lack of clear information connecting program outputs (numbers of systems built, number of people served) and the costs incurred.
- o Incomplete information on the types of costs incurred. For instance, no distinction among costs for labor, capital equipment, supplies, transportation, etc.
- o No information on the costs of community inputs into project (either cash expenditures or in-kind expenditures).
- o No distinction among costs for field related activities, administration and management, health education or training.
- o Little or no information on the recurrent costs of the projects that have been completed.
- o Incomplete information on the distinction between local currency and foreign currency costs.
- o Incomplete information on all of the sources of funding for a project, particularly counterpart inputs and support.

- o Lack of information on taxes, duties, and other fees that have to be paid.

Although these findings were based on water supply projects, similar problems exist in other primary health care activities.

#### D. Objectives of the Costing Format

To address the needs for and typical shortcomings of cost information, a set of objectives for a cost format have been established:

1. That costs be broken down by categories to distinguish between depreciable and non-depreciable items.
2. That large costs that are particular to a specific program be identified (i.e., land, buildings, major equipment).
3. That the organization of the cost information facilitate several standard types of analyses (such as annualized or present worth analysis, total costs and average costs) at a preliminary level -- for use by program managers without expertise in financial analysis.
4. That the organization of the cost information and the use of preliminary analyses permit the identification of programs where additional analyses (i.e., by an economic analyst) or additional requests for information would be worthwhile.
5. That the proposed format be generic enough that it could be used in a range of PHC activities (water supply and sanitation; health education; immunizations; and ORT).
6. That the proposed format could be incorporated at all levels of program planning and implementation (from project design to evaluations) to promote familiarity with and consistency in cost analysis.
7. That the information that is required for inclusion in the costing format be based on detailed project records and that the information could be developed and the format prepared by program or project field personnel.
8. That all sources of funding (and the amounts) be identified.

It should be noted that the overall intent of developing a standardized cost format is to make available a select amount of useful data, not to generate the data that might be needed for in-depth cost analyses.

Likewise, the use of cost information from the standardized format will rely on methodologies that have already been developed and explained elsewhere.

However, some of the key issues surrounding costing methodologies and examples of several useful analyses of the cost data to be produced are presented in the following sections of this paper.

#### E. Methodological Issues

The presentation of cost data in any type of format requires a certain amount of work that involves collecting data, performing calculations, and grouping information in categories. To accomplish these tasks there are certain ways to do the calculations, terms to define and decisions to make about what data to include or not include. The manner of accomplishing these tasks is defined by the methodology and there are certain methodological issues that have a bearing on the usefulness of the results. Some of these key methodological issues are:

Cost Calculations. In determining the cost of a program, much of the work involves listing and summing the actual costs in certain categories. However, some calculations (i.e., inventory at the beginning of the year, plus quantity received during the year minus inventory at the end of the year, times the unit cost) are required to determine the materials cost of providing ORS packets, vaccines, or water meters. Methodologies have been developed to illustrate both types of costs needed and the procedures that should be used for these calculations. A number of methodologies have been developed to calculate both capital and recurrent costs, particularly for ORT and immunization programs. Two useful references are The Cost of An Oral Rehydration Therapy Program: A Manual for Managers(12), Expanded Programme on Immunization: Costing Guidelines(13) and, Manual for Assessment and Planning of National ORT Programs.(9) These and other references provide a basis for estimating and costing items such as the number and unit cost of ORS packets and the transportation and storage costs of vaccines (for example) as well as other program costs. For water supply and sanitation projects useful guidelines for developing cost information are contained in Water Supply and Sanitation Project Preparation Handbook, World Bank Technical Paper No. 12(3), by the World Bank, as well as two WASH publications: Assessment of the Operations and Maintenance Component of Water Supply Projects(6) and Development of an Operation and Maintenance System for Shaba Refugee Water Supply Project(5) (maintenance system design and cost assessment).

Cost Allocation. Before entering the cost data in specific categories, certain costs that are common to the program under study and other programs must be allocated to the right program. Examples of "common" costs are: jointly used offices, administrative areas and equipment; vehicles; hospital resources; and personnel. Costs are allocated to a program on a percentage basis using such indicators as floor area used for program purposes divided by total floor area (to allocate building and hospital costs), or number of visits by children with diarrhea divided by all visits by children (to allocate a nurses salary to an ORT program), for example. There are no hard and fast rules for allocation of costs, but indicators should be

chosen that represent the program being studied. The references listed under cost calculation present useful examples of how costs can be allocated to specific programs.

**Development vs. Operating Costs.** Because of the implications on program financing and sustainability, a distinction should be made between development costs (often called investment costs) and operating costs (often called recurrent costs). No clear line exists between development costs and operating costs, but the type of input in relation to its timing of use is a useful criteria. One definition used by Massey(11) is that "recurrent or operating costs are the costs of all resources involved in using the new [production] capability or keeping it operationally ready for use over its intended life". All other costs are development costs. It should be noted that the distinction between development and operating costs may be program specific.

Note that fixed costs and variable costs (that vary with program output level) may be components of either development or operating costs. A distinction between them need not be made for the proposed costing format. However, a more detailed study of these types of costs may be useful in projecting program costs at different levels of output.

Because the main objective of the proposed costing format is to generate relatively raw data that has been collected at the field level but not yet analyzed, methodological issues that are related to possible analyses are not discussed here. However, it is worthwhile to identify some of the terms that are commonly used:

**Discounting:** The process of computing the present value of some benefit or cost to be received in the future by application of a rate of discount to the future value.(10)

**Shadow Pricing:** The process of adjusting market prices in order to substitute real economic values of inputs and outputs for analytic and decision-making purposes; for example, adjusting labor costs or product prices that are affected by market power or lack of competition.(10)

**Cost-Benefit Analysis:** An analytic technique for judging the economic merit of a product or program comparing its costs and benefits (in monetary terms). In cost-benefit the denominator is expressed in monetary terms; in cost effectiveness analysis it is not.

**Cost-Effectiveness Analysis:** An analytic technique for judging the relative economic merit of one product or program in comparison with alternative ways of achieving the same objective.

## **F. Proposed Format and Definitions of Cost Components**

To meet the objectives that were discussed earlier, proposed formats for cost information have been developed. These are shown in Figures 1, 2 and 3. **Figure 1**, provides a summary of overall program costs for both development and operating costs. The foreign currency component of the program is also shown. **Figure 2, Program Development Costs**, shows a format for the presentation of development costs by source of funding. **Figure 3, Annual Program Operating Costs**, shows a format for the presentation of program operating cost, also by source of funding. In Figures 2 and 3, for each source of funding a breakdown of costs is required for each of the following categories: personnel; materials; supplies and operating costs; transportation; and, land, buildings, vehicles and major equipment.

