(936-5992)

PDFCJ735

AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

SEP 20 1990

Mr. Charles C. Pecarro
Vice President of Finance
Center for Human Services
7200 Wisconsin Avenue
Bethesda, MD 20814

Subject: Cooperative Agreement No. DPE-5992-A-00-0050-00

Dear Mr. Pecarro:

Pursuant to the authority contained in the Foreign Assistance Act of 1961, as amended, and the Federal Grant and Cooperative Agreement Act of 1977, the Agency for International Development (hereinafter referred to as "A.I.D.") hereby provides to the Center for Human Services (hereinafter referred to as "CHS" or "Recipient") the sum of five hundred ninety-nine thousand dollars ($599,000) in partial support of the Applied Research in Child Survival Services Program, as more fully described in Attachment 2, entitled "Program Description".

This Cooperative Agreement is effective and obligation is made as of the date of this letter and shall apply to commitments made by the Recipient in furtherance of program objectives through the estimated completion date of September 20, 1995. Funds disbursed by A.I.D. but uncommitted by the Recipient at the expiration of this period shall be refunded to A.I.D.

The total estimated amount of the program is $13,601,696, of which A.I.D. shall fund $13,200,000 (hereinafter referred to as "Total Estimated Agreement Amount"), and the Recipient shall fund $401,696. Of the Total Estimated Agreement Amount, $599,000 is hereby obligated (hereinafter referred to as "Obligated Amount").

Of the $13,200,000, $8,500,000 is to be provided by A.I.D. as central S&T/H funds, and up to $4,700,000 may be provided from other A.I.D. bureaus and missions. A.I.D. shall not be liable for reimbursing the Recipient for any costs in excess of the obligated amount. However, subject to the availability of funds, evaluation of the program, and program priorities at the time, A.I.D. may periodically increase the obligated amount, through written modification of this Cooperative Agreement, until such time as the Obligated Amount may equal the Total Estimated Agreement Amount.

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This Cooperative Agreement is made to the Recipient on the condition that the funds will be administered in accordance with the terms and conditions as set forth in this Cover Letter, Attachment 1, entitled "Schedule", Attachment 2, entitled "Program Description", and Attachment 3, entitled "Standard Provisions", which together constitute the entire Cooperative Agreement document and have been agreed to by your organization.

Please acknowledge receipt of this Cooperative Agreement by signing all copies of this Cover Letter, retaining one copy for your files, and returning the remaining copies to the undersigned. Please be sure to return all copies marked "Funds Available."

Sincerely,

Stephen A. Dean
Agreement Officer
A.I.D./W Project Division
Health and Population Branch
Office of Procurement

Attachments:

1. Schedule
2. Program Description
3. Standard Provisions

ACKNOWLEDGED:

BY: _____

TYPED OR PRINTED NAME: Charles C. Pecarro

TITLE: Vice President of Finance

DATE: 9/27/80

FISCAL DATA

A. GENERAL

A.1. Total Estimated Agreement Amount: $13,200,000
A.2. Total Obligated Amount: $599,000
A.3. Project No.: 936-5992
A.4. A.I.D. Project Office: S&T/H, J. Heiby
A.5. Funding Source: A.I.D./W
A.6. DUNS No.: 99-182-9151
A.7. TIN No.: 52-0887367

B. SPECIFIC

B.1.(a)	PIO/T No.:	0361432
B.1.(b)	Appropriation:	72-1101021.8
B.1.(c)	Allotment:	048-36-099-00-20-01
B.1.(d)	BPC:	DDHA-90-13600-KG11
B.1.(e)	Amount:	$399,000
B.1.(f)	Project No.:	936-5992
B.1.(g)	Funding Source:	S&T/H/AR
B.1.(h)	PIO/T No.:	0361634
B.1.(i)	Appropriation:	72-11X1021.7
B.1.(j)	Allotment:	677-36-099-00-20-01
B.1.(k)	BPC:	DDCX-90-13600-KG11
B.1.(l)	Amount:	$200,000
B.1.(m)	Project No.:	936-5992
B.1.(n)	Funding Source:	S&T/H/AR

ATTACHMENT 1

SCHEDULE

A. PURPOSE OF COOPERATIVE AGREEMENT

The purpose of this Cooperative Agreement is to provide support for a five year program to develop, refine, and institutionalize practical approaches to assuring the quality of care provided in large scale less-developed country programs that deliver child survival and other basic health services, as more specifically described in Attachment 2 of this Cooperative Agreement entitled, "Program Description."

B. PERIOD OF COOPERATIVE AGREEMENT

B.1. The effective date of this Cooperative Agreement is the date of the Cooperative Agreement letter, and the estimated completion date is September 20, 1995.

B.2. Funds obligated hereunder are available for program expenditures for the estimated period from September 20, 1990 to approximately March 31, 1991.

C. AMOUNT OF COOPERATIVE AGREEMENT AND PAYMENT

C.1. The total estimated cost of the program described in Attachment 2 of this Cooperative Agreement is $13,601,696.

C.2. The total estimated amount of the A.I.D. contribution to the total estimated program costs shown in C.1. above, to be provided through this Cooperative Agreement (hereinafter referred to as "Total Estimated Agreement Amount") for the period shown in B.1. above is $13,200,000.

C.3. A.I.D. hereby obligates the amount of $599,000 (hereinafter referred to as "Obligated Amount") for program expenditures during the estimated period set forth in B.2. above.

C.4. Additional funds up to the total estimated amount of this Cooperative Agreement shown in C.2. above may be obligated by A.I.D. subject to the availability of funds, evaluation of the program, program priorities at the time, and the requirements of the Standard Provision of this Cooperative Agreement entitled "Revision of Grant Budget", as set forth in Attachment 3.

C.5. Payment shall be made to the Recipient in accordance with procedures set forth the Standard Provision entitled "Payment - Letter of Credit", as set forth in Attachment 3.

D. COOPERATIVE AGREEMENT BUDGET

D.1. The following is the Budget for this Cooperative Agreement. Except as specified in the Standard Provision of this Cooperative Agreement entitled "Revision of Grant Budget", as set forth in Attachment 3, the Recipient may adjust budget amounts within the total estimated agreement amount as may be reasonably necessary for the attainment of program objectives.

D.2. Budget

	Description	A.I.D.	Recipient Contributions	Total
(a)	Salaries & Wages	$2,316,108	$40,740	$2,356,848
	Fringe Benefits	856,961	15,481	872,442
	Host Country Nationals	298,188	0	298,188
	Consultants	119,722	7,760	127,482
	Technical Advisory Group	52,615	0	52,615
	Travel and Per Diem	397,579	12,370	409,949
	Other Direct Costs	407,300	1,145	408,445
	Expendable Supplies and Materials	26,662	582	27,244
	Nonexpendable Equipment	40,424	931	41,355
	Workshops/ Studios/Conference	1,300,000	0	1,300,000
	Subcontracts/ Subagreements	4,998,981	0	4,998,981
	Matching Grants	0	292,196	292,196
	SUBTOTAL	$10,814,540	371,205	11,185,745
(b)	INDIRECT COSTS	2,385,460	30,491	2,415,951
	TOTAL ESTIMATED AMOUNT	$13,200,000	$401,696	$13,601,696

E. REPORTING REQUIREMENTS

E.1. Financial Reporting

E.1.(a) Financial reporting requirements shall be in accordance with the Standard Provision of this Cooperative Agreement entitled, "Payment - "Letter of Credit," as set forth in Attachment 3.

E.1.(b) All financial reports shall be submitted to A.I.D., Office of Financial Management, Program Accounting and Finance Division (FM/PAFD - Washington, D.C. 20523. In addition, three copies of all financial reports shall be submitted to the A.I.D. Project Office specified in the Cover Letter of this Cooperative Agreement.

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E.1.(c) With the exception of the final financial report, all financial reports shall be submitted within 30 days following the end of the reporting period. The final financial report shall be submitted within 90 days following the estimated completion date of this Cooperative Agreement.

E.2. Program Performance Reporting

The Recipient shall submit the following:

E.2.(a) Quarterly Reports

E.2.(a)(1) The Recipient shall submit five copies of quarterly program performance reports which coincide with the financial reporting periods described in Section E.1. above to the A.I.D. Project Office specified in the Cover Letter of this Cooperative Agreement. These reports shall be submitted within 30 days following the end of the reporting period and shall briefly present the following information:

E.2.(a)(1)(A) A comparison of actual accomplishments with the goals established for the period, the findings of the investigator, or both. If the output of programs can be readily quantified, such quantitative data shall be related to cost data for computation of unit costs.

E.2.(a)(1)(B) Reasons why established goals were not met, if applicable.

E.2.(a)(1)(C) Other pertinent information including, when appropriate, analysis and explanation of cost overruns or high unit costs.

E.2.(a)(2) Between the required performance reporting dates, events may occur that have significant impact upon the program. In such instances, the Recipient shall inform A.I.D. as soon as the following types of conditions become known:

E.2.(a)(2)(A) Problems, delays, or adverse conditions that will materially affect the ability to attain program objectives, prevent the meeting of time schedules and goals, or preclude the attainment of work units by established time periods. This disclosure shall be accompanied by a statement of the action taken, or contemplated, and any A.I.D. assistance needed to resolve the situation.

E.2.(a)(2)(B) Favorable developments or events that enable time schedules to be met sooner than anticipated or more work units to be produced than originally projected.

E.2.(a)(2)(C) If any performance review conducted by the Recipient discloses the need for change in the budget estimates in accordance with the criteria established in the Standard Provision of this Cooperative Agreement entitled "Revision of Grant Budget", the Recipient shall submit a request for budget revision to the Agreement Officer and the A.I.D. Project Officer specified in the Cover Letter of this Cooperative Agreement.

E.2.(a)(3) Quarterly updates and proposed modifications of annual work plans, specifically to include travel projected for the subsequent quarter.

E.2.(b) Annual Reports

E.2.(b)(1) Within 30 days following the annual anniversary date of this Cooperative Agreement, The Recipient shall submit to the A.I.D. Project Office specified in the Cover Letter of this Cooperative Agreement 10 copies of an annual progress report which will be a description of the year's activities including technical, scientific, managerial, and fiscal information. The report shall include:

E.2.(b)(1)(A) A review of program and problems to date, and a discussion of technical and managerial issues significant to the success or failure of the Cooperative Agreement.

E.2.(b)(1)(B) A description of activities to be undertaken in the subsequent year.

E.2.(b)(1)(C) A review of the budget to date by fiscal category expenditures, and a forecast of the expected expenditures for the coming year.

E.2.(c) Evaluations

The project will be closely monitored on a continuing basis by the CTO with the assistance of the staff of the Office of Health (S&T/H). There will also be annual management reviews. Major evaluations are anticipated at mid-term and at the end of the project. These will use A.I.D. staff and outside experts to make a detailed assessment of project organization and development, fellows placement and recommendations for project improvement. The results of the final evaluation will be used to make a decision on project continuation.

E.2.(d) Final Report

Within 90 days following the estimated completion date of this Cooperative Agreement, the Recipient shall submit 10 copies of a final report to the A.I.D. Project Office specified in the Cover Letter of this Cooperative Agreement. It will include: (1) an Executive Summary of the Cooperative Agreement's accomplishments or failings; (2) a description of Cooperative Agreement activities from its inception; (3) significance of these activities; (4) comments and recommendations; (5) significance of the Cooperative Agreement's activities to A.I.D.; and (6) a fiscal report that describes in detail how the Cooperative Agreement funds were used.

F. SUBSTANTIAL INVOLVEMENT UNDERSTANDINGS

It is understood and agreed that A.I.D. will be substantially involved during performance of this Cooperative Agreement as follows:

F.1. Pursuant to Section E.1.(e) of the Program Description (Attachment 2) of this Cooperative Agreement, the Recipient will collaborate with A.I.D. in the selection of an Advisory Board which will be responsible for periodic review of the program to ensure broad recruitment of fellows and advisors, for oversight of fellow selection and for appropriateness of assignments.

F.2. A.I.D. will assist in development and identification of funding for assignments, review and approve A.I.D. funded fellows, review and concur in personnel, participate as a non-voting member in the Fellows Advisory Board, approve international travel, and review and approve annual work plan and quarterly reports.

G. INDIRECT COST RATES

Pursuant to the Standard Provision of this Cooperative Agreement entitled, "Negotiated Indirect Cost Rates - Provisional" and, "Negotiated Indirect Cost Rates - Predetermined", a rate or rates shall be established for each of the Recipient's accounting periods which apply to this Cooperative Agreement. Pending establishment of revised predetermined, provisional or final indirect cost rates for each of the Recipient's accounting periods which apply to this Cooperative Agreement, provisional payments on account of allowable indirect costs shall be made on the basis of the following negotiated predetermined rates applied to the bases which are set forth below.

Description	Rate	Base	Period	Type
Fringe Benefits	37%	1/	1/	1/
Overhead (International	19%	2/	2/	2/
G&A	22%	3/	3/	3/

1/ Base of Application: Total Labor Dollars
Type of Rate: Provisional
Period: Date of award - until amended

2/ Base of Application: Direct Labor Dollars plus applicable Fringe, Special Materials and Allowances
Type of Rate: Provisional
Period: Date of award - until amended

3/ Base of Application: Total Cost Input less G&A Expenses
Type of Rate: Provisional
Period: Date of award - until amended

H. TITLE TO PROPERTY

Title to property purchased by the Recipient under this Cooperative Agreement shall vest in the Grantee. The Standard Provision of this Cooperative Agreement entitled "Title To and Use of Property (Grantee Property)" applies. Disposition of property shall be in accordance with said Standard Provision.

I. PROCUREMENT AND CONTRACTING

I.1. Authorized Geographic Code

All goods/commodities shall have their source and origin in the United States (A.I.D. Geographic Code 000), except as A.I.D. may otherwise agree in writing.

J. SPECIAL PROVISIONS

For the purposes of this Cooperative Agreement, references to "OMB Circular A-122" or "OMB Circular A-21" in the Standard Provisions of this Cooperative Agreement shall include the A.I.D. implementation of such Circulars, as set forth in Subparts 731.7 or 731.3, respectively, of the A.I.D. Acquisition Regulations (AIDAR) (48 CFR Chapter 7).

