THE MEDEX APPROACH: AN EVALUATION OF THE WORK OF THE HEALTH MANPOWER DEVELOPMENT STAFF OF THE UNIVERSITY OF HAWAII

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CONTENTS

PREFACE

This evaluation of the work of the Health Manpower Development Staff (HMDS) of the University of Hawaii was conducted between January 5, 1981, and the first week of February, 1981. At the request of the Agency for International Development (USAID), the consultants assessed the performance of the University of Hawaii and collected information that would be useful in determining the future direction of contract activities.

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The evaluation benefited enormously from the open and active collaboration of Dr. Richard Smith and his associates of the Health Manpower Development Staff of the University of Hawaii. It also was facilitated by the cooperation and support of the USAID missions and the University of Hawaii teams in Guyana, Lesotho, and Pakistan.

The consultants were supported and encouraged by Ministry of Health personnel in Guyana, Lesotho, and Pakistan. Without the assistance and cooperation of these persons, this evaluation would not have been possible.

EXECUTIVE SUMMARY

The Agency for International Development has supported the Health Manpower Development Staff (HMDS) of the University of Hawaii since 1974. The work of the HMDS has been focused on the development of a comprehensive system to assist governments in the design and implementation of three-tiered primary health care (PHC) programs. The technology, which is based on concepts developed in the U.S. to extend physicians' services, generally is referred to as MEDEX.

AID has provided financial support in three phases, the third of which is covered by a contract signed in 1978 and scheduled to end on June 20, 1983. This contract stipulates that evaluations are to be conducted at the end of the third and fifth years. To fulfill this requirement and to facilitate planning for the final two years of the contract, AID requested that the American Public Health Association assist in arranging for this evaluation.

The evaluation was conducted by a seven-person team, three members of which are employed by AID. Another three persons were drawn from the health professional community outside AID; the team leader is a recently-retired AID foreign service officer. The team assembled in Honolulu on January 5, 1981, at the office of the HMDS. The members devoted one week to reviewing materials and participating in discussions with HMDS personnel. At the beginning of the second week, the team leader and another member departed for Pakistan to assess the application of the MEDEX technology in that country. The others remained in Honolulu to review materials in greater depth. Subsequently, two members of the team visited Guyana to study how the HMDS system is used there; the team leader and another member traveled to Lesotho for the same purpose.

It is too early to make firm judgments about the overall effectiveness of the MEDEX technology. The HMDS approach to designing primary health care systems and preparing the modules, manuals, and other prototype materials that are part of that approach is essentially complete, but the system has not been used extensively in field programs. In Guyana, mid-level health workers (MLHWs) have been trained and deployed, but they have not been linked completely with the community health workers (CHWs) who are at the bottom level of the PHC pyramid. In Lesotho, the first group of mid-level workers, known as nurse-clinicians, is still in training. In Pakistan, the first group of medical technicians, the title applied to MEDEX-type personnel, has been graduated, but, at the time of the evaluation, they had not been assigned their new functions. (A MEDEX-based system has been in place for a somewhat longer time in Micronesia, but this system was not assessed because field visits were limited to less developed countries where AID-financed projects are being conducted.) Thus, although the evaluation team tried to assess the technology as a whole and the results of the initial application in the field, it could not apply the ultimate test of effectiveness--successful use over an extended period.

The MEDEX technology consists of the MEDEX Design Approach (or MDA), various instruments and materials for both training and management, and a number of processes to ensure that the materials and frameworks are used effectively and constructively. The MEDEX approach encompasses the planning, implementation, management, and evaluation of low-cost primary health care systems.

In general, the evaluation team found the MEDEX Design Approach to be logical, sensible, and understandable. Although the technology does not address every question which may arise during the design and implementation of a PHC system, it is the only prototypical approach known to provide so complete and systematic a basis for the establishment of such a system. The team identified some potential or actual problem areas that warrant further consideration. These include the linkages between physicians and MLHWs, and between MLHWs and CHWs, the lack of adequate data with which to evaluate the cost-effectiveness of the technology, the strength and adequacy of preventive and promotive care as provided by MLHWs, and the relationship between MLHWs and other paramedical personnel.

As part of the MEDEX technology, the HMDS has developed competency-based training modules to prepare MLHWs and CHWs for the preventive, promotive, and curative aspects of primary health care, and it has also designed and produced training modules to meet the mid-level management requirements of primary health care systems and the continuing education requirements of MLHWs and CHWs. The large volume of prototype modules constitutes an impressive accomplishment.

In all three countries where the MEDEX technology was reviewed by the evaluation team, the prototype training modules, in combination with adaptation and training workshops, were found to be valuable in producing good, local training materials for paramedicals. The modules on clinical skills are better and more detailed that those on managerial and administrative skills. Guidance materials and a process for involving the doctors who will direct the PHC systems and supervise the MLHWs have not been developed. The materials, although excellent overall, should be reviewed to ensure that the curative and preventive and promotive activities of the paramedicals are balanced properly and to avoid the use of language that is unnecessarily complex, technical, or obscure.

The HMDS processes for transferring and adapting prototype materials include primary health care seminars; workshops for curriculum adaptation, mid-level management, tutor-training, management training, continuing education, etc.; and international conferences. Although it was not possible to assess these processes directly, the indications are that they generally are effective.

A fundamental feature of the MEDEX technology is the recognition that effective PHC delivery systems depend on reliable processes of management and logistics support. Although the management aspects of the HMDS activities are in relatively early stages of evolution and the prototype materials generally are in preliminary draft form, they are well regarded by host country health officials.

In general, the evaluation team concluded that the quality of HMDS performance is higher in the areas of systems design and materials preparation than in the planning, execution, and support of field programs. Several problems have weakened field program management. For example, the HMDS has not been entirely effective in identifying and correcting personnel problems. In addition, personnel occasionally have been sent to the field with inadequate orientation--a problem that is recognized by the HMDS but which the HMDS feels it cannot solve, given the limitations of the contracts with AID.

It is implied in the core contract between AID and the University of Hawaii which covers Phase III that there would be as many as eight country programs in which to develop and test the evolving MEDEX materials and processes. Only three have materialized. It is not possible conclusively to determine whether these three programs, plus the earlier field activities, provide an adequate basis for testing the MEDEX system. However, based on the information it acquired and on interviews with host country officials and others who use the system, the evaluation team concluded that the MEDEX technology does provide an adequate basis for training health service personnel in workable systems of primary health care. It is doubtful, therefore, that additional field programs are needed to demonstrate the potential feasibility of the approach.

The core contract calls for the University of Hawaii to establish a network of three or more U.S. institutions with domestic U.S. MEDEX experience to increase the U.S. response-capability for developing MEDEX-type primary health care programs overseas. Two institutions, the University of Washington and the University of North Dakota, joined the University of Hawaii in the proposed network. The HMDS developed a successful program to integrate network university staff into the international program. Nonetheless, the evaluation team concluded that, to date, the costs of the network activities have probably outweighed the benefits. The team recommends that the three universities and AID develop and agree on a plan for future collaboration after core support is withdrawn.

During the early years of AID support, the HMDS focused its energy and attention almost exclusively on the development of the three-tiered system and associated modules and materials. This was in accordance with the core contract and reflected the HMDS' concern that it not be drawn prematurely or piecemeal into country-project activities. However, now that the basic developmental work is largely complete, the HMDS is prepared to take on field assignments appropriate to their expertise in primary health care project design and implementation. Therefore, the evaluation team recommends that the Development Support Bureau (DSB) and the HMDS inform USAID missions that it is prepared to adopt a flexible and project-oriented approach to the use of the MEDEX technology.

The AID Non-Competitive Procurement Review Board's determination that the HMDS had predominant capability in the execution of the MEDEX technology was a sensible action to support the objectives of the core contract. However, unless missions and host governments show more interest in the use of the MEDEX approach, this determination is meaningless.

Under the Phase III contract, it was the intention of the Development Support Bureau that the draft materials developed by the HMDS be used and refined in LDC MEDEX programs representing differing conditions and that the results of the field-tests be used to complete and publish the modules at the end of the five-year contract (1983). In line with this intent, the HMDS has been reluctant to share the evolving materials with others. It did not wish to circulate material that was incomplete or inadequate. The HMDS recognized that the early versions were of uneven quality and it was concerned that premature circulation would subject HMDS staff to undue criticism before they completed the overall design and corrected weaknesses. The material also included copyrighted illustrations, etc., which the HMDS did not have permission to publish. The HMDS was concerned that other organizations might take the incomplete material, particularly the training modules, and adapt it for commercial use. Moreover, the HMDS felt there was a danger that, if the drafts were distributed piecemeal, they might be used without adaptation to differing country situations, and [illegible] way that discredited the entire system.

This reluctance to share materials and the stress placed by the HMDS on the overall system have resulted in rather widespread criticism by AID personnel and some other host country representatives. A common impression is that the HMDS is secretive and not open enough in the use of its materials. There also is a feeling that the HMDS is inflexible in adapting its materials to local conditions. It is worth noting, however, that the adapted materials which were printed and distributed by the Pakistan government were proudly displayed, with the support and endorsement of the HMDS, by Pakistani representatives at a recent regional meeting of the World Health Organization (WHO).

The evaluation team understands and sympathizes with the HMDS view. Nonetheless, it believes that the HMDS probably erred in placing so much emphasis on the design and protection of the overall system. A more open and flexible approach to the potential use of the system's elements probably would have been beneficial.

The evaluation team believes it is time to begin to distribute widely the MEDEX materials. The HMDS agrees. However, the modules and other materials are in varying stages of refinement, and all would benefit from consistent editing and simplification. As a first step, the team suggests that the HMDS consider preparing for distribution a complete package that describes the system and its components. Subsequently, individual modules or appropriate groups of materials could be reproduced and distributed as they are completed.

Each year the institutions that comprise the MEDEX network sponsor an international conference attended by network participants and representatives from countries where MEDEX-based programs are being implemented. The LDC participants are unanimous that the conferences are useful.

The HMDS has maintained contact with the World Health Organization. A member of the evaluation team who visited WHO headquarters found a knowledge of and a favorable attitude toward the MEDEX technology. In addition, the evaluator learned that WHO is considering the designation of the HMDS as a WHO collaborating center.

The HMDS has maintained productive working relations with the Development Support Bureau of AID. However, relations with regional bureaus have been less effective. In part, this is due to the traditional difficulties associated with centrally-funded activities. There is inadequate understanding on both sides (i.e., AID and HMDS) of how best to extend the results of the development work being carried out by the HMDS so that it reaches LDC health ministries. In general, the regional bureaus have shown limited interest in using the HMDS services and system. In addition, some USAID missions have been reluctant to turn to a contractor who, they feel, has a preconceived, and perhaps inflexible, solution to a complex local problem. It is worth noting that this was not the feeling in the three countries where HMDS has been implementing projects.

The problem of inadequate use appears to result, in large part, from an inadequate understanding among field personnel of the MEDEX technology. The MEDEX system was developed with AID funds as one way to organize primary health care. Having paid to have the technology developed, AID must make certain that it is adequately understood by field missions and operating personnel. A knowledge of the system is needed to make sensible decisions about its use in primary health care projects.

At this time there appears to be only a limited demand for full-fledged MEDEX-type primary health care systems, but there is a great worldwide need for accessible health care. Given the willingness of the HMDS to take a more flexible approach to the use of its technology, the experience which has been accumulated, and the internal logic of the system, it is likely that there will be a continued need for HMDS services.

If AID continues to regard primary health care as the area of highest priority for health sector programming, the work completed during the three phases of the MEDEX project should become a valuable resource for the future. The evaluation team concluded that some follow-on core support for the University of Hawaii will be required to ensure a maximum return on the investment that has been made already. The continued improvement of the prototype materials, the design of evaluation methods, the provision of technical assistance, in the planning, evaluation, and implementation of PHC programs, etc., warrant a continuation of support for the HMDS when Phase III ends. Arrangements should be made to provide technical advice to countries that are using the MEDEX system but which no longer have an active AID project (e.g., Pakistan). In addition, the HMDS and AID should consider the systematic use of HMDS experience to train personnel from AID, LDCs, and international organizations in the use of the MEDEX technology.

ABBREVIATIONS

AED	Academy for Educational Development
AID/W	Agency for International Development/Washington
BHS	Basic Health Services
CHW	Community Health Worker
CMO	Chief Medical Officer
DHEW	Department of Health, Education and Welfare
DSB	Development Support Bureau
FAO	Food and Agricultural Organization of the United Nacions
FP	Family Planning
FTE	Full-Time Equivalent
GOL	Government of Lesotho
GOP	Government of Pakistan
HMDS	Health Manpower Development Staff
HSA	Health Services Area
IDB	Interamerican Development Bank
IDRC	International Development Research Centre of Canada
IHRC	Integrated Rural Health Complex
LDC	Less Developed Country
LOP	Life of Project
MCH	Maternal and Child Health
MDA	MEDEX Design Approach
Medex	Medical Extension Worker*

* See Glossary.

MLHW	Mid-Level Health Worker
MOH	Ministry of Health
NBHS	National Basic Health Services
PAHO	Pan American Health Organization
PHAL	Private Health Association of Lesotho
PHC	Primary Health Care
PIACT	Program for the Introduction and Adaptation of Contraceptive Technology
PID	Project Identification Document
PP	Project Paper
PSO	Office of the Permanent Secretary
R&D	Research and Development
USAID	United States Agency for International Development
USPHS	United States Public Health Service
VHW	Village Health Worker
WHO	World Health Organization

GLOSSARY

Basic Health Services

Primary health care services directed toward the sustaining of life and the prevention of premature death. These services include first aid, treatment of fever and dysentery, and oral rehydration. They are usually provided by CHWs and paramedical workers. They also include specified preventive (e.g., BCG and tetanus immunizations) and promotive (e.g., nutrition education) activities.*

Community Health Worker (CHW)

A term to designate the provider of basic health care services in locations at the periphery or isolated from hospitals and health centers. The community where CHWs work usually is a rural village, but it may be an urban or peri-urban neighborhood.*

MEDEX

An approach to designing improved and expanded health service coverage. The word is a contraction of the French and Spanish phrases for "extension of the doctor" (i.e., "extension du médecin" and "un extension del medico"). It was created to denote medical and health service and the extension of coverage.*

Medex

A generic term to describe the category of intermediate or mid-level doctor-extenders. The terminology varies from country to country. This category of workers includes medical assistants, mid-level health workers, physician-assistants (PAs), nurse-practitioners, wechakorn, assistant medical officers, etc. A non-pejorative term, the word "Medex" was developed to facilitate the creation of a new image for this group of health practitioners.

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* Source: Project Paper No. 931-1180, MEDEX Phase III.

Primary Health Care

A multisectorial concept directed toward the improvement of well-being. The term denotes "simple and effective measures, in terms of cost, technique, and organization, which are easily accessible to the people requiring relief from pain and suffering and which improve the living conditions of individuals, families, and communities" (Promotion of National Health Services Relating to Primary Health Care, WHO, Geneva, 1976).

Primary Health Care Services

Those services provided at the individual's and the community's first point of contact with the health system. These may be either basic health services, provided by CHWs, or more sophisticated, curative, preventive, or promotive services provided by doctors or paramedical personnel. Health-related vertical program activities (e.g., communicable disease case findings, development of safe water supplies, family planning, malaria control) are included in this category. Secondary-level health care services are provided by specialists, usually in hospitals. The services provided by specialists in larger medical centers with sophisticated laboratory and rehabilitation capabilities are usually referred to as tertiary-level services.*

* Source: Project Paper No. 931-1180, MEDEX Phase III.

I. INTRODUCTION

Background

The United States Agency for International Development (USAID) has supported the work of the Health Manpower Development Staff (HMDS) of the John A. Burns School of Medicine, University of Hawaii, since 1974. During Phases I and II (June 20, 1974 - June 30, 1978), the efforts of the HMDS were directed primarily toward the development of a framework, processes, and materials to facilitate the design and implementation by host countries of three-tiered primary health care (PHC) systems. In the HMDS approach, which is based in part on concepts developed in the United States, paramedical personnel are used to "extend" the services of physicians--hence, the term "Medex."

Phase III of AID support for the HMDS began in 1978. It is scheduled to end on June 20, 1983. As specified in the contract with AID, during Phase III, the HMDS is to complete the development of the MEDEX technology (the system) begun in the first two phases and to test the application of that system in as many as eight countries. It is stipulated in the contract covering Phase III that at the end of the third and fifth years an AID evaluation, with external assistance, is to be conducted. In addition to this formal requirement to assess progress to date, the Washington office of the Agency for International Development (AID/W), which is responsible for managing the core contract with the University of Hawaii, is seeking advice on the direction which should be taken during the final two years of the five-year contract and on options which should be considered for possible follow-on activities at the end of five years.

Goals and Objectives of Evaluation

The team assembled to evaluate MEDEX, Phase III, Project No. 931-1180, had three goals. These were:

1. To document for AID/W that the services stipulated under Contract No. AID/DSPE-C-0006 are being provided.

2. To recommend the continuation, replication, or modification of the scope of work for years 4 and 5 of the project.

3. To review the contractor's performance in achieving a program or sector goal (expressed in log frame for project).

To fulfill these goals, the evaluators were to complete the following tasks (the objectives of the project):

1. Evaluate the contractor's achievements and progress to date in performance of the core contract.

2. If appropriate, recommend actions by AID/W or the contractor to improve the performance of the contract.

3. Assess the MEDEX technology and its program components, including, if possible, measures of the effects of those components.

4. Assess the potential impact of the contractor and MEDEX technology in the sphere of international primary health care and determine the appropriateness and relevance of that technology to primary health care in LDCs and to AID's development priorities.

5. Make recommendations on specific issues addressed (see "Issues To Be Addressed") and identify constraints to implementation which have affected or could affect in the future the contractor's performance.

Scope of Work

AID/W stipulated that the evaluation team was to undertake certain activities while conducting the assessment. The scope of work was to conform to the evaluation design, which was communicated, in advance, to the contractor. The team was required to:

1. Provide an accurate description of the MEDEX technology.

2. Examine the role of the HMDS within the context of the international primary health care movement and estimate its impact on LDC governments where the contractor has input.

3. Collect relevant information on the following aspects of core contract performance as stated in the project log frame and in contract outputs:

   a. Exploratory Briefings

b. Primary Health Care Seminars

c. Technical Guidance in Project Design

d. Materials Development

e. Curriculum Adaptation Workshops

f. Teacher Training Workshops

g. Management/Logistics Workshops

h. Preceptor-Deployment Workshops

i. Evaluation Workshops

j. Reporting Procedures.

4. On the basis of such information, assess, in qualitative terms, the contractor's performance. (Descriptions of any self-evaluation initiated by the contractor and of any external appraisals of any aspects of the contractor's work applicable to this project were to be included in this assessment.)

5. On the basis of the information that was collected, determine whether contract outputs are being met.

6. Determine the scope and effectiveness of the contractor's efforts to establish a network of U.S. universities and LDC centers of MEDEX expertise.