The development of program development cost information and its presentation in the format of **Figure 2** has several advantages:

1. The format is simple and easily understandable and facilitates several preliminary economic analyses (shown later in this paper) that can be used to compare programs.
2. The information is in a format in which the data can be adjusted (using inflation rates, cost indices, currency rates, etc.) to show costs for a similar program at a future date. Different cost categories can be inflated at different rates if desired.
3. It permits identification of the resources provided by each of the contributors to the project.
4. The listing of separate categories for materials and major equipment permits identification of these items and the amortization of these items (over their expected lives) in cost analyses. Note that because material costs are summed, an average expected life must be assumed for amortization of this group of costs.
5. Although lacking the detail needed for sophisticated analyses and for cost-benefit or cost effectiveness analyses, it allows (when combined with program output information) the program manager, analyst or evaluator to make selected judgments about the merits of this program and to determine if additional, more in-depth cost analyses are warranted.

**Figure 3 - Annual Program Operating Costs**, is conceptually similar to the format for development costs but focuses on the recurrent costs of a program. Cost breakdowns are provided for: personnel; operating expenses; repairs; transportation; and, major equipment. These categories have the same advantages as those for development, with the additional feature that repair costs can be identified. Also, new or replacement equipment can be identified and amortized in a cost analysis.

FIGURE 1

Program  
Cost Summary Table

Cost Category	Development Phase		Operating Phase (year _____)	
	Local Currency	Foreign Currency	Local Currency	Foreign Currency
Personnel <sup>(1)</sup>				
Materials <sup>(2)</sup>				
Building, Vehicles & Equipment				
Land				
Operating Expenses <sup>(3)</sup>				
Misc. <sup>(4)</sup>				
<b>TOTAL</b>				

(1) Includes salaries and per diem, housing, and expatriate transportation costs.

(2) Includes depreciable items such as furniture, piping, valves, cement, etc.

(3) Includes supplies, transportation, utilities, maintenance, initial program supplies, etc.

(4) Includes taxes, duties, and financing charges (list separately).

FIGURE 2

Program Development Costs (Period from \_\_\_\_\_ to \_\_\_\_\_)

Breakdown of Program Development Costs						
Source of Funds	Total Costs	Personnel <sup>(1)</sup>	Materials <sup>(2)</sup>	Supplies and Operating Costs <sup>(3)</sup>	Transportation Costs <sup>(4)</sup>	Land, Building, Vehicles Major Equipment <sup>(5)</sup> (List & Provide Expected Life)
Primary Donor or Lending Agency						
Host Government						
Communities						
Other <sup>(6)</sup> (List)						
Sub Total						
TOTAL						

Note: Costs are to be allocated to this program prior to entry in Table; For allocation methodologies see Expanded Programme on Immunization: Costing Guidelines, Andrew L. Creese for World Health Organization, 1979; and, The Cost of an Oral Rehydration Therapy Program; A Manual for Managers, Shepard, Lerman, Cash, Harvard School of Public Health, 1985.

1. Personnel Costs are actual and in-kind (note separately) contributions and include salaries and per diem, housing, expatriate transportation to and from country.
2. Materials include office furniture; piping, valves; cement, etc. (for WS&S); and other depreciable items with useful life of more than one year.
3. Supplies and operating costs include non-depreciable operating supplies and costs (electricity, water, telephone, etc.) as well as initial supplies of such items as drugs, ORS, syringes, vaccines and water treatment chemicals.
4. Transportation costs include vehicle operating and repair costs (gas, tires, batteries), and program related bus, rail, and air fare costs.
5. Depreciable equipment (list expected life).
6. Other Donors (or Lenders), local pro's, employers, etc.

FIGURE 3

Annual Program Operating Costs (Period from \_\_\_\_\_ to \_\_\_\_\_) and are: Actual/Estimated (Circle One)

		Breakdown of Annual Operating Costs					
Source of Funds	Total Costs	Personnel <sup>(1)</sup>	Operating Costs <sup>(2)</sup>	Repairs <sup>(3)</sup>	Transportation Costs <sup>(4)</sup>	Vehicles and Major Equipment <sup>(5)</sup> (List & Provide Expected Life)	Other <sup>(6)</sup>
Primary Donor or Lending Agency							
Host Government							
Communities							
Other <sup>(6)</sup> (List)							
Sub Total							
TOTAL							

Note: Costs to be allocated to this program prior to entry in Table; see references in Figure 3 for allocation methodology; For water supply projects see Assessment of the Operations and Maintenance Component of Water Supply Projects, WASH Technical Report No. 35, June 1986.

1. Personnel costs are actual and in-kind (note separately) contributions and include salaries and per diem, housing, and expatriate transportation to and from country.
2. Operating expenses include all operating supplies (office and field supplies, drugs, ORS, syringes, vaccines, water treatment chemicals) and operating costs (electricity, water, telephone, etc.), and any financing charges.
3. Repairs include costs to repair equipment, water or sanitation systems, but not vehicles.
4. Transportation costs include vehicle operating and repair costs (gas, tires, batteries), and program related bus, rail, and air fare costs.
5. Depreciable new or replacement equipment and vehicles (list expected life).
6. Financing costs; miscellaneous non-depreciable costs.
7. Other Donors (or Lenders), Local PVOs, employers, etc.

Figure 4 - Program Narrative, provides information on the organization and objectives of the program. Coupled with the data from development and operating costs, it facilitates some of the preliminary level analyses that may be required.

In addition to the formats described above, cost information for different project functions is useful. Based on the research for this paper, a list of the most useful cost categories (by function) has been developed. This list is presented in Table 1. The cost categories can be used to capture cost data for the program as a whole, or for each source of funding. In any case, more sophisticated cost monitoring systems are required (from the project start) to capture this information than for the formats discussed above.

#### G. Preliminary Analysis of Cost Data

One of the principal benefits of using a standardized format for organizing the collection and presentation of data is that it promotes familiarity with the types of cost data needed and promotes consistency in data inclusion. This lends itself to more accurate representation of the true cost of a program.

Although the formats that are proposed are not radically different from others being used (on a spot basis), it is expected that the categories proposed will promote more attention to the inclusion of all relevant program costs. In addition, the categories proposed can represent the costs of a broad range of primary health care activities.