K. ORDER OF PRECEDENCE

In the event of any inconsistencies in this Cooperative Agreement, they shall be resolved by applying the following descending order of precedence:

Attachment 1 - Schedule
Cover Letter
Attachment 3 - Standard Provisions

L. STANDARD PROVISIONS

L.1. The Standard Provisions set forth as Attachment 3 of this Cooperative Agreement consist of the following Standard Provisions marked by an "X", which are attached hereto and made a part of this Cooperative Agreement:

L.1.(a) MANDATORY STANDARD PROVISIONS FOR U.S., NONGOVERNMENTAL GRANTEES

(X) Allowable Costs and Audit (November 1985)
(X) Accounting, Audit, and Records (November 1985)
(X) Refunds (November 1985)
(X) Revision of Grant Budget (November 1985)
(X) Termination and Suspension (November 1985)
(X) Disputes (November 1985)
(X) Ineligible Countries (November 1985)
(X) Nondiscrimination in Federally Assisted Programs (November 1985)
(X) U.S. Officials Not to Benefit (November 1985)
(X) Covenant Against Contingent Fees (November 1985)
(X) Nonliability (November 1985)
(X) Amendment (November 1985)
(X) Notices (November 1985)

L.1.(b) ADDITIONAL STANDARD PROVISIONS FOR U.S., NONGOVERNMENTAL GRANTEES

(X) Payment - Letter of Credit (November 1985)
( ) Payment - Periodic Advance (November 1985)
( ) Payment - Cost Reimbursement (November 1985)
(X) Air Travel and Transportation (November 1985)
(X) Ocean Shipment of Goods (November 1985)
(X) Procurement of Goods and Services (November 1985)
(X) AID Eligibility Rules for Goods and Services (November 1985)
(X) Subagreements (November 1985)
( ) Local Cost Financing With U.S. Dollars (November 1985)
(X) Patent Rights (November 1985)
(X) Publications (November 1985)
(X) Negotiated Indirect Cost Rates - Predetermined (November 1985)
(X) Negotiated Indirect Cost Rates - Provisional (November 1985)

(X)	Regulations Governing Employees (November 1985)
(X)	Participant Training (November 1985)
( )	Voluntary Population Planning (November 1985)
( )	Protection of the Individual as a Research Subject (November 1985)
( )	Care of Laboratory Animals (November 1985)
( )	Government Furnished Excess Personal Property (November 1985)
(X)	Title To and Use of Property (Grantee Title) (November 1985)
( )	Title To and Care of Property (U.S. Government Title) (November 1985)
( )	Title To and Care of Property (Cooperating Country Title) (November 1985)
(X)	Cost Sharing (Matching) (November 1985)
(X)	Use of Pouch Facilities (November 1985)
(X)	Conversion of United States Dollars to Local Currency (November 1985)

L.2. The Expiration Date for the OMB Control Numbers indicated in the Standard Provisions is 12/31/89.

M. COST SHARING

M.1. The Recipient agrees to expend from non-federal funds not less than the amount shown in the budget (Section D.) of this Cooperative Agreement under the Column headed "Recipient Contributions".

M.2. Cost sharing is required under this Cooperative Agreement pursuant to Section M.1. above, and the Standard Provision of this Cooperative Agreement entitled "Cost Sharing (Matching)" applies.

M.3. The aforesaid Standard Provision makes reference to project costs. "Project Costs" are defined in Attachment E of OMB Circular A-110, as all allowable costs (as set forth in the applicable Federal cost principles [see the Standard Provision of this Cooperative Agreement entitled "Allowable Costs"]) incurred by a Recipient and the value of in-kind contributions made by the Recipient or third parties in accomplishing the objectives of this Cooperative Agreement during the program period.

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ATTACHMENT 2

PROGRAM DESCRIPTION

I. INTRODUCTION

The program that will be supported through this Cooperative Agreement represents a logical extension of the line of research carried out under the Primary Health Care-Operations Research (PRICOR II) project. The background section (II) provides a detailed discussion of the research strategy and findings of this project. The Appendix illustrates the type of operations research studies currently supported and their results. The following section (III) outlines the major technical issues to be addressed through this cooperative agreement under the Applied Research in Child Survival Services (ARCSS) project.

In summary, the recipient will carry out a 5 year program to develop, refine, and institutionalize practical approaches to assuring the quality of care provided in large scale less-developed country programs that deliver child survival and other basic health services. Such a quality assurance (QA) program will include efforts to monitor the quality of services using well-defined standards and methodologies that do not require high levels of expertise. The PRICOR II experience in Systems Analysis (SA) provides the point of departure for developing such an approach. As discussed in the following sections, additional research must focus on adapting the general SA strategy to use by regular program personnel rather than investigators.

Quality assurance also includes dealing with the deficiencies in care identified through monitoring. Under PRICOR II, such efforts were labeled operations research. ARCSS will emphasize development of problem-solving approaches that, like monitoring activities, are also suitable for application by regular program staff. This focus does not preclude support for local investigators outside the program itself, particularly for relatively complex issues. The major objective of project assistance, however, remains transferring to program personnel the capacity to systematically identify and solve problems in the way services are delivered. For most programs, this orientation corresponds to the potential role of the supervisory and management information systems.

II PROJECT BACKGROUND

For the past five years, the Primary Health Care Operations Research project (PRICOR II) has examined the manner in which child survival services are actually implemented in large scale programs. This focus was based on the premise that the health impact of a program is the net result of how well a broad range of service delivery activities are carried out. A recent study (Walker et.al., AJPH 78:2, 149-152) showed that death rates among children hospitalized for diarrhea in five Jamaican hospitals were consistently related to deficiencies in the quality of care provided.

The closer that actual care, as reflected by patient records, approached the standards developed by a panel of experts, the fewer children died. Although there is no apparent reason why the same relationship should not apply in child survival programs, the PRICOR II mid-term evaluation noted:

> The attention focused on the process of service delivery is all too rare; no one has ever attempted to develop a systematic approach or tools to identify implementation problems and develop solutions to those problems at the periphery.

There is a large body of research, much of it supported by A.I.D., which deals with the effect of child survival interventions in terms of epidemiological or KAP surveys. Such studies provide important information on parameters such as immunization status or mothers' knowledge of ORT. To a large degree, however, these studies treat the program delivery system as a "black box", a poorly understood entity that somehow produces the effects that are then so carefully studied. Surprisingly little research addresses the details of service delivery, such as the nature of program efforts to assure appropriate follow-up of children treated with ORT.

Certainly, program evaluations have examined service delivery activities, often producing valuable guidance. However, this approach represents more art than science. The subjective insights of experts may be accurate, but they are not the product of a well defined methodology that could be applied by ordinary managers after the experts have departed. Visits by teams of experts are relatively rare events. The practical logistics of brief reviews of complex programs also limits what can be accomplished. For example, a distinguished team reviewing the Indonesian EPI and ORT programs found supervision to be pervasively "weak", but was able to say little beyond this about what specific activities were performed inadequately or what concrete changes were called for. The report understandably does not provide objective benchmarks for monitoring improvement in the supervisors' performance. Details, such as how supervisors monitor patient counselling in EPI sessions are implicitly left to local program managers to analyze and improve.

The design of PRICOR II reflects skepticism about the degree to which local managers themselves know the details of service delivery activities in their own programs. While service statistics are often collected routinely, managers' knowledge of the actual activities carried out by their staff are unsystematic, if not casual, and highly incomplete even for the most perceptive observer. A central objective of the project is the development of practical methodologies for gathering information on the process of service delivery, including the quality of care, the nature of efforts to reach target populations, and the effectiveness of support functions like supervision, training, and management information. A.I.D.'s leading role in this field was recognized by the mid-term evaluation team, which noted:

...what PRICOR II was attempting to do was experimental in nature...there was no precedent to follow, no reservoir of knowledge or experience to tap. PRICOR had to chart its own course and test various approaches and methods to identify and develop some useful tools.

A. A WORKING DEFINITION OF QUALITY OF CARE IN CHILD SURVIVAL PROGRAMS: As the first step in examining the process of delivering child survival services, the project developed a list of the activities of interest. Drawing on the public health literature and a panel of outside experts, the staff developed a consensus list of the concrete activities that are believed to be necessary to provide effective services. The project's approach was explicitly reductionist, breaking complex functions down into their component activities. The process of taking the clinical history of a patient with acute diarrhea, for example, included 10 distinct tasks. A central requirement of the list is that each activity be defined in quantitative terms that allow the measurement of change in performance. If one were to observe history taking for diarrhea patients, using these definitions, at two different points, it would then be possible to say that performance had gotten better, worse, or stayed the same. The ability to make such measurements is critical to developing interventions, such as operations research, to improve performance.

The project has labeled this list a "thesaurus". Like any such list based on expert opinion, it must be considered provisional rather than definitive. Some of the activities included may prove to be relatively unimportant, and certain essential activities may be defined inadequately or missing altogether. But the thesaurus reduces service delivery activities to measurable terms, presented systematically in a widely distributed document. In this way, the project seeks to facilitate criticism, empirical testing, and refinement of our ideas about how services should be delivered.

For program staff that provide services directly, quality of care can thus be defined concretely: the essential activities can be identified and their performance measured in quantitative terms. The activities of interest include not only clinical care, but also patient counselling and outreach. The thesaurus also attempts to define the performance of support staff in similar terms. Staff activities in supervision, training, logistics and management information are intended, in principal, to influence the performance of service providers. Within the program, these support activities are the major determinants of the quality of care that is actually provided. On the whole, there is less expert consensus regarding support systems. Authorities may broadly agree, for example, how a child with diarrhea should be managed by a service provider. In contrast, there is less agreement on what the supervisor of such a service provider should be doing to monitor and support high-quality services.

The thesaurus provides a framework for examining the activities of service providers and support staff. The highly specific, concrete activities listed are, taken individually, highly approachable as research topics. There is little reason to doubt that we can study an issue as narrow, for example, as the role of the supervisor in monitoring the follow-up of the presumptive treatment of pneumonia. Indeed, it is remarkable that details of service delivery of such obvious relevance are so rarely the focus of research.

In terms of practical management decisions, such narrowly focused studies appear to be far more generalizable than the more traditional studies that address broad issues, such as demonstrating the feasibility of a new outreach strategy. Large scale modifications in a delivery system are likely to be associated with a number of poorly understood, potentially confounding variables. A well chosen comparison group eliminates these extraneous factors for the purposes of that particular study, allowing the investigator to isolate the effect of the new outreach strategy. The rigor of the study design allows the investigator to effectively ignore a range of factors that may affect outreach, but are not included in the study.

The perspective of the program manager is different: How can the program provide effective outreach? For the manager of a similar program in another country, applying the findings of such a broad study is problematic; the manager cannot afford to arbitrarily ignore any factors that are relevant to the effectiveness of outreach activities. By focusing on narrower issues, PRICOR II is seeking to develop studies in which the range of potentially confounding variables is greatly reduced, allowing a wider application of findings.

Even child survival programs that are very different overall include a number of specific activities that are comparable. The detailed listing of activities in the thesaurus is also intended to exploit these points of similarity. Where different programs attempt to carry out the same service delivery activity through different combinations of supervision, training, and other forms of support, a "natural experiment" exists. For specific activities like the supervisor's monitoring of pneumonia follow-up, simply describing how this is done in several programs (and the results) appears useful. Programs should be learning from the experience of others, rather than re-inventing the wheel. And if poor performance of an individual activity is highly prevalent among a number of programs, it probably deserves priority attention as a research topic.

The listing of service delivery activities in the thesaurus largely defines the universe, a sample of which has been examined in the field through the project. Program personnel have also found other uses for the thesaurus, including development of training courses, supervisory tools, and process evaluation.

B. AN ASSESSMENT OF QUALITY OF CARE IN 12 CHILD SURVIVAL PROGRAMS: Within the framework provided by the thesaurus, PRICOR II carried out what the mid-term evaluation team regarded as the first large scale, detailed examination of the delivery of child survival services. Project staff and their host country counterparts used a range of techniques to collect information on how services were actually delivered in the program under study, including:

- Observation of service delivery
- Review of clinical and support facilities
- Observation of home visits
- Record review
- Key informant interview
  - o Clinic staff
  - o Non-professional health workers
- Client interviews
  - o Household
  - o Exit (from clinic)
- Role playing observation
- Training course observation
- Observation of supervisory contacts
- Supervisor interview
- Community key informant interview
- Population-based surveys

The exercise of developing data collection instruments, making the corresponding field observations, and analyzing the results is labeled a "systems analysis". These efforts explicitly focused on the most peripheral elements of the involved program. The instruments are highly structured to minimize the influence of the subjective judgement of the observer. The structured format also permitted the project to use relatively unskilled observers.

The resulting data base includes six thousand observations and interviews addressing 1) immunizations, 2) oral rehydration therapy and diarrheal disease control, 3) malaria, 4) pneumonia, 5) maternal health, 6) child spacing. and 7) growth monitoring and promotion.

For the purposes of the systems analysis, the design of a program consists of the various concrete individual activities that are to be carried out by the program staff. In examining the degree to which different activities are actually carried out, the systems analysis is addressing the implementation of this design: Are people doing what they're supposed to be doing? The activities of interest can be usefully viewed as organized into a few distinct categories or systems, each of which can be subdivided to the level of observable activities. The systems analyses focused on:

1. Quality of Care: To what extent do service providers comply with accepted standards, allowing for local variations, including:

   a. Clinical history

   b. Physical examination

   c. Treatment

   d. Counselling

   e. Follow-up

   f. Record keeping

2. Outreach: The activities of program staff to provide health education related to different child survival services, targeted for clinic attendees, the general population, or specific sub-populations, addressing:

   a. Content of messages

   b. Methodology of presentation

   c. Effectiveness (knowledge and behavior)

   d. Coverage

3. Primary Supervision: The activities of field supervisors to monitor the quality of care and outreach activities of service providers, identify performance problems, and deal with them, specifying:

   a. The service provider activities under consideration

   b. The problem-identification and problem-solving methodologies used

   c. The effectiveness of the supervisor's intervention

   d. The level of attention given to the various service provider activities over time.

4. Second and Higher Levels of Supervision: The activities of program staff who supervise subordinates who are themselves supervisors, focusing on the monitoring and support they provide to the problem-solving process, taking into account:

   a. The service provider activities where the subordinate supervisor intervened

   b. The problem identification or problem solving methodologies used by the subordinate supervisor

c. The methodologies used by the senior supervisor to assess the subordinate's efforts

d. The effectiveness of the senior supervisor in assessing problem identification and problem solving

e. The methodologies used by the senior supervisor to correct shortcomings in the subordinate's efforts

f. The effectiveness of the senior supervisor in resolving shortcomings in problem identification and problem solving

g. Guidance provided to the subordinate supervisor regarding which service delivery activities to examine and which methodologies to apply

5. Training: The degree to which formal training courses actually provide the competencies to perform the individual service delivery and support activities listed in the thesaurus (as modified for local use), considering:

a. If and when training addressed the service delivery or support activity of interest

b. The methodologies used, if any, to measure competencies

c. The availability of documentation for these competencies, particularly individual results

d. Direct measurement of current competencies, including supervisors and trainers, as well as service providers, and addressing logistics and information management

e. Program efforts to convey practical job knowledge as well as technical competencies, including documentation of trainee's knowledge of specific job responsibilities and the availability of written guidelines

6. Logistics: The overall adequacy of the supply of drugs, forms, and equipment for child survival services and the effectiveness of the program's system for distributing these supplies, examining parameters such as:

a. Actual supplies compared to the estimated requirement of the target population

b. Responsiveness of the logistics system to supply requests in terms of time and amount

c. Level of inventory at which supplies are ordered

d. Minimum and maximum stocks over the past year and number of stockouts.