7. Examine any activities which the contractor has conducted beyond the scope of the present contract and assess their relevance, if appropriate, in terms of the overall intent of the contract (e.g., IDRC-funded Guyana project; manuals produced for conducting workshops; core staff training for network participants; etc.).

8. Describe how instructional and other materials/technologies developed by the contractor are field-tested and subsequently revised, if necessary, on the basis of such trials.

9. Visit selected countries and examine the record of the contractor's effectiveness in orienting host-country officials in the use of the MEDEX design for primary

health care delivery, workshop activities during implementation phases of host country programs, and other technical assistance inputs.

Issues To Be Addressed

It was specified in the Scope of Work that the evaluators were to address eight specific issues. These issues are described below.

1. The Project Paper specifies that the MEDEX technology will be applied in as many as eight operational field programs during the five-year life of the program. The contract outputs and budget were based on this premise. At this time, three programs are operational (Pakistan, Lesotho, and Guyana) and a decision to begin implementation of a fourth program (MEDCAM/Cameroon) is expected. Is it likely that additional country projects can be initiated in the time remaining to this project? If yes, can the core contract staff assume the responsibilities required to implement and backstop added field projects? If no, is there adequate feedback from existing programs to finalize the technology as an appropriate design for primary health care delivery systems?

2. The contract provides for the establishment by the contractor of a network of U.S. institutions that have domestic MEDEX experience to increase the capability of the U.S. to respond to MEDEX-type primary health care programs. The role of the network institutions following their sub-contractual arrangement with the University of Hawaii, Health Manpower Development Staff, needs to be reviewed from the standpoint of each institution's capacity to maintain a staff trained in international MEDEX technology, a market for these services, funding resources, and appropriate contracting mechanisms for the most efficient use of these resources.

3. The current core contract directs the contractor to apply the MEDEX technology to countries interested in considering its use in a total national primary health care effort. Has this requirement prevented the contractor from exploiting program development opportunities (e.g., requests from Yemen, Korea,

Philippines, and Tanzania for consultation to review curriculum development requirements for varying levels of health workers)?

4. The AID Non-Competitive Procurement Review Board determined that the University of Hawaii Health Manpower Development Staff had the predominant capability for MEDEX primary health care design technology. How has this determination affected the contractor's ability to develop country-level programs?

5. The Project Paper states: "During Phase III, the draft prototype modules will be utilized in up to eight LDC MEDEX programs representing varying socioeconomic settings and [a] range of LDC conditions which will provide feedback for the refinement and publication of the training modules at the end of the five years."

   Requests for the training materials currently under development by the contractor are frequently received from a variety of sources, AID, and private sector organizations. Some materials have become available as country-specific materials through contractor-assisted programs (e.g., Pakistan). The policy of the DS/HEA has been that these are still draft materials and that the contractor has the five-year core contract period to field-test and complete the prototype materials for publication. Should these training materials (modules, protocols, etc.) continue to be treated as drafts and should the contractor have the five-year contract period to complete and publish the MEDEX technology?

6. Should the international MEDEX network conferences be continued annually, as provided for in the Project Paper and contract? If so, how can the results of such conferences be shared within AID, among other donors, and among LDCs?

7. What is the market for the "MEDEX technology"? Have missions been made sufficiently aware of the resources of the contractor? Does the AID contractor-selection process tend to exclude those contractors with "predominant capability" in favor of the competitive process? SER/CM has indicated that in certain instances when the HMDS bids on a project, it has unfair advantage because core staff are offered free to country projects (except for travel), which means that the

financial proposal offered by the HMDS cannot be accepted as presented. This, however, was done in accordance with provisions under the DS/HEA core contract. How does this affect the university's ability to compete for country programs?

8. The HMDS has been almost 100 percent AID-funded. Beyond the current core contract arrangement, in what ways might the contractor and AID collaborate in the future?

Methodology

The evaluation was conducted by a seven-member team. Three members of the team are employed by AID, two in the Development Support Bureau, Office of Health, and one in the Near East Bureau; three persons have established technical competence outside the Agency; and one person, the team leader, is a recently-retired AID foreign service officer who held a variety of senior-level managerial positions both overseas and in Washington. Three members of the team are physicians and one is a non-medical officer of the U.S. Public Health Service (USPHS).

The members of the team assembled in Honolulu, Hawaii, on January 5, 1981, at the office of the HMDS. They spent one week together reviewing materials at the HMDS facilities (they had access to all documents prepared in advance by the contractor and DS/HEA and were able to request additional documentation when necessary) and participating in group discussions with HMDS personnel. At the beginning of the second week, the team leader and one of the non-AID physicians departed for Pakistan to conduct an assessment of the application of the MEDEX technology in that country. The other members of the team remained in Honolulu to review materials in greater depth and to pursue matters of special interest with individual HMDS staff members. Each member of the team was assigned primary responsibility for one or more elements of the study.

Field visits were made to each of the three countries where the MEDEX technology has been applied: Pakistan, Lesotho, and Guyana. The team leader and one non-AID physician went to Pakistan, where they spent approximately two weeks. They met with government officials involved in the Basic Health Services Project at the federal level and in three of the four provinces. Using the set of questions developed in Honolulu by the evaluation team, they interviewed persons in provincial health departments, training schools for medical technicians, rural health centers, and basic health units. They also met with long-term advisers from the University of Hawaii, USAID representatives, and personnel of the World Health Organization (WHO).

Toward the end of their two-week assignment, they met with Pakistan government officials at the federal level and reviewed their observations and conclusions.

The field evaluation in Lesotho was conducted by the team leader and the USPHS officer. The procedure that was used in Pakistan was followed also in Lesotho. Drawing on the questions developed earlier, the team interviewed government officials, USAID representatives, University of Hawaii staff, WHO personnel, and representatives of the private sector. (In Lesotho, private mission hospitals provide more than half the health care in the country; thus, the views and attitudes of staff in these facilities toward MEDEX concepts were particularly important.) The two evaluators also visited government and mission hospitals and a rural clinic. They had an opportunity to meet with the current class of "nurse-clinicians" (the term applied to mid-level health workers in Lesotho) and to discuss at length the students' views of the training program and its methodology. As was the case in Pakistan, before leaving Lesotho, the team met with the representatives of the government who are responsible for administering the program and discussed the conclusions they reached during their visit.

The experience in Guyana was reviewed by one of the outside physicians in the group and by an AID staff member. The questions developed by the evaluation team were the basis for discussions with Ministry of Health (MOH) officials, staff of the Guyanese MEDEX program, USAID representatives, the long-term adviser from the University of Hawaii, a WHO representative, and other donor staff. The evaluators met with representatives of the Georgetown Hospital and the Guyana Pharmaceutical Corporation. In addition, field visits were made to three rural health stations where "Medex" (the designation applied to mid-level workers in Guyana) were operating. Before ending their five-day visit, the evaluators discussed their general observations with Guyanese officials and USAID staff.

II. THE EVALUATION

This chapter contains a description of the observations and findings of the evaluation team. Appropriate conclusions and recommendations are included in the discussion of each specific activity. In reading the assessments that follow, it is important to keep clearly in mind the current stage of evolution of the materials that are being developed by the HMDS and the status of the MEDEX-design programs in each of the three countries visited by the evaluators. In some instances, the team was unable to make detailed assessments in the limited time available. Therefore, given the many components to be examined, the evaluators decided to first pool their impressions following discussions with HMDS personnel and to then try to assess how useful the various components were in developing PHC programs in each of the three countries.

The evaluation team attempted to assess the MEDEX technology as a total system. It examined the MEDEX design, materials, and processes (e.g., workshops, technical assistance) and was able to make some preliminary judgments about those elements of the system which have been used in programs in Guyana, Lesotho, and Pakistan. The team, however, cannot provide at this time solid evidence of the ultimate test of the effectiveness of the technology--successful application over time. The reader is therefore cautioned to consider as tentative or preliminary all conclusions on the long-term impact of the methodology.

It is important to note also that various questions were raised during the evaluation of certain components of the MEDEX technology. These questions, which qualify the team's conclusions and which are distinct from the specific issues which the team was asked to address (see "Scope of Work," Chapter I), are integrated into the discussions of specific aspects of the evaluations. (The issues identified in the Scope of Work are covered in the third chapter of this report.)

One of the team's tasks was to provide a description of the MEDEX technology. This description is attached as Appendix D. As an aid to the reader, a quantitative summary of the outputs of the project, which the team has determined are on schedule and in compliance with the contract, has also been prepared. This is attached as Appendix G.

The MEDEX System

The MEDEX technology consists of the MEDEX Design Approach (or MDA), various instruments and materials for both training and management, and a number of processes for ensuring that the materials and frameworks are used effectively and constructively. The MEDEX approach encompasses the

planning, implementation, management, and evaluation of low-cost primary health care systems. In 1978, the HMDS published Manpower and Primary Health Care. Edited by Dr. Smith, this book contains guidelines for designing a three-tiered primary health care delivery system. Widely circulated in primary health care circles in the United States and abroad, the document has been particularly useful in explaining the MEDEX Design Approach.

The MDA is itself a set of frameworks for guiding the conceptualization, planning, and development of an integrated primary health care delivery system that meets the specific needs of a less developed country. Some of the distinguishing features of the technology are the competency-based training, the systems approach, and the three-tiered structure in which physicians are linked to mid-level (Medex) and community health workers.

The overall "technology package" envisaged by the HMDS, and to be completed by the end of the current five-year contract, is being used as the basis for adaptation in specific country settings. For the evaluation, the team visited three countries--Guyana, Lesotho, and Pakistan--where programs that use the MEDEX Design Approach and prototype materials and processes are being implemented. In Guyana, approximately 60 mid-level health workers have been fully trained and deployed, but the overall structure is not in place, the training of community health workers has not proceeded beyond the first class, and linkages have not been established systematically. In Lesotho, the first group of mid-level workers (nurse-clinicians) is now in training. There are community health workers in the field who were trained in earlier programs, but none has been trained in programs that use the MEDEX technology. The Lesotho Project Design does provide, however, for the complete training of nurse-clinicians with the MEDEX technology. In Pakistan, the first group of mid-level health workers trained in the MEDEX system has been graduated. However, at the time of the evaluation, none was serving as a "medical technician" (the term applied to mid-level workers in Pakistan). Furthermore, at this time, community health workers have been trained in pilot programs only.

The evaluators did not try to judge the success of what did happen in a country, or to determine what did not occur (such circumstances are only partially within the control of the HMDS), nor did they make detailed assessments, given the limited time available and the number of components to be examined. They did determine how the components of the MEDEX system work, and how they were or are used, and whether they are appreciated. The value to the developing countries of the systems development materials, guidance manuals, checklists, and workshop processes could not be judged in Hawaii. For this reason, the team made three site visits. The actual performance of the PHC systems and of mid-level health workers in those systems could not be assessed in Pakistan or Lesotho, and only preliminary

judgments may be made about Guyana. No MLHWs trained in the MEDEX system have been deployed in Pakistan or Lesotho. In Guyana, the team did observe deployed Medex who appear to be performing effectively in an expanding primary health care program.

A. The MEDEX Design Approach

In general the evaluation team found the MEDEX Design Approach to be logical, sensible, and understandable. The team was impressed with the large volume of materials that has been produced and with the comprehensiveness of the design. The MEDEX technology does not address all the questions that may arise during the design and implementation of a PHC system, but it is the only prototypical approach known to provide so complete and systematic a basis for the establishment of such a system.

The intended purpose in using the MDA frameworks is to identify and respond to such problems as fragmented development, lack of national commitment, obsolete health service organizations, inadequate management and support, lack of a PHC manpower plan, ineffective and inefficient training, lack of on-the-job continuing education, unlinked national, regional, and community PHC programs, and undeveloped planning capability for PHC. Many of these problems (e.g., adequate cost analysis and financing, involvement of doctors, establishment of a health information-and-evaluation feedback system, etc.) remain troublesome in field application. Is this the fault of the frameworks? Is this largely a reflection of the tenacious nature of the management and of institutional weaknesses that are found in all LDCs but which take time to correct? Would another approach be more successful? It is not possible to provide complete answers to these questions at this time. The frameworks adequately forecast most of the major problems, but there are no easy solutions to those problems. Development is complex, difficult, and generally slow; the programs that have received assistance from the HMDS have been operating for a short time only. Moreover, there are certain political, social, economic, and cultural constraints over which the HMDS has no control that affect how well and to what extent the approach can be used.

While observing and assessing the system, the team became aware of certain potential or actual limitations of the technology and of possible deficiencies that warrant further consideration. The team identified as problem areas the linkage of physicians to MLHWs and CHWs, the lack of adequate data with which to evaluate the cost-effectiveness of the technology or its field application, the strength and adequacy of preventive and promotive care as provided by the MLHWs, and the relationship between MLHWs and other paramedical personnel (including the use of mid-level workers to train CHWs).

During the evaluation, a number of major questions also were raised about the application, acceptance, and use of the technology. For example:

- How flexible and sensitive to local conditions and viewpoints is the HMDS in discussing and applying the frameworks?
- Will local authorities accept the MEDEX approach to the further development of their health services systems?
- Do the countries feel compelled to accept either the entire MEDEX approach or nothing?

Dr. Smith and other members of the HMDS indicated a willingness to be flexible about the application of the MEDEX technology in the field. They did insist, however, that there be a genuine desire on the part of a government to develop a PHC system, and not an isolated pilot project or a single element which could not survive on its own. They firmly believe that isolated health services components will fail unless the total system which is needed to support each component is understood.

The team's observations prompted consideration of the skills and flexibility of the HMDS in managing collaborative relationships with host country governments. The willingness to view the development of PHC programs through the conceptual framework of the MEDEX Design Approach, as opposed to a variety of other approaches, may well depend on the extent to which host country officials sense that they are participating in a dialogue that reflects consideration of their constraints. If they sense that they are not being listened to sympathetically or are being manipulated, they may not feel inclined to subscribe to the proposed conceptual framework. To achieve the cooperation of the host country, the HMDS must provide skillful technical assistance and establish a genuinely collaborative working style. The HMDS must give much attention to long- and short-term technical assistance, to backstopping, and to quality control over and monitoring of that support. Monitoring is aided by careful debriefing of in-country personnel. A collaborative and sensitive approach to, for example, exploratory discussion, PHC seminars, and project design must be taken. One result of strengthening these aspects of technical assistance may be better use of the design framework.

B. Prototype Materials

Part of the MEDEX technology is a set of prototype competency-based training modules, guidelines, and management materials. The HMDS has developed modules to train MLHWs and CHWs in the preventive, promotive, and curative aspects of primary health care, and it has also designed and produced training modules to meet the mid-level management requirements of rural primary health care systems and the continuing education requirements of MLHWs and community health workers. The large volume of prototype modules for both mid-level and community health workers constitutes an impressive accomplishment.

In reviewing the materials, the team identified both strengths and weaknesses. For example, the prototype training modules for MLHWs have been useful and effective in generating printed competency-based training manuals in-country, although they have not all been uniformly clearly written and perfected. The modules on clinical skills are better and more detailed than those on managerial and administrative skills. The prototype modules for community health workers are useful, but they require more extensive adaptation because of wide variations from country to country, and even within a country, in the levels and possible roles of CHWs. Obviously, cultural factors assume more significance in the development of CHW materials than in the development of some other modules. As one might expect, the role of CHWs is more country-specific than the role of MLHWs. Although prototype CHW materials are less useful in the direct adaptation of text, their very existence may stimulate the development of better training for this cadre of health worker.

There are indications that the core staff of the HMDS have responded less sympathetically to the field staff's feedback on the adaptation of training manuals for CHWs than to similar feedback on MLHWs. It is unclear how far the HMDS has progressed in developing in LDCs wholly integrated, tiered systems, with well defined roles and personnel linkages at all levels (the conceptual framework would indicate otherwise), given the primary emphasis on the training of mid-level health personnel, or paramedicals.

The team applied certain of its findings on MEDEX prototype materials to the three countries where MEDEX programs are operating. These findings are summarized as follows:

SELECTED FINDINGS RELATED TO MEDEX PROTOTYPE MATERIALS

Findings	Country		
	Guyana	Lesotho	Pakistan
Adapted modules as basis for in-country training of MLHWs	Excellent	Excellent	Excellent
Language of prototype modules	Acceptable	Acceptable	Needs Simplification
Technological level of prototype modules	Acceptable	Acceptable	Acceptable
Need more emphasis on good history-taking and physical diagnosis	Yes		Yes
HMDS CHW prototype modules	Useful with Adaptation	Useful with Adaptation	Useful with Adaptation
Early MLHW training materials included how to train CHWs	No	Yes	Yes
Slides	Useful	Acceptable, but locally-made slides preferred	Very Useful

It is clear that in all three countries the HMDS prototype training modules, in combination with adaptation and training workshops, are considered to be valuable in producing good training materials for paramedicals. With better training materials, one can expect training to improve, particularly if the principle of competency-based training is accepted. In each country, there is evidence that aspects of the MEDEX technology (e.g., competency-based training) are being considered for application in

other programs. This attests to the basic soundness of the HMDS training approach.

One might ask how serious LDCs are about using the MEDEX design framework to develop tiered PHC systems. The country projects which the evaluation team visited are at too early a stage of development to provide a definitive answer to this question. In a very short time, the training system in all three countries has improved, and, as a result, paramedical workers are now better trained. The guidance materials and processes for involving the doctors who will direct the PHC systems and supervise the MLHWs have, however, not been available, although reasonably good materials have been developed for the physicians responsible for training. The importance of involving doctors is recognized (indeed, it is one of the issues under discussion), but adequate supervisory-and-referral relationships have not been established. The late development of operations manuals and the failure to adequately clarify physicians' roles reflect, in part, the inherent difficulties of trying to make progress in areas where the authority of existing workers must be redefined.

The early focus and strength of the U.S. MEDEX program were the programs to train nurse-practitioners and paramedical workers to assume a curative role. Work in a centralized public health civil service in a developing country was not part of the earlier program, although that experience was acquired later. The evaluation team believes that the earlier HMDS materials did not adequately cover the problems encountered and the skills needed in the latter setting, including management, supervision, restructuring and civil service systems, organization of community health programs, etc. Moreover, the early materials developed by the HMDS may not have been as well focused on the doctors and CHWs and their linkages to others in the health system as the MDA frameworks imply. But, as the HMDS has acquired experience in developing countries, it has improved MEDEX materials. The development of these materials could be improved further by systematically measuring the effectiveness of the technological components in field programs and the success of the projects themselves.

The HMDS was specifically requested to develop an evaluation protocol during Phase III. The protocol was developed and endorsed by AID in July 1979. This protocol is sensible and uses data generally available in the field, but it is not adequate to answer the basic question of whether the MEDEX approach makes cost-effective primary health care services more accessible. The evaluation design does not go beyond the measure of increases in numbers of encounters or other gross utilization data. It does not include a provision for measuring the percentage of the population that uses health care. Nor is there a provision to measure an increase in the number of individuals, as opposed to the number of visits. More important, in none of the three countries have evaluation workshops been held or evaluation programs been adapted from prototype materials. In the opinion of the evaluation team, continuing evaluation of field programs could be improved with modest changes in the data which are collected within the health system and in the analysis and use of those data.