In using the information that would be presented in the cost formats, a number of useful questions can be answered when the cost data is combined with program output data. Among these questions are:

- o What is the average cost per beneficiary?
- o What is the average cost per unit (water supply capacity, latrines installed, vaccines used, ORS solutions used, etc.)?
- o What were the actual costs of the program versus the estimated costs?
- o Was funding adequate to achieve the proposed program objectives?
- o How do the costs compare with similar programs (on a cost per beneficiary, by total cost, or by category -- health education or training)?
- o What are the implications for sustainability of the program (do revenues adequately cover costs)?
- o Should a more detailed analysis be carried out (such as a cost effectiveness or benefit cost analysis)?

FIGURE 4

Program Narrative

1. Program Title:

2. Funding Organizations (List and Describe Financing Arrangements):

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3. Objectives (Describe major objectives and targets of program):

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4. Responsibilities (Describe responsibilities of government agencies/  
ministries, donors, lending agencies, communities, etc.):

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5. Program Time Frame (Start-up and Operation):

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**Table 1**  
Cost Categories  
By Function

Development Phase

- o Administration and Management
- o Planning and Design
- o Health Education, Communication, Promotion
- o Set-up and/or Construction costs
- o Community Participation
- o Initial Training

Operating Phase

- o Administration and Management
- o Program Operations
- o Training and Education
- o Financing

To answer these questions, several calculations are useful at the preliminary level. These are described in the following section of this paper.

Average cost per beneficiary (per capita). This calculation can be computed for either the start-up cost or the operating cost and is calculated as

$$\begin{array}{l} \text{Average Cost} \\ \text{Per Beneficiary} \end{array} = \begin{array}{l} \text{total development} \\ \text{(or annual} \\ \text{operating costs)} \end{array} + \begin{array}{l} \text{number of current} \\ \text{beneficiaries} \end{array}$$

Alternatively this cost can be computed for the number of future beneficiaries (in the case of a water system with a future design population). A similar calculation can be done for categories of cost to arrive at cost per beneficiary for training or cost per beneficiary for health education.

Average cost per unit. This calculation is usually done for the development or investment cost as

$$\begin{array}{l} \text{Average} \\ \text{Annual Cost} \\ \text{Per Unit} \end{array} = \begin{array}{l} \text{total development cost} \\ \text{+} \\ \text{quantity} \end{array}$$

In this case, the unit could be expressed in terms of inputs (cost per day of labor) in terms of intermediate outputs (cost per unit of service -- i.e., ORS packets) or in terms of final effects (cost for reductions in mortality or morbidity). The latter are clearly important but difficult to analyze because of the difficulty of separating the effects of different health services that affect health status.

Marginal costs. Where the costs of a program are based on providing increases in service then the marginal cost (the cost of providing the next unit(s)) can be computed.

$$\begin{array}{l} \text{Marginal Cost} \\ \text{Per Unit} \end{array} = \begin{array}{l} \text{change in total cost} \\ \text{(old program vs.} \\ \text{new program)} \end{array} + \begin{array}{l} \text{change in quantity} \end{array}$$

Present Worth Analysis. This is a process of computing the present value of some benefit or cost to be received in the future by application of a rate of discount to the future value -- for the purpose of comparing alternatives (See Understanding Health Economics(10), and Principles of Engineering Economy(2), for present worth methodologies).

Annual Cost Analysis. A process which is similar to the present worth analysis where a non-uniform series of money disbursements is converted to a set of equal annual disbursements through application of a rate of discount (See references listed above for annual cost methodologies).

Calculation of the "R" Coefficient: The R coefficient for a program is the ratio of its recurrent expenditure requirements to the total investment (development expenditure) outlay. It indicates the annual recurrent expenditure required per unit of capital (development) spending. To calculate the "R" coefficient, the program expenditures have to first be classified into capital and annual recurrent expenditures. For programs where the level of recurrent inputs vary, an average of yearly costs or the recurrent cost for the year where the project is in full operation may be used for the annual operating cost. The R coefficient is obtained from:

$$\text{"R" Coefficient} = \frac{\text{Annual Operating Cost}}{\text{Development Cost}}$$

R coefficients have been developed for a variety of types of projects, from agriculture to health. Examples of typical R values are contained in Table 2.

It should be noted that the use of an R value by itself is not recommended. One possible reason for a low R value is that the capital cost is unusually high. R value comparisons should, therefore, be accompanied by comparisons of other indicators, such as annual costs.

One reason for developing better R coefficient data is to provide decision-makers with more information to compute an average value. In certain cases, grant or loan programs have been rejected by host countries because the R value they used was unrepresentative and showed that recurrent costs for a proposed grant program would be unacceptably high.

#### H. Examples of Presentation and Preliminary Analysis of Cost Data

##### Example Water Supply Program

To illustrate the types of costs that can be presented in the simplified format discussed earlier, a hypothetical case study was constructed for a water supply program. The cost formats, the description of the program and a simplified annual cost analysis are presented in Appendix A. The costs of the program and the goals and objectives are typical of ongoing USAID supported water supply programs.

Using the data that are shown in Appendix A, several calculations were made and are summarized below.

Illustrative summary of the recurrent  
expenditure implications of projects as a  
proportion of investment expenditure  
across development sectors  
("r" coefficient)

<u>Sector</u>	<u>"r" Coefficient</u>
 <u>Agriculture</u>	
Fisheries	0.08
Forestry	0.04
General agriculture	0.10
Livestock	0.14
Rural development	0.08-0.43
Vetarinary services	0.07
 <u>Buildings</u>	 0.01
 <u>Education</u>	
Agricultrual colleges	0.17
Polytechnic Schools	0.17
Primary Schools	0.06-7.0
Secondary Schools	0.08-0.72
Universities	0.02-0.22
 <u>Health</u>	
District hospitals	0.11-0.30
General hospitals	0.183
Medical Auxiliary Training Schools	0.14
Nurses College	0.20
Nutrition Rehabilitation Unit	0.34
Rural Health Centers	0.27-0.71
Urban Health Centers	0.17
 <u>Housing</u>	 0.03
 <u>Manufacturing, Commerce and Construction</u>	 0.01
 <u>Roads</u>	
Feeder Roads	0.06-0.14
Paved Roads	0.03-0.07
 <u>Social and Rural Development</u>	 0.04
 <u>Tourism</u>	 0.05

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Source: Heller (1979)

- o Total development cost of the program \$2,150,000
- o Average annual operating cost of the program 200,000/year
- o Annualized development cost (@ 10%) 304,500/year
- o Annualized operating cost (@ 10%) 185,250/year

Using this information and the total number of beneficiaries, the following additional calculations can be made.

$$\text{Development Cost Per Beneficiary} = \frac{\text{Total Development Cost}}{\text{No. of Beneficiaries}} = \frac{\$2,150,000}{60,000} = \$36/\text{person}$$

$$\text{Annual Operating Cost Per Beneficiary} = \frac{\text{Annual Average Operating Cost}}{\text{No. of Beneficiaries}} = \frac{\$200,000}{60,000} = \$3.33/\text{person/year}$$

Assuming six (6) persons per family, the annual operating cost is equal to \$20 per household. However, it is worthwhile to note that the annual cost includes financing charges of \$75,000 per year which may or may not be charged directly to the users through the water rate structure.