7. Management Information: Without questioning the merit of conventional service statistics, the systems analyses were chiefly concerned with the role of information in the implementation of services at the peripheral levels of the program, including consideration of:

a. Content of records

1) Quality of care measures in health worker or supervisor records
2) Identification of high priority subgroups for follow-up based on information from clinical records or community sources
3) Summary of supervisory problem-identification and problem-solving activities
4) Coverage of the target population for specific services and education
5) The effectiveness of educational activities

b. Utilization: the use of records in:

1) Clinical screening of patients
2) Organization of population outreach activities
3) Supervision, including problem identification and in targeting the problem identification activities of subordinate supervisors

c. Verification: the accuracy of program records, including:

1) Program efforts, if any, to verify selected information

2) The validity of program information based on direct verification in the systems analysis

In summary, for any given child survival service, the systems analysis was concerned with seven major systems which, as outlined above, are further subdivided into about 40 issue areas. At the level of concrete activities that can be observed, there are on the order of 200 distinct staff activities that are of interest for each child survival intervention. In 12 countries, the project examined the performance of the staff of ordinary service delivery programs. These systems analyses address the question, to what extent do the staff actually carry out the tasks that experts think are necessary to have a health impact. The participating countries are:

1. Thailand
2. Zaire
3. Haiti
4. Costa Rica
5. Colombia
6. Indonesia

7. Philippines
8. Peru
9. Niger
10. Pakistan
11. Senegal
12. Togo

These studies were not designed as a statistically representative sample of the implementation of the country programs, or of child survival programs in general. Nevertheless, PRICOR II appears to be the first large scale, systematic effort to map quality of care and its program determinants in LDC child survival programs. The findings leave little room for doubt that (1) deficiencies in the quality of care provided in these programs are extensive and serious, (2) that program mechanisms to detect and correct these deficiencies are poorly developed, and (3) that under widely varying circumstances, it is feasible to examine service delivery and identify practical solutions to many of the problems identified.

The following examples from systems analyses illustrate the nature of the findings to date.

1. Quality of Care:

   a. Clinical History: A large proportion of the mortality from diarrheal diseases is associated with invasive pathogens such as Shigella, for which antibiotic therapy is indicated. It is important to screen diarrhea patients for the most common sign, visible blood in the stool. In a model clinic in Pakistan this screening took place in 89% of cases, but only 52% of the time in Punjab, 6% in Thailand, 60% in Peru, and 22% in the Philippines. In Niger, health workers asked no questions at all in 58% of diarrhea cases presenting for treatment. While vomiting frequently accompanies dehydrating diarrhea and could therefore hinder ORT administration, service providers often neglected this simple question. While the model clinic in Pakistan asked 85% of mothers of these cases about vomiting, in the Punjab, only 43% of cases were asked, in Peru 20%, and in the Philippines 9%.

For ARI, previous antibiotic treatment is an important consideration in evaluating the child and is critical if antibiotics are to be prescribed for presumed pneumonia. In Pakistan clinics, this screening occurred in only 17% of cases and in the Philippines, 51%. A similar reasoning applies to asking about previous chloroquine use in a case presumed to be malaria, but in the Punjab only one patient in 20 was asked this question and none of 81 such patients in Niger. Although primaquine, which is contra-indicated in pregnancy, was used in 13% of presumptive malaria cases in the Punjab, none of the fertile age women were screened for pregnancy.

b. Physical Examination: In the Philippines, 90% of the health workers observed reported having received training in growth monitoring. Nevertheless, more than one-third of the weighing was done with improper techniques, compounded by a 16% error rate in recording weight and age. In Thailand, only 55% of growth curve plots were correct.

The WHO diagnostic algorithm for pneumonia is based chiefly on changes in the respiratory rate and the presence of intercostal retractions. Although 80% of the observed service providers in the Philippines reported training in ARI, in only 19% of 370 cases presenting with ARI symptoms did they count respirations and in only 28% did they examine for retractions. In the Pakistan model clinic, ARI patients' respiratory rate was noted less than 30 % of the time. In visits to the homes of children with ARI, community volunteers in Colombia did not actually observe the child in 81% of the cases.

Although malaria and bacterial meningitis can present with a similar symptom complex, health workers tested for nuchal rigidity in only 3% of presumptive malaria cases in Niger. Indeed, in only 35% of these cases did they perform any examination and for patients with diarrhea, fewer than 10% were examined in any way. In Zaire, where official norms prescribe six distinct steps in the examination of a diarrhea patient, only 43% of the cases complied with this standard. In the Pakistan model clinic, diarrhea patients were weighed (to monitor rehydration) only 4% of the time and examination of skin turgor as a simple sign of dehydration was included in only one patient in five.

c. Treatment: Child survival services are generally considered simple interventions, but even trained health workers were found to have serious lapses. In Zaire, although ORT was widely used, the average volume given was ineffectual (4-7 cc per kg compared to a recommended minimum of 50 cc per kg) and only one patient in four was classified by severity, the accepted basis for choosing a treatment regimen. In the Punjab, ORT was also the accepted treatment, but was used alone in only 4% of diarrhea cases, while in 75% it was combined with a variety of drugs, a practice WHO explicitly discourages on the basis of ineffectiveness, cost, and risk of side effects. Only 2% of the time was the ORS actually prepared and administered in the clinic. In Thailand, only 3% of cases were classified by severity. In Peru, nurses correctly prepared ORS 90% of the time and its administration in the clinic was universal. However, in only 35% of cases did the nurse monitor the amount of ORS taken by the child or changes in hydration status. Fifty-six percent of nurses correctly responded to vomiting by giving smaller volumes of ORS at more frequent intervals. In Niger, only 40% of health workers recommended an acceptable sugar-salt solution and their instructions for mixing ORS packets were only marginally better at 53%; for 60% of cases, they provided a charcoal-based treatment rather than ORT.

In Indonesia, 70% of ARI treatments were inappropriate, primarily the administration of oral ampicillin to cases with the symptoms of a viral upper respiratory tract infection. In addition to wasting resources, such practices contribute to the rising prevalence of antibiotic resistance. In the Pakistan model clinic, 95% of ARI cases received a prescription for antibiotics, largely viral upper respiratory tract infections for which antibiotics provide no benefits.

In the Punjab, in only 60% of presumptive treatments for malaria was the dosage appropriate, and in only 55% of cases was a diagnostic thick smear carried out. In Niger, trained traditional midwives washed their hands before attending the recently delivered mother only 17% of the time, provided cord care in only half the cases and provided no specific advice to the mother in 30 observed visits. Only two actual deliveries were observed, but although 95% of midwives claim to always use a new razor blade to cut the umbilical cord, in one of these deliveries the mid wife produced a used blade.

Immunization procedures were generally the best-performed of the child survival services. In Peru, 20 of 28 steps involved in vaccinating a child were performed with less than 15% errors. In the Punjab cold chain procedures were complete in more than 91% of sessions and sterile practices were observed in 88% of immunizations. In the Philippines, sterility was maintained in 91% of cases, but in Zaire 35% of immunizations were with a used needle.

d. Counselling: To a large degree, the effectiveness of child survival programs depends on effective communication with the mother who brings her child to a clinic or health worker. Studies of knowledge, attitudes, and practices measure the overall impact of such counselling, combined with other sources of information and advice. Communications research techniques have also been developed to test the design of specific messages. The systems analyses examined what program staff actually say to patients.

To have an effect on the nutrition status of children, most growth monitoring programs depend on influencing the feeding practices of the mother through counselling. In Haiti, however, in only 3 of 57 observed interactions did the health worker even tell the mother the nutrition status of her child, as revealed by the growth monitoring process just carried out. In the Philippines, the results of weighing were interpreted for only 10% of mothers and only 2% were further invited to ask questions related to the rather sophisticated reasoning that underlies the periodic measurement of growth velocity. Actual interventions intended to influence the child's nutrition, such as discussion of feeding practices or encouragement of breast feeding, were limited to 4% of the cases observed. In Thailand, interpretation and advice were included in 15% of weighing. In Zaire, for children found to have lost weight

since the last weighing, a sub-population at relatively high risk, still only 20% of mothers were counselled - a rate that was virtually identical with the group as a whole, indicating lack of targeting as well as low coverage. In Colombia, during home visits health workers diligently but mechanically completed visit forms that included breast feeding status of the mother. But while recording this information in 81% of visits, they went on to discuss breast feeding in only 7% of visits.

In Peru, nurses explained how often to administer ORT to 45% of mothers of children being treated for diarrhea. They mentioned how to evaluate the child and what to do in case of vomiting in 30% of cases, actually demonstrated ORT in 32%, and noted that ORT does not stop diarrhea 25% of the time. In only 10% of cases did the nurse ask the mother to repeat the instructions. Asking the mother questions to confirm her understanding was equally infrequent. The use of educational materials was rare, about 2% of interactions. In the Punjab, health workers remembered to mention the importance of additional free water along with ORT one time in three. They explained how long to give ORT in 23% of cases and the criteria for returning in 29%. Six percent of mothers of diarrhea patients were invited to ask questions and 2% to repeat the instructions. The standard advice on continued feeding during diarrhea was included 60% of the time in Thailand, 50% in the Pakistan model clinic, 60% in Peru, and 39% in the Philippines.

For children being treated for pneumonia in the Philippines, mothers were advised to complete the antibiotic regimen (rather than discontinuing when symptoms abate, a common but unsound practice) in 8% of cases. The importance of increased respiratory distress, lethargy and other signs of treatment failure (and high risk of mortality) were explained to only 4 of 370 mothers. The importance of continued feeding was mentioned in 60%.

In the Punjab, counselling to complete the entire dose of antimalarial was included in 21% of cases. Health workers asked the patient or mother to repeat instructions in 9% of cases and outlined indications to return in 6%. In Niger, health workers instructed 30% of malaria patients to return if they became "worse," but mentioned the signs of life-threatening cerebral malaria (or meningitis presenting as malaria) less than 3% of the time. Trained village midwives in this program did not recommend malaria prophylaxis in any of the 17 prenatal visits observed, nor did they propose tetanus immunization. Although two-thirds of mothers do not summon the mid wife prior to delivery, in only one prenatal visit did the mid wife advise that she be called early.

Counselling was a relatively weak component of immunization services. In Peru, only 47% of mothers were advised that DPT might produce a self-limiting febrile reaction and in only 55% was the purpose of the vaccine explained. In the Punjab, 29% of mothers were told [illegible] possible fever and 2% were invited to ask questions. In Thailand, health staff in immunization sessions discussed side effects, the date and location of the next immunization and similar topics in 9% of cases.

e. Follow-up: Consciously or not, every child survival program identifies a sub-population known to be at a high risk of illness or death, compared to the general population. A child seen with signs suggesting pneumonia has a risk of death several orders of magnitude higher than a child chosen at random from the same population, even if the absolute risk is perhaps one percent or less. Similar reasoning applies to a child being treated presumptively for malaria or one with active diarrhea. Less dramatic but elevated risks apply to children found to be malnourished or faltering in growth, and defaulters from immunization and prenatal care programs. Many programs accept, in principle, the responsibility to actively seek a follow-up contact with such high-risk sub-populations.

One strategy is to simply tell the mother to return under certain conditions or at a certain time, perhaps explaining the rationale for doing so. As discussed above, this element of counselling was frequently overlooked. In the Pakistan model clinic, 90% of mothers gave the incorrect date for their child's next scheduled immunization. Even though 70% of mothers were in fact informed by the health worker, less than 5% of the time did the health worker confirm that the mother understood correctly or invite questions.

Patient records allow opportunistic follow-up when the program has contact with the child for other reasons. In Punjab clinics, however, 20% of all children exiting the clinic had one or more immunizations due, with nearly 50% due for measles immunization.

For acute conditions associated with a high risk over a brief period of time, such as pneumonia, a program may carry out active follow-up by program staff who make home visits. In addition to records of the location of the household, such a strategy would probably require a separate follow-up file, organized by date, sometimes known as a "tickler" file. Although the programs in Costa Rica, Colombia, and Punjab included extensive, systematic household visits, targeted follow-up of individual patients was not included.

f. Record keeping: The accuracy and completeness of the clinical records maintained by service providers are critical to many supervisory strategies. In Thailand, health workers recorded the pertinent findings of their assessment of diarrhea patients only 12% of the time, although they were more thorough in recording immunizations given (94%). In the Punjab, mobile vaccination teams examined the child's existing vaccination card or provided a new one 70% of the time. During growth monitoring sessions in Thailand, health workers recorded the correct weight in every case observed but then plotted the weight correctly in only 55% of cases, about the same accuracy as seen in the Philippines. In Costa Rica, survey verification of 1,680 family records using lot quality assurance sampling showed that, using widely accepted standards, health worker records were substantially wrong 25- 30% of the time in estimating the

coverage of different vaccines. For growth monitoring, half of the health workers did not have an adequate supply of growth charts and only one in three maintained a register of children found to be malnourished. Where records were kept, they were of acceptable quality by most standards. In Niger, there was no reliable written information on any aspect of service delivery. In Peru, the child's vaccination card was completed correctly 94% of cases, but health workers delayed completing the clinic registry until there was no backlog of patients, resulting in a 40% error rate.

2. Outreach: Several of the programs included active efforts to provide health education through household visits and group talks in the community as well as in the clinic. In the Punjab, among households that had been visited (63% within 3 months), even the general areas dealt with were recalled by only 1% of 1,313 adults interviewed. Probing indicated that immunizations were discussed more than twice as frequently as the program's other major services, malaria and diarrhea. In Niger, midwives conducted demonstrations of weaning foods with no defined coverage strategy and did not address specific feeding practices. Only 7% of health workers attempted any outreach related to diarrheal diseases. Among the 41 health education sessions on malaria that were observed, potential health worker interventions were curiously neglected: chemoprophylaxis for pregnant women and the recommended presumptive treatment were mentioned in only 10% of sessions.