The team recommends that the HMDS study the possibility of revising the collection, analysis, and use of data in continuing field programs.

The evaluators did not have time to study thoroughly all materials, but they were able to identify several potential problem areas that need to be reviewed carefully by qualified experts before final publication to minimize possible deficiencies in any portion of the materials. They suggest that the HMDS examine and try to create an appropriate balance between the clinical and curative role and the preventive/promotive, public health, or community health role of paramedicals. The language of modules should be examined to ensure that it is not unnecessarily complex, technical, or obscure. Illustrations should be adequate and be designed to facilitate adult education in LDCs. The evaluators also suggest that the HMDS consider what the modules convey. For example, is it sensible to develop modules that present only a single "best" or "compromise" choice of techniques (e.g., salt-sugar solution only, and not oralyte, for oral rehydration therapy) rather than an array of choices (or an array of illustrations)? In raising such questions and issues, the team reaffirms the wisdom of the HMDS' continuing efforts to further refine and enrich the materials. In no sense do these efforts detract from the work accomplished to date.

Despite difficulties and weaknesses, the evaluation team believes that the Health Manpower Development Staff has done an excellent job of designing and executing a complex yet manageable model for providing primary health care. Though they have been criticized for a tendency toward rigidity, the staff have been praised by health experts in each of the three countries for having produced high quality materials that are well suited to local conditions. In Lesotho, three modules were produced although there were no prototype forms. And, as HMDS field personnel noted time and again, there was ample opportunity to change prototype materials to suit the requirements of the particular country.

C. The MEDEX Processes

The HMDS has developed a variety of processes for transferring and adapting the prototype training modules and other materials to individual countries. These processes include primary health care seminars; workshops in, for example, curriculum adaptation, mid-level management, tutor-training, on-site management training, and continuing education; and international conferences.

The exploratory briefings and PHC seminars varied in form and setting, depending on situations and personalities, and for this reason it is difficult to assess them as a whole. The indications are that they were effective. The workshop designs and procedures worked out by the HMDS seem to have been useful and effective. Problems associated with this aspect

of the technical assistance effort were complicated further by the varying contractual arrangements for the country programs and by restrictions on time for travel and orientation.

MEDEX Management and Support Systems

Comments on MEDEX management and support systems are warranted. In the evolution of the overall system, the development of management materials did not begin until Phase III. This may be because the primary emphasis was on the training of paramedical physician-extenders until the MEDEX technology evolved into a three-tiered structure that could be administered by a ministry of health. Even now, most of the systems development materials on management are in early draft, although they have been used in some field applications.

A fundamental feature of the MEDEX technology is the recognition that effective PHC delivery systems depend on reliable processes of management and logistics support. The HMDS argues that one of the keys to low-cost delivery systems is rationalization of the organization and arrangements for support.

A major element of the MEDEX Design Approach is collaborative review of existing management systems at organized, in-country workshops and analysis of weaknesses and gaps. Review and analysis are followed by management studies, which are undertaken by host country personnel with the support of HMDS advisers, and additional workshops with host government officials involved in the management systems. The objective of these studies and workshops is to help the participants understand the existing problems and to draw on prototype materials for possible solutions.

While in Honolulu, the evaluation team got the impression that the management materials were somewhat doctrinaire and ethnocentric; in the field, however, the team observed that there is considerable flexibility in application. Although the management aspects of HMDS activities are in the early stages of evolution, they are well regarded by host country health officials, particularly in Lesotho. They are focused on acknowledged and major problem areas. The adaptation of the materials produced by HMDS field personnel has not been completed, but local health personnel consider the materials to be excellent starting points.

Institutional Strengths and Weaknesses: Manpower Development and Performance

Overall, there has been rapid progress in PHC manpower development in Guyana, Lesotho, and Pakistan, despite a variety of technical assistance

problems. The progress in all three countries attests to the effectiveness of the MEDEX approach in introducing carefully prepared, competency-based training modules into an in-country adaptation process that is guided by a holistic systems model of the efforts needed. Indeed, in all three countries, officials have commented on the relevance and overall high quality of the modular training materials and the adaptation process.

Mid-level manpower training has clearly benefited. The important idea that MLHWs can, in general, successfully train CHWs is being tested in Pakistan. The preliminary indications are that in some circumstances it is indeed feasible to use MHLWs to train CHWs. Clearly, these results can be attributed in part to the use of HMDS prototype modules in an adaptation process that is guided by country-specific conditions.

In none of the three countries have the linkages for a three-tiered PHC system been established fully. The only substantial institutionalization achieved in Pakistan by the time the project terminated was, in the evaluators' judgment, the adaptation and publication by the Pakistan government of the training and reference manuals for the mid-level and community health workers and the related opening, staffing, and equipping of MLHW training centers. In all three countries, the physicians who must manage the PHC systems and the community organizations that must support the efforts of the CHW have not been adequately integrated into the system or linked to other levels.

The evaluation team has concluded that the quality of the overall performance of the HMDS is considerably higher in the areas of system design and materials preparation than in designing, executing, and supporting field programs. Several problems have weakened program management. Some of these problems were clearly beyond the control of the HMDS, but others could have been avoided or minimized had headquarters taken appropriate action.

A number of questions that cannot be answered at this time have been raised. For example, does the orienting framework of the MEDEX Design Approach lead to the creation of linkages and redefined or shifting authority and responsibilities? Are host country health planners and managers led to stress the middle level even though the system is three-tiered? Is the basic orientation of the framework itself the role of the "Medex"?*

Some 14 persons make up the Health Manpower Development Staff, and it is to these persons and their predecessors that the outputs described elsewhere in this report may be attributed. Since 1974, the HMDS has built up a highly talented and productive core staff. Several have been

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* This category of health personnel was developed in the U.S., where the term is taken to mean a curative assistant to a doctor, not one who supports a subordinate corps of community-level workers (i.e., someone who does <u>not</u> actually have a mid-level role).

trained as both physicians and public health officers. On the average, the professional staff have been associated with the HMDS for approximately four years, which makes for considerable continuity.

In general, the quality of the HMDS personnel in Honolulu is higher than the quality of field staff, although there are exceptions. There have been instances when the HMDS selected and assigned persons who were not well suited to their tasks. To the credit of the HMDS, prompt action was taken to correct these situations as soon as the problem was recognized.

The HMDS has not been entirely effective in identifying and correcting personnel problems. HMDS staff in Honolulu tend to regard field personnel as an extension of the headquarters, and they therefore try to supervise them in almost the same way that headquarters staff are supervised. They have not adequately recognized that personnel in country programs must respond primarily to their host government counterparts. Consequently, consultation with host government officials about the selection or movement of HMDS personnel is sometimes inadequate. In some instances, the role of the USAID mission is not defined well. The HMDS has the right to select and assign persons who understand and can represent the MEDEX system, but it must recognize also that decisions must be made in collaboration with host governments and USAID missions. The successful execution of the MEDEX system may, in large part, depend on the presence and availability of high quality advisers and a collaborative approach to the problems of local health administrators.

A matter related to the selection and assignment of personnel is the orientation of field staff. Because the HMDS headquarters staff is small, rarely is a member available as a candidate for a position in the field. Given a system as complex and as highly developed as MEDEX, it is extremely important that field personnel fully understand the system that is being adapted. In a few instances, long-term advisers with little understanding of the MEDEX system have been assigned to country programs. In at least one instance an adviser who was liked and respected by the host government was not given an extended appointment, primarily because he did not understand the MEDEX system well enough.

The HMDS fully recognizes the importance of an adequate orientation for field pesonnel, but it feels that current USAID mission contracts constrain its ability to select, orient, and retain field personnel in Hawaii for an adequate period of time. According to the HMDS, under these contracts, funds cannot be used to bring candidates for field positions to Honolulu for interviews. If this is true, the evaluators recommend that AID amend the contracts to permit use of funds for this purpose. The quality of field advisers is too critical to the success of programs to economize on the selection and orientation processes.

USAID missions and host governments are impatient to see advisers in their field positions and are seldom supportive of a lengthy orientation at headquarters. Somehow, a balance must be achieved. MEDEX personnel must be adequately oriented to the system that is being adapted and implemented but, at the same time, the operational needs of host governments and USAID missions must be taken into account. Adequate provision should be made in either the core contract or in the individual country program contracts for adequate orientation of field personnel.

The HMDS' slightly weaker performance in field programs, as opposed to headquarters activities, can probably be attributed to the fact that headquarters staff clearly assign the highest priority to systems design and module development. This should not be surprising, given the emphasis on this activity in the AID core contract. Nor is it out of step with the development of the MEDEX system. However, given the progress that has been made, less basic development work is needed, and it is appropriate at this time that more attention be given to the support of field programs. The three programs conducted thus far demonstrate the basic feasibility of the system, but the system will not evolve completely without high quality technical advice and effective support for existing programs and for new programs that emerge. The HMDS should increasingly direct itself to this area.

Despite the acknowledged problems in executing country programs, each of the HMDS field teams expressed appreciation for the support and encouragement of the staff based at the Honolulu headquarters. The problems cited by the evaluation team should be viewed as opportunities for improvement in a generally positive and productive situation.

III. THE ISSUES: OBSERVATIONS AND RECOMMENDATIONS

The evaluators were asked to address eight specific issues related to the use and application of the MEDEX technology, publication and field-testing of materials for training and management, the role of the network institutions, the exploitation of program development opportunities, the use of international conferences, and future collaboration. In this chapter, the authors attempt to provide their assessment of the issues and some recommendations for action.

Issue 1: Application of the Technology

According to the core contract covering Phase III, it was assumed that field programs would be undertaken in as many as eight countries during the five-year life of the program and that there would thus be ample opportunity during Phase III to develop and test the evolving MEDEX materials and processes. The contract outputs and budget are based on this premise. To date, programs have become operational in only three countries--Pakistan, Lesotho, and Guyana. HMDS staff are awaiting a decision to begin implementation in a fourth country, Cameroon. AID asked the evaluation team to determine whether additional country projects might be initiated in the time remaining to the project and whether core contract staff could assume the responsibilities required to implement and backstop those projects. The Agency also wanted to know whether the technology could be finalized as an appropriate design for primary health care delivery systems if additional projects were not implemented. The team had to determine whether there was adequate feedback from completed or operating programs to justify this decision.

There are approximately two years remaining to the present core contract covering Phase III of the project. Usually, the lead time involved in AID country projects--from request, through design and approval, to implementation--exceeds two years. Consequently, it is unlikely that any new major project will be identified and initiated during the life of the present contract. A project in Cameroon is now pending host government approval; it is not certain that it will come to fruition. A few other projects in Africa that are already in the pipeline would benefit from the MEDEX technology--in design and implementation. Thus, the team concluded that, although it is unlikely that projects that have not been identified will be initiated, at least two or three others which are under consideration at this time might be implemented before the contract ends.

Are the existing field programs sufficient to test or "finalize" the MEDEX technology? The evaluators concluded that, in the absence of a methodology or systematic method for assessing each component of the MEDEX

technology as it is applied in a specific setting, it is not possible to determine conclusively whether the three existing programs, plus the earlier field activities, provide an adequate basis for testing the MEDEX system in its entirety or as separate elements. However, based on the ad hoc information acquired and interviews with host country officials and other participants who use the system, the evaluation team generally agreed that the MEDEX technology does indeed provide an adequate basis for training health service personnel in workable systems of primary health care. It is doubtful, therefore, that additional programs are needed to demonstrate the potential feasibility of the approach. Given the conditions peculiar to each country, a modified approach must be developed. Different lessons will be learned in each setting where the basic system is applied. The MEDEX technology is an evolving system which has both technical elements and procedural guidelines. Every new effort to use the system will benefit from the results of preceding efforts. In this sense, the technology is dynamic and will never be "finalized."

Issue 2: The Role of the Network Institutions

According to the terms of the contract, the contractor was to establish a network of U.S. institutions that have domestic MEDEX experience to increase the U.S. response-capability for MEDEX-type primary health care programs. The evaluators were asked to review the role of the network institutions after considering each institution's capacity to maintain a staff trained in the international MEDEX technology, a market for MEDEX services, funding resources, and appropriate contracting mechanisms to ensure the efficient use of those resources. The evaluation team's findings and recommendations follow.

The Project Paper, which authorized funds for the core contract with the University of Hawaii, called for the establishment of "three or more U.S. institutions linked in a network to provide technical assistance to LDCs in the MEDEX primary health care system." The objective was to create by the end of the project a network composed of "core staff (HMDS), the staff of the U.S. institutions, and the selected LDC MEDEX programs . . . which [could] provide a full range of technical assistance in the implementation of future bilateral country programs." The intent is stated slightly differently elsewhere in the Project Paper: "By the end of the project, network members will be able to provide a full range of technical assistance necessary in the development and implementation of MEDEX programs in LDCs." These two statements are ambiguous. Is each institution to function independently as a resource capable of providing the full range of technical assistance required to implement LDC MEDEX programs? Or are institutions with complementary skills to form a network which can provide the full range of services? These questions have not been resolved. The answers may be critical to the assessment of the final outcome of the network development portion of this project.

The criterion for selecting institutions that might become part of the network is listed in the PP. It is stated that the institutions must have experience in domestic MEDEX programs that deliver health services to rural areas or in the use of competency-based training. Six U.S. institutions which had experience in U.S. MEDEX programs were identified.

The mechanism for bringing the institutions into a network was not detailed in the PP. The contract specified only that the prime contractor, the University of Hawaii, should award subcontracts to U.S. universities with MEDEX experience to create a network of linked institutions that would function after U.S. support had been withdrawn. The University of Hawaii was authorized to fund the costs for as many as 48 person-months of effort in the first year and as many as 60 person-months thereafter. The costs were to cover the salaries, benefits, and overhead of personnel from U.S. universities that became part of the network.

The contractor originally planned to finance under the subcontracts the equivalent of one full-time position per year at each of five schools for up to five years. Because only two of the proposed schools actually joined the network, and because the two subcontractors were not signed until May 1979, the plan was amended. The current plan specifies funding for three years for three full-time equivalent positions per year at each of the schools.

Within the contract guidelines, the HMDS devised a program to bring the new institutions into the network, to use the existing skills of network personnel, and to train personnel, whose experience was almost entirely domestic, in the use of MEDEX concepts in LDC health programs. The program consists of four basic activities:

1. Core Development Residencies (network personnel are brought to Honolulu in small groups for a structured, four-week orientation program on international health development and the international MEDEX program);

2. Annual Network Conferences (all or most network staff and HMDS staff spend three to five days discussing the program--progress, problems, and future directions);

3. Quarterly Administrative Meetings (one or two officials from each institution discuss problems and future plans);

4. Longer-Term Residencies (network personnel work with HMDS staff in Honolulu or in a less developed country on the actual implementation of the MEDEX program).

Of the six universities identified in the PP, only two, the University of Washington and the University of North Dakota, are members of the network. In both cases, the staff who are participating are from domestic MEDEX programs which have been operating for about 10 years. (The North Dakota program is officially designated "Nurse-Practitioner," rather than MEDEX, but the term "MEDEX" is used here for convenience.) The concerned organizations, MEDEX/Northwest, School of Public Health and Community Medicine, University of Washington, and Nurse-Practitioner Program, Schools of Nursing and Medicine, University of North Dakota, are only loosely linked to the parent universities, and they are largely dependent on outside grant money for their support.

The full-time-equivalent positions provided under each subcontract are used to fund the part-time participation of six persons at the University of North Dakota and seven persons at the University of Washington. The first personnel who were selected were volunteers drawn from the ranks of MEDEX staff at each institution. The skills and expertise of the original network participants reflected the fact that the domestic MEDEX programs were essentially training programs that placed little emphasis on health planning or management. Most of the participants were trainers who had had limited exposure to international health problems or health problems peculiar to LDCs. They did have some experience with cross-cultural problems, having worked with Indians and Chicano migrant workers. The University of Washington has hired a management expert with international experience who is now participating in network activities. The University of North Dakota has hired two persons, a former AID employee who has extensive international health experience and a management specialist. The former will head the program and the latter will supplement the staff.

Although the international MEDEX program evolved in part from the domestic program, there are substantial and significant differences in the two programs. The domestic program lacks health management components, and the role of the Medex (i.e., the paramedical worker) is different. In domestic projects, the Medex is a medical "extender" in the sense that (s)he increases the number of patients that can be served by a physician. Generally, however, the Medex works in an area near the medical doctor and is under the doctor's direct supervision. The Medex is also largely an extender of curative care and is generally not involved in community health programs. In developing countries, a three-tiered system within a government program places the Medex in a very different role. As the link between the physician and the community health worker, the Medex receives less guidance and is at a geographic distance from the supervising physician. The Medex is responsible for maintaining a balance of preventive and community-oriented programs and curative programs. (S)he is also responsible for training, supervising, and providing administrative and technical support to a group of community health workers. The principal carryovers from the domestic to the international program are competency-based training and paramedicals who perform delegated curative acts.

The program devised by the HMDS to integrate network staff into the international program has been successful. Eleven network personnel have participated in two Core Development Residency courses. The focus of these four-week structured training sessions was primarily an overview of problems and trends in international primary health care. One week was devoted to cross-cultural sensitivity. Evaluation forms were completed at the end of each residency, and participants also were interviewed. The comments are evidence that network personnel considered the four weeks to be a valuable experience.

The first network conference was held in Honolulu, Hawaii, in October 1979. It was largely an orientation to the goals and methods of the HMDS program, an overview of international health programs, and a discussion of the potential for collaboration among the universities. The conference was attended by most of the concerned HMDS staff, personnel from the Universities of North Dakota and Washington, and participants from Howard University, which was then considering joining the network. The second conference, held in Seattle, Washington, in September 1980, was largely a discussion of progress to date, problems, and plans for the future.

Through August 1980, staff from the network institutions spent 17.5 person-months in Honolulu working with HMDS staff to develop MEDEX materials. Approximately 4.5 person-months were spent with HMDS staff in the field. These figures are considerably below the planned level for long-term residencies, especially for field activities. Three persons from the network were in Honolulu while the evaluation team was there. There are realistic plans to increase participation in LDC activities. At the beginning of the long-term residency program, HMDS staff and network staff had problems establishing teacher-student relationships. Some network participants felt that their expertise and skills were not being recognized and used as much as they should be. These problems seem to have dissipated as the program has progressed. However, another problem has not been solved. Network personnel are able to work on the development of MEDEX materials only while they are in Hawaii. They do not have access to the full set of materials at their home universities for further work.

The universities to which the participating MEDEX groups are attached were not selected on the basis of their institutional experience or reputation in international health. In retrospect, these criteria should have played a major role in selection because it appears that MEDEX domestic experience is not so relevant as anticipated. It is noteworthy that MEDEX staff at the University of Washington have begun to address this problem. They have formed an informal International Health Committee which will meet periodically to discuss issues and ideas in international health. One objective of the meetings will be to identify the expertise in international health and related fields which is scattered throughout the university. An initial list of over 40 interested people was compiled, and the first meeting of the group was held in January 1980. There has also been an attempt to establish formal links with other institutions in the Seattle area (e.g., Battelle Laboratories and the Program for the Introduction and Adaptation of Contraceptive Technology (PIACT)) which could

contribute useful, complementary skills for LDC health programs. The evaluators know of no similar efforts at the University of North Dakota.