Annualized development and operating costs are somewhat lower than when these costs are represented as one time payments.

$$\text{Annualized Development Cost Per Beneficiary} = \frac{\text{Annualized Development Cost}}{\text{No. of Beneficiaries}} = \frac{\$304,500}{60,000} = \$5.07/\text{person/year}$$

$$\text{Annualized Operating Cost Per Beneficiary} = \frac{\text{Annualized Operating Cost}}{\text{No. of Beneficiaries}} = \frac{\$185,250}{60,000} = \$3.09/\text{person/year}$$

The "R" coefficient is also of interest, especially when compared to similar programs or programs in other sectors.

$$"R" = \frac{\text{Annual Operating Cost}}{\text{Development Cost}} = \frac{\$200,000}{\$2,150,000} = .09$$

Note that simple gravity water supply systems in rural areas typically have low R coefficients. This result reflects the choice of an appropriate technology and the use of materials that can be easily repaired on site by communities. Compare this result to other programs listed in Table 2.

While the data that is represented above is hypothetical, it does represent typical program costs for self-help, rural water supplies.

Example ORT or Immunization Program

To illustrate that the costs of an immunization program can be presented in the same simplified format as a water supply program, costs from an actual immunization program were used. The costs have

been slightly modified to make them more representative of a broader range of immunization programs. The cost formats, a description of the immunization program, and a simplified cost analysis are presented in Appendix B.

Using the data that are shown in Appendix B, several calculations were made and are summarized below.

o	Total development cost of the program	\$252,300
o	Average annual operating cost of the program	48,700/year
o	Annualized development cost (@ 10%)	39,825/year
o	Annualized operating cost (@ 10%)	48,700/year

Using the information and the total number of beneficiaries, the following additional calculations can be made.

$$\text{Development Cost Per Beneficiary} = \frac{\text{Total Development Cost}}{\text{No. of Beneficiaries}} = \frac{\$252,300}{13,500} = \$18.69/\text{person/year}$$

$$\text{Operating Cost Per Beneficiary} = \frac{\text{Average Annual Operating Cost}}{\text{No. of Beneficiaries}} = \frac{\$48,700}{13,500} = \$3.60/\text{person/year}$$

Annualized development and operating costs are somewhat lower than when these costs are represented as one-time payment.

$$\text{Annualized Development Cost Per Beneficiary} = \frac{\text{Annualized Development Cost}}{\text{No. of Beneficiaries}} = \frac{\$39,825}{13,500} = \$2.95/\text{person/year}$$

$$\text{Annualized Operating Cost Per Beneficiary} = \frac{\text{Annualized Operating Cost}}{\text{No. of Beneficiaries}} = \frac{\$48,700}{13,500} = \$3.60/\text{person/year}$$

In this case, the annual operating cost and its annualized value (\$3.60/person/year) have the same value because there are no replacement equipment or vehicles.

The "R" coefficient is also of interest, especially when compared to similar programs.

$$\text{"R"} = \frac{\text{Annual Operating Cost}}{\text{Development Cost}} = \frac{\$48,700}{252,300} = 0.19$$

Note that the recurrent costs for an immunization program tend to be a higher percentage of the capital cost than for simple water supply projects. However, the development costs for an immunization project tend to be much lower.

## I. Conclusions and Recommendations

Using the information gathered during the research for this paper and from testing of the simplified formats presented, the following conclusions and recommendations have been developed.

### Conclusions

1. Much of the existing cost data in the literature is inconsistent and lacking in the detail needed to develop reasonably accurate conclusions on the actual and comparative costs of primary health care activities. This is especially true for recurrent cost information.
2. A simplified costing format is feasible for a variety of primary health care activities that include water supply and sanitation, health education, ORT and immunization programs.
3. Data from the costing format can be used at a preliminary level to develop costs per beneficiary, annualized costs, and "R" coefficients.
4. Use of a standardized costing format should promote familiarization with costing terminology, more attention to including all relevant program costs, and better indications of where additional program cost analyses would be useful.
5. More work needs to be done on standardizing costing terminology and methodologies.

### Recommendations

1. In particular, bilateral organizations such as USAID should work with the World Health Organization to standardize costing terminology, methodology and presentation formats to improve the accuracy and utility of PHC program cost data. Such standardization will be especially useful where programs use competing funds and where possibilities for better program coordination and integration exist.
2. Standardization, or at least dialogue, should be attempted among the principle funding organizations that are involved in primary health care activities in developing countries.
3. Additional work should be undertaken to standardize the simplified costing techniques (such as present worth and annualized costs) that can be useful in program analyses. In particular, guidelines for: the selection of discount rates; the use of replacement costs, the duration (in years) of amortization, and the sensitivity of the analyses to variations in rates and other variables should be investigated.

4. The development of standardized costing methodologies and guidelines should be incorporated at the program planning stage and not as an afterthought. Including the necessary cost data collection systems throughout the program will ensure the best use of data for both program management and analysis.
5. Where existing costing techniques are inadequate, technical assistance teams or evaluation teams can introduce costing concepts to field personnel, using the standard formats. The methodologies used to develop the back-up information for the overall cost summaries can become more sophisticated as the user's experience increases.

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**APPENDIX A**

**Example Water Supply  
Program Costs**

APPENDIX A

Cost Analysis Using  
Example Water Supply Program

1. The basic program description is contained in Figure A-1.
2. All development costs are inflated from the year they were incurred (1981-1983) to 1987 and have been entered into Figure A-2 for each category. Examples of the types of costs that are included in each category are listed below.