Whatever the content of outreach efforts, the methodology of presentation is of interest. Practices were similar to those used in clinic-based patient counselling. Of 853 home visits in the Punjab that were examined, demonstration of how to prepare an oral rehydration solution took place in nine households. Other techniques such as asking the mother to repeat information, asking questions or providing educational materials were difficult to find. Time is also a factor. In Niger, group "talks" on maternal health averaged 4.3 minutes in length.

With the content of health education activities defined only in fairly general terms it is understandable that these programs made little effort to measure the effectiveness of outreach. In the Punjab, 51% of those interviewed in the households survey were unable to name a single symptom of malaria and 54% reported that they would discontinue drug treatment when the fever stopped rather than completing the course. Only 36% could name any measure to prevent malaria. Outreach had little influence on tetanus immunization, with only 24% of families reporting that the fertile age women in the household had been immunized.

The program in Colombia emphasized a highly structured and relatively intense outreach strategy. Volunteers periodically canvassed about 25 neighboring households, following a standard visit form. Observation of 137 visits showed that these contacts were dominated by stereotyped information collection, with little

active education. Compared to mothers in a nearby community without such visits, those in the program area were marginally better informed. Ninety-five percent recognized ORS compared to 75% in the comparison area, and they used other drugs or suspended feeding for diarrhea only half as often. Both groups correctly recognized malnutrition based on a sample growth card 70% of the time. Program area mothers were better at recognizing growth faltering (24% vs. 4%), but the average level of skill was low. Knowledge of the immunization schedule was also poor in both groups and there was no measurable impact of outreach activities related to acute respiratory diseases.

In Costa Rica, professional community health workers canvass a defined population quarterly to provide a small number of services which include education in ORT and provision of packets. Nevertheless, although 88% of mothers recognized the ORS packet, only 31% actually used it during their child's latest episode of diarrhea. Less than 50% of the ORT solutions prepared by these mothers under observation were classified as correct.

In the Pakistan model clinic, 24% of households reported an outreach visit in the preceding 30 days but two-thirds of this group could not specify a health message, even with prompts from the interviewer. In Niger, only 14% of the surveyed population named a village level worker as the source of information on ORT.

3. Primary Supervision: The term "supervision" is an abstraction subject to a wide variety of interpretations. To measure the performance of supervisors, PRICOR II defined the role of supervisors in terms of concrete, observable activities. The project's basic perspective for supervision is based on the detailed listing of service provider activities discussed above: How does the supervisor influence the specific activities that service providers are supposed to carry out? While there are arguably other functions that could be reasonably attributed to supervisors, PRICOR II focuses on understanding what is usually termed the problem solving process.

Given a specific service provider activity, like interpreting a child's growth curve for the mother, the project seeks to address several issues:

(1) When supervisors examine this activity, do they find performance problems where they are present?

(2) How does the cost-effectiveness of this problem identification process vary with different alternative methodologies, such as interviewing the health worker compared to a role play simulation compared to direct observation of the service?

(3) When they find a problem in this activity, do supervisors deal with it effectively?

(4) How does the cost-effectiveness of this problem -solving process vary with alternative methodologies such as different types of performance incentives or persistent coaching?

(5) What is the distribution of these supervisory interventions among the different service provider activities? Do supervisors neglect some techniques like exit interviews or certain service provider activities such as follow-up?

The project defines problem-solving in terms of discrete, concrete activities, some of which, may not exist at all in a given program. Considering the large number of service provider activities that could be addressed, each of which could be subject to several distinct problem solving methodologies, the supervisor must select from a very broad range of possibilities regarding what to do on a given visit. In practice, supervisors do not actually perceive this variety of options and observations of their field contacts in the systems analyses revealed a narrow range of loosely-organized activities.

Field supervisors in the Philippines have frequent contacts with service providers (at least weekly). On the basis of these observations, they were asked to estimate the extent of selected service provider activities, with the understanding that their estimates would be verified through direct observation by the systems analysis team. Their impressions of the quality of care they had been observing so frequently were strikingly inaccurate. In taking the history of ARI patients supervisors estimated that questions about past treatment were asked in 88% of cases but in only 41% of 314 observed cases was this done; they thought difficulty drinking was assessed 40% of the time, compared to 1% actually observed; a history of tuberculosis was taken in 2% of cases, rather than the 72% estimated by supervisors. They thought respiratory rate was observed in 36% of cases, but in fact it was done in only 14%. Supervisors thought 66% of cases received important counselling about signs of deterioration (and risk of death) but only 1% did. Rather than advise 82% of mothers of the importance of completing the antibiotic regimen, health workers did so in 8%. Similarly, in managing diarrhea diseases, health workers asked about blood in the stool 28% of the time rather than the 87% estimated by supervisors, asked about vomiting in 11% rather than 82% of cases, and asked about previous treatment 38% of the time rather than 88%.

These supervisors had no apparent incentive to exaggerate performance. Despite access to the service deliver process, supervisors lacked training and guidance in observation strategies. When present during growth monitoring sessions, they examined a sample of growth cards only 25% of the time and observed the health workers' interpretation in 27% of visits. In none of the 1,013 immunizations observed in the systems analyses did supervisors check technique. Not surprisingly, specific problem-solving was not

common. 54% of supervisors could not even name one technique to provide motivation to improve the performance of service providers and in only 9% of contacts was any kind of feedback provided by the supervisor.

In the Punjab, 59% of 37 observed supervisory meetings were less than 15 minutes long. Problem cases were discussed in 3% of the meetings and health worker skills were demonstrated in 8%. None of these contacts addressed, for example, ORT quality of care or counselling. In the Pakistan model clinic, a list of 27 problems generated by the supervisory staff did not include a single quality of care, counselling, or outreach issue. In Peru, 75% of service providers estimated that their supervisor, who worked in the same clinic, discussed their performance at most once per month.

In Niger, service providers received 1.2 visits per year, averaging 26 minutes. Only one of 51 observed contacts included observation of the preparation of ORS or the treatment of a patient. When questioned, only a third of the supervisors thought supplies of chloroquine were problematic, but 57% of the health workers were found to have none. None of the observed visits addressed the identification of malnourished children, observation of any kind of health education, or participation in a home visit. For maternal health, only one-fourth of supervisors claimed to evaluate the midwives knowledge and only 15% addressed any kind of problem. Of all of the observed visits, only 10% included any direct contact with members of the community and only 25% were recorded on a standard form. Less than half of the visits included any questioning of the health worker. In Senegal, 53 out of 62 malaria treatments carried out in the presence of a supervisor provided an incorrect dosage of chloroquine, but none of these was identified as a problem by the supervisor. When, in separate interviews, 100 supervisors were asked to identify two problems in the program, only 54 of these related to the performance of service providers. Included among these were 35 references to malaria treatment, but none of the supervisors were able to specify the nature of the shortcoming. The program does not include a standardized supervisory instrument and locally-developed forms range from none to an elaborate questionnaire requiring two hours to complete.

4. Second and Higher Levels of Supervision: All of the programs studied included in their formal organizational structure, one or more administrative levels with the theoretical function of supervising the activities of lower level supervisors. In principle, this group of senior supervisors, however they are designated, are responsible for (1) monitoring the effectiveness of field supervisors in identifying and solving problems, (2) correcting shortcomings in their subordinates' performance in this area, and (3) directing field supervisors' efforts in terms of the service provider activities that they deal with and the methodologies that they employ. The programs under study are particularly dependent on effective higher level supervision in view of the fact that none of the junior supervisors which were observed, reported any training in problem-solving per se.

In the course of examining the activities of field supervisors, none of the systems analyses detected any evidence of meaningful supervision of the problem solving process. Despite the manifest weaknesses of junior supervisors in this area, higher level monitoring of their activities was not merely insufficient, but rather absent even as a recognized function of the senior staff. The quality of care and outreach issues examined in the systems analyses are, in effect, entirely delegated to an ill- prepared cadre of junior staff.

In Senegal, second and third level supervisors observed during field visits assumed the role of their subordinates who observed while they dealt directly with the health worker. The performance of the subordinate in problem-solving was not addressed.

5. Training: All of the programs examined provided both pre-service and in-service training for service providers. In view of the poorly-developed problem-solving role of the supervisory system, the bulk of the success of these programs must be attributed to this training, combined with the initiative of individual service providers. Nevertheless, none of the programs has implemented a systematic effort to measure and document the distinct competencies required to carry out the corresponding service delivery activities.

The study in Peru demonstrated that for immunization services, role playing simulations closely correlated with observed performance in every task area except record keeping. None of the programs, however, used simulations to systematically measure the skills of their staff. Based on retrospective reporting, some staff in these programs did not receive training that addressed practical elements of their job. In the Philippines, only 3% of service providers thought their training in immunization emphasized demonstration and practice of the skills they would be expected to use in their jobs. An equally small proportion had their competencies tested with these techniques. Although 75% of this group reported formal training in growth monitoring within 3 years, only 14% recalled training in interpreting the growth curve for the mother. In Zaire, although 73% of health workers had received training in the clinical management of diarrhea, their responsibilities in counselling were effectively omitted and their skills in this area were never tested.

In Colombia, health volunteers received a training course developed specifically to address their role in ARI. By written examination, 79% understood assessment of the child's respiratory rate. Based on a role play simulation, less than half adequately assessed the patient. Actual performance in observed field visits proved to be satisfactory in only 30%. In this case, supervisors were able to largely correct the shortcomings of the training course, raising performance to 88% after three visits which focused on deficiencies detected in the role play simulation.

In Niger, half of the health workers had received refresher training in the past two years. But since the training was based on their original pre-service curriculum, it did not specifically address the performance problems outlined above.

None of the systems analyses included observation of the training of field supervisors, higher level supervisors, or trainers, nor were training in management information or logistics directly examined. Staff performance suggests that compared to service delivery, training in these areas has been relatively neglected.

6. Logistics: The principles of supply management are well developed. The systems analyses did not include any innovative approaches to logistics. In several programs, supply shortages did appear to substantially influence quality of care. In the Punjab, 23% of the population that did not attend the local ministry clinic attributed this to lack of supplies, while only 1% cited cost. In the Philippines, 30% of rural health units had no vaccines on hand. In the past year, 46% of clinics were without ORS for more than a week at least once. Thirty percent of these clinics did not maintain an ORS supply log and only in only 13% did the log include supply on hand. In Costa Rica, a major factor inhibiting measles immunization was the reluctance of health workers to open a 10 dose vial for a single child, a common situation.

7. Management Information Systems: All of the programs collected and recorded service statistics, although this was minimal in Niger. The orientation of these systems appears to be largely that of allowing higher level managers to monitor the level of activity in certain broad areas of service delivery. In Thailand, clinics are required to submit 23 separate reports, two of them weekly and 18 monthly. Reporting requirements for district and provincial health offices are similar. One day each week is designated for reporting activities at the local level, although reporting- related work was also observed throughout the week. The degree to which the burden of such a reporting system is balanced by improved planning and management is widely debated. The focus of the systems analyses was on the direct contribution of information to service delivery activities at the lower level of the program.

a. Quality of Care Data: None of the programs included an organized effort to measure and document the quality of care they were providing. In the absence of systematic monitoring, none of the programs could be considered to have a formal strategy for quality assurance. Across the programs, responsibility for monitoring service delivery was assigned to a supervisory hierarchy. But there was no well-developed information system in any of the programs for collecting and processing the supervisors' finding. Higher level supervisors and managers did not receive systematic information on the activities of field

supervisors to monitor quality, identify problems, and deal with them. Similarly, the specific nature of the most prevalent quality of care problems in these programs was not monitored by managers, except, perhaps, through casual observation.

There was, of course, no analysis of information on quality of care problems. Lacking access to the program's own experience, the design of in-service training was not targeted toward areas of weak performance. When the systems analysis provided this kind of information, trainers often made effective use of it. In Zaire, counselling on malaria treatment was so perfunctory that none of the mothers could give the correct dosage for their child in exit interviews. After staff training focused on performance in malaria counselling, 15 consecutive mothers interviewed all gave the correct dose.

b. Identification of high risk subgroups: Except for Niger, the programs generated clinical records with potential for identifying high risk sub-populations for special attention or follow-up. These include growth monitoring results, immunization records, clinical records for diarrheal diseases, pneumonia, or malaria, and prenatal records. As noted above, there was some use of immunization records to actively screen for children in need of immunization who contact the health system for other reasons. Actual follow-up of high risk individuals or subgroups in the community was, however, rare, even in the programs that conducted extensive outreach.

The potential advantages of more targeted outreach are illustrated by a study in Zaire. By limiting counselling to the mothers of children with documented growth faltering, program staff were able to triple their time with a given mother, raising the mother's knowledge of their child's weight gain from 40% correct to 93%. The overall duration of growth monitoring sessions was simultaneously reduced 25%. These improvements were the result of using available information and did not require any additional training or other resources.

c. Population coverage: The coverage strategies of the programs in Costa Rica, Punjab, and Colombia are based on a periodic canvass of households or villages. The reporting systems in place do provide the basis for monitoring overall contacts, but not specific service delivery activities. Health workers in Colombia accurately report on the breast feeding status of their target population, but the information system does not reveal that in only 7% of cases do they actually make any effort to promote breast feeding. Simply tracking household visits in the Punjab may give the manager an overly optimistic impression regarding what was actually being covered: Health workers inquired about possible malaria cases only 35% of the time and asked about candidates for immunization in 55% of visits. Among those receiving DPT-3 or polio-3, only 50% were advised to visit the clinic for measles immunization at 9 months and only 3% of the time did the health worker make sure the mother actually understood the instructions. Such coverage issues are not included in program reports.

For the programs which did not follow a periodic canvass strategy, the relationship between the activities of the staff and coverage rates was not monitored through the information system. Service statistics can, of course, be compared to an estimation of the population in need of the service at issue. But reports in these programs do not show managers who among the target population has been exposed to the different promotional messages, how many times, or the results. The study in Costa Rica showed that a wide range of such coverage issues can be addressed through very small surveys at the local level (sample size of 12 - 20) using lot quality assurance sampling (LQAS).

d. Information on the effectiveness of health education: All of the programs included a large element of health education to be carried out through service providers. As described previously, performance in this area was consistently among the weakest elements of service delivery. At the same time, none of the programs systematically monitored the effectiveness clinic counselling or outreach activities. These interactions are accessible for monitoring - the Punjab systems analysis included 853 outreach visits and 715 clinic exit interviews in a two week period. Nevertheless, educational messages and methodologies apparently were repeated thousands of times in these programs without collecting any evidence that this massive intervention was effective.

e. Verification of reported data: Except for Niger, every program studied invested substantial resources in collecting and analyzing information. Traditional service statistics, such as total counts of children treated with ORT in the past month, are difficult to verify. Not surprisingly, none of the programs systematically carried out such verification. Information describing the details of how services are provided, including quality of care and educational activities, are amenable to verification. However, in view of the pervasive lack of such information, it is not surprising that direct, systematic verification of a sample of reported data was not practiced in any of these programs. Similarly, the limited reporting on supervisory visits was implicitly assumed to be accurate enough for program purposes.