Although there have been some problems in developing the network, the program designed by HMDS and the efforts that staff have made to implement the plan impressed the evaluation team. HMDS staff have made a concerted effort to enlist the six schools identified in the PP, as well as a seventh school, the University of California, Davis, which does not have a domestic MEDEX program, but does have extensive experience in competency-based training. It is not the fault of HMDS that only two schools decided to participate in the project. The decisions not to participate may be attributed to a variety of external factors that are not related to the project (e.g., existing AID relationships or reluctance to be an AID contractor).

Evidently, the time required by HMDS staff to develop the network was greatly underestimated in the original project design, and it is doubtful that participation by three more universities could have been managed without diverting HMDS staff from other project activities. Even with only two universities participating, the time that HMDS staff required for network activities during the first two years of the subcontracts was probably disproportionate, both to this element's importance in providing technical assistance in developing countries and in relation to the rest of the project. There is no solid basis for judging the value of the network schools' contributions to the project's goals, but it is the evaluation team's best judgment that, to date, the costs of this activity have outweighed the benefits.

The long-term benefit of network activity--an expanded base of U.S. technical assistance for LDC MEDEX programs--depends on several factors. The project design makes the implicit assumption that the demand for MEDEX programs in LDCs will increase. The validity of this assumption depends on how widely the MEDEX system is accepted and selected as an effective way to institute primary health care programs and on how high a priority LDCs and donors place on primary health care. AID's willingness to use university resources for field activities is also a factor. An examination of these factors was beyond the scope of this evaluation, but, if the assumption is valid, the outcome will depend on the capacity of the network to develop an institutional competence in the effective development of PHC systems in LDCs and on the ability of the University of North Dakota and the University of Washington to compete for contracts in the market without the support of AID. If there is great interest in MEDEX-type programs, one can assume that, once the MEDEX materials are made available generally and are widely disseminated, many institutions will be using the materials and competing for business. It is likely that many of these institutions will be more experienced and better known in international health than either of the two network schools.

This leads, finally, back to the ambiguity in the project design. Will the two network schools be competing as independent institutions, with all the skills and expertise necessary to design and implement LDC primary health care programs? Or will the three schools continue to operate as a network which, collectively, has all the skills, and has them in greater depth than any one individual institution?

It is highly unlikely that AID will continue to provide core support for three institutions and, if there is to be any continued core support for a MEDEX center, the University of Hawaii would be the obvious choice among the three. Will the network institutions continue their relationship upon termination of the present contract? This is a question which the three universities will have to decide among themselves.

If this or a similar project were being developed today, the team would question the value of including a network development component. And, if such an activity were included, the team would also question the rationale for limiting the network to schools with domestic MEDEX programs. The HMDS and the network schools have devoted much manpower and effort to this activity. At this time it appears that HMDS staff are requiring less and less time for network development and that the members of the network are increasing their contributions to other project goals. The team recommends that the three universities and AID develop, and reach agreement on, a plan for future collaboration which offers good prospects for using the resources of the two universities to develop PHC programs in developing countries after core support is withdrawn. The evaluators also recommend that AID and the HMDS consider developing a less structured, but larger, network through which other schools engaged in international health programs could become familiar with and involved in the MEDEX approach to primary health care. Subcontracts with other schools are not recommended.

Issue 3: Exploitation of Program Development Opportunities

The current core contract directs the contractor to apply the MEDEX technology to countries interested in considering its use in a total, integrated national primary health care effort. The evaluation team was asked to determine whether this contractual requirement has prevented the contractor from exploiting program development opportunities.

During the early years of AID support, the HMDS focused its energy and attention almost exclusively on the development of the three-tiered system and the multitude of associated modules and other materials. This was in keeping with the requirements of the AID contract. From time to time, the HMDS has been criticized for its unwillingness to respond to the periodic requests from AID missions for advisory assistance in developing

only the training components in primary health care.* Dr. Smith has felt that if the HMDS allows itself to be diverted from its primary task, or if it permits the relatively small staff to be prematurely immersed in various project activities, the principal objective of the organization will not be attained. He has resisted requests for HMDS assistance in activities that are related to only one element of the overall system which he and his staff attempted to design.** (For example, efforts to use HMDS experience with competency-based training techniques were resisted on the grounds that it would be counterproductive to train mid-level or community-based workers in the absence of a technical and management support system.) Dr. Smith and his associates are convinced that the first priority was to design a model for an integrated system and to prepare detailed materials to guide the necessary planning, organization, and training. Consequently, an enormous volume of detailed materials--the building-blocks of the system--was developed. The publication, dissemination, and use of these materials have become matters for discussion. (See "Issue 5".)

With the development work largely completed, the HMDS is prepared to take on more ad hoc assignments. Therefore, the evaluation team recommends that the Development Support Bureau and HMDS make clear to USAID missions and operating bureaus that the University of Hawaii is interested in and willing to adopt a flexible, project-oriented approach to the use of the MEDEX technology.

Issue 4: Determination of HMDS Capabilities

The Non-Competitive Procurement Review Board of the Agency for International Development determined that the HMDS had the predominant capability to execute the MEDEX technology. AID asked the evaluation team to assess the impact of that decision. The team concluded that this determination would be helpful to USAID missions that actively sought to use the HMDS to execute country programs. Moreover, where AID/W was interested in promoting the use of the University of Hawaii to support core contract objectives, it was sensible. However, the team believes that, ultimately, identification of the HMDS' capability will be meaningless if the missions do not show more interest in using the MEDEX approach and if other opportunities to use the system do not arise.

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* For example, Yemen, Korea, the Philippines, and Tanzania have issued requests for consultation to review curriculum development requirements for varying levels of health workers.

** In fact, the contract restricts the HMDS from responding to such requests.

Issue 5: Field-Testing and Publication of Materials

The current policy of DS/HEA is to consider as drafts the materials being developed by the contractor and to permit the contractor to complete, field-test, and publish the MEDEX technology within the five years allocated to the project. It was the intention that the draft materials would be used in LDC MEDEX programs representing varying socioeconomic settings and conditions peculiar to LDCs, and that the results of the field-tests would be used to refine and publish the training modules at the end of the five years of the contract. Requests for the materials have come from a variety of sources, from inside AID and from the private sector. Some materials have become available as country-specific materials through contractor-assisted programs (e.g., Pakistan). The issues at this time are whether the modules, protocols, and other materials should continue to be considered as drafts and whether the contractor should have the five-year period to complete the development and field-testing of the materials.

Committed to completing the overall MEDEX system, the HMDS has been reluctant to share its evolving materials with others. The HMDS has given three reasons to explain this reluctance. One, the HMDS does not wish to circulate material which is known to be incomplete or inadequate. The staff have recognized that the early versions of their materials are not of uniform quality, and they are concerned that premature distribution will subject them to undue criticism before they can complete the overall design and correct the acknowledged weaknesses. They also feel constrained because they have incorporated copyrighted illustrations and the like in materials which they do not have permission to publish. Two, the HMDS is concerned that other contractors, especially those in the private sector, might take the incomplete material, particularly the training modules, and adapt it for commercial use before it is in a form that can stand on its own. Three, Dr. Smith and the others feel that if materials are distributed piecemeal, it is possible that only selected elements that have not been adapted to local conditions will be used in certain situations. Under these conditions, a failure might be used unfairly to question the viability of the entire system. For these reasons, then, the HMDS is careful to protect draft materials and to release them only under controlled circumstances.

This singleness of purpose and this reluctance to share materials openly have been costly. The evaluation team noted rather widespread negative attitudes toward the MEDEX system and the HMDS which appear to be, in large part, the consequence of the policies and practices described above. A common impression among AID personnel, and among host country representatives as well, is that the HMDS tends to be rigid in the application of the MEDEX system. In some cases, this is described as an unwillingness to be flexible in adapting material to local conditions. In other cases, it is taken to mean that a Ministry of Health or an AID

mission is forced to choose either the entire MEDEX design or nothing at all, and that it is not possible to use only those elements which are appropriate to a country's needs. Another rather commonly held view is that the HMDS tends to be secretive and is not open enough about the distribution and adaptation of HMDS materials. One AID field health officer was interested in the MEDEX system, but when she learned that the MEDEX modules could not be removed from the Office of Health, in the Development Support Bureau, she decided not to take the time to study them. Her feeling was that if the modules were not available for analysis in the USAID mission, and if they could not be shared with host country counterparts, they were of little practical value. Government officials involved in the installation of MEDEX systems in both Pakistan and Lesotho stated that the HMDS has been secretive in its use of the MEDEX materials. Overall, there seems to be a strong sense within the organization that the HMDS owns and is the proprietor of the materials it produces. This attitude probably has discouraged use of the materials.

Although some officials have been concerned about the HMDS' protection of its materials and its inclination toward secretiveness, it is worth noting that adapted modules which were printed and distributed by the Pakistan Federal Ministry of Health were proudly displayed by Pakistani representatives at a regional meeting of the WHO with the support and endorsement of the HMDS.

On balance, the evaluation team is sympathetic toward the approach of the HMDS. Clearly, if the group had not concentrated its energies on the evolution of a coherent system, it could not have produced the mass of valuable materials which now exists and which AID contracted for. The evaluators understand the HMDS' concern about premature distribution of materials and the risks of using isolated modules which were designed as components of a larger system. To some degree, the view that AID personnel in particular have of the HMDS can be attributed to a lack of information about and an inadequate understanding of the purposes of the core contract. (In fact, the core contract does not require that the materials be finalized until the contract is terminated.)

The evaluation team believes that the HMDS probably erred in emphasizing the design and protection of the entire system; more openness and a more flexible approach to the potential use of system elements would have been beneficial. The evaluators also believe that Dr. Smith and his associates probably now share this view. In any event, the drafts of the overall design and the associated prototype materials will be completed by the end of the third year (June 1981).

With a coherent and relatively complete structure, the HMDS is in a better position to be open and flexible about the application of the MEDEX technology. It is possible now to show to AID and host country ministries of health how the various pieces interrelate, and it should be

possible to design country systems that use the various elements in a process suited to local conditions.

The evaluation team believes that it is time to begin to distribute widely MEDEX materials. The HMDS agrees. However, the modules and other materials are in varying stages of refinement, and all would benefit from consistent editing and simplification. Although the evaluators believe that the HMDS should move as rapidly as possible to institute widespread distribution, they are not able to describe in detail how this should be done (e.g., should the materials be published formally or merely reproduced for use by USAID missions, international organizations, etc.). A first step might be to prepare for distribution a complete package that describes the system and its components. Subsequently, individual modules or appropriate groups of materials could be reproduced and distributed after they have been refined. Presumably, all materials will be in final form and disseminated by the end of Phase III.

It is important that the materials be circulated widely as rapidly as possible, and within reasonable limits of quality control, so that practitioners in the PHC field can benefit from the work the HMDS has done and, just as importantly, contribute to the further improvement of the materials. The Office of Health in the Development Support Bureau should discuss this issue in detail with the HMDS, and it should amend the contract, as necessary, to facilitate publication of the materials.

The team recommends that AID and HMDS jointly work out a plan for the systematic completion of the modular materials and develop a plan and a schedule for the publication and distribution of the prototype materials that have been prepared under the core contract. The evaluation team also suggests that HMDS prepare as soon as possible (within the next several months) introductory materials that describe the entire system and that include examples of the system's components.

Issue 6: International MEDEX Conferences

Each year, the institutions that are part of the MEDEX network sponsor an international conference. These "Network Conferences," as they are known, are attended by government health representatives from the countries where MEDEX programs are being implemented. In addressing this topic, the evaluators attempted to find out how the results of the conferences are (or could be) shared within the Agency and with other donors and LDCs.

The evaluation team found that, in some instances, persons involved in MEDEX programs visit various LDCs to offer advice or to learn from others' experience in applying MEDEX concepts. The LDC participants are unanimous that the annual conferences are useful. The opportunity to

compare experience can be helpful. Some LDC participants have indicated that they have not had as great an opportunity as they would like to share their own experience in using the components of the MEDEX technology, but, this reservation aside, they strongly endorse the conferences.

As part of its efforts to increase international organizations' understanding and awareness of the MEDEX technology, the HMDS is in periodic contact with the World Health Organization. A member of the evaluation team visited the WHO headquarters; there, he noted general knowledge of the University of Hawaii's efforts and a favorable attitude toward the MEDEX technology, particularly among those who had personally visited the HMDS offices. Several WHO staff are particularly interested in the progress which has been made by the HMDS in the management area, and especially in management training. Others stress the importance of developing training and other materials locally and of not depending too heavily on the preparation abroad of prototype materials. WHO is considering designating the MEDEX program at the University of Hawaii as a WHO collaborating center. This would constitute a general endorsement of MEDEX efforts. The WHO would contribute little financial support; however the endorsement and the linkages that might be established through this association would contribute to efforts to increase awareness of the MEDEX technology.

Issue 7: Relationships Between AID and the HMDS

One of the topics which the evaluation team addressed was relationships between AID and the HMDS, and between the HMDS and the regional bureaus and missions. In discussing this topic, the team considered the following questions:

- Is there a market for the MEDEX technology?
- Are the missions sufficiently aware of the contractor's resources?
- Does the AID contractor-selection process tend to exclude those contractors with "predominant capability" in favor of the competitive process?
- In what way is the University of Hawaii's ability to compete for country programs affected by financial considerations?

The team's findings and recommendations on these issues are provided below.

As might be expected, the HMDS has developed several relationships with AID, a large and multi-faceted organization. The HMDS' relationship with the Development Support Bureau is quite different from its relationships with the regional bureaus and the various USAID missions. If one had to make any generalization about the relationship between AID and the HMDS, it would be that on both sides there is inadequate knowledge and understanding of how best to extend the results of the development work of the HMDS to health ministries in LDCs.

The HMDS has been supported by the Office of Health for the past five years. Both parties have a reasonably clear idea of their common goals and objectives. Unfortunately, AID has not learned how to plan and execute centrally-funded projects so that the regional operating bureaus and USAID missions can optimally understand and support them and results can be translated effectively and straightforwardly into relevant mission-supported projects. The regional bureaus tend to be critical of centrally-funded activities. They feel that projects frequently are not based on actual field requirements, do not produce practical and usable results, and divert scarce resources from more urgent development programs. But it must be recognized also that field missions, and even regional bureaus, have neither the resources nor the capacity to identify and finance the research and development work that is needed to find solutions to many of the tenacious problems now retarding worldwide development.

There is tension among regional and central bureaus and competition for funds for centrally-sponsored activities and mission projects. This fact is taken for granted within the Agency, but seldom is the situation completely understood by outsiders. USAID missions tend to be suspicious of centrally-funded contractors, and particularly of universities that beocme contractors. The commonly-held view among field personnel is that centrally-funded university contractors are primarily interested in fulfilling their own objectives, and not the objectives of missions' development programs. Consequently, the missions tend to monitor operating programs so closely that they seriously constrain the contractors' ability to carry out their tasks. Persistent educational efforts by central bureaus and centrally-funded contractors are necessary to dispel these suspicions.

In a sense, the HMDS has been caught in an internal dilemma that it does not fully understand. The PP and the core contract call for the university to establish as many as eight operational programs. But the establishment of these programs is dependent upon host governments' interest in and requests for such projects, the endorsement of missions and regional bureaus, and the selection of Hawaii University as the executing agent. Although interest was expressed initially in seven or eight countries, only three programs have materialized. There is little question that, for the most part, the regional bureaus and missions have not actively promoted use of the MEDEX technology. If the regional bureaus

had demonstrated more enthusiastic support and understanding, it is possible that a larger number of programs could have been mounted.

Some common perceptions of MEDEX were described in a preceding section of this chapter (see "Issue 5"). As has been noted, in its discussions with AID staff, the evaluation team observed a reluctance to use the MEDEX approach. The impression is that the University of Hawaii insists on implementing the entire MEDEX scheme and that it is reluctant to alter it to fit local conditions. This feeling is not, however, evident in the three countries with ongoing MEDEX programs.

USAID missions are almost always skeptical of "grand designs," and they are particularly fearful that they will lose control over a project when such a design is implemented by a university contractor. Few missions are willing to give carte blanche to any contractor, especially if they know that the contractor has a preconceived solution to what they perceive to be a complex local problem. The unavailability of MEDEX materials and the impression of secretiveness undoubtedly reinforce the missions' attitudes. Also, some missions seem to feel that the "sales pitch" is too strong; this, too, apparently generates additional resistance.

The responsibility for this situation rests partly with AID. The HMDS was established at AID's encouragement and with its financial support. It was created to develop a technology which could be adapted and used by LDC governments with U.S. economic assistance. A lack of knowledge and understanding is reflected in most of the attitudes of AID field personnel and regional bureau staff. The MEDEX system has not been adequately explained to AID missions or regional bureaus. The director of HMDS has had several opportunities to present briefings on the system to audiences in regional bureaus. Unfortunately, given the complexity of the subject and the comprehensiveness of the MEDEX components, the mechanics of the system cannot be fully grasped in the limited time set aside for most briefings. Only when the elements are explained carefully, and then disaggregated and covered in detail, is the system understandable.

It is the responsibility of the Development Support Bureau to ensure that the operating entities of the Agency fully understand the MEDEX approach to primary health care. The provision of such care is the first priority of AID's health sector strategy. The MEDEX system was developed with AID funds as one way to organize primary health care. Having paid to have the system developed, AID must make certain that it is understood by field missions and operating personnel. A knowledge of the system is needed to make informed decisions. The HMDS should do what it can to show others how the MEDEX system works, and the DSB should determine how it can ensure that all operating and program personnel in AID are fully informed of and understand the MEDEX technology and its potential for application in LDCs.

It is difficult to draw global conclusions, but some observations can be made that point to a market for the MEDEX technology. All three countries appreciate the assistance they have received to improve paramedical training. In two of the three countries, host country representatives pointed out that they conceived and tested other paramedical programs before the arrival of MEDEX. Indeed, they were interested in MEDEX because it is similar or complementary to their earlier programs. It should be pointed out that in all three countries the prototype materials were modified substantially during the adaptation process and that local participants considered this to be a productive exercise.

The question of likely future demand for the technology cannot be answered in objective or quantifiable terms. If one were to review existing AID country programs and try to assess the likelihood that a request will be received for U.S. assistance in initiating a full-fledged primary health care system, one would have to conclude that there is no significant foreseeable demand. If, however, one considers the worldwide need for accessible health care, and the willingness of the HMDS to take a more flexible approach to the use of its technology, one would provide a quite different answer. Given its experience and the internal logic of its system, the HMDS can offer LDCs practical solutions to common problems in planning, managing, and training for PHC systems, and, at the same time, it can demonstrate concretely the interrelationships involved in the process.