Development Costs

- o Personnel
  - Salaries, fringe benefits, per diem for program personnel
  - Housing
  - Expatriate transportation
  - Salaries and expenses for masons and plumbers hired by communities
- o Materials
  - Pipe, valves, joint glue, cement
  - Office furniture
  - Lumber and wallboard for pump houses
  - Tools for communities
- o Supplies and Operating Costs
  - Utilities for program office
  - First year supply of chlorine for communities
  - Lumber for forms, construction supplies
- o Transportation Costs
  - Gasoline, oil, filters and tires for vehicles
  - Vehicle maintenance and repair costs
  - Bus, rail and air fares for program personnel (in-country)
- o Land, Building, Vehicles, Major Equipment
  - Land purchased for warehouses or for locating community facilities (for pipelines, water intakes, storage tanks).
  - Pumps
  - Water treatment equipment
  - Project vehicles and/or construction equipment
  - Warehouses or office buildings

3. To illustrate a simplified annual cost analysis for the development phase of the program, the data from Figure A-2 are used. Note that this analysis has been simplified by ignoring the salvage value and replacement costs of depreciable items. A useful project life for the water system is assumed to be 15 years. For computing the annualized cost, a discount rate of 10% is used. The annual cost is computed by the formula:

$$\text{Annual Cost} = \frac{\text{Development Cost}}{\text{Annual Cost Factor (ACF:discount rate, years)}}$$

Annual cost factors are obtained from Table A-1.

a) Personnel	$\frac{\$540,000}{\text{ACF (10\%, 15)}}$	=	$\frac{\$540,000}{7.606}$	=	\$ 71,000/year
b) Materials	$\frac{\$1,050,000}{\text{ACF (10\%, 15)}}$	=	$\frac{\$1,050,000}{7.606}$	=	\$138,000/year
c) Supplies and Operating Costs	$\frac{\$290,000}{\text{ACF (10\%, 15)}}$	=	$\frac{\$290,000}{7.606}$	=	\$ 38,150/year
d) Transportation	$\frac{\$40,000}{\text{ACF (10\%, 15)}}$	=	$\frac{\$40,000}{7.606}$	=	\$ 5,300/year
e) Land	$\frac{\$25,000}{\text{ACF (10\%, 30)}}$	=	$\frac{\$25,000}{9.427}$	=	\$ 2,650/year
f) Warehouse	$\frac{\$30,000}{\text{ACF (10\%, 30)}}$	=	$\frac{\$30,000}{9.427}$	=	\$ 3,200/year
g) Vehicles	$\frac{\$75,000}{\text{ACF (10\%, 5)}}$	=	$\frac{\$75,000}{3.791}$	=	\$ 19,800/year
h) Pumps	$\frac{\$100,000}{\text{ACF (10\%, 5)}}$	=	$\frac{\$100,000}{3.791}$	=	\$ 26,400/year
			<b>TOTAL</b>		<b>\$304,500/year</b>
			<b>ANNUAL COST</b>		

4. Typical operating costs using 1987 prices for the example water supply program are shown in Figure A-3. Examples of the types of costs that are included in each category are listed below.

#### Operating Costs

o Personnel

- Actual salary costs that include fringe benefits and per diem
- Salaries of regional maintenance support teams
- Salaries of repair or operating personnel paid by communities

TABLE OF ANNUALIZING FACTORS (Present Values of an Annuity)<sup>1</sup>

Number of Years, n	Real Interest Rate, <sup>12</sup>																			
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	0.901	0.893	0.885	0.877	0.870	0.862	0.853	0.847	0.840	0.833
2	1.970	1.942	1.913	1.884	1.855	1.833	1.808	1.783	1.759	1.736	1.713	1.690	1.668	1.647	1.626	1.605	1.585	1.566	1.547	1.528
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487	2.444	2.402	2.361	2.322	2.283	2.246	2.210	2.174	2.140	2.106
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170	3.102	3.037	2.974	2.914	2.855	2.798	2.743	2.690	2.639	2.589
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791	3.696	3.605	3.517	3.433	3.352	3.274	3.199	3.127	3.058	2.991
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.484	4.355	4.231	4.111	3.998	3.889	3.784	3.685	3.589	3.498	3.410	3.326
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868	4.712	4.564	4.423	4.289	4.160	4.039	3.922	3.812	3.706	3.605
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335	5.146	4.968	4.799	4.639	4.487	4.344	4.207	4.078	3.954	3.837
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759	5.537	5.328	5.132	4.946	4.772	4.607	4.451	4.303	4.163	4.031
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145	5.889	5.650	5.426	5.216	5.019	4.833	4.659	4.494	4.339	4.192
11	10.368	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495	6.207	5.938	5.687	5.453	5.234	5.029	4.836	4.656	4.486	4.327
12	11.255	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814	6.492	6.194	5.918	5.660	5.421	5.197	4.988	4.793	4.611	4.439
13	12.134	11.348	10.635	9.986	9.394	8.853	8.350	7.904	7.487	7.103	6.750	6.424	6.122	5.842	5.583	5.342	5.118	4.910	4.719	4.533
14	13.004	12.106	11.296	10.563	9.899	9.295	8.745	8.244	7.786	7.367	6.982	6.628	6.302	6.002	5.724	5.468	5.229	5.008	4.802	4.611
15	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.559	8.061	7.606	7.191	6.811	6.462	6.142	5.847	5.575	5.324	5.092	4.876	4.675
16	14.718	13.578	12.561	11.632	10.838	10.106	9.447	8.851	8.313	7.824	7.379	6.974	6.604	6.265	5.954	5.668	5.405	5.162	4.938	4.730
17	15.562	14.292	13.166	12.166	11.274	10.477	9.763	9.122	8.544	8.022	7.549	7.120	6.729	6.373	6.047	5.749	5.475	5.222	4.990	4.775
18	16.398	14.992	13.754	12.699	11.690	10.828	10.059	9.372	8.756	8.201	7.702	7.250	6.840	6.467	6.128	5.818	5.534	5.273	5.033	4.812
19	17.226	15.678	14.324	13.134	12.005	11.158	10.336	9.604	8.950	8.365	7.839	7.366	6.938	6.550	6.198	5.877	5.584	5.316	5.070	4.843
20	18.046	16.351	14.877	13.590	12.462	11.470	10.594	9.818	9.129	8.514	7.963	7.469	7.025	6.623	6.259	5.929	5.628	5.353	5.101	4.870
21	18.857	17.011	15.415	14.029	12.821	11.764	10.836	10.017	9.292	8.649	8.073	7.562	7.102	6.687	6.312	5.973	5.665	5.384	5.127	4.891
22	19.660	17.658	15.957	14.451	13.163	12.042	11.061	10.201	9.442	8.772	8.176	7.645	7.170	6.743	6.359	6.011	5.696	5.410	5.149	4.909
23	20.456	18.292	16.444	14.857	13.489	12.363	11.272	10.371	9.580	8.885	8.266	7.718	7.230	6.792	6.399	6.044	5.723	5.432	5.167	4.925
24	21.243	18.914	16.936	15.247	13.799	12.550	11.469	10.529	9.707	8.985	8.348	7.784	7.283	6.835	6.434	6.073	5.746	5.451	5.182	4.937
25	22.023	19.523	17.413	15.622	14.094	12.783	11.654	10.675	9.823	9.077	8.422	7.843	7.330	6.873	6.464	6.097	5.756	5.467	5.195	4.948
26	22.795	20.121	17.877	15.983	14.375	13.003	11.826	10.810	9.929	9.161	8.488	7.896	7.372	6.906	6.491	6.118	5.783	5.488	5.206	4.956
27	23.560	20.707	18.327	16.330	14.643	13.211	11.987	10.933	10.027	9.237	8.548	7.943	7.409	6.935	6.514	6.136	5.798	5.492	5.215	4.964
28	24.316	21.281	18.764	16.663	14.898	13.406	12.137	11.051	10.116	9.307	8.602	7.984	7.441	6.961	6.534	6.152	5.810	5.502	5.223	4.970
29	25.066	21.844	19.188	16.984	15.141	13.591	12.278	11.158	10.198	9.370	8.650	8.022	7.470	6.983	6.551	6.166	5.820	5.510	5.229	4.975
30	25.808	22.396	19.600	17.292	15.372	13.765	12.409	11.258	10.274	9.427	8.694	8.055	7.496	7.003	6.566	6.177	5.829	5.517	5.235	4.979