8. Conclusions: The mid-term evaluation team noted an intrinsic tension between the interests of scientific investigators and managers. Where the traditional standards of science, as applied to service delivery, conflict with the manager's need to solve problems and deliver services, the team favored orienting PRICOR II toward the manager. The development of the systems analysis methodology has required the project staff to address conceptually complex issues. Nevertheless, even at this early stage in its evolution, the methodology is sufficiently practical that it has been carried out by local program staff and investigators with progressively less outside assistance.

By conventional scientific standards, the findings illustrated above would not be considered strictly representative of the large national programs from which samples were drawn. In several cases, the confidence limits of the observations are broad and the reliability of the observation techniques needs to be confirmed. Even as the project addresses such concerns, a number of overall impressions emerge, particularly from the perspective of the manager with the responsibility for delivering child survival services:

a. Quality of care is seriously flawed, even in the best of these programs. There is little reason to doubt that this is an area that merits our attention. Even without setting arbitrary standards, when an essential activity is entirely missing more than half of the time, it is difficult to justify doing nothing. Moreover, for many such observations, it is unclear how effectively these activities were carried out when they were observed to be present. Among the 25% of Philippine health workers who do count respirations in ARI cases, further study is needed to assess their accuracy and their interpretation of the findings for example.

b. Poor quality of care can also be enormously inefficient. It is only reasonable to ask how much quality-of-care assurance can resource-poor programs afford. At the same time, several growth monitoring programs, which represent substantial direct and opportunity costs, lost most of their potential impact through poor quality counselling. The frequency with which viral upper respiratory tract infections were treated with antibiotics in several programs is another example of such inefficiency.

c. The range of concrete quality of care problems identified in the systems analyses have face validity with managers and public health experts. The general areas of weakness, for the most part, are not unexpected. The chief contribution of the systems analyses has been to identity the specific activities where performance is poor and to measure these shortcomings quantitatively. A central premise of the project is that a manager's vague awareness of a problem is not a compelling impetus for corrective action.

d. The internal systems with the theoretical capacity to monitor quality of care, detect deficiencies, and deal with them are virtually universal in these programs in the form of supervisory and management information systems. The consistent failure of these mechanisms to even begin to address the pervasive quality of care problems observed in the systems analyses is disturbing. The professional literature in this area offers little practical guidance for even the most motivated and talented manager. This fundamental program process urgently needs study.

e. While absolute limitations in available resources present managers with difficult and sometimes insoluble problems, many of the quality-of-care issues identified reflect poor use of resources already available. Even the poorest programs supported costly training efforts that bore little conscious relation to the shortcomings that systems analysis later documented. Similarly, the marginal content of supervisory visits is not primarily an issue of cost.

f. The performance of both service providers and support staff was affected by a lack of detail in their job descriptions. In many instances, the programs had not clearly communicated to their staff what they were supposed to do. This lack of definition of performance standards in turn inhibits efforts to monitor staff competencies. Of all the problems revealed by the systems analyses, these appear to be among the most straightforward to deal with.

g. Many of the constraints on the program managers are not addressed by an examination of the service delivery process. A number of these factors involve poorly- defined political and cultural considerations that are not amenable to a standardized methodology. Nevertheless, the reaction of policy-level managers, as well as those at lower echelons, to information outlining the service delivery problems of their programs has been remarkably positive. Whatever outside constraints may be operative, many managers are clearly prepared to deal with specific problems when there are well defined, practical options available to them.

h. Knowledge of a specific problem frequently leads to concrete action to deal with it. In Costa Rica, the adverse impact of multiple dose vials of measles vaccines was addressed through a change in procurement at the national level. Where the appropriate response is not immediately clear, the project supports small scale operations research to address a single, narrow problem. In Zaire, inadequate volumes of ORT were found along with ineffectual counselling, both of which markedly improved following a training and supervision intervention The role of such studies is discussed below.

C. THE ROLE OF OPERATIONS RESEARCH IN RESOLVING PROBLEMS IDENTIFIED THROUGH SYSTEMS ANALYSIS: For the purposes of PRICOR II, the term systems analysis refers to a descriptive or diagnostic field study whose purpose is to characterize how a broad range of service delivery activities are actually carried out. "Operations research" is used for the subsequent studies developed primarily in response to the findings of the systems analysis. This includes two major types of research:

1. More Detailed Diagnostic Studies of a Selected Element of the Delivery System: A systems analysis that covers the delivery of several services and the corresponding support systems, all within a few weeks of field work by a small staff, cannot examine every activity in depth. Rather, the systems analysis serves a screening test function, identifying areas where performance is problematic, but not necessarily pinpointing the underlying causes. The project has supported several studies which constitute a second phase of systems analysis. Using the same methodologies, these studies have focused on examining a circumscribed area with sufficient detail to identify the weaknesses in specific support activities that in turn contribute to the originally identified problem. In Zaire, for example, studies are examining the performance of support functions (such as supervision, training, and management information) associated with inadequate refrigeration of vaccines. Diagnostic studies may also extend the scope of the original systems analysis. In the Philippines, such studies are examining the national malaria program, tuberculosis control, and a national nutrition program, none of which were included in the initial systems analysis. In Peru, the Ministry of Health requested a similar extension of the systems analysis into new services, combined with expanded geographic coverage.

2. Prospective Development and Testing of Measures to Resolve Problems Identified in the Systems Analysis: A critical element in actually solving many problems is creative insight. PRICOR II can make no claim to influencing this elusive process. The systems analysis does however allow investigators to focus their thinking on a narrowly defined, concrete problem. Thus, studies in Zaire address problems such as the failure of supervisors to evaluate the effectiveness of certain health education efforts. This represents the project's basic strategy for institutionalizing operations research in LDC programs: reduce the scope of the research issue to the point that it can be addressed by simple research designs, usually rapidly and at low cost. This represents a different perspective from the academic research tradition, even when the research is labeled "applied". Most of the 54 studies in Zaire have budgets in the $2000-4000 range, compared to a PRICOR I average of $60,000.

Operations research that focuses on influencing what the program staff do has a further advantage in terms of reducing the complexity and cost of studies. Service delivery activities are, for the most part, common, accessible events. The logistics of a study related to counselling the mothers of malaria patients are far less demanding than the corresponding epidemiological study of malaria mortality. Both types of research are important, but the rigor that is necessary for impact studies seems to have discouraged programs from developing these simple yet useful process studies.

For a number of service delivery activities, prospective testing of alternative approaches is needed to fill a void in established standards. The weakness of supervisory problem solving observed in the systems analysis reflects a poorly developed state- of-the-art. The actual effectiveness of different concrete actions to find and solve problems is virtually unmeasured. Prospective studies are needed to test a number of plausible but neglected techniques. Beyond general principles, there is currently no empirical basis for advising supervisors how to more efficiently identify and resolve quality-of-care problems. The design and implementation of outreach strategies targeted for different high risk populations represents another poorly-researched area where only prospective studies, as opposed to analysis of existing programs, are likely to provide useful guidance. The design and application of management information systems to monitor quality of care, outreach, and related problem solving is also so poorly developed that the basic study of alternatives is needed.

3. Status of Current Operations Research Studies: PRICOR has developed 79 studies in the 8 countries where funding for studies to follow up the systems analysis was available. Fifty-four of these are located in Zaire, the site of the earliest such systems analysis. Of the studies in Zaire, 11 address quality of care issues, 19 deal with outreach, 5 with supervision, 4 with training, 6 with logistics, and 1 with management information. Several studies address an identical issue through approaches developed independently in different locations. Most of these have not yet reported findings. Examples of available results from other countries include:

In Columbia, one study documented improved but nevertheless flawed performance after a training intervention. An ongoing study has found little benefit from modifying the format of records completed by service providers. Studies in Indonesia have documented a 35% decrease in unnecessary antibiotic use in ARI patients through a simple supervisory intervention. Other studies used clinical and community based eduction to reduce the patient load of mild, upper respiratory tract infections by 43%.

Only studies in Costa Rica and Peru explicitly examined methodological issues related to research in quality of care. In Costa Rica, the application of Lot Quality Assurance Sampling (LQAS) documented the utility of small samples (12-20) where the issue is whether or not performance standards have been met. In Peru, the close correlation of role play simulations and actual performance in immunizations suggests a larger role for simulations in monitoring quality of care.

D. COMPARATIVE ANALYSIS: The systems analysis findings strongly suggest that there are large numbers of discrete implementation problems distributed throughout child survival programs. A sustainable approach to dealing with these problems must emphasize institutionalized mechanisms for monitoring service delivery activities, identifying problems, and solving them. In most programs, such a focus involves chiefly the supervisory and information systems. The mid-term evaluation team emphasized the importance of training host country counterparts to develop these areas.

For problems that prove to be too difficult for routine problem-solving approaches, operations research can be a useful management tool. Here, the project seeks to develop small, rapid, and cheap study designs that can be applied to the large number of anticipated problems.

Both routine problem solving and more formal operations research are likely to benefit from the experience of other programs that have dealt with the same issue. Since virtually all programs have had very little information on the details of quality-of-care and support activities, there has not been much experience to share. PRICOR has now collected such information, oriented around a common set of definitions of the activities of interest (the thesaurus). The project staff is currently preparing a series of comparative analysis reports. These comparisons will seek common patterns among the different programs that may provide lessons for programs outside the project.

The most straight forward issue is the overall frequency of performance problems among selected service delivery activities. For example, in growth monitoring programs in Haiti, the Philippines, Thailand, and Zaire, less than half of mothers were counselled about their child's weight gain. This set of observations should cause the managers of similar programs elsewhere to examine their own performance in this area. Of course, a larger set of observations of this kind would be even more convincing. The project has established a practical framework for other investigators and evaluators, who can now contribute additional observations.

An important but somewhat more difficult comparison involves the program determinants of quality of care. For a specific service provider activity, such as making a follow-up contact with a child being treated for pneumonia, programs provide different combinations of support activities intended to assure that such follow-up is adequate. Systems analysis allows investigators to measure such support activities as training, primary and higher levels of supervision, management information, and logistics. If certain health worker competencies are found in every program with good performance in follow-up, managers in other programs would have a good reason to monitor such competencies. Similarly, if the factors associated with effective pneumonia follow-up are also predictive of follow-up for immunization drop outs or growth- faltering children, managers would have even more reason to apply these findings in their own programs.

In principle, the same rationale applies to a comparative analysis of operations research studies. Currently, however, only a small number of studies have been completed.

III. RATIONALE FOR THE APPLIED RESEARCH IN CHILD SURVIVAL SERVICES (ARCSS) PROJECT

Methodologies developed for the first time under PRICOR II have revealed widespread shortcomings in the way child survival services are actually delivered in large scale programs. Even the best-performed services in the best programs evinced serious performance problems of which local managers were at best only vaguely aware. Many program service delivery activities fell short of accepted standards by a large margin. Epidemiological research suggests that the flawed implementation of child survival interventions results in preventable illness and death.

The ARCSS project will continue and refine the innovative strategy developed under PRICOR II. The problems associated with quality of care and outreach activities are large-scale and complex, far beyond the capacity of a single project to resolve. In this sense, ARCSS remains a research activity with a primary goal that of developing tools that will be applied by others. As an expected secondary result of this research, the practical evaluation of these tools will produce immediate benefits by identifying and resolving specific problems.

A. TECHNICAL ISSUES TO BE ADDRESSED: The results of PRICOR II suggest a number of areas where current approaches need refinement. At the same time, ARCSS will address new technical areas that were not included in PRICOR II. Major issues include:

1. Refinement of Data Collection Methodologies: Relatively little effort was devoted to comparing data collection methodologies under PRICOR II. The approaches that were taken represent reasonable professional judgement, much like the criteria applied in other types of field research. However, these techniques must be applied periodically to be useful - it is the current performance of their staff that concerns managers. Therefore, relatively small differences in the cost- effectiveness of the data collection process merit attention. On the basis of such a comparison in Peru, a national systems analysis is relying largely on role play simulations rather than more expensive observation of service delivery. There are a number of similar choices of methodology to be made, and these choices should be supported by data as much as possible.

Except for Costa Rica, PRICOR II systems analyses and operations research studies generally used a sample size determined by traditional social science standards. LQAS illustrates how smaller samples can meet the manager's need to make a decision, within defined confidence limits.

Routine quality assurance monitoring will also introduce the need to examine longitudinal data sets. ARCSS will examine the performance of service delivery activities over time to address issues related to how stable a given level of performance is, including the long-term impact of training and supervisory interventions.

Increased attention to the validity of observations is also warranted. Evidence of an observer effect has been noted in Niger and other studies, illustrating the value of using more than one technique to make key measurements of performance. In some instances, observation of selected service delivery activities should be complemented with time use studies before proposing new activities for health workers or support staff.

The current list of variables of interest in the thesaurus presents a problem of sheer size that most managers are likely to find unwieldy. Indicators that produced no relevant findings in several systems analysis are candidates for elimination or relegation to a group designated for low priority. On the other hand, areas of service delivery that remain poorly defined after a systems analysis may require an expanded or at least improved list of variables. If these steps do not produce a substantially reduced number of thesaurus variables, the project should develop a series of recommended priorities. If a manager can specify a general area of interest and level of available resources for a systems analysis, the project should be able to provide recommendations for which variables are likely to be the most revealing.

2. Generation of a Systems Analysis/Operations Research Data Base: Studies that deal with a very specific service delivery activity, but in detail, are likely to have applications in other programs. There are, for example, a relatively small number of program factors that seem likely to influence how well a health worker explains the rate of ORT administration to a mother. Several studies might show that only health workers with certain competencies in a role play simulation give effective explanations in the clinic. It seems likely that even a program quite dissimilar from those that were studied would benefit from such information, possibly confirming the association if there are resources to do so.