Issue 8: Future Collaboration

AID has contributed almost 100 percent of the funding for the work of the HMDS. In considering this fact, the evaluation team tried to determine how AID and the contractor could continue to collaborate after the contract is terminated. The team proposes a number of recommendations for the future.

If AID continues to regard primary health care as the area of highest priority for programming in the health sector, the work completed during the three phases of the MEDEX project should become a valuable resource for future programs. The basic question is, what mechanism will ensure the best use of the technology and of the institutional expertise and personnel resources which have been built up over the course of the project?

Given experience to date, the evaluation team concluded that some continued core support from AID for the University of Hawaii will be required to ensure a maximum return on investment. There will continue to be a need to refine the prototype materials. In addition, methods for evaluating the application of these materials in field programs will have to be designed and tested. New program opportunities will doubtless

emerge, and LDCs and USAID missions will need technical assistance to design PHC programs, regardless of the involvement of the University of Hawaii in the implementation of those programs. In addition, as current field programs move toward completion, host country ministries of health will almost certainly wish to call on the HMDS for periodic short-term assistance in further adapting and improving the materials now in use. (Host country officials and USAID representatives in Guyana anticipated the desirability of continuing to draw upon HMDS technical assistance after the expiration of the core contract. Personnel in the Pakistan government indicated to the evaluators that they would like to be able to call on the University of Hawaii from time to time for technical advice. With the expiration of the contract for the Pakistan program, the core contract should be amended to permit the provision of post-project technical assistance and pre-project planning advice.)

Besides providing for the continued availability of HMDS technical support, AID and the University of Hawaii should consider a range of other options for the role of the HMDS after 1983. They should consider providing a training center for AID personnel, LDC policy-level and senior operating personnel, and, perhaps, personnel from other U.S. or international organizations who are interested in the application of the MEDEX technology in LDC health programs. The training could take a variety of forms. Relatively formal, or structured, training courses at the University of Hawaii might be offered for LDC personnel who will return to their countries to use the MEDEX technology in a PHC program. In this approach, a group of personnel might be trained together to form a "critical mass" of MEDEX expertise which would be used after the trainees return to their country. Short courses might be offered at the University of Hawaii for policy-level LDC personnel, and residencies, similar to the current longer-term residencies for network personnel, could be provided for AID health officers, as well as health personnel from the various international organizations and from other organizations in the U.S. and in LDCs. These residencies would be tailored to individual needs.

Educational programs might be offered in workshops and at conferences at selected locations around the world. Two kinds of educational programs could be provided. One would inform people about the MEDEX approach to LDC health problems, the other would bring together groups of persons who are implementing PHC programs to exchange information. The latter would resemble the current international Network Conferences.

The core group could serve as the focal point of a continuing network. It would not necessarily provide continuing financial support for the network, but it would be part of a structured system through which people and organizations with common goals, ideas, and problems can maintain links for information exchange and mutual assistance.

The possibility of using the HMDS to conduct field research should also be considered. Certainly, if the staff function as the nucleus of

a network, they should be involved in the continuous, systematic collection and analysis of field experience, and they should be the principal group responsible for disseminating the results of analyses.

As was indicated above, the evaluation team recommends that AID amend the core contract to permit the HMDS to provide technical assistance to countries that are using the MEDEX technology but which no longer have an active AID project. At this time, this change would apply only to Pakistan, but other countries might be added to the list in the future. The MEDEX technology is an evolving, changing system, and countries such as Pakistan may want members of the HMDS to make visits to facilitate the periodic updating and revision of their program designs, adapted materials, etc. The evaluation team understands that only pre-project technical assistance is possible under the current core contract. It recommends, however, that post-project collaboration also be authorized.

Summary of Recommendations for the Future

1. The University of Hawaii will need some continued core support from AID to ensure a maximum return on investment. The prototype materials should continue to be refined, and methods for evaluating the application of these materials in field programs should be designed and tested.

2. New opportunities to develop programs are expected to emerge. Technical assistance to design PHC programs should be given to LDCs and USAID missions, regardless of the involvement of the University of Hawaii in the implementation of those programs.

3. The HMDS should provide periodic, short-term technical assistance to host country ministries of health to facilitate the further adaptation and improvement of the programs and materials now in use. The contracts for the programs in each country should be amended so that such assistance can be provided after the project has been terminated. If this is not feasible, the core contract should provide such coverage.

4. In addition to providing for the continued availability of HMDS technical support, AID and the University of Hawaii should consider a range of other options for the role of the HMDS after 1983. For example, they might consider the following:

a. Establishment of a training center for AID personnel, LDC policy-level and senior operating personnel, and personnel from other U.S. or international organizations who are interested in the application of the MEDEX technology in LDC health programs. Formal, structured training courses for LDC personnel and short courses and residencies for AID health officers and other health personnel from the U.S. and abroad might be offered at the University of Hawaii.

b. Incorporation of educational programs into workshops and conferences held at selected locations around the world. The purpose of the programs would be to inform people of the MEDEX approach to primary health care delivery and to exchange information.

5. The HMDS might consider establishing the core group as the focal point of a continuing network. Financial support could be provided, but the basic purpose of the group would be to promote mutual assistance and the exchange of information about primary health care between people and organizations with common goals, ideas, and problems.

6. The use of the HMDS to conduct field research should be considered. MEDEX staff should be involved in the continuous, systematic collection and analysis of field experience, and in the evaluation of the several components of the MEDEX technology. They should be the principal group responsible for disseminating the results of analyses. The Development Support Bureau should ensure, however, that there is adequate dissemination to all AID staff concerned with primary health care.

Appendix A

GUYANA PROGRAM REVIEW

Introduction

The team made a brief visit to Guyana to evaluate Health Manpower Development Staff (HMDS) inputs into the Guyana health program, not to evaluate the host country program itself. The team's primary contacts were the HMDS long-term adviser (who arrived only two months ago), the director and administrator of the MEDEX/Guyana Training Program, and the United States Agency for International Development (USAID) health adviser and mission director. The team also met with senior Ministry of Health (MOH) officials, MEDEX/Guyana staff, IDB/PAHO technical advisers, and the directors of both the Georgetown Hospital and the Guyana Pharmaceutical Corporation. The team visited three health stations in rural Guyana where graduate Medex were in practice.

Health conditions in Guyana are particularly poor among the rural population, which comprises two-thirds of the total population of 826,000. According to available statistics, 20 percent of all deaths are attributable to communicable diseases, 50 percent to pneumonia, and 35 percent to gastroenteritis. There has been a significant resurgence of reported cases of malaria in the hinterland along the Brazilian and Venezuelan borders. Throughout Guyana, venereal diseases are becoming a problem.

A joint PAHO/FAO* study conducted in the early 1970s indicated that 60 percent of all children under age 5 suffer from some degree of malnutrition; in rural areas, 22 percent of children under 5 are moderately or severely malnourished. The government is publicly committed to providing every citizen with primary health care, but these services are seriously deficient in rural areas. Manpower constraints, a traditional hospital-based health system, and the difficulties of transportation in the hinterland contribute to the nation's problems in delivering health care.

Under the supervision of the Ministry of Health in Georgetown, curative and preventive services are delivered to the Guyanese through a system of regional hospitals, health centers, health stations, and health posts. These are staffed by a variety of health personnel, including

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Health conditions in Guyana are better than health conditions in most of Central and South America. But reporting is inadequate, and the health status of the rural population especially, which comprises two-thirds of Guyana's population of 826,000, is probably understated. According to available statistics, 20 percent of all deaths are attributable to communicable diseases, 50 percent to pneumonia, and 35 percent to gastroenteritis. There has been a significant resurgence of reported cases of malaria in the hinterland along the Brazilian and Venezuelan borders. Throughout Guyana, venereal diseases are becoming a problem.

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* Pan American Health Organization/Food and Agricultural Organization of the United Nations.

doctors, nurses, midwives, dispensers, Medex, and community health workers. The central referring hospital (900 beds) is located in Georgetown. The greatest concentration of health care facilities and health personnel is in the Georgetown area and along the coast, where 90 percent of the population reside. In addition to the public sector facilities, there is a private health care sector that consists of clinics and hospitals. These, too, are located primarily in and near Georgetown. The corporations have a separate system of clinics which will be integrated gradually with the public sector facilities.

Planning for a nationwide primary health care program based on the MEDEX ("doctor-extender") approach began in 1976. A project of assistance then followed. This was implemented jointly by the International Development Research Centre (IDRC) and the Health Manpower Development Staff of the University of Hawaii. The project lasted from 1977 to 1979. In a pilot project beginning in 1979, and with the assistance of the Government of The Netherlands, Guyana trained and deployed 26 community health workers (CHWs). An evaluation of that project was scheduled for March 1981.

Since 1978, the Interamerican Development Bank (IDB) has been assisting in the construction and renovation of hospitals and rural health facilities and has provided technical assistance to strengthen the management infrastructure support systems of the Ministry of Health.

Following pre-project assistance under an AID contract with the HMDS, USAID and the Government of Guyana entered into a Loan/Grant Agreement, entitled "Rural Health Systems Project," in August 1980. The HMDS was selected to provide the technical assistance required (1) to plan and provide basic and refresher training of Medex and community health workers and (2) to develop and implement the management systems which are needed to support these workers after they have been deployed in rural areas. The project will terminate in August 1984.

Background

The HMDS began working with Guyana on primary health care expansion and the MEDEX approach in 1976. Guyanese contacts indicated that MEDEX/Hawaii provided useful advisory assistance during this planning period. Visits by MEDEX staff to Guyana and a seminar for Guyanese officials in Hawaii led to the adoption of the MEDEX program and competency-based training techniques. Dr. Frank Williams, director of the MEDEX program in Guyana, and Ms. Melissa Humphrey, administrator of the MEDEX program, attended the seminar and now, five years later, continue to direct the training program under the general supervision of the chief medical officer (CMO) of the Ministry of Health. They are particularly dedicated, capable, and effective.

The Guyanese government's adoption of the MEDEX system was based on a commitment to provide basic nationwide health care and on the recognition that physicians could never accomplish this task, given the country's manpower and economic constraints. The government recognized that it was necessary to relieve the pressure on the overworked hospital outpatient services, especially in Georgetown (this could be done by providing improved services at the local level), and to provide basic services to the scattered populations in the hinterland. Traditionally, health personnel were trained to provide primarily curative, urban-based services. The only official health workers who reached the rural areas with services were the dispenser and medical rangers who were not trained to cope with the task. The MEDEX approach, therefore, was adopted to decentralize the system and to establish a mid-level category of health worker who had received problem-oriented, competency-based training and who was equipped to provide appropriate preventive, promotive, diagnostic, and curative services. In such a tiered manpower system, the mid-level health workers would train and supervise community health workers and be the link between the center and the periphery.

Beginning in 1977, the HMDS helped the Guyanese design and initiate a training program and adapt curricula for mid-level health workers. Medex were officially established as a new professional category, and the training of dispensers and medical rangers was phased out. HMDS inputs have included primary health care seminars and workshops for Ministry of Health officials and donors, the development of Project Identification Documents (PIDs) and Project Papers (PPs), the provision of prototype modules and short-term guidelines, and technical assistance in health planning, training, curriculum adaptation, management, continuing education, and evaluation. The MEDEX system crystallized an existing trend toward greater reliance on mid-level health personnel, and the HMDS prototype modules, adaptation workshops, and competency-based training methodologies constituted the tools for the process. Guyanese officials indicated that HMDS helped to focus the overall primary health care program on prevention and promotion, community involvement, the concept of a tiered, but collaborative, health team, and requirements for improved management.

Medex

Numbers of trained nurses at various levels, male and female, work in public sector hospitals, health centers, health stations, dispensaries, and medical outposts. These health workers are a valuable resource in Guyana.

Candidates for training as Medex are selected on the basis of previous substantial experience in the field of health care. Candidates are

screened by a multidisciplinary group that includes a University of Guyana representative, the principal nursing officer, the MEDEX administrator, trainer, and director, the IDB technical adviser, the chief dispenser, and other, similar personnel. Personal interviews are conducted. A procedure for pretesting the use of the training modules is part of the selection process. Although the comparative advantages of training mid-level health workers from scratch and of retraining health personnel have been debated, the approach in Guyana seems to be appropriate and cost-effective.

A special unit for training Medex was created by the Ministry of Health. This unit is under the direction of Dr. Frank Williams, who is assisted by Ms. Melissa Humphrey. The University of Guyana has approved the training program and curriculum, and it now issues certificates to graduates. The Ministry of Health plans to eventually institutionalize the training of Medex and all health staff in the university. This transfer of authority may jeopardize the continuity and quality of the project. The Medex training program is in the forefront of primary health care expansion, primarily because the caliber of the current project directors is high and a non-traditional, competency-based approach is used.

To date, three classes of Medex (60 trainees) have been graduated. The first graduates were deployed in September 1978, the second in September 1979, and the third in March 1980. They are distributed geographically: 26 percent are in the hinterland, 40 percent in rural coastal areas, 7 percent in the riverine, and 26 percent in urban sites. Five Medex work at headquarters as tutors. They help train other Medex and supervise each Medex site at least twice a year.

A fourth class of 17 student-Medex will graduate from the 15-month training program in August. Two additional classes of 20-25 students each will be graduated during the last two years of the project. The total number of Medex trained will be approximately 125 by the end of the project. Guyana's national need is estimated at 200.

Of those who are trained, it is planned that 3 will serve as tutors in the Medex Training Unit; 10 will be trained and deployed as senior Medex at the district level, where they will provide supervision and continuing education; 7 will be trained and deployed at the regional level for administration, management, and supervision; and 2 will be trained and deployed at the central MOH level for administration, management, and supervision. Approximately 100 Medex will be available for regular assignment.

The deployment of trained Medex to the underserved interior has been and will continue to be less rapid than is desirable because facilities, including housing, still need to be constructed in some areas. Furthermore, transport and communications in the interior can be difficult (boats,

horses, and many hours on foot), but conditions are improving. A two-way radio system now links nine Medex stations (one of which the team visited) with the headquarters in Georgetown. Evidence suggests that the two-way radio is an effective and valuable communications link between the more isolated Medex and their supervisors, enabling the latter to provide continuing education, make referrals and difficult diagnoses, and attend to administration. It is less costly and time-consuming to use the radio than to send supervisors into areas where terrain and transportation are difficult.

One radio service particularly appreciated by Medex is the medical conference which is broadcast every Saturday morning. A medical case is discussed at length by the physician-trainer and the Medex. Extension of radio communication is envisaged, pending the results of an evaluation of this pilot project. The evaluation, which will be administered by the Academy for Educational Development (AED), in collaboration with the MEDEX project, will be completed soon.

The training modules developed by HMDS underwent extensive adaptation for Guyana in 1976-1977. The evaluation team is no longer concerned that some of the basic modules may be too technical because the Guyanese candidates for training are highly educated in medical concepts and have had no difficulty comprehending the information.

The physician now in charge of training has been with the program for one year. He appears to be highly enthusiastic about the MEDEX approach and competency-based training. Having acquired experience only as a government medical officer and on medical wards, he indicated that he had some difficulty adjusting to the idea of integrating promotive health care with curative medicine. His own ideas changed markedly after he attended the HMDS international seminar in Hawaii in the summer of 1980 and participated in a primary health care seminar in Bulgaria. He may leave his post when the current training session ends. If he does so, there will be an urgent need to select a replacement and appoint a long-term training adviser.

The training program includes clinical practice periods in the hospital, where the physician-trainer works closely with hospital consultants and is assisted by Medex tutors. An effort is made to expose the students to every kind of case they are likely to encounter in the field. The director of the hospital and one of the physicians indicated that, although they are busy, they try to cooperate as fully as possible, because they realize that a successful MEDEX program will eventually lighten their own burdens at the hospital. The Georgetown Hospital Accident and Emergency Unit receives as many as 500-600 patients a day. Many come for minor ailments which could be treated by a Medex at a health center or health post.

The schedule for Class IV has been revised to include a five-week block of activities devoted to developing the Medex' skills in both community health assessment and identification of community health-change strategies. This block of activities has been scheduled as one of the earliest student experiences so that community health awareness can be established early in the training. The emphasis on the development of community health skills is maintained throughout the course; students are held responsible for monitoring the health of selected families. This component culminates in the final six weeks of training, when the Medex are prepared to train community workers in a learning sequence which combines classroom and field experiences.

Although the community focus has been enlarged, more site visits are needed to encourage Medex to go out into the communities to tackle basic public health problems, and not remain in clinics. More inter-sectorial cooperation and teamwork are required. The Medex are receiving training which will help them sort out the roles of other health professionals. Problems tend to arise when a new category of health worker and new concepts are introduced. The career structure for Medex also needs to be addressed.

The team observed that the Medex in the field keep their training modules on hand for ready reference. This is a reflection of the usefulness of training materials based on the competency-based approach.

It is important to note that the Guyanese view the training program and adaptation of the modules as a dynamic process in which feedback is solicited continuously from participants and training materials are adapted as improvements are identified. The team was not in a position to determine how systematic this process is and how much the HMDS participates.

Continuing education materials have been adapted and incorporated into supervisory training and are included in the supervisors' site visit booklet. As part of the MEDEX methodology, continuing education workshops are held annually. The team interviewed Medex at health stations who suggested that the workshops are valued highly. One workshop was to be held in March 1981. Ms. Joyce Lyons of the HMDS was to participate in that program.

Community Health Workers

With support from the Dutch Government (now terminated), 26 community health workers were trained for the interior. Each CHW received three months of training. Some CHWs have been working for a year, some only since August. Their work will be evaluated, and the results will be

considered in the design of an expanded CHW training program, which will be implemented with HMDS assistance. The questionnaire for this evaluation is being developed. A workshop to complete the evaluation design has been scheduled for March. The HMDS will provide input.

As planned in the Rural Health Systems Project, approximately 200 additional CHWs will be trained. Once a Medex is deployed to a rural post, (s)he is expected to assist the community in selecting the community health worker. The Medex will then train the CHW, both at the regional station and in the community. Under the terms of the contract, the Medex in Class IV are to be prepared for their role as trainers and supervisors of community health workers. The Medex who have already been trained were not taught to train CHWs; they will receive a special course. The ability of the Medex to help select and train CHWs has yet to be tested.

The results of an evaluation of the Dutch-sponsored CHW training program and of a social study of coastal communities will be used in the prototype adaptation process to develop a curriculum for training CHWs. The sociological survey is being done in the coastal areas to determine what particular changes in the CHW modules are needed there, given the more accessible and better educated population. The evaluation team anticipated that the HMDS might have a doctrinaire approach to the CHWs' role, but apparently it does not.

A significant problem affecting the training and deployment of CHWs is payment. Under the Dutch government-sponsored project, the CHWs were paid during training and for the following three months only. After that, communities were expected to pay the CHWs themselves. This approach has not worked well. The Guyanese agree that, under the Dutch project, payment of CHWs for training and initiation created a political and financial dilemma. Publicly, the government has pledged free health services to all its people. The evaluation team feels that the HMDS should have been more aggressive during the planning phase in helping the Guyanese deal with this problem (e.g., by sharing experiences, developing cost-analyses, etc.).