<sup>1</sup> Factor =  $(1 - (1+i)^{-n})/i$ , where  $i$  is a decimal.

<sup>2</sup> Real Interest Rate = Bank Interest Rate - Inflation Rate

- o Operating Costs
  - All operating supplies (for field and regional offices)
  - Electricity and fuel costs for pumps
  - Utilities
  - Water treatment chemicals
  
- o Repairs
  - Repair materials for water systems and equipment
  
- o Transportation Costs
  - Gasoline, oil, filters and tires for vehicles
  - Vehicle maintenance and repair costs
  - Bus, rail and air fares for program personnel or communities
  
- o Vehicles and Major Equipment
  - New or replacement equipment
  - Replacement vehicles
  
- o Other
  - Miscellaneous costs
  - Financing costs

5. To illustrate a simplified annual cost analysis for the operating phase of a program, the data from Figure A-3 are used. Note that the assumptions made are the same as those for the analysis of the development phase.

a) Personnel		=	\$ 48,000/year
b) Operating Costs		=	42,000/year
c) Repairs		=	8,000/year
d) Transportation Costs		=	7,000/year
e) Vehicles and Major Equip.	$\frac{\$15,000}{ACF (10\%, 5)}$	=	$\frac{\$15,000}{3.791}$ = 3,950/year
Pump	$\frac{\$5,000}{ACF (10\%, 5)}$	=	$\frac{\$5,000}{3.791}$ = 1,300/year
f) Financing		=	75,000/year
			<b>TOTAL ANNUAL COST</b>
			<b>\$185,250/year</b>

FIGURE A-1

Program Narrative

1. Program Title: 

Example of Water Supply Program
---------------------------------
  
2. Funding Organizations (List and Describe Financing Arrangements):  
The project is funded by USAID. Funding is provided through a \$750,000 grant and \$1,000,000 in loan funds at an interest rate of 7.5%.  
The counterpart, Ministry of Health, is providing \$250,000 in funds.  
Communities are paying the costs of hiring skilled labor and the cost of certain project materials.
  
3. Objectives (Describe major objectives and targets of program):  
The project goal was to serve 60,000 persons in rural areas with gravity water supply (where possible) or with well and pump systems. Communities included in the program had between 500 and 2,000 inhabitants. Approximately 80 water systems were built.
  
4. Responsibilities (Describe responsibilities of government agencies/ ministries, donors, lending agencies, communities, etc.):  
Financing and grant funds are provided by the principal donar, USAID.  
The Ministry of Health provides health promoters and engineering staff for the PVO which is implementing the program. Communities are responsible for construction of the water systems (through skilled and unskilled labor) and for operating costs of the systems when complete.
  
5. Program Time Frame (Start-up and Operation): The program was started on Jan. 1, 1981, and completed on Dec. 3, 1983 (a 3-year period). Operation of the first system began in September 1981.

FIGURE A-2

Program Development Costs (Period from Jan. 1, 1981 to Dec. 31, 1981)

Breakdown of Program Development Costs						
Source of Funds	Total Costs	Personnel <sup>(1)</sup>	Materials <sup>(2)</sup>	Supplies and Operating Costs <sup>(3)</sup>	Transportation Costs <sup>(4)</sup>	Land, Building, Vehicles Major Equipment <sup>(5)</sup> (List & Provide Expected Life)
Primary Donor or Lending Agency	1,750,000	450,000	850,000	220,000	25,000	30,000 - Warehouse (30 yrs.) 75,000 - 5 Vehicles (5 yrs.) 100,000 - 20 Pumps (5 yrs.)
Host Government	250,000	65,000	125,000	50,000	10,000	--
Communities	150,000	25,000	75,000	20,000	5,000	25,000 - Land
Other <sup>(6)</sup> (List)	--	--	--	--	--	--
Sub Total	2,150,000	540,000	1,050,000	290,000	40,000	230,000
TOTAL	2,150,000					

Note: Costs are to be allocated to this program prior to entry in Table; For allocation methodologies see Expanded Programme on Immunization: Costing Guidelines, Andrew L. Creese for World Health Organization, 1979; and, The Cost of an Oral Rehydration Therapy Program; A Manual for Managers, Shepard, Lerman, Cash, Harvard School of Public Health, 1985.

1. Personnel Costs are actual costs (not in-kind contributions) and include salaries and per diem, housing, expatriate transportation to and from country.
2. Materials include office furniture; piping, valves; cement, etc. (for WS&S); and other depreciable items with useful life of more than one year.
3. Supplies and operating costs include non-depreciable operating supplies and costs (electricity, water, telephone, etc.) as well as initial supplies of such items as drugs, ORS, syringes, vaccines and water treatment chemicals.
4. Transportation costs include vehicle operating and repair costs (gas, tires, batteries), and program related bus, rail, and air fare costs.
5. Depreciable equipment (list expected life).
6. Other Donors (or Lenders), local pro's, employers, etc.