Realistically, few programs appear to have such resources. For most of the large number of service delivery activities in these programs, support activities seem to have been based largely on guess work. Certainly, the training, supervision, and information collection intended to support adequate ORT administration in Zaire were profoundly inadequate. Many other child survival programs, perhaps quite different in other respects, face precisely the same question: What does the program have to do to assure that children at risk for frank dehydration will receive adequate treatment at the hands of service providers? Zaire, like most other such programs, is not in a position to carry out empirical testing for every such

question. Yet, whether explicitly or by default, decisions must be made for each such issue. A body of knowledge documenting the experience of disparate programs in all major service delivery activities would facilitate better decisions.

In some cases, cultural, political, and other confounding variables may diminish what one program can learn from another, even for highly circumscribed issues like ORT dosage. In part, the utility of the collected experience of other programs grows with the number and diversity of programs contributing. Further, the relatively low cost of developing such a data set would be justified by even limited applications. The fact that a systematic body of knowledge on implementation issues has not developed before now is understandable if other child survival programs, like the 12 studied under PRICOR II, simply do not have information to contribute. The PRICOR II data set is a modest beginning, but it establishes the basic framework. ARCSS will refine this framework by continually examining the practical utility of the way the thesaurus defines service delivery activities. ARCSS will also expand the set of observations directly through support for additional systems analyses. Further, the project will seek to encourage systems analyses independent of project funding through training, technical assistance, written materials, and other dissemination activities. A videotape produced under PRICOR II which serves to raise awareness of quality-of-care issues and the need for the kind of information generated by systems analysis and operations research will contribute to dissemination efforts.

Collaboration with other centrally-funded health projects will be expanded under ARCSS. Quality assurance methodologies oriented toward the skill level of regular program staff also have potential applications in technical assistance projects. Even used on an ad hoc basis, such techniques could give expert consultants new, detailed information upon which to base recommendations. Similarly, cost and financing studies could be more informative if quality of care measures were also incorporated. Studies that examine management decision-making in response to epidemiological data might benefit from also considering the managers' knowledge of the service delivery process and their ability to actually change what their staff do. ARCSS will also contribute to the training elements of central projects by providing case study material related to the details of service delivery, particularly problem identification and problem solving. Concrete examples from program experience are infrequent in much of the training currently offered. At the same time, ARCSS will tap available technical expertise in these projects for advice on the design of the corresponding quality assurance programs.

3. <u>FURTHER SIMPLIFICATION OF OPERATIONS RESEARCH STUDIES</u>: By simply making the findings of systems analysis available to decision-makers and investigators, PRICOR II effectively reduced the average size of operations research studies by 90%, compared to PRICOR I. With very specific problems as their agenda, investigators developed studies with budgets frequently below $3000. The complexity of study designs and,

less dramatically, the duration of the studies were also reduced. There are certainly issues that require the longer, more complex studies that are traditional in operations research. But the systems analyses have demonstrated a large number of discrete problems in service delivery that were not previously appreciated by investigators. Any realistic strategy for carrying out the needed research must minimize the cost of addressing any one of these issues. The process of designing field research rarely considers the opportunity cost, the areas outside of the focus of the study at issue that therefore cannot be studied with available resources.

A decision-maker with a long list of problematic service delivery activities may question the wisdom of an operations research program that concentrates resources in a highly precise examination of but a handful of the pertinent issues. LQAS illustrates the perspective taken by most managers: At a defined level of confidence, are the results of a new approach good enough to adopt it? The program reality, as reflected by systems analysis findings, does not suggest a focus on subtle distinctions but on gross performance problems. If only 20% of mothers are counselled on their child's growth pattern, few managers would give priority to the distinction between this and a new approach that raised it to, say 28%, however elegant the involved study. The project's research strategy will continue to emphasize small scale studies, with the objective of further lowering the average cost and duration.

Small scale studies are urgently needed to address a previously neglected set of issues: the program determinants of quality of care. It is generally accepted that complex support systems like training, supervision, logistics, and information have a decisive, if ill-defined, relationship to the performance of service providers in quality of care and outreach. The missing observations are those that clarify the details of this association. For example, in order to detect errors in chloroquine dosages, a field supervisor may choose from several concrete methodologies, such as observing treatment, interviewing the health worker, reviewing clinical records, or home visits to families of treated patients. For any one of these overall methodologies there are a range of approaches. A supervisor could use different combinations of such methodologies and could apply them at different frequencies. At present, we are almost totally ignorant of the cost-effectiveness of these alternatives, many of which are eminently practical.

For most such program determinants of service provider performance, the systems analyses indicate an overall weakness, but do not illuminate specific relationships. Many plausible support activities are simply nonexistent and can be assessed only by a prospective operations research study in which investigators induce supervisors or trainers to do something they haven't done before. Current PRICOR II studies generally test relatively complex interventions that modify a large number of distinct support activities simultaneously and then measure broad changes in the effectiveness of service delivery. For example, a study in Zaire demonstrated that after providing retraining and "increased"

supervision for service providers in counselling in malaria treatment, mothers were far more knowledgeable. The conclusions of such a study are useful and convincing, but leave many important details unexplained. For example, the effectiveness of concrete steps taken by supervisors to identify shortcomings in counselling remain unclear; all of the improvement might be due to the training.

Despite the overall success of the intervention, the identification of problems by supervisors could be ineffective or might involve a level of effort that is not sustainable. As discussed previously, the study design does not require examination of such details to reach a valid conclusion. But managers do have a need to understand individual support activities such as monitoring malaria counselling or the competencies that result from training. ARCSS will emphasize studies with this more narrow focus.

4. ADAPTATION OF SYSTEMS ANALYSIS FOR ROUTINE USE AS A MANAGEMENT INFORMATION SYSTEM: The problems identified by the systems analysis show how quality of care, outreach, and support services can decline or stagnate when they are not monitored, even in an otherwise vigorous program. Under PRICOR II, initial efforts have been made to make systems analysis a routine management tool. In Peru, MOH staff are being trained by PRICOR investigators to extend systems analysis to additional child survival services in representative clinics throughout the country. In the Philippines, ministry personnel are carrying out a systems analysis of the national malaria program that they developed themselves with minimal assistance, and a similar initiative in tuberculosis is planned. In Colombia, the private foundation that implemented the systems analysis is now assisting other agencies in applying the same techniques. Collaborative efforts with the Aga Khan Foundation are focusing on systems analysis materials that can be applied by local managers with little if any outside assistance. The ARCSS project will continue this process by assisting managers to develop practical mechanisms to gather information on service delivery routinely, rather than as a one-time, external initiative.

The data collection techniques themselves are largely straight forward, but, as noted by the midterm evaluation team, it is important to provide program staff with training that focuses explicitly on organizing routine collection, using available personnel.

The information burden of introducing quality of care, outreach, and support system data is an important consideration. To a large degree, both the pertinent observations and the corresponding reporting fall to the supervisory system. Potentially, such monitoring could simply replace less productive activities in most programs. If organized efforts to monitor quality of care and outreach lead to demonstrable improvements, a number of programs can be expected to invest more resources in Supervisory activities. Nevertheless, a strategy for routine monitoring of service delivery activities must be sufficiently

flexible to accommodate a wide range of resource availability. Some programs simply will not be able to mobilize large quality assurance efforts. At the same time, the PRICOR II experience with one-time systems analysis offers limited guidance for long-term monitoring. If, for example, service provider performance in history-taking for diarrhea patients is found to be adequate, it is unclear how frequently this should be re-examined. Longitudinal studies of different service delivery activities are needed to clarify the most efficient schedule of monitoring for finding performance problems.

Even in the face of a severely limited monitoring capacity, programs can collect useful observations. None of the PRICOR II systems analyses were comprehensive, and much smaller efforts could identify problems that deserve attention. An examination limited to the screening of diarrhea patients for likely Shigella infections would have produced valuable insights in several of the programs. For the purposes of routine monitoring of the process of service delivery, systems analysis can thus be divided into very small units. While there is room for debate concerning how much a given program should invest in such monitoring, there is no technical reason why the level of effort should be zero, as is so commonly the case at present.

A major research issue for the ARCSS project concerns how managers can make the most effective use of a limited capacity to monitor the systems analysis variables. The traditional approach to service statistics is based on fixed, stereotyped reporting forms that are collected and analyzed periodically, often monthly. This strategy could be applied to process data at less frequent intervals. Thus, if supervisors were asked to carry out a level of effort roughly equivalent to 4% of a comprehensive systems analysis every month, managers could monitor quality of care, outreach, and support systems completely over a two year period.

Such a strategy would be among the simplest to design and would greatly expand the information on the process of service delivery available to the manager. This approach, however, lacks any provision for setting priorities in response to the program's identified problems or the experience of other programs. At the same time, the complex decision making necessary to tailor supervisor monitoring according to the nature of earlier findings may prove to be eminently feasible: the nature of the problem appears to be well-suited for computer technology, which makes the processing of such data sets increasingly practical. To a large degree, the practical contributions of such low-cost information processing have been limited in child survival programs because so few types of data (such as immunization coverage) were at issue. ARCSS will seek to apply this promising technology to a vastly more diverse, yet practical, set of variables.

5. POLICY AND MANAGEMENT ISSUES: PRICOR II explicitly focused on the peripheral components of the involved delivery system. This focus was intended primarily to limit the scope of an already ambitious research agenda. While continuing the orientation towards the performance of service delivery activities, the ARCSS project will examine the role played by higher level supervisors, mid-level managers, and policy-level managers. The project will give highest priority to the lowest administrative level in this group, the second level supervisor who serves as the immediate supervisor for field supervisors. Although titles and responsibilities may vary from program to program, the second level supervisor provides an important model for studies of higher level staff. There are virtually no studies of how this group influences quality of care and outreach activities by working through field supervisors. The available systems analysis results suggest that supervisors at this level, often among the most technically qualified staff in the program, have surprisingly little influence on the details of service delivery. It appears that prospective operations research will be needed since systems analysis findings are likely to be chiefly negative.

While the project will draw on a broad literature in the management sciences, even in studies at the policy level, ARCSS will focus on the link with the discrete activities of service providers. Management theory will be complemented by an empirical examination of the influence exerted by senior managers on the performance of their staff in concrete activities like the administration of an adequate dose of oral rehydration solution.

6. CORRELATION OF PROCESS AND EFFECTIVENESS MEASURES: The previously cited study by Walker, et.al. shows that there is, overall, an association between how the process of service delivery is carried out and the health effect of the program. From the manager's perspective, these findings justify program efforts to achieve the various standards recommended by the panel of experts involved in the study. The study does not provide a basis for deciding which of these standards are most important or which, if any, could be prudently de-emphasized or even ignored. This is, of course, very much an issue for many of the service provider activities listed in the PRICOR II thesaurus.

Many service provider activities are intended to influence the behavior of patients or their caretakers. If a systems analysis documents that service providers consistently refer severe ARI cases exactly as prescribed, the question remains, do these children actually reach the hospital? Similar questions apply to many elements of clinical care. If service providers are found to ask about blood in the stool in every patient presenting with diarrhea, do they actually identify and correctly manage children with Shigella? As these examples illustrate, service provider activities can be evaluated in terms of the specific, proximate effect that was intended. ARCSS will empirically validate the actual effect of implementing these service delivery activities as prescribed by the opinion of experts.

The effectiveness of support activities represents an even more pressing research agenda. The systems analysis demonstrated that relatively unskilled observers trained in observation techniques can identify specific shortcomings in service delivery. Although field supervisors are typically assigned this very function, the accuracy of their judgments is virtually unexamined. Similarly, their effectiveness in solving concrete problems with defined techniques is an area where studies are remarkably limited. Much the same could be said about higher levels of supervision, outreach activities, and patient follow-up.

7. COST ISSUES: While the focus of methodological development in ARCSS will continue to be the measurement of the service delivery process and the effectiveness of distinct activities, conventional cost analysis is an important consideration in each case. For example, the mix of techniques that could be applied to monitor the performance of health workers are likely to vary widely in cost as well as effectiveness. The role of effective but costly approaches must be necessarily limited. Such considerations may result, for example, in greater reliance on structured interviews with health workers for monitoring quality of care, with only infrequent validation through observation and follow-up visits to patients.

8. ADDITIONAL HEALTH SERVICE AREAS: The Agency child survival strategy anticipates that the development of effective mechanisms to deliver simple technologies like ORT will provide a sound basis for building a sustainable health delivery system. The basic approach of examining the process of service delivery by breaking it down into observable activities, is not limited to any specific services. Indeed, much of what has been learned about systems analysis and focused operations research is directly applicable to the more complex services that A.I.D. supports. A recent review of ROCAP food assistance identified a need for an operations research strategy based on systems analysis. In the Philippines, officials in the national tuberculosis program have requested PRICOR II assistance in developing the first systems analysis of their activities. Increasingly, the major issue related to Vitamin A deficiency is how to implement the corresponding services. Similar issues apply to AIDS prevention and the care provided in referral centers and by the private sector. Thus, while ARCSS will continue to emphasize ORT, immunizations, ARI case management, growth monitoring and promotion, presumptive treatment of malaria, and maternal health services, other basic health services and institutional issues will be included where there are opportunities to further develop the fundamental strategy.

9. TRAINING: The PRICOR II staff provided informal training to host country counterparts, who carried out the bulk of study design, data collection, and analysis. ARCSS will support an expanded, more formal training initiative that will not be limited to research supported by the project. Rather the project will attempt to broadly transfer skills in this poorly-developed field.

IV. DETAILED PROJECT DESCRIPTION

A. SECTOR GOAL AND PROJECT PURPOSE

The project's goal is to reduce Morbidity and mortality among LDC populations, with a focus on children under five years. The central purpose of ARCSS is to improve the quality of child survival services in LDC health programs, both public and private. Because the quality assurance strategies that will be refined and promoted are largely generic rather that specific to certain services (such as ORT,) services other than child survival will be affected. Indeed, under PRICOR II, host country counterparts quickly perceived the broader applications of systems analysis and have proposed its use in tuberculosis control, food assistance and even dental services.

The Agency's 1986 child survival strategy anticipates the development of sustainable health systems following from an initial focus on a small number of child survival interventions. ARCSS responds to this mandate at the operational level by extending quality assurance methodologies developed for services like ORT to other components of LDC delivery systems. To a certain extent, services such as tuberculosis control also compete with child survival services for limited program resources. Studies supported under the project will clarify the level of resources needed to achieve an acceptable level of quality in such services. This, in turn, should facilitate to support for child survival programs by providing relevant data that are not presently available.