Management

Some Guyanese and USAID contacts have suggested that the HMDS provides strong technical assistance in training. It does not, however, provide equally strong assistance in management. The recent visit of Mr. Petrich and the arrival of the long-term management adviser, Mr. Jamieson, are viewed as positive steps toward correcting this imbalance, but it is too early to judge adequately the effects of this action. The management adviser's scope of work has been revised to enhance his ability

to work in collaboration with the PAHO/IDB project, which plays a major role in management planning for the health services.

The long-term adviser will be located at the Ministry of Health, where he will work directly with the Permanent Secretary (PSO). His position in the MOH should enhance his potential effectiveness. One of his objectives is to decentralize, with central policy guidance, operational management authority to the 10 regions. Currently, managerial decisions and actions which could be handled by lower-level personnel are being handled by the PSO.

Under the terms of the bilateral project, the HMDS, through the long-term adviser and with short-term technical assistance, will assist the MOH with supervision, communications, transportation, supply information, facilities development and maintenance, and health services management in rural areas. The HMDS clearly recognizes that the effectiveness of the Medex and CHWs depends on institutionalized management support. It is too early to evaluate the HMDS' ability to cope with this monumental task.

In addition to assisting with overall management, the HMDS includes in its training methodology courses that are based on operations manuals. (Manuals have been developed for each level of the delivery system.) In addition, the HMDS teaches basic management skills to improve work performance. This method is a useful and practical innovation, and the skills are valued to the limited extent to which they have been used to date.

Inter-Organizational Relationships

The HMDS initiated discussions with the Guyanese in 1976 and collaborated with the IDRC on the initial MEDEX training project from 1976 to 1979. In addition, it provided assistance to the Guyanese in broader primary health care planning activities (through seminars, materials, technical assistance) and developed a PID (1978) and a PP (1979) for AID program support. The Project Agreement and the contract were not signed until August 1980. The lag-time between the finalization of the AID Project Paper and the signing of the contract presented considerable difficulties which affected continuity, recruitment of long-term advisers, and revisions of the project as a result of changes in USAID/Guyana staff.

USAID/Guyana felt that the HMDS did not exercise adequate care in recruiting and selecting the long-term advisers. The management adviser and the training adviser were selected and received a month-long orientation at MEDEX/Hawaii. They arrived in Guyana in late November. The management adviser seems to be well accepted as a facilitator by the various agencies and departments involved. Although he has been in Guyana for only two months, he seems to have a good understanding of the political

situation, personalities, and management problems, and he is taking a practical approach to working collaboratively and supportively with the Guyanese.

The training adviser was not acceptable and left several days after he arrived. USAID and Guyanese contacts agree that he was ill-suited for the job. Evidently, he did not demonstrate a firm understanding of or support for the MEDEX primary health care approach, and he insisted on filling an inappropriate role as chief-of-party. The Guyanese directing the MEDEX program made it clear that they do not need an adviser, but a cooperative, "hands-on" physician-tutor who can assist in the training of the Medex.

The team feels that the HMDS should be more cautious during the recruitment and orientation process. The success of the MEDEX approach depends in part on the capabilities of the long-term advisers, and on their complete understanding of and dedication to primary health care and the MEDEX technology. The next candidate for the position of training adviser should meet with the USAID and Guyanese counterparts before he is employed to avoid problems such as those described above.

If the costs of recruitment and orientation were absorbed into the core contract, some problems might be alleviated. These costs are not directly authorized at this time.

AID and HMDS have disagreed about the implementation of HMDS assistance. This may be because there is a discrepancy between the scope and the intent of the HMDS' role under the core contract and in the bilateral project. Under the core contract, and in the design of the bilateral project, the HMDS was to provide assistance in the planning, implementation, management, and evaluation of the overall primary health care system. It also was to assist with manpower training. Since the recent AID-funded bilateral agreement became effective, HMDS participation has been viewed more narrowly.

The team was concerned about several events which occurred during its visit and which suggested a communications problem and the absence of a mutually acceptable modus operandi. The HMDS planned to invite the director of the Guyana MEDEX program to a major international meeting on primary health care in Calcutta so that he could share the experiences of his program with other participants, meet with representatives of the Lesotho and Pakistan MEDEX programs, and benefit from exposure to the worldwide primary health care movement. USAID/Guyana questioned the appropriateness of the travel, given existing demands on the director's time and doubts about the relevance of travel to the Guyana program. USAID was also concerned that the HMDS had discussed the travel with the director before consulting the mission. Also, during the team's visit, the HMDS requested concurrence for a core staff member to visit Guyana to

provide technical assistance. The USAID found the justification inadequate. It is obvious that AID, USAID/Guyana, the contractor, and host country counterparts need to reach a common understanding about their respective roles to further the effective implementation of the program and the application of the MEDEX technology, and to avoid possible misunderstandings on the part of the Guyanese.

Conclusions

The HMDS has been instrumental in shifting the focus of the Guyana national health program from the hospital to the periphery and in assisting in the institutionalization of mid-level and community health workers, who are trained to provide basic promotive, preventive, and curative services, using the competency-based training approach. The government has demonstrated its commitment to expanding primary health care and the MEDEX approach. However, the integration of community health workers into the system has only begun, and the ability of the Medex to train CHWs has yet to be tested.

Reconnaissance visits, primary health care seminars, project design activities, short-term technical assistance, provision of prototype materials, and assistance in the adaptation of materials have been timely, appropriate, and valued by the Guyanese. More assistance is needed in resolving problems related to payment of community health workers, health team interrelationships, differences in the needs of Guyanese residing along the coast and in the hinterland, and inter-sectorial coordination. Guyanese management practices need to be strengthened. It is too early to evaluate the potential impact of the long-term management adviser. A long-term training adviser who will work collaboratively with the MEDEX/Guyana team needs to be actively and carefully recruited.

Competency-based training is understood and accepted well by Guyanese authorities. The modules supplied by the HMDS have been valued and are generally useful, and the Guyanese have participated actively in their adaptation to local needs. The need for continuing education is recognized, and seminars, regular radio reviews of cases, and supervision of tutors have been organized to update the Medex. The training strategy for CHWs is being developed. The HMDS recognizes that different curricula are needed to prepare CHWs for the hinterland and coastal areas.

HMDS' relationships with Guyanese counterparts are positive and collaborative. In general, donor and Guyanese collaboration is notable and works well. However, USAID and the HMDS need to agree upon a constructive procedural and technical modus operandi to further clarify their respective roles.

LIST OF PROTOTYPE MODULES PROVIDED TO GUYANA PROGRAM (Modules in Various Stages of Adaptation)

Core Skills

Anatomy and Physiology
Medical History
Physical Examination
Causes of Diseases
Formulary

General Clinics

Common Skin Problems
DEENT Problems
Respiratory System and Heart Problems
Gastrointestinal Problems
Genito-Urinary Problems
Infectious Diseases
Common Medical Conditions

Trauma and Emergency

Trauma and Emergency

Maternal and Child Health

Problems of Women
Child Care
Family Planning
Diseases of Infants and Children
Prenatal and Postnatal Care
Labor and Delivery

Community Health

Community Environmental Health
Community Family Planning
Community Nutrition and Flip Charts

SUMMARY OF TECHNICAL ASSISTANCE INPUTS IN GUYANA

April 1975	Dr. R.A. Smith and Dr. A. McPherson to review and evaluate the health service delivery system in Guyana and to determine the potential role of mid-level health manpower development in significantly expanding health services to the majority of the nation's population.
September 1976	Dr. R.A. Smith, preliminary discussion with MOH and other Guyanese officials and private sector interests regarding a primary health care delivery project.
October 1976	Dr. M. O'Byrne to develop list of common diseases, determine rural facilities for training and referral purposes, and collect information on background of MEDEX candidates.
February 1977	Dr. R. Powell and Dr. M. Bomgaars to establish management support basis for MEDEX project, help plan the logistic support system for the project, and assist in developing evaluation guidelines for the project.
March 1977	Dr. M. O'Byrne and J. Lyons to assist the MEDEX/Guyana staff in making final preparations for the first class of MEDEX students.
March-May 1977	Medex T.G. Coles to provide backup support and advice to the MEDEX/Guyana training staff during the early phases of their first Medex training course.
April 1977	Antonio Navarro to review environmental health factors as they would have an impact on the training and deployment of Medex.
May-June 1977	Mr. B.L. Chandler to provide backup support and advice to the MEDEX/Guyana training staff during their first Medex training course.
July 1977	Dr. R.A. Smith to evaluate the first six months of project operations in concert with Dr. Mousseau-Gershman, provide assistance in strengthening of receptive framework, and assist in staging the preceptorship/clinical rotation phase of the training of Medex.

July-August 1977	Ernest E. Petrich to work with the MEDEX program director in the development of logistical support and other aspects of the management infrastructure of the program.
August 1977	Joyce Lyons to assist the project team in pursuing the development of the educational aspects of the teaching modules for the MEDEX students.
December 1977	Joyce Lyons to discuss present evaluation system and possibilities for changes.
June 1978	Ms. J. Lyons in Guyana for pretesting, tutor-training, and planning.
June 1978	Dr. M. Bomgaars to review IDRC/MEDEX project and to assist in the development of an evaluation plan.
July 1978	Mr. E. Petrich in Guyana for training tutors in and testing use of management module.
October 1978	Dr. R.A. Smith in Guyana to assist in the redefinition of a national framework for the Medex program as part of USAID PID development.
November 1978	Ms. Joyce Lyons and Medex T. Coles in Guyana to explore approaches to continuing education of deployed Medex.
March 1979	Dr. M. Bomgaars, Dr. R.A. Smith, and Mr. Ernest Petrich in Guyana to prepare project paper for AID-funded project.
August 1979	Ms. Joyce Lyons and Medex T. Coles in Guyana to review training materials.
October 1979	Representatives from Medex Training Center and MOH in Honolulu to attend the International Medex Conference.
March 1980	Ms. Joyce Lyons and Medex T. Coles in Guyana for curriculum adaptation activities.
July 1980	Dr. Mona Bomgaars and Mr. Ernest Petrich in Guyana to negotiate technical assistance contract.
October 1980	Representatives from Medex Training Center and MOH in Honolulu for International MEDEX Conference.

Appendix B

LESOTHO PROGRAM REVIEW

Background

The Agency for International Development (AID) and the Ministry of Health (MOH) of Lesotho first discussed possible assistance in the area of primary health care in 1974. An AID-financed team from the University of California, Santa Cruz, which was then working in Lesotho, suggested to the Ministry of Health that it contact the University of Hawaii to learn about the MEDEX system. Following the initial contact, a team from the University of Hawaii visited Lesotho in August 1976. At that time, staff of the Ministry of Health, USAID personnel, and MEDEX staff in Honolulu prepared an AID Project Paper (PP). Although the paper was completed and printed in January 1977, the project was not formally approved until September 1977, at which time a Grant Agreement was signed between AID and the Government of Lesotho (GOL). This project, the Lesotho Rural Health Development Project, was to last five years and would cost approximately $4 million, $3.25 million of which AID would provide; the GOL would contribute $750,000.

A contract for technical assistance was signed with the University of Hawaii in January 1979. The University of Hawaii contract required that the project be carried out in two phases. Phase I, the planning and development stage, lasted 18 months. Phase II, which is focused on the training and deployment of primary health care personnel, began on September 1, 1980. It will end on December 31, 1983.

During Phase I, attention was focused on the use of management studies as a basis for recommending organizational changes in the MOH and for laying the groundwork for other long-term planning projects. At that time, a number of contractual activities were undertaken. A workshop was held to delineate health services areas (HSAs) (July 1979); the "Plan for Strengthening and Supporting a Primary Health Care System" was prepared (August 1979); a management workshop, "Strengthening of Primary Health Care Support Systems," was conducted (November 1979); and a curriculum adaptation workshop was held (January 1980).

With the curriculum adaptation workshop began the process of adapting the prototype modules provided by the HMDS. During the first week of the workshop, the nurse-clinician training material was discussed. The second week was devoted to discussions of village health worker (VHW) material. Each of the basic modules was given to several of the 25 workshop participants, who made suggestions and met in committees over several months to finalize and adopt each module for use in Lesotho.

Phase II of the USAID/University of Hawaii contract began in September 1980. It is focused on the training of mid-level (nurse-clinicians) and village-level workers, and the actual initiation of the three-tiered MEDEX system. It also includes additional management and planning activities. Present efforts stress the training of nurse-clinicians and the strengthening of management and planning capabilities. No mid-level workers have been sent to the field. No village health workers have been trained in the MEDEX system, and only some management and planning activities have been implemented. Given these facts, it would be premature to judge the ultimate success or failure of the MEDEX system in Lesotho. The reader should be aware of this, and of the fact that the evaluation team was in Lesotho for only a short time.

Problems

Given the scale and complexity of this project, problems and obstacles to implementation were anticipated. The health delivery system now in place in Lesotho is pluralistic and is largely staffed by expatriate doctors who serve only two or three years before returning to their homeland. This system posed what was perhaps the most difficult problem in instituting a MEDEX system in Lesotho.

More than 50 percent of the medical care now provided in Lesotho is furnished through private hospitals and clinics operated by missionary groups. The government took a big step in establishing HSAs throughout the country to rationalize the relationships between hospitals and rural clinics, but no uniform standards or practices govern those relationships. Some mission clinics are controlled by parish priests rather than by a district hospital. Support for logistics, supplies, drugs, and supervision varies from clinic to clinic. Ten or more different village health worker programs are now in place. The three-tiered system envisaged in Lesotho requires a reasonably consistent pattern of technical support and a managerial relationship between the physicians and the hospitals, and between the nurse-clinicians at the rural clinics and the village health workers (VHWs). The lack of continuity among physicians, the multiplicity of existing arrangements, and the variations in programs for village-level workers complicate the difficult process of establishing a national primary health care system.

There have been several other less fundamental problems. During the transition from Phase I to Phase II, the University of Hawaii decided to replace two staff members who had been assigned initially to the project in Lesotho. Although it is difficult in retrospect to assess the validity of this decision, the evaluators concluded that the university was probably justified in its action. However, in making the decision, the HMDS did not consult with the Ministry of Health or with USAID in Lesotho;

consequently, the latter parties considered the decision to be unilateral and arbitrary. Subsequent attempts by the university to explain its decision have only partially assuaged the resulting irritation, and implementation of the contract has suffered from inadequate communication.

The training of the first groups of nurse-clinicians began in September 1980. There have been a number of problems in securing reliable and effective teachers for the course. It has been necessary to rely on visiting teachers who were drawn ad hoc from the health care community. Most of the tutors are expatriate medical staff. One consequence of this approach has been that some tutors have not followed as precisely as they should the modules produced through adaptation. In a few cases, the tutors have introduced material that contradicts information in the modules. Inherent in the concept of competency-based training is the need to develop and follow step-by-step teaching modules. This process is weakened when the curriculum is not followed or is taught inconsistently by rotating tutors. The Ministry of Health is committed to providing full-time non-physician teaching staff supported by a part-time physician. The presence of these persons will ameliorate, but may not entirely solve, the difficulties.

The long-term success of the program will depend on the availability of Lesotho staff to manage and refine the system that is put in place under the University of Hawaii contract. As in most less developed countries, there is a scarcity of technical personnel who can be trained and who can staff the MOH. Until recently, there were no candidates for the long-term training positions specified in the project plans. Three persons are now scheduled for training abroad. Undoubtedly, there will continue to be problems in locating and training adequate numbers of headquarters personnel.

As is common in most less developed countries, the data and statistics needed for effective planning and analysis are limited. (This problem is treated more extensively in the final section of this report.)

Current Status of the Project

Twenty-two students are in training to become the first "nurse-clinicians," the term applied to MEDEX technicians in Lesotho. At this time, all nurse-clinicians are female and all have been drawn from the ranks of registered nurses. The nursing profession is a powerful group in Lesotho, and its influence in determining the structure of health activities in the country has been great. According to current plans, in the future, all nurse-clinician candidates will be selected from this group.

The training modules for nurse-clinician training have been adapted from University of Hawaii prototypes and they are in use. In addition, three new modules for which prototype modules did not exist were developed in Lesotho. These are "Mental Health," "Primary Health Care," and "Community Gardening."

Provisions have been made to establish the position of Nurse-Clinician in the Ministry of Health and the Private Health Association of Lesotho (PHAL). A draft module has been completed for the training of village health workers by nurse-clinicians, but, because a variety of VHW programs already exists, some revision will probably be necessary.

An unresolved issue is the integration of nurse-clinicans with other field health workers, such as physicians, public health nurses, health inspectors, etc. Efforts are being made to clarify these relationships. No irreconcilable differences are evident.

In the field of organization and management, health planning and health service areas have been defined and will soon be established. The use of geographic planning areas to institute a primary health care system will give both the Ministry of Health and professionals in the private sector a rationale for making inputs at the lower levels of the health system. Inherent in the design is the potential for a more comprehensive and cost-effective health care system.

An operational manual for district-level operations is in draft. No formal written document of the kind existed before this effort was undertaken. Considering the large turnover in the country, the manual should be useful to the MOH as an additional tool for providing health care in rural areas.

Although not an integral part of the Rural Health Development Project or of the contract with the University of Hawaii, the GOL, with the help of the Dutch government, has created a central drug manufacturing and distribution organization. This organization has already brought down drug costs, ard it may prove to be a great asset to the nation's health delivery system.

Findings and Conclusions

There is universal agreement that the prototype modules supplied by the University of Hawaii are technically sound and valuable to the Lesotho effort. They have proven to be relevant and are relatively easy to adapt to conditions in Lesotho. In addition, the evidence suggests that the competency-based curriculum can be used effectively to train nurse-clinicians.

Some trainers have changed material for classroom use, but this appears to be a temporary phenomenon, the result of using rotating tutors who have not been adequately trained in the system. The replacement of rotating tutors with full-time staff and greater control over occasional visiting teachers should minimize this problem in the future.

Surprisingly, there were almost no objections to the modular, competency-based approach to training, although some students expressed an interest in having access to a library where they could study subjects in more depth.

Although the nurse-clinician training is proceeding satisfactorily, much work remains in defining the role of this new health worker vis-à-vis the supervising physician, the VHWs whom they are supposed to support and supervise, and the public health nurses and other fieldworkers with whom they work. The linkages and roles of all these workers have not been clearly defined. The physicians' role in supervising the nurse-clinicians is particularly important, given the relatively short assignments of most expatriate doctors. The physicians must be guided to perform their assigned role so that the supervision envisaged in the three-tiered MEDEX system is in fact provided. If this vital link is missing or functioning imperfectly, the nurse-clinicians may have serious problems.

Neither the MOH nor the University of Hawaii has developed a formal evaluation plan or evaluation instruments to measure the success or failure of the project. All parties seem to think that evaluation is necessary and worthwhile. The University of Hawaii has developed an evaluation protocol which, although it needs to be improved and updated, could be adapted to the situation in Lesotho.