FIGURE A-3

(typical year)

Annual Program Operating Costs (Period from \_\_\_\_\_ to \_\_\_\_\_) and are Actual/Estimated  
(Circle One)

Breakdown of Annual Operating Costs							
Source of Funds	Total Costs	Personnel <sup>(1)</sup>	Operating Costs <sup>(2)</sup>	Repairs <sup>(3)</sup>	Transportation Costs <sup>(4)</sup>	Vehicles and Major Equipment <sup>(5)</sup> (List & Provide Expected Life)	Other <sup>(6)</sup>
Primary Donor or Lending Agency	--	--	--	--	--	--	--
Host Government	130,000	30,000	2,000	3,000	5,000	15,000 - average 1 vehicle per year	75,000 (int.)
Communities	65,000	18,000	40,000	5,000	2,000	5,000 - average 1 pump per year	--
Other <sup>(6)</sup> (List)	--	--	--	--	--	--	--
Sub Total	200,000	48,000	42,000	8,000	7,000	20,000	75,000
TOTAL	200,000						

Note: Costs to be allocated to this program prior to entry in Table; see references in Figure 3 for allocation methodology; For water supply projects see Assessment of the Operations and Maintenance Component of Water Supply Projects, WASH Technical Report No. 35, June 1986.

1. Personnel costs are actual costs (not in-kind contributions) and include salaries and per diem, housing, and expatriate transportation to and from country.
2. Operating expenses include all operating supplies (office and field supplies, drugs, ORS, syringes, vaccines, water treatment chemicals) and operating costs (electricity, water, telephone, etc.), and any financing charges.
3. Repairs include costs to repair equipment, water or sanitation systems, but not vehicles.
4. Transportation costs include vehicle operating and repair costs (gas, tires, batteries), and program related bus, rail, and air fare costs.
5. Depreciable new or replacement equipment and vehicles (list expected life).
6. Financing costs; miscellaneous non-depreciable costs.
7. Other Donors (or Lenders), Local PVOs, employers, etc.

FIGURE A-4

Program  
Cost Summary Table

Cost Category	Development Phase		Operating Phase (year )	
	Total	Foreign Currency	Total	Foreign Currency
Personnel <sup>(1)</sup>	\$ 540,000	\$100,000	\$ 48,000	--
Materials <sup>(2)</sup>	1,050,000	50,000	--	--
Building, Vehicles & Equipment	205,000	175,000	20,000	20,000
Land	25,000	--	--	--
Operating Expenses <sup>(3)</sup>	330,000	--	57,000	--
Misc. <sup>(4)</sup>			75,000	75,000
TOTAL	\$2,150,000		200,000/yr	

(1) Includes salaries and per diem, housing, and expatriate transportation costs.

(2) Includes depreciable items such as furniture, piping, valves, cement, etc.

(3) Includes supplies, transportation, utilities, maintenance and repairs, initial program supplies, etc.

(4) Includes taxes, duties, and finance charges.

**APPENDIX B**

**Costing Analysis Using  
Example Immunization Program**

## APPENDIX B

### Costing Analysis Using Example Immunization Program

1. The basic program description is contained in Figure B-1.
2. All development costs are inflated from the year they were incurred (1985) to 1987 and have been entered into Figure B-2 for each category. Examples of the types of costs that are included in each category are listed below. Note that costs shown are only those that have been allocated to this program.

#### Development Costs

- o Personnel
    - Salaries, fringe benefits, per diem for program personnel for start-up activities and initial training.
    - Related housing and travel costs for expatriates
  - o Materials
    - Office furniture (incl. cabinets, filing cabinets, etc.)
  - o Supplies and Operating Costs
    - Utilities for main office during development phase
    - Misc. supplies
  - o Transportation Costs
    - Gasoline, oil, filters, and tires for vehicles
    - Vehicle maintenance and repair costs
    - Bus, rail, and air fares for program personnel (in-country)
  - o Land, Building, Vehicles, Major Equipment
    - Any land purchase costs associated with construction of clinics
    - Project vehicles
    - Clinics and Central Warehouse
    - Cold chain equipment
3. To illustrate a simplified annual cost analysis for the development phase of the program, the data from Figure B-2 are used. The program development costs are annualized over the 10 year period of immunization effectiveness. Note that this analysis has been simplified by ignoring

the salvage value and replacement costs of depreciable items (except for buildings). The building is estimated to have a 30 year life and a salvage value of \$102,175 after 10 years. For computing the annualized cost, a discount rate of 10% is used. The annual cost is computed by the formula:

$$\text{Annual Cost} = \frac{\text{Development Cost}}{\text{Annual Cost Factor (ACF:discount rate, years)}}$$

Annual cost factors are obtained from Table A-1.

a) Personnel	$\frac{\$21,500}{\text{ACF (10\%, 10)}}$	=	$\frac{\$21,500}{6.145}$	=	\$ 3,500/year
b) Materials	$\frac{\$1,000}{\text{ACF (10\%, 10)}}$	=	$\frac{\$1,000}{6.145}$	=	\$ 175/year
c) Supplies and Operating Costs	$\frac{\$3,000}{\text{ACF (10\%, 10)}}$	=	$\frac{\$3,000}{6.145}$	=	\$ 500/year
d) Transportation	$\frac{\$4,600}{\text{ACF (10\%, 10)}}$	=	$\frac{\$4,600}{6.145}$	=	\$ 750/year
e) Buildings	$\frac{\$152,500 - 102,175 + 102,175 \times 10\%}{\text{ACF (10\%, 30-20)}}$	=	$\frac{\$50,325 + 10,220}{6.145}$	=	\$18,400/year
f) Vehicles	$\frac{\$17,700}{\text{ACF (10\%, 5)}}$	=	$\frac{\$17,700}{3.791}$	=	\$ 4,700/year
g) Cold Chain	$\frac{\$44,700}{\text{ACF (10\%, 5)}}$	=	$\frac{\$44,700}{3.791}$	=	\$11,800/year
			<b>TOTAL ANNUAL COST</b>		<b>\$39,825/year</b>

4. Typical operating costs using 1987 prices for the example immunization program are shown in Figure B-3. Examples of the types of costs that are included in each category are listed below.