ARCSS will complement more established approaches to supporting the provision of health services as a means to improving health. A.I.D. and other donors have extensively supported training, commodities, impact evaluation, service delivery costs and other program elements. However, mechanisms to monitor the performance of service delivery activities and then deal with shortcomings, such as those illustrated in the background section, have received relatively little attention. Many programs have extensive, often burdensome, information systems, but these systems do not address the details of how well services are delivered. Neither have other applied research efforts attempted to produce models or standards for monitoring the quality of services and dealing with problems. In several countries where systems analyses were carried out under PRICOR II, including Zaire, Pakistan, Philippines, Niger, Colombia, and Peru, local authorities spontaneously commented on the fact that they were being presented with a qualitatively new kind of information.

The problems identified through this approach consist largely of specific, concrete service delivery activities that are not carried out effectively, often not at all. Where managers have no mechanism to systematically monitor such activities, it is to be expected that quality of care problems will be common and persistent. But when such problems are known to managers, they are highly amendable to management action in many cases since the central issue is what program staff do or fail to do. PRICOR II experience confirms that many quality of care problems are correctable within the resource limitations of existing programs. In all of the 12 programs examined, there were serious, widespread deficiencies in quality of care, most of which appear correctable through straight forward interventions.

In theory, all of the programs studied provided for some level of monitoring and problem-solving. In practice, the supervisory and information systems with these responsibilities failed to detect the most prevalent quality of care deficiencies identified by the systems analysis. Nevertheless, an institutional frame work for quality assurance is virtually universal among child survival programs. At the same time the systems analysis methodologies developed under PRICOR II did not require highly skilled observers to identify the problems that routine program efforts had missed. Achievement of the project purpose will depend to a large degree on refining and simplifying the techniques developed under PRICOR II and transferring these approaches to host country personnel. Quality of care assurance is thus viewed as primarily a routine management function albeit one that is at present very poorly developed.

The project will also accord priority in the country selection process to programs which express a commitment to institutionalizing quality assurance activities through assigning specific staff to this set of activities. Further, unlike PRICOR II, ARCSS will support repeated assessments of the performance of service delivery activities over time, rather than a single systems analysis. This longitudinal approach will permit a graded reduction in the level of outside assistance as counterparts gain experience in monitoring the quality of a given service, identifying problems, and dealing with them.

B. STATEMENT OF WORK

The recipient will provide 240 person-months of senior level professional staff, 180 person-months of junior staff, 30 person-months of outside consultants, and corresponding secretarial, administrative, and office support to carry out the activities described below. The areas of technical expertise relevant to this agreement include quality of care assurance, clinical medicine, primary health care, epidemiology, management, operations research, and information processing. Proposed staff should include facility in French and Spanish and additional language capabilities are desirable.

The components of the project fall into three major categories.:

1. Methodology Refinement: PRICOR II has demonstrated that quality of care problems can be identified and solved, suggesting that such problems are extensive and poorly appreciated. Relatively little effort under PRICOR II (or elsewhere) has been directed toward the efficiency of this process. LDC program constraints demand that any such procedures considered for routine application produce the maximum level of useful information for a given investment of resources. Different programs can be expected to present widely differing patterns of deficiencies and levels of resources to apply to quality assurance. Further, quality assurance efforts themselves are likely to alter this mix over time.

Under circumstances that are intrinsically dynamic, maintaining efficiency and setting appropriate priorities is a major challenge for research supported by the project. By the end of the project, ARCSS will have produced an empirically-based set of guidelines for implementing quality assurance activities under widely varying circumstances. These guidelines will include services for diarrheal disease control, Pneumonia case management, growth monitoring and promotion, presumptive treatment of malaria and at least one service outside the child survival category. Immunization services will also be addressed, allowing for the relatively high quality of these services documented by PRICOR II.

As further outlined below, the refinement of quality assurance methodologies includes both field research and analysis that can be carried out in the recipient's offices. Including methodological studies in a field activity raises the level of effort above that which would otherwise be required to implement a quality assurance program. Specifically, such studies involve comparing alternative approaches to monitoring a given element of health care or to dealing with a given deficiency. For planning purposes, this category of activity is distinguished from simply applying state-of-the-art quality assurance approaches. Approximately 100 person-months will be devoted to methodological studies and analyses.

2. Development of a Quality of Care Information Base, Comparative Analysis, and Information Dissemination: In order to stimulate a broad understanding and use of data on quality assurance, ARCSS will develop and disseminate information from a quality of care information data base. ARCSS will deal with quality of care issues in terms of highly circumscribed,concrete activities. This framework, begun under PRICOR II, facilitates the application of findings from one program to other programs. For broad or strategic decisions, such as choosing between clinic-based immunizations alone or combined with mobile teams, experience in Peru may provide few insights for a manager in Nepal. In contrast, for an issue as narrow as how to monitor counselling on vaccine side effects, the experience of a given program is more likely to be useful for managers in other programs.

By the end of the project, the data base will contain detailed information about common quality of care problems in at least 5 child survival programs, the nature of efforts to deal with individual problems, and the results of these efforts. This framework will permit interested program managers in other countries to focus attention on program elements that are the most problematic elsewhere and provide a range of tested solutions to consider. An estimated 20 programs not participating in the project are expected to apply such data as a basis for subsequent management interventions.

The data base will also address the program factors that influence service provider performance for selected activities. Thus, for a given activity such as the physical examination of ARI patients, the data base will show correlations between the quality of care actually provided and measures of (1) the related performance of supervisors, (2) service provider competencies and job knowledge, (3) content of the management information system and (4) other program factors believed to influence how well health workers perform a certain task. Clear associations of this kind that are consistent over several programs would also have applications in other programs. Currently, planning resource allocations, training for different personnel categories, supervision, information collection and other support areas is of necessity based largely on guesswork. If managers have an empirical basis for these decisions in terms of the desired outcome, greater efficiency is possible. The project staff will carry out analysis in this area and make the results available to A.I.D. missions, U.N. health agencies, other donors, schools of public health, and S&T/H cooperating agencies, as well as interested LDC programs.

The Recipient will provide appropriate facilities for entering and analyzing relevant data on QA activities from all project field activities and produce and disseminate reports that compare findings across programs. Approximately 34 person-months will be devoted to the Quality of Care Information Base, beyond country- specific activities.

3. Application of Quality Assurance Methodologies: Observations of service delivery carried out under PRICOR II are consistent with a broad range of project evaluations:

To large degree, child survival programs fail to systematically monitor the performance of their staff; even extensive deficiencies in performance are missed by the supervisory and management information systems; and consequently, managers are not dealing with problems even though the resources to do so are potentially available.

The managers of these programs face many constraints in improving the quality of care in their programs. In the absence of well-developed methodologies that address quality, however, it is difficult to assess other factors, such as cultural values, political imperatives, level of motivation and others. The level of

host country initiative in applying PRICOR II approaches is nevertheless encouraging. At the end of the project, it is expected that systematic and effective quality assurance strategies will be established as ongoing elements in 9 health programs, with a predominate focus on child survival services in 7 of these. An additional 9 programs will have developed the technical capacity to implement a quality assurance strategy, as demonstrated by successfully carrying out quality assurance activities on an ad hoc basis.

The field activities of the recipient will be concentrated in six LDC programs, designated as country studies. To facilitate the institutionalization of QA activities, these studies are expected to have an average duration of three years. At least two of these country studies will be carried out through subagreements with U.S. institutions, awarded on the basis of peer review. These subagreements will be subject to A.I.D. approval. This mechanism is intended to utilize the comparative advantage of institutions which, while not necessarily qualified to implement the entire range of project activities, offer the field of quality assurance particularly strong qualifications in a technical area of interest or in a specific LDC program.

For each of the country programs implemented by the recipient, a resident advisor, who may be a host country national, will be provided and a project office will be established. In addition, the recipient will provide approximately 180 person-months of home-office and on-site support from the project core staff and consultants.

For each country study, the recipient will provide technical assistance to the program staff in monitoring quality of care and in dealing with identified deficiencies. In addition, the recipient will conduct an estimated four systems analyses using non-program staff, to provide a standard for evaluating the effectiveness of program monitoring efforts. Also using resources outside the involved program, the recipient will support approximately 100 small-scale operations research studies to evaluate or improve program efforts to deal with problems identified through quality of care monitoring activities or through the recipient's systems analyses. Country studies are expected to address an average of five child survival or other health services in at least four administrative units.

For an additional eight LDC programs, the recipient will provide short-and medium term technical assistance in QA Local costs provided by the recipient in these cases will be limited to data collection for an average of two systems analysis and methodologies studies. Approximately 100 person-months will be devoted to this activity.

The recipient will also support formal in-country workshops on QA independent of country study and technical assistance activities. As described below, these standardized training courses will address policy-level and operational level audiences. Approximately 9 of each type will be conducted, with an estimated 36 person-months devoted to preparing and conducting the workshops.

C. PROJECT COMPONENTS:

1. Field Activities: As with PRICOR II, field activities are the largest component of the project. These activities have four overall objectives:

- Identify and solve problems in the delivery of child survival (or other) services,

- Transfer skills in these areas to host country counterparts,

- Contribute to the project's central data base on quality of care assurance,

- Refine methodologies for identifying and solving service delivery problems (discussed below.)

In order to accommodate different levels of need, resources, and interest among LDC program managers and USAIDs, ARCSS will offer different levels of assistance. While the project's strategy is compatible with individual arrangements in each participating country, the following paradigm represent the expected distribution of effort for planning purposes.

1. Country Studies: PRICOR II systems analysis examined service delivery activities only once. Field work was carried out by project staff (chiefly hired locally) rather than the program itself. All observations took place at essentially the same time, with all field work completed in a few weeks. These studies usually examined only a sample of the larger program. In addition to streamlining the methodology (see below,) ARCSS will modify this approach to facilitate incorporation of quality of care monitoring as a routine program activity. Similarly, the corresponding problem-solving interventions, including operations research will be tailored for routine use as a practical management tool.

The institutionalization of quality assurance activities implies the continual examination and improvement of services, not a single assessment. The longitudinal monitoring of quality of care, with multiple examinations of the same service over time is central to the ARCSS strategy. This requires country studies long enough to carry out several cycles of observation for any given service.

Similarly, the scope of a given set of field observations must be adjusted to the capacity of the involved program staff. Supervisors or other staff that may be selected for monitoring quality, will not be able to carry out a comprehensive systems analysis in a single visit. Dealing with the problems identified further reduces the time available to monitor service delivery. Thus, at any given time, only some service delivery activities of interest could be monitored. One element of methodology development is helping programs focus supervisors' efforts where they are likely to do the most good. If the performance of some activities is consistent and stable over time, relatively infrequent monitoring may be adequate. If performance varies or has been problematic, such activities may deserve closer monitoring. The estimated impact of a given service delivery activity on health may also influence how frequently it should be monitored. The feasibility and cost of identifying and dealing with problems in different activities is also a consideration. Thus, a duration of approximately three years is anticipated for programs committed to developing a permanent quality assurance capacity.

The duration of country studies should also permit a phased expansion of quality assurance activities, allowing for development of training for the program staff, technical materials and data collection instruments, and an information system. As discussed below, ARCSS will support operations research to refine both the identification of problems and their resolution. The three year period of assistance will allow the project staff to transfer the relevant skills in such research to host country counterparts in the program or local research institutions. Where country studies are of briefer duration, the transfer of research skills may not be feasible. Institutionalization of quality assurance activities would also be less certain.

2. Methodology Refinement: PRICOR II has shown that relatively unskilled observers using unsophisticated techniques can uncover serious, previously unappreciated problems in the quality of care. Further, straight forward management actions or more formal operations research studies can resolve many of these problems, even when resources are severely limited. In view of the fact that quality of care issues in child survival programs have received relatively little attention, it is not surprising that the techniques used to address these issues are themselves largely unexamined. An instructive exception is the PRICOR II Peru systems analysis which employed both direct observation of service delivery and role playing simulation to assess immunization services. The virtually identical results suggest a larger role for simulation techniques in quality of care monitoring since this approach is far cheaper than field observations in many cases. Where appropriate, ARCSS will use S&T/H funds to add methodological studies to country studies. The project will also carry out related analysis of data from different country studies. Among the components of this area are:

a. Comparison of the Cost-effectiveness of alternative techniques for identifying or solving quality of care problems. Using actual program staff (such as supervisors) the project will compare different methodologies, (such as direct observation of service delivery and interviews of service providers.) It will be important to repeat such comparisons for a number of service provider activities (e.g. clinical history of ARI patients, counselling mothers of growth faltering children.)

b. Improved performance standards for support services: The detailed examination of service provider activities under PRICOR II provided the basis for assessing supervision, training, management information and other support systems. Rather than rely on general principles to define for example, what constitutes good supervision, the supervisor's performance can be described in concrete terms. Thus, for a service provider activity such as the presumptive treatment of malaria, the supervisor's performance in assessing this activity and dealing with problems can be described in concrete terms. The service provider's performance provides an objective, proximate measure of the supervisor's effectiveness. In a similar manner, the contribution of training to competencies in this narrow area and the related content of the information system could be examined.

Studies like this are needed to develop performance standards for the support staff that influence how child survival services are delivered (as distinct from the service providers themselves.) The limited efforts of PRICOR II are encouraging, but more systematic, expanded attention is needed. Under ARCSS, studies will emphasize an in-depth examination of narrowly-defined issues, as opposed to a comprehensive but superficial treatment of support systems.

c. Streamlined Service Provider Performance Standards: The PRICOR II Thesaurus defines service provider performance in terms of a large number of quantitative indicators. With the benefit of experience, some of these can be prudently eliminated, and others modified or replaced. The utility of the list could also be improved through grouping indicators under indices. This would allow, for example, performance of the several activities involved in examining a child with diarrhea to be summarized as a single, weighted score.

The project will also seek to provide an empirical basis for selecting the most revealing sample of indicators for a given purpose. Similarly, optimal sample sizes for different purposes merits further examination.

d. Validation of Performance Standards: In order to define what constitutes adequate quality of care, PRICOR II relied chiefly on expert opinion. In some activities, these standards appear to be free of controversy. For example, the maintenance of sterility in giving a vaccination does not require further justification. The health benefits of fully implementing some standards,however, deserve study, such as:

1) providing specific nutrition counselling, 2) referrals to other facilities, 3) estimation of fluid deficit in diarrhea, and 4) outreach activities to promote service utilization. The research issue is essentially, if programs actually carry out these activities as prescribed, do they have the desired effect?

e. Measuring the Stability of Performance: Once a given activity has been examined, it is unclear how long the program can wait before re-examining it. The level of performance according to the latest assessment is probably an important factor, along with any interventions that were carried out. Similarly, other activities compete for the manager's attention, based on priority and time since evaluation. In addition, performance in certain activities may be less variable than others. In order to minimize the unproductive use of supervisor time, some empirical guidelines must be developed for what activities merit fairly frequent monitoring and which can be safely examined at long intervals.