Among the data required in the University of Hawaii evaluation protocol are numbers of existing manpower and facilities, as well as some utilization data. This information has been collected in Lesotho and could be used as baseline data. Other data on the percentage of the population who use care at a given clinic--with or without a nurse-clinician--cannot be obtained from the present data system. Changes may be required in the basic health reporting system.

The present system does not record how many individual patients are seen in a given period of time (i.e., one year). This information could be obtained relatively easily by asking the patient whether this is his/her first visit this year. The information could be recorded each day on the forms on which other health information is recorded. In the absence of records which indicate whether a patient is visiting a clinic or other facility for the first time, or for the first time in a given time period, it is not possible to determine what percentage of a given population is being served by the new practitioners.

It may be necessary to review and revise the health records used in the field by the nurse-clinicians and other clinic staff to ensure that the above evaluation and proper planning are available to project managers. Medical records and their use is an area of considerable specialized knowledge. The employment of a short-term outside consultant in this area might, therefore, be considered.

The process of institutionalizing the MEDEX system in the Ministry of Health has only just begun, and considerable effort must be made to ensure that counterparts are in place and functioning and that curriculum development is an ongoing part of the MOH's training system. Furthermore, the management and planning capabilities that are essential to future refinement-and-improvement efforts must continue to be stressed. Senior managers in the MOH are fully aware of this need, but here, as in most less developed countries where key personnel are particularly scarce, constant vigilance is needed to ensure that the entire primary health care system becomes self-sustaining after University of Hawaii personnel are withdrawn.

It would be sensible to make the adapted modules a more obvious and integral part of the ministry system. At this time, many persons in Lesotho think the modules belong to the University of Hawaii. The modules should be regarded as a ministry product. To facilitate the necessary change in perception, it might be useful to print the modules as official government documents and to treat them as such in the future.

Better cost-accounting data are needed for use in the districts. The added cost of the nurse-clinician program must also be considered. This area of concern has been identified by both University of Hawaii field staff and by the Ministry of Health. It is related to the general problem associated with the existing pattern of centralized financing practiced by the GOL. It is possible that a short-term consultant could provide assistance in this area. His responsibility would be to identify present costs and suggest changes in accounting that will result in the provision of long-term, ongoing data.

The MOH recently received a report from the PHAL which describes how costs are allocated within each PHAL mission hospital. The ministry does not have parallel data for its own hospitals and clinics. Similarly, the cost of hospital activities in relation to clinic activities cannot be established. Also, it is not possible to analyze cost-per-person served or cost-per-person in a service area. This kind of information is vital to the understanding and evaluation of the usefulness of any changes in the primary health care system.

The additional cost of deploying the nurse-clinicians in both the government sector and the private sector has been considered by the Ministry of Health. The MOH is committed to resolving this issue, but

inadequate data are available to make the necessary decisions. At this time, the GOL is deciding how best to provide financial support for mission costs, which will increase with the deployment of nurse-clinicians (and for other reasons). At the time of this evaluation, no firm decision had been made.

As in most countries, there is an enormous demand in Lesotho for curative care. That demand is so great, in fact, that the curative role of the nurse-clinician may overwhelm outreach and the supervision of non-clinical village health activities. Given the limited time and energy of those in the delivery system, the competition between curative and preventive activities should be monitored carefully. There is pressure now to use the nurse-clinician as a screener in large outpatient departments in both mission and government hospitals. The MOH may have difficulty maintaining the proper balance in the system.

The MOH has dealt with the legal aspects of establishing the nurse-clinician as a new professional category. An amendment to the present act governing the nursing practice is pending in the legislature. It is possible that as job functions are clarified, it will be necessary to create other regulations or to make other changes.

The nurse-clinicians who are in training have found their training to be very good. The modular material is understandable, and the audio-visual aids are a useful, if not a central, element of the learning experience. The nurse-clinicians are interested in future in-service follow-up training. The effectiveness of the clinical experience has varied, largely in relation to the interest of and the support provided by the physicians with whom the nurse-clinicians have been associated. The nurse-clinicians anticipate that their chief problems in the field will be transportation and communication. These two areas warrant further study in light of the costs and benefits involved and the results of an assessment of the GOL's financial and other capabilities.

Relations between the University of Hawaii team in Lesotho and HMDS headquarters staff have been good. The field team found headquarters support to be reliable and knowledgeable. The team in Maseru feels that it has had sufficient authority to adapt the prototype material to conditions in Lesotho and has not been unduly constrained by headquarters. (In fact, three modules for which prototypes did not exist were produced in Maseru, using the basic MEDEX framework.)

Communications between the University of Hawaii team, in both Honolulu and Maseru, and the Ministry of Health are not adequate. Goodwill exists on both sides, but overall working relations are not as productive as they should be. As a minimum, information-exchanges should be improved by scheduling more joint meetings or by increasing the flow of information in both directions. In the absence of more complete knowledge of the

history, personalities and issues, the evaluators cannot make more specific recommendations. It is evident that a problem does exist and that work is needed to improve the present situation.

Appendix C

PAKISTAN PROGRAM REVIEW

Summary

In January 1981, four MEDEX long-term advisers left Pakistan, thus closing Phase I of the USAID-supported Basic Health Services (BHS) Project, which had begun in September 1977. The anticipated five-year follow-up (Phase II) was in abeyance because of the discontinuance of economic aid under the Foreign Assistance Act. (The termination of aid had led to a sharp reduction in loans for the construction of facilities during Phase I.) The MEDEX advisers who were evacuated to Hawaii between December 1979 and January and February 1980 found it difficult to reintroduce their services into Pakistan. At the onset of Phase I, major changes in government had taken place, and some of the most politically powerful supporters of the BHS Project lost office.

Despite these difficulties, the Health Manpower Development Staff (HMDS) was able to combine MEDEX core technology with a technical advisory program to achieve the following in Pakistan:

- Publication and use of several thousand sets of training modules (1,573 pages, 6 volumes) for mid-level health workers (MLHWs). The modules are recognized as the first printed, explicit teaching materials in Pakistan for paramedical workers. Based on competency-based training principles, these materials are used to teach both students and teachers about the necessary objectives, evaluations, and activities that are part of the basic health services system. The modules have been used in 20 schools in all four provinces to train 650 paramedicals. The materials were developed through the successful implementation of a key strategy of the MEDEX approach: local adaptation of materials. Pakistani health personnel adapted for their systems the prototype modular training materials that were developed and that are regularly updated by HMDS core staff at the University of Hawaii.

- Successful orientation, via the MEDEX-guided, two-and-one-half-month adaptation workshop, of Ministry of Health (MOH) doctors, administrators, and paramedicals to the concepts, procedures, and training required to deliver primary health care (basic health care) services.

- Acceptance of the concept of competency-based training by Ministry of Health planners and administrators and the staff of certain medical colleges and paramedical training schools.

- Development of more than 20 pilot projects in local villages to teach communities to identify, and MLHWs to train, community health workers (CHWs). Despite the apprehension about involvement in local politics, there have been positive and encouraging results. A 381-page manual to guide MLHWs and CHWs in the training of the latter has been developed through intensive field work and collaboration between MEDEX and Pakistani personnel.

- Apparently successful, although inadequately documented, development of the training skills of trainers of both MLHWs and CHWs. Several workshops (e.g., adaptation workshop, teacher-training workshop, preceptor-deployment workshop) were conducted for this purpose.

- Improvement in the teaching of paramedicals through the innovative provision and use of teaching slides (3,000) keyed to module texts, of algorithmic protocols to clarify the diagnosis of health problems, and of management protocols to guide treatment.

- Examination and documentation of the principal management problems to be overcome in establishing and operating an Integrated Rural Health Complex (IHRC), the major organizational unit chosen for the implementation of basic health services. Five management studies were completed and issued in a 405-page report, a national management workshop was held, and an Operations Manual for IHRCs (78 pages) was produced. The written materials should facilitate discussions among the staff of the federal and provincial health and finance organizations who are concerned about improving the management of the basic health services.

These and other achievements attest to the effectiveness and value of applying in Pakistan the MEDEX conceptual frameworks, training materials, procedures, and workshops developed by the HMDS under the AID core contract. The accomplishments are in part attributable to the capabilities and work of the in-country HMDS advisers and the short-term consultants from the University of Hawaii.

Paramedical training in Pakistan has been, and is likely to remain, greatly improved as a result of the successful implementation of the MEDEX design approach (MDA). However, many problems and weaknesses remain, and there are uncertainties about the successful development and operation of the basic health services system. In large part, this is due to the premature termination of project activities. Much progress was accomplished in three years, despite the extraneous circumstances, but between five years and 10 years are needed to launch firmly large-scale change in the health service system. Some deficiencies in the MEDEX design system approach were identified as contributing to weaknesses in the BHS system (e.g., limited technical capacity in the federal and provincial BHS cells, variable support for BHS in the several provinces, limited understanding and support of BHS by medical officers, limited support of the CHW and community participation aspects of BHS, ambivalence toward technical assistance, etc.). The shortcomings of the MEDEX inputs were identified. These shortcomings can be ameliorated; some have already been addressed in recent modifications of MEDEX core materials. They include:

- Concentration on the role of MLHWs which results in insufficient attention to the importance in BHS of the roles of district health officers, tehsil and district hospitals, medical colleges, community health workers, and community health committees.

- Insufficient emphasis on organizational st engthening and institution-building of the BHS cell of the Ministry of Health and provincial health units.

- Insufficient provision for systematic, organized feedback from HMDS field staff and from Pakistani counterparts on the technical aspects of the program.

- Insufficient attention to the politics, history, and structure of the health service system in Pakistan and to the lessons learned from numerous earlier attempts to develop cadres of paramedical staff.

- Insufficient specification in the modules of the tasks required to institute preventive and community health programs in the field.

- Higher priority, in scheduling and rescheduling short-term consultation, given to central HMDS/Hawaii needs than to timing and technical assistance needs of Pakistan.

Background

A. Early History

The idea of using regionalized health centers in Pakistan to provide rural basic health services has its origins in the Bhore Committee Report (1946). An approach to using paramedicals to provide extended basic health services, the Peoples Health Scheme has been a feature of the last several health plans. The different programs have had varied, limited success because of the difficulty of supporting the activities of paramedicals and of establishing these personnel within the Ministry of Health, with its structure of posts, grades, promotions, and salaries. Various paramedicals have been trained, including:

--lady health visitors;

--rural health inspectors;

--medical assistants;

--health guards;

--dispensers;

--compounders;

--sanitarians; and

--malaria workers.

B. Development of the Project

The World Health Organization (WHO) sponsored an exercise in health planning, "Country Health Programming," which lasted from November 1974 to March 1975. This led to the formulation of the Basic Health Services Project as a means to extend health services to rural areas using health auxiliaries. Following the exercise, the Planning Commission held the Health Auxiliary Teachers Workshop (July 21-23, 1975), and the Health Manpower Training Workshop (November 17-22, 1975), at which Dr. Richard Smith, director of the HMDS, presented the concepts of competency-based training. Dr. Siraj Ul Haq, chief of health planning, earlier had heard Dr. Smith at a meeting in the Sudan to which he had been invited by WHO's

expert in training, Dr. Flahault. The Health Manpower Training Workshop, organized with the technical assistance of WHO and the University of Hawaii, used the staff of the HMDS. Dr. Smith gave the keynote address. Joyce Lyons, also of the HMDS, co-chaired the first technical session, the subject of which was community health workers. Dr. Michael O'Byrne chaired the second technical session, on health auxiliaries.

HMDS staff members Dr. Archie MacPherson and John LeSar were invited to help write AID's project paper (PP) on basic health services. The PP ultimately led to a loan and grant agreement, which was signed in April 1977. An AID-financed host country contract for technical assistance was signed by the University of Hawaii and the Government of Pakistan (GOP) on June 11, 1977.

The first HMDS long-term advisers, Dr. Jack Watson, chief-of-party, and Dr. Michael O'Byrne, an expert in the development of curricula and modules, arrived in Islamabad in September 1977. The field operations nurse, Dick Johnson, arrived in December 1977 to develop the community health worker and community participation component. A regional training adviser for the large province of Punjab, Dr. Michael Porter, was recruited in January 1978. A fifth position, Management Systems Adviser, was supposed to have been filled by the WHO. However, this responsibility was never adequately encumbered until the HMDS contract was amended to authorize the HMDS to recruit John Eaton in April 1979. The complement of field advisers changed after Dr. Watson left the project in March 1979 and was replaced by Dr. Porter, who in June 1979 was replaced in Punjab by Dr. Robert Mack. Dr. O'Byrne left at the end of his two-year tour, but he was not replaced.

The HMDS' advisory efforts were complemented by the following short-term consultancies:

Date	Consultant	Assignment
August 1978	R. Smith	Project Review
November 1978	E. Petrich	Project Administration
May 1979	J. Lyons and J. Rich	Tutor-Training Workshop and Training Schools
July 1979	P. Alt	Contract Discussions
September 1979	T. Coles	Preceptor-Deployment Workshop
November 1979	M. Bomgaars	CHW Workshop

Date	Consultant	Assignment
September 1980	E. Petrich	Management and Planning Workshop

A National Basic Health Services (NBHS) cell was created by the GOP, and Dr. Mushtaq Ahmed Chaudhary was placed in charge. Dr. Watson visited five medical colleges in October 1977.

Three basic problems became apparent within the first several months of the project. One, the person in charge of the Training Section of the NBHS, Bashir-ul-Haq, left his position, thus handicapping curriculum development and tutor-training activities. No technical replacement was appointed as a counterpart to the HMDS staff, although the position was subsequently filled by an administrator. Two, some of the provincial departments of finance and of planning and development were reluctant to release funds to the provincial health departments for BHS programs. This was and continues to be a serious problem because implementation rests with the provinces. Three, the WHO failed to provide the management adviser as agreed. When an adviser was recruited (after more than a year's delay), he was found to have the wrong skills, and he lasted only 14 months. He was replaced by a member of the HMDS, John Eaton, through a special amendment to the agreement, in April 1979.

Perhaps the most important factor contributing to the dislocation of this project was the removal from power of Prime Minister Bhutto before the HMDS team arrived. The Director-General of Health, General Nasir Sheikh, who had been a strong proponent and architect of the BHS program, departed also. Subsequent changes in officials at provincial levels and the diminished political support of the NBHS cell have hampered implementation of the project. Consequently, progress in the development of training seems to be all the more impressive.

The successful implementation of the Basic Health Services Project has been affected also by the contractual mechanism. The use of a host-country contract for Pakistan was not appropriate, given the smallness of the host government institution (the NBHS cell) and its limited management capacity. The AID mission, therefore, did much of the managing. This was an awkward arrangement, and intrinsic irritations were aggravated when the unilateral decision was made to evacuate the HMDS team when the U.S. Embassy was burned. Also, the reduction in AID funds available to the project following termination of U.S. aid affected the quantitative outputs of the project.

It was envisioned in the original PP that ambitious accomplishments would be made, but, partly because of the problems described above,

outputs were modest. It was envisioned that, at the end of three years (Phase I), there would be 12 functioning Integrated Rural Health Complexes covering 3.4 million people, 36 training units in the provinces, 108 trained tutors, 810 trained mid-level workers, 1,350 trained community health workers, 24 trained executive managers, 48 trained district and assistant district health officers, 65 trained personnel managers, 65 trained drug and supply managers, 65 trained budget and financial planners, and 60 trained information-system supervisors. These ambitious outputs had not been met when the project was terminated in January 1981. Not one of the six IHRCs that were retargeted through amendments was in operation. However, Pakistan-adapted, competency-based curricula had been developed for both mid-level and community health workers, 20 schools had been established, more than 400 mid-level workers had been trained, and several score of community health workers had been trained in pilot efforts by, and as part of the field-training of, mid-level workers.

Evaluation of MEDEX Technology

It is the intention of the authors of this report to evaluate the use and impact of the MEDEX technology in the Pakistan project, and not the success of the project itself. Through reconnaissance visits, primary health care seminars, and assistance in the development of PIDs and the design of PPs, HMDS staff affected Pakistani thinking and planning for the Basic Health Services Project. The effects of the HMDS frameworks on the conceptualization of primary health care in Pakistan and on the design and implementation of the BHS Project are difficult to determine. The workshops held in Pakistan clearly influenced the thinking and skills of the Pakistani participants, although their impact was diminished somewhat because the same participants did not continue through the several workshops. Four of the six workshops were held: Curriculum Adaptation (January 1978), Teacher-Training (May 1978), Preceptor-Deployment (September 1979), and Management (September 1980). The project was not sufficiently advanced at termination to hold the workshops in continuing education or evaluation. Long-term technical assistance was provided by a medical/public health chief-of-party, a community health worker trainer/developer, and a management analyst in the NBHS cell in Islamabad, and by a medical/public health training adviser in Lahore, Punjab. Although valuable time was lost and the influence of the staff was diminished when U.S. personnel were evacuated, it is clear that by providing technical assistance, the HMDS was able to mobilize provincial and NBHS personnel to use the prototype materials. A WHO training adviser, Dr. Giacometti, joined the BHS Project in July 1978. Dr. Giacometti worked first in Sind and Baluchistan and then moved to Islamabad, where he is now the principal long-term technical adviser, the replacement for the HMDS team. He appears to be more concerned with the local political and organizational processes that support CHWs than with the development and use of training and guidance materials. His approach may complement that

of the HMDS, for village-level health organizations are not a focus in the PP nor in the Medex prototype materials. HMDS short-term technical assistance has been knowledgeable, skillful, and effective, especially in the context of workshops, but it has not been used to the extent anticipated because of the dislocation of the project and difficulties in scheduling (e.g., HMDS management consultants were unable to respond to the Pakistani request to attend the workshop in supervisory management because they had other commitments).

Problems and Status of the BHS Project

As was indicated in a preceding section of this report, the Basic Health Services Project grew out of a WHO-sponsored exercise known as Country Health Programming (1974-1975) and a subsequent workshop in health manpower training (November 1975). The AID project paper was prepared in the months that followed these activities. During that period, the project benefited from the strong interest and support of Prime Minister Zulfigar Ali Bhutto and his personal physician, then Director-General, Nasir Sheikh. However, not long after the project agreement was signed (April 1977), Prime Minister Bhutto was deposed. By the time the University of Hawaii team arrived, Bhutto and Sheikh had both departed, and the momentum generated by support at such high levels had dissipated. As a result, the environment for the project was altered substantially and the problems that are common to a project of this kind were compounded.

The University of Hawaii staff found that there was a limited awareness of the project and varying degrees of support among the provincial governments. This may have been because the project earlier had depended on high-level support only. The national consensus which was assumed to exist was in fact wanting.

The USAID agreement with the Government of Pakistan called for the establishment of a National Basic Health Services cell, which was to be staffed with five full-time professionals. The unit was never fully staffed. In addition, the process of establishing civil service status at an appropriate level for the new medical technicians was very slow, and in fact the process was not complete when the Hawaii team was phased out.