#### Operating Costs

o Personnel

- Salary costs, fringe benefits, and per diem for program personnel (health workers, medical personnel, drivers, etc.) for program operation and on-the-job training
- Related housing and external travel costs for expatriates

- o Operating Costs
  - All operating supplies: vaccines, bandages, syringes, pharmaceutical, etc.
  - Utility costs for clinics and warehouses, including fuel for cold chain equipment
  - Rent, cleaning or other misc. charges
  
- o Repairs
  - Repairs for equipment (except vehicles)
  
- o Transportation Cost
  - Gasoline, oil, filters, and tires for vehicles
  - Vehicle maintenance and repair costs
  - Bus, rail, and air fares for program personnel
  
- o Vehicle and Major Equipment
  - New or replacement vehicles or equipment
  
- o Other
  - Financing costs
  - Media promotion costs

5. To illustrate a simplified annual cost analysis for the operating phase of a program, the data from Figure B-3 are used. Note that the assumptions made are the same as those for the analysis of the development phase.

a) Personnel	=	\$15,650/year
b) Operating Costs	=	\$21,000/year
c) Repairs	=	\$ 600/year
d) Transportation Costs	=	\$10,700/year
e) Other	=	\$ 750/year
	<b>TOTAL</b>	<b>\$48,700/Year</b>
	<b>ANNUAL COST</b>	

FIGURE B-1

Program Narrative

1. Program Title:

Example of Immunization Program

2. Funding Organizations (List and Describe Financing Arrangements):

The project is funded by USAID and the Ministry of Health. Secondary  
funding is provided through UNICEF. All external funds are provided  
through grants.

3. Objectives (Describe major objectives and targets of program):

The project provides full immunization coverage through 25 clinics in  
urban areas throughout the country. Over the course of the five-year  
program, 13,500 children are expected to be immunized against measles,  
pertussis, diphtheria, polio, tetanus, and tuberculosis.

4. Responsibilities (Describe responsibilities of government agencies/  
ministries, donors, lending agencies, communities, etc.):

Principal funding for the development (start-up) of the program and the  
majority of the recurrent cost are provided by USAID with secondary  
support from UNICEF. The Ministry of Health constructed all of the local  
local clinics and has principal responsibility for the field implementation  
of the program.

5. Program Time Frame (Start-up and Operation): The program development

started on Jan. 1, 1985, and full scale operation was started Jan. 1. 1986.

FIGURE B-2

Program Development Costs (Period from Jan. 1, 1985 to Dec. 31, 1985 )

Breakdown of Program Development Costs						
Source of Funds	Total Costs	Personnel <sup>(1)</sup>	Materials <sup>(2)</sup>	Supplies and Operating Costs <sup>(3)</sup>	Transportation Costs <sup>(4)</sup>	Land, Building, Vehicles Major Equipment <sup>(5)</sup> (List & Provide Expected Life)
Primary Donor or Lending Agency	68,800	5,000	--	2,500	1,300	16,500 - Warehouse (54 yrs.) 43,500 - Cold Chain (5 yrs.) Equipment
Host Government	169,000	15,000	1,000	500	2,500	150,000 - Clinics (30 yrs.)
Communities	--	--	--	--	--	--
Other <sup>(6)</sup> (List)	14,500	1,500	--	--	800	2,500 - Clinics (30 yrs.) 1,200 - Vehicles (54 yrs.) 8,500 - Cold Chain Equipment (54 yrs.)
Sub Total	252,300	21,500	1,000	3,000	4,600	222,200
TOTAL	252,300					

Note: Costs are to be allocated to this program prior to entry in Table; For allocation methodologies see Expanded Programme on Immunization: Costing Guidelines, Andrew L. Creese for World Health Organization, 1979; and, The Cost of an Oral Rehydration Therapy Program; A Manual for Managers, Shepard, Lerman, Cash, Harvard School of Public Health, 1985.

1. Personnel Costs are actual costs (not in-kind contributions) and include salaries and per diem, housing, expatriate transportation to and from country.
2. Materials include office furniture; piping, valves; cement, etc. (for WS&S); and other depreciable items with useful life of more than one year.
3. Supplies and operating costs include non-depreciable operating supplies and costs (electricity, water, telephone, etc.) as well as initial supplies of such items as drugs, ORS, syringes, vaccines and water treatment chemicals.
4. Transportation costs include vehicle operating and repair costs (gas, tires, batteries), and program related bus, rail, and air fare costs.
5. Depreciable equipment (list expected life).
6. Other Donors (or Lenders), local pro's, employers, etc.

Annual Program Operating Costs (Period from \_\_\_\_\_ to \_\_\_\_\_) and are Actual/Estimated (Circle One)

		Breakdown of Annual Operating Costs					
Source of Funds	Total Costs	Personnel <sup>(1)</sup>	Operating Costs <sup>(2)</sup>	Repairs <sup>(3)</sup>	Transportation Costs <sup>(4)</sup>	Vehicles and Major Equipment <sup>(5)</sup> (List & Provide Expected Life)	Other <sup>(6)</sup>
Primary Donor or Lending Agency	19,250	4,200	10,000	250	4,300	--	500 Media
Host Government	16,650	10,000	500	100	5,800	--	250 Media
Communities	--	--	--	--	--	--	--
Other <sup>(6)</sup> (List)	12,800	1,450	10,500	250	600	--	--
Sub Total	48,700	15,650	21,000	600	10,700	--	750
TOTAL	48,700						

Note: Costs to be allocated to this program prior to entry in Table; see references in Figure 3 for allocation methodology; For water supply projects see Assessment of the Operations and Maintenance Component of Water Supply Projects, WASH Technical Report No. 35, June 1986.

1. Personnel costs are actual costs (not in-kind contributions) and include salaries and per diem, housing, and expatriate transportation to and from country.
2. Operating expenses include all operating supplies (office and field supplies, drugs, ORS, syringes, vaccines, water treatment chemicals) and operating costs (electricity, water, telephone, etc.), and any financing charges.
3. Repairs include costs to repair equipment, water or sanitation systems, but not vehicles.
4. Transportation costs include vehicle operating and repair costs (gas, tires, batteries), and program related bus, rail, and air fare costs.
5. Depreciable new or replacement equipment and vehicles (list expected life).
6. Financing costs; miscellaneous non-depreciable costs.
7. Other Donors (or Lenders), Local PVOs, employers, etc.

FIGURE B-4

Program  
Cost Summary Table

Cost Category	Development Phase		Operating Phase (year )	
	Total	Foreign Currency	Total	Foreign Currency
Personnel <sup>(1)</sup>	\$ 21,500	\$ 2,500	\$ 15,650	\$ 3,500
Materials <sup>(2)</sup>	1,000	--	--	--
Building, Vehicles & Equipment	222,200	60,000	--	--
Land	--	--	--	--
Operating Expenses <sup>(3)</sup>	7,600	--	32,750	--
Misc. <sup>(4)</sup>	--	--	--	--
<b>TOTAL</b>	<b>\$252,300</b>		<b>48,400</b>	

(1) Includes salaries and per diem, housing, and expatriate transportation costs.

(2) Includes depreciable items such as furniture, piping, valves, cement, etc.

(3) Includes supplies, transportation, utilities, maintenance and repairs, initial program supplies, etc.

(4) Includes taxes, duties, and financing charges.