3. Technical Assistance: Some programs may wish only limited assistance related to quality of care issues. These include programs which: 1) are not convinced of the need for an ongoing quality assurance program, 2) programs with funding limitations, and 3) programs with substantial in- house capabilities that require only limited technical assistance.

Under the appropriate circumstances, ARCSS will provide such assistance including, if requested, implementation of a one-time systems analysis or assistance in the development of operations research studies related to quality issues.

4. Policy Dialogue: A program's participation in the project is predicated on interest in the quality of the program's services. The development of effective approaches for identifying deficiencies and then dealing with them presents the policy-level manager with a qualitatively new set of tools. A quality assurance program, usually operating through a supervisory hierarchy, allows the manager to actively influence the details of service delivery. Thus, beyond traditional policy issues such as mix of services or personnel assignments, managers have a very large range of options related to the details of what their staff actually do. These include the overall level of effort invested in quality assurance and more specific decisions regarding priorities for activities to be examined and dealing with systemic or particularly different problems. Insights from quality assurance activities may also influence decisions on larger program strategies such as the program's capacity for added services.

Using a quality assurance mechanism, a decision-maker could, for example, implement a policy of breastfeeding promotion. Rather than simply issuing normative standards, the manager could actively monitor and influence the process of providing this service and any influence it may have on other service delivery activities. Policies to encourage higher quality care in priority areas or to focus training resources on areas of weakness would also be feasible.

In some cases, USAIDs may identify specific areas of concern to be highlighted in project analyses, either informally or through bilateral covenants, conditions precedent, reporting requirements, or performance-based disbursements.

ARCSS will also address the process of implementing policy-level decisions related to service delivery. As outlined above, the project's research strategy will emphasize an in-depth analysis of narrowly-defined service delivery activities, examining the performance of the service provider, field supervisor, and successive levels of the supervisory system to the management level. This analysis would also include the relevant content of the information system, and any formal training or logistics system interventions related to the service delivery activity at issue.

5. Program Determinants of Quality of Care: Even where the project does not have a mandate to study the performance of senior managers, the performance of lower level support staff will remain a major research focus. Analysis of the contribution of these systems under PRICOR II lagged behind that directed toward service provider performance. In addition to refining standards of performance for supervision, training and other support activities, the project will examine actual performance. One element of this approach is expanded observations of support staff linked with the corresponding performance of the service provider. In addition, the project will support prospective operations research studies to evaluate specific interventions of interest. PRICOR II systems analyses suggest, for example, that problem solving by supervisors is so poorly developed that many plausible approaches are too rare to be addressed through observational studies. In these cases, the project staff would train supervisors to carry out new techniques in order to assess their potential.

6. Training: The issues involved in quality of care assurance are relatively complex, largely unfamiliar to LDC program staff and decision-makers, and not well-summarized in available training programs or materials. PRICOR II experience with the use of 1-2 day workshops to present the results of systems analysis to policy-level managers has been positive. Such workshops will be included in ARCSS country studies to periodically summarize the results of both monitoring and problem solving activities, and to facilitate guidance by senior management. As with PRICOR II, USAID participation is also expected.

Longer workshops (1-2 weeks) have also proved a useful and economical approach to assisting national staff in the design of operations research studies. These will also continue under ARCSS, along with informal training during technical assistance visits.

In addition, the project will expand the use of formal training both within and outside of country studies:

a. Quality Assurance Awareness Workshops: The project will develop and present two-four day workshops to introduce the objectives, methodologies, and results of quality assurance programs. The core content of these workshops, including written materials, audio-visual aides, and case studies will be largely standardized to minimize costs. Limited customization of the content to address local priorities will be based on materials and data already available. No separate data collection is anticipated unless arranged as technical assistance. To minimize local costs, these workshops will be presented in conjunction with other health-related conferences when feasible. The chief target audience is mid-and upper level managers.

b. Quality Assurance Training Workshops: These two-three week workshops will be intended to transfer basic skills and knowledge needed to monitor the quality of care in selected services, identify deficiencies, and carry out problem-solving interventions, including operations research studies. Topics will include defining performance standards, development of observation instruments, sampling, data analysis, the design and evaluation of problem solving interventions, cost analysis, and dissemination of findings. Participants will carry out quality of care observations and design one or more small scale problem-solving studies. The target audience will be mid-level managers in public and private health programs, the professional staff of academic and research institutions, and LDC consulting organizations. Where large scale expansion is desired by the host country, a brief training-of-trainers component may be added.

c. Travel: Substantial travel by staff and consultants will be necessary to carry out field activities. Over the period of the agreements approximately 30 trips to Latin America, 35 trips to the Asia/Near East/Europe region, and 40 trips to Africa are anticipated. All such travel will be subject to A.I.D. approval.

d. Technical Advisory Group (TAG): The recipient will provide administrative and financial support for a TAG composed of approximately eight senior outside experts in the technical areas relevant to the project. The TAG will meet in the Washington, D.C. area annually to review the project over a two day period. In addition, the TAG will review project reports and technical documents between meetings. Members will be selected by the recipient with A.I.D. concurrence.

e. Evaluations: A.I.D. will conduct a midterm and a final evaluation of the activities carried out under this agreement and subagreements. While these evaluations will be separately funded, the recipient will provide access to project activities and data as needed.

f. Reports and Deliverables: Separate from the dissemination activities discussed above, the recipient will submit to A.I.D. the following management and technical reports, in addition to the annual and quarterly reports specified in Section E.2:

1. Annual Project Workplan (3 copies):
This report will outline the proposed activities for the following year and will be submitted annually within two months after acceptance of this cooperative agreement. In subsequent years, the Workplan will be submitted with the Annual Progress Report for the preceding year, as specified in Section E.2. Workplans will be subject to A.I.D. approval.

2. Country Study and Technical Assistance Agreements:
Each of these activities will have a written statement of work to be performed, estimated level of effort, and estimated budget which will be submitted for A.I.D. approval.

3. Operations Research Protocol Summaries:
A brief summary of proposed operations research studies will be submitted for A.I.D. approval.

4. Trip Reports (one copy): For each international trip supported by this agreement, the traveler will submit a brief substantive report to A.I.D.

5. Technical Analylitical Reports (10 copies):
The recipient will submit a detailed description and analysis of each country study and technical assistance activity, within four months of completion. Similarly, each formal workshop will be summarized in a report that also addresses evaluation of the training.

6. Comparative Analysis Reports (50 copies):
On the basis of cross-program comparisons, the recipient will submit an analytical summary of QA findings from project activities. Reports will be submitted annually beginning in the second year of the project. The fifth year report will include an empirically-based set of guidelines for implementing quality assurance activities under widely-varying circumstances.

g. Special Provisions:

a. Consistent with the "substantial involvement" concept underlying the cooperative agreement instrument, the A.I.D. project manager will activity participate in substantive as well as managerial decisions, including the design and implementation of project activities, data analysis and publication and presentation of findings. The project officer will also (1) approve the selection of study sites and country-specific workplans, (2) approve travel funded under this agreement and consultant agreements, (3) provide technical office approval of subagreements, (4) participate in technical assistance and training activities, and (5) review reports and substantive correspondence in draft.

b. The recipient will establish an office in the Washington D.C. area with convenient access to the A.I.D. Office of Health in Rosslyn, Virginia.

c. The recipient will provide appropriate computer equipment and modem linkage to allow the A.I.D. Project Officer access to the project data base.

d. In addition to distribution of technical and analytical reports to an appropriate professional audience including but not limited to A.I.D., the recipient will support other efforts to disseminate the findings and methods of the project. These include publication in professional journals, presentations at professional meetings, and meetings with representatives of organizations concerned with QA issues.

e. All subagreements and equipment purchases in excess of $10,000 must be approved in advance by the S&T/H project officer.

f. Each country where research and technical assistance takes place under this project will be deemed to be a cooperating country for the purpose of permitting local cost financing. The aggregate cost of all goods and services under each subagreement in a cooperating country may be procured in the Special Free World Category (Code 935).

g. Information on level of effort provided in this statement of work is illustrative only in order to establish a common ground for realistic proposals. Such information is advisory.

Extend IN 6747 c

AID 1320-1 (3-87)

-PIO/T

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT IMPLEMENTATION ORDER/TECHNICAL SERVICES

1 Cooperating Country: WORLDWIDE

Page 1 of Pages

2 PIO/T No: 936 1432

3 [X] Original or Amendment No ____

4. Project/Activity No and Title: 936-5992

Applied Research in Child Survival Services

DISTRIBUTION

Initials: [illegible]

Date Posted: 5/23/90

FUNDS RECEIVED BY: [illegible]

OFFICE OF FINANCIAL MANAGEMENT

5. Appropriation Symbol: 72-1101021.8

6. Budget Plan Code: DDHA-90-13600-KG11 048-36-099-00-20-01

7. Obligation Status: [X] Administrative Reservation [ ] Implementing Document

8. Project Assistance Completion Date (Mo., Day, Yr.): 11-30-96

9. Authorized Agent: MS/OP/W

10. This PIO/T is in full conformance with PRO/AG No. PAF signed Date 4-19-90

11a. Type of Action and Governing AID Handbook: [ ] AID Contract (HB 14) [✓] AID Grant or Cooperative Agreement (HB 13) [ ] PASA/RSSA (HB 12) [ ] Other

11b. Contract/Grant/Cooperative Agreement/PASA/RSSA Reference Number (If this a an Amendment)

DPE-5992-A-00-0050-00

12. Estimated Financing (A detailed budget in support of column (2) is attached as Attachment No. ____

Maximum AID Financing Available		(1) Previous Total	(2) Increase	(3) Decrease	(4) Total to Date
	A. Dollars		399,000		399,000
	B. U.S.-Owned Local Currency				

13. Mission References

14A Instructions to Authorized Agent

Request that you negotiate a competitive Cooperative Agreement to carry out the activities described in the attached Statement of Work. A five year budget and selection criteria are attached. This PIO/T includes funds for the period September 30, 1990 through January 31, 1991.

CN in process; will advise when funds can be obligated.

14B. Address of Voucher Paying Office: Agency for International Development
FM/CMPD, 700 SA-2
Washington, D.C. 20523

15. Clearances - Include typed name, office symbol, telephone number and date for all clearances.

A. The Project Officer certifies that the specifications in the statement of work or program description are technically adequate.
S&T/H/AR, James Heiby — Phone No. 875-4699 — Date 4/18/90

C. S&T/H/AR, Pamela Johnson — Date 4/18/90
S&T/H, Genease Pettigrew — Date 4/20/90

E. S&T/H, Nancy Pielemeier — Date 4/23/90
S&T/PO, Craig Noren — Date 5/22/90

B. The statement of work or program description lies within the purview of the initiating office and approved agency programs.
S&T/H, Ann Van Dusen — Date 4/23/90

D. Funds for the services requested are available
PFM/FM/A/PNP, Rose Anderson — Date

16. For the Cooperating Country: The terms and conditions set forth herein are hereby agreed to

Signature _____ Date _____

Title

17. For the Agency for International Development

Signature Elizabeth P. Roche Date 5/22/90

Title Elizabeth P. Roche, Chief, S&T/PO/PR

*See HB 3, Sup. A, App. C, Att B, for preparation instructions. Note: The completed form contains sensitive information whose unauthorized disclosure may subject an employee to disciplinary action.

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JN - add to CIMS

AID 1350-1 (3-87)

*PIO/T

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT IMPLEMENTATION ORDER/TECHNICAL SERVICES

1 Cooperating Country: WORLDWIDE

Page 1 of Pages

2 PIO/T No: 0361634

3 [X] Original or Amendment No

4 Project/Activity No and Title: 936-5992

Applied Research in Child Survival Services

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FUNDS RESERVED BY: Initials: Date Posted: PFM/FM/A/PNP

OFFICE OF FINANCIAL MANAGEMENT

5 Appropriation Symbol: 72-11X1021.7

6 Budget Plan Code: DDCX-90-13600-KG11 677-36-099-00-20-01

7 Obligation Status: [X] Administrative Reservation [ ] Implementing Document

8 Project Assistance Completion Date (Mo., Day, Yr.): 11/30/96

9 Authorized Agent: MS/OP/W

10 This PIO/T is in full conformance with PRO/AG No: PAF Signed Date: 4/19/90

11a Type of Action and Governing AID Handbook: [ ] AID Contract (HB 14) [X] AID Grant or Cooperative Agreement (HB 13) [ ] PASA/RSSA (HB 12) [ ] Other

11b Contract/Grant/Cooperative Agreement/PASA/RSSA Reference Number (If this is an Amendment)

12 Estimated Financing (A detailed budget in support of column (2) is attached as Attachment No)

Maximum AID Financing Available		(1) Previous Total	(2) Increase	(3) Decrease	(4) Total to Date
	A Dollars		200,000		200,000
	B U.S.-Owned Local Currency				

13 Mission References:

14A Instructions to Authorized Agent

Request that you add these funds to the Cooperative Agreement to be competitively procured based on PIO/T 0361432. These funds are for the period February 1, 1991 through March 31, 1991. All other terms and conditions remain unchanged.

CN requirement met; funds can be obligated.

Please process in conjunction with PIO/T #0361432.

14B Address of Voucher Paying Office: Agency for International Development
PFM/FM SA-2
Washington, D.C. 20523

15 Clearances — Include typed name, office symbol, telephone number and date for all clearances

A. The Project Officer certifies that the specifications in the statement of work or program description are technically adequate: S&T/H/AR, James Heiby	Phone No. 875-4699 Date 6/28/90	B. The statement of work or program description lies within the purview of the initiating office and approved agency programs. Nancy R. Pielemeier for S&T/H, Ann Van Dusen	Date 7/3/90
C. S&T/H/AR, Pamela Johnson PJ for S&T/H, Genease Pettigrew GP	Date 6/28/90 7/3/90	D. Funds for the services requested are available: PFM/FM/A/PNP, Rose Anderson RA	Date
E. S&T/H, Nancy Pielemeier NRP S&T/PO, Craig Noren	Date 7/3/90 7-11-90		

16 For the Cooperating Country: The terms and conditions set forth herein are hereby agreed to

Signature _____ Date _____

Title

17. For the Agency for International Development

Signature: Elizabeth P. Roche Date: 7/12/90

Title: Elizabeth P. Roche, Chief, S&T/PO/PR

*See HB 3, Sup. A, App. C, Att 8, for preparation instructions. Note: The completed form contains sensitive information whose unauthorized disclosure may subject an employee to disciplinary action.

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