Several implementation problems hindered the project as well. The long delay in filling the position of Management Adviser and the related difficulty of integrating the WHO regional training adviser into the University of Hawaii team complicated implementation and made coherent project development much more difficult. The departure of the Hawaii team leader after only 18 months was also a setback, as was the departure of the medical education curriculum specialist at the end of his first

two-year tour. There were several controversial contract management issues (e.g., housing, post differential) which periodically diverted attention from substantive tasks. The burning of the U.S. Embassy in November 1979 and the subsequent evacuation of the entire University of Hawaii team created frictions with the Ministry of Health which were only slowly overcome.

Despite these and many other, more ordinary, implementation problems, by the time the Hawaii team departed in early 1981, a great deal had been accomplished. A summary of the status of the project and of accomplishments to January 1981 follows.

- Modules for mid-level health workers were successfully adapted and published.
- The materials for community health workers were adapted, and manuals were published in English and Urdu. (To date, these have not been used in field operations.)
- Medical technician training schools were established in all four provinces, and 650 medical technicians were trained or placed in training.
- Although a number of medical technicians have been trained, none have been officially deployed. Formal positions have not yet been established, nor have test results been announced. (Some medical technicians are working in the field, however, in positions they occupied before their training.)
- Efforts are being made to create new civil service positions for medical technicians. (The action has been pending since 1978 in an inter-provincial council.)
- There has been a general acceptance of the competency-based training approach.
- The pace at which the new system is being accepted and adopted in the different provinces varies. The Northwest Frontier Province is leading the way with a rather enthusiastic effort, but the Punjab is moving much more slowly. There have been significant and favorable changes in the attitudes of many federal and provincial health officials.
- It is reported that there have been successful pilot efforts to organize efforts at the community level,

using medical technicians (MLHWs) in field-training to help select and train community health workers.

- Many efforts have been undertaken in Pakistan to develop supervisory and community health instruments. An initial effort also was made to design a method for evaluating the effectiveness of medical technicians in the field.

- A workshop methodology has been effectively used to produce materials, train participants, etc. A large collection of slides (3,000) has been assembled by the HMDS and integrated into the instructional materials for medical-technician training.

Observations on the Use of the HMDS Technology in Pakistan

The review of the application of the MEDEX technology revealed areas of strength and weakness. The evaluation team's observations in both areas are provided below.

A. Strengths

Overall, the quality of the technical assistance provided by Hawaii field personnel was very good. The team in Pakistan was well supported administratively by the HMDS in Honolulu. The team had adequate authority to adapt HMDS materials to the Pakistan situation and benefited from a flow of information on the evolution of the MEDEX technology. The MEDEX team was well supported by competent short-term consultants from Honolulu.

The training materials were generally excellent. By using the prototype modules, the team saved a great deal of time in preparing the material in Pakistan. Both Pakistani and American personnel stated that approximately 80 percent of the prototype material found its way into the final Pakistani modules for MLHWs. The formats for the instructional materials were understandable and could be used by Pakistani trainees. The slides were helpful, and there appeared to be a consensus among Pakistani trainers that the algorithms could facilitate teaching.

The methods used by the HMDS were also effective. The competency-based training approach was accepted and appreciated by everyone whom the evaluators contacted. The use of an adaptation workshop to alter the HMDS modules for use in Pakistan was also successful. Various levels of Pakistani officials and persons outside the government participated in the

workshop, and, as a result, MLHW materials were produced which were universally praised by the Pakistanis encountered during the evaluation. The workshop was a good orientation for the participants who were to work in primary health care and to teach health workers. The workshop in teacher-training was appreciated, but some felt that it should have lasted longer.

B. Weaknesses

There was evidence that the technical assistance provided by Hawaii staff had certain weaknesses as well as strengths. There was a feeling among some Pakistanis that the field team was not as collaborative as it might have been and the members tended to operate in isolation from their Pakistani colleagues. There was also less institutional development than was desired, in part because the GOP did not provide adequate counterpart staff. The Hawaii approach in Pakistan was heavily oriented toward the mid-level worker, and insufficient attention was given to the community level and to the integration of the doctor into the PHC system. The feeling among MOH personnel was that the HMDS orientation toward the role of the MEDEX-type MLHW tended to discourage the inclination to build on previous national experience. Both Hawaii field staff and Pakistani health officers felt that HMDS staff in Honolulu did not pay enough attention to experience and realities in the field.

Several weaknesses in training materials and methods were identified. The teaching materials will need to be revised periodically, but no plan or systematic approach for feedback or future adaptations has been developed. Some of the materials have been translated by individual teachers into Urdu to facilitate instruction, but ad hoc translation is not a reliable approach. The algorithms are understandable and usable, but they were not sufficiently explained to tutors and provincial training officers. The selection and training of tutors were not sufficiently systematic, nor was the training itself considered long enough to prepare the tutors adequately for teaching clinical skills.

There is a lack of guidance-and-assessment materials and of methods for assessing classroom and field training for medical technicians (MLHWs). The Hawaii advisers spent little time verifying how methods and materials were being used and whether they were being used as intended. Competency-based training applied to the training of teachers would, logically, include the verification of tutors' competency in teaching medical technicians. The examinations given to medical technicians need to be evaluated. In addition, the implications of the rather high rate of failure in these exams need to be considered.

Findings and Conclusions

The principal findings and conclusions of the evaluators are as follows:

- The prototype modules supplied by the University of Hawaii were technically sound and valuable to the Pakistan effort.
- The preliminary evidence suggests that the competency-based curriculum can be used effectively to train medical technicians.
- The limited preliminary evidence suggests that the MEDEX concept of using medical technicians to train community health workers is feasible.
- There is some doubt that the medical technicians will on their own initiative carry out their responsibilities to organize the communities, provide supervision, and deliver preventive care.
- The primary focus in the prototype materials has been on MLHWs; consequently, less attention has been given to the roles and importance of supervisory doctors at the top of the pyramid and to the community health workers at the bottom.
- The Ministry of Health is satisfied with the materials that have been developed and printed. It does not plan to further refine the materials until they have been tested and used in the field for two or more years.
- There are unresolved questions about the capacity of community health workers to perform the multiple tasks assigned to them, and about the means by which CHWs should be compensated.
- There is limited institutional capacity within the federal Ministry of Health and in the provincial governments to carry forward detailed technical work on curriculum design, materials revision, etc. Nevertheless, the federal Ministry of Health does not feel there is a need at this time for additional long-term advisers.
- Additional advisory services will be needed to maintain program momentum, and particularly to support provincial efforts.

- The training and follow-up of the trainers of medical technicians (i.e., tutors and program training officers) have not been adequately assessed or controlled to ensure the quality of the teaching and learning process. Too few instruments, too little guidance, and too little of the long-term adviser's time were provided to verify that medical technicians were being trained adequately. There are indications that in some cases the training has not been adequate to develop acceptable clinical skills.

- Testimony from the NBHS cell and Punjab tutors suggests that the diagnostic pathway protocols were useful and well used by some teachers and students. Further evidence of their utility should be collected.

- The curriculum, teaching materials, and performance assessment instruments do not sufficiently emphasize the preventive, supervisory, and support-of-community health skills and duties of CHWs and medical technicians in comparison with the emphasis on clinical diagnostic and management skills. Recent efforts in Pakistan to develop these aspects have been progressing, despite weaknesses in guidance and prototype materials.

- One result of the long delay in obtaining a long-term adviser is that the management component is lagging seriously behind other program elements.

- Initially, University of Hawaii prototype material on management was not available. Work was done in Pakistan to analyze management issues and to prepare an operations manual. Only recently was the first draft of the manual prepared.

- The use of a host country contract mechanism for University of Hawaii services was not productive. Neither the Government of Pakistan, nor the University of Hawaii, nor the USAID found the mechanism acceptable.

- The University of Hawaii core staff in Honolulu have been effective in providing administrative support, in furnishing competent short-term consultants, and in giving field staff adequate authority to respond to local conditions.

- The Hawaii core staff have been less effective, however, in maintaining an effective dialogue with field personnel on technical and program issues, in orienting long-term advisers before they depart for field assignments, and in examining and using field experience to revise prototype materials.

- The major work of implementing basic health services will be done at the provincial and district levels during the next several years. The federal National Basic Health Services cell has completed the initial set of training materials. The effective operation of training schools and the implementation of integrated rural health complexes will be accomplished, it is hoped, at provincial and lower levels of government.

- Short-term follow-up consultation with HMDS technical personnel who are familiar with the Pakistan BHS program would be fruitful. Consultation might be provided on one of the routine components of the MEDEX system that has not yet been used in Pakistan (e.g., continuing education or evaluation workshops could be held). The timing and objectives of the consultation and of the workshop should be determined by the NBHS cell.

Appendix D

SUMMARY DESCRIPTION OF MEDEX

MEDEX originated in the United States in response to the poor geographic distribution of physicians, and in particular to the limited availability of physicians in rural areas. The term "Medex" is used to denote a trained medical- or physician-"extender"--a paramedical technician who, under the general supervision of a physician, is able to treat most routine cases ordinarily seen by a physician. Where Medex are available, doctors are free to attend to more complex medical problems and to bring medical attention to a much larger number of patients. The first formal program for training this new category of health professionals was established at the University of Washington in 1969. Between 1969 and 1974, with the support of the U.S. Department of Health, Education and Welfare (DHEW),* the system for training and deploying physician-extenders was developed and implemented in nine medical schools in the United States.

The MEDEX concept was next applied to and further developed in Micronesia under the sponsorship of the DHEW and the Government of the U.S. Trust Territories. A large number of Micronesians were trained for service as Medex. Subsequently, these physician-extenders trained community health workers, thus bringing to fruition the concept of a mid-level health provider who links the physician to the village-level worker. The MEDEX approach was also applied, with AID support, in Lampang Province, Thailand.

Recognizing the relevance and potential value of MEDEX for less-developed countries (LDCs), AID encouraged further development of the concept. In 1974 it funded a contract under which the Health Manpower Development Staff (HMDS) was established within the John A. Burns School of Medicine at the University of Hawaii. The director of the HMDS, Dr. Richard Smith, played a key role in the development of MEDEX concepts and has been associated with the program since its inception at the University of Washington.

With the provision of AID funding support in 1974, the primary direction of the effort to develop MEDEX was shifted away from the U.S.-based physician-extender program to a three-tiered system (physician, mid-level paramedical technician, and community health worker), the evolution of which had already begun in Micronesia. AID supporting funds for the HMDS were provided initially through a DHEW contract, which was in effect from June 20, 1974 until December 31, 1975. This initial period was defined as Phase I. Phase II also was financed by AID through the DHEW; it lasted

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* Now known as Department of Health and Human Services, or HHS.

from January 1, 1976 until June 30, 1978. Phases I and II were devoted primarily to the development of basic materials and processes to support a three-tiered MEDEX system for providing primary health care (PHC). During this time, draft competency-based training materials were being prepared.

Following a positive assessment in 1977 of progress in the development of materials, AID decided to continue and expand its support for HMDS activities. A five-year program of support (Phase III) was drawn up and approved, and a contract between AID and the University of Hawaii was signed. The contract covers the period July 1, 1978 - June 30, 1983. The objective of this contract is "to complete the development of [the] MEDEX technology started in Phases I and II and to provide technical assistance to selected LDCs in the design and operation of integrated MEDEX primary health care systems." (During Phase III, the HMDS has placed increasing emphasis on the improvement of the management infrastructure of PHC programs.)

By the beginning of Phase III, the evolution of the MEDEX system had already benefited from early experience in Micronesia and Thailand, and a beginning had been made in Guyana and Pakistan. But with Phase III the primary focus was shifted away from the basic design and development of training and other modules and toward the application and field-testing of the MEDEX approach, even though some work still remained to be done on some prototype modules. It is implied in the core contract for Phase III that primary health care programs will be established in as many as eight countries under separate USAID mission contracts with the University of Hawaii. In addition, the University of Hawaii is requested to establish a "network" of additional universities that are capable of staffing and supporting MEDEX programs in LDCs.

AID-financed and HMDS-supported programs were established in Pakistan in 1977, in Lesotho in 1979, and in Guyana in 1980.* (The project in Guyana was an expansion of an earlier program involving the HMDS; financing was provided by the International Development Research Center of Canada (IDRC).) The HMDS also provided program design and advisory services in Liberia and Cameroon.

The System Approach

As developed by the Health Manpower Development Staff, University of Hawaii, the MEDEX "system" is a comprehensive, evolving technology for the

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* Although these activities were funded outside the core contract, materials and core staff support from the core contract were used.

development and implementation of primary health care systems. It encompasses a three-tiered, pyramidal structure. The organization is under the overall supervision of a physician, with paramedical personnel at the middle level and community-based workers at the bottom. Collaboration among these health workers is essential. The mid-level health workers (MLHWs) are responsible for training, supporting, and supervising community health workers (CHWs) and for providing primary health care services. These PHC services include preventive and promotive health activities as well as curative care.

MEDEX provides a systematic overview of the main problem areas that must be addressed in order to develop primary health care systems that work. These are: a broad sense of support, a receptive framework, the involvement of physicians, competency-based training, a deployment system, continuing professional development, managerial support, evaluation, and information-feedback. By using MEDEX prototype materials and concepts, a host government should be able to develop constructive solutions to these problems.

HMDS systems-analysis, accompanied by appropriate primary health care planning assistance, provides a framework within which the rationale and strategy for primary health care in a particular country can be developed and all the components of the MEDEX technology can be integrated. In the context of that general framework, and with the development of host country self-sufficiency as a goal, the HMDS focuses on two critical intervention points in primary health care: manpower development and management systems.

The HMDS has developed prototype health and management training and operational materials, known as modules, in addition to a systematic process to adapt the modules to country-specific needs and resources. Competency-based training techniques were used to develop the training modules. In the competency-based approach to training (a feature of the system), the precise skills and knowledge which are needed to perform a given task (or set of tasks) are determined. A step-by-step training program is then devised. Self-instructional as well as teaching and audio-visual materials are used to prepare each student to perform all the tasks which his designated role requires.

Each training module has four basic components: the student text, the instructor's manual, evaluation material, and adaptation aids. In addition to these materials, the HMDS has prepared operations manuals to guide advisers and host country personnel in the adaptation, training, and management processes. It is inherent in the system that the prototype materials must be adapted to the environment of the country where they are to be applied. To this end, and to ensure that health workers are both knowledgeable and motivated, specially structured workshops have been developed. Among them are adaptation workshops, teacher/trainer workshops, preceptor-deployment workshops, continuing education workshops, management workshops, and evaluation workshops.

The prototype materials have been designed to prepare mid- and community-level workers to perform their clinical and preventive health functions. Other materials cover the analysis, management, and use of the support systems (e.g., financing, personnel, logistics, drug supply, etc.). These support systems must be in place for a primary health care system to operate successfully.

MEDEX Technology

The term "MEDEX technology" refers to the entire body of orienting frameworks, methods, and training materials and other instruments developed and used by the Health Manpower Development Staff of the University of Hawaii to help developing countries implement and operate their own functioning primary health care delivery systems.

These tools must:

--be capable of serving as a coherent approach to developing strategies for health planning;

--be based on considerations common to most programs;

--be broad enough to be relevant to common problems, but also flexible enough to be adaptable to the needs of specific settings;

--contain a starting point and an initiation technology to implement plans; and

--be capable of producing country-specific programs that are applicable throughout the country.

It is worth noting that the following elements, which are described in MEDEX writings and used in [illegible] systems, were first developed in various countries by others before either MEDEX or the HMDS was created:

--low cost delivery systems;

--three-tiered health services;

--basic health services;

--community-based health services;

--physician-extenders;

--auxiliary health workers;

--medical assistants;

--intermediate or mid-level health workers;

--task analysis;

--behavioral objectives;

--competency-based training and curricula;

--systems approaches to health services; and

--regionalization of health services.

Although few of its components are unprecedented, the MEDEX technology is, nonetheless, a unique elaboration and combination of (1) frameworks for guiding the conceptualization and planning of an entire PHC delivery system (the MEDEX Design Approach, or MDA); (2) instruments and materials that are immediately useful in developing various parts of the system; and (3) processes for ensuring that frameworks and materials are used constructively. With their overviews of systems, the frameworks help designers avoid a "bits-and-pieces" approach to health services that often creates unviable systems (e.g., dispensary nurses without supplies). By providing a solid, comprehensive basis for the development of country-specific training materials, the HMDS speeds up the development of a training capability and improves the quality of training through a competency-based approach. The aim in using the processes is to ensure the local adaptation of only that material brought into the country which is needed (or selected), the involvement of appropriate host country personnel in the process, and the development in the host country of skills needed to run an appropriately designed and viable system.

A. MEDEX Design Approach: Frameworks

The purpose in using orienting frameworks is to obtain a holistic overview of PHC that can be used to guide developing countries toward a rationale that leads first to a coherent strategy and then to effective activities to achieve a viable and well adapted national PHC delivery system. This set of frameworks is called the MEDEX Design Approach (MDA). (These frameworks are graphically illustrated in Exhibit A.) Through systems planning and management and the training and deployment of mid-level and community health workers, a tiered system is created and the capacity of the host country to plan, manage, and train is developed.

Exhibit A

FRAMEWORKS OF THE MEDEX DESIGN APPROACH

ASSUMPTIONS →	MDA ACTIONS →	TO ACHIEVE →	TO MINIMIZE PROBLEMS
PHC services are integral to rural development.	Develop a rationale, then a strategy, for a PHC system.	Broad Support Base	Fragmented Development
MLHWs and CHWs bridge the gap between modern medicine and community needs.	Obtain national commitment.	Receptive Framework	Lack of National Commitment
Development and deployment of appropriate manpower leads to health system reorganization.	Use a system-approach to rationalize sectors.	Doctors' Involvement	Obsolete Health Service Organization
Community health programs survive only if they are connected with the larger, central government system.	Analyze and strengthen support systems.	Competency-Based Training	Inadequate Management and Support
Intermediate-level health workers are needed for central acceptance and support of village health workers.	Develop: a. Peripherally-delegated tiered manpower structure; b. Receptive framework for MLHWs and CHWs.	Development System	No Overall PHC Manpower Plan
CHWs and MLHWs are more acceptable if they are trained as doctor-extenders rather than as substitutes.	Train for competency.	Continuing Education and Professional Development	Ineffective, Inefficient Training
	Link center to periphery through MLHWs.	Evaluation and Health Information Feedback System	Unlinked National/Regional/Community-Level PHC Programs
	Develop capability to plan PHC.		Undeveloped Planning Capability for PHC
	Develop continuing education.		No On-the-Job Continuing Education

B. MEDEX Instruments

Among the MEDEX instruments are prototype training materials, modules, guidance materials, checklists, and guidelines for the reports, documents, and audiovisual materials that are produced by the HMDS and available from HMDS headquarters for use in developing PHC systems. This large collection of materials is continuously updated and revised. The tools can be categorized as follows:

- Training Modules and Reference Manuals for Mid-Level Health Workers and Community Health Workers

  Core Skills

  Primary Health Care of Mid-Level Health Workers

  Anatomy and Physiology

  Medical History

  Physical Examination

  Causes of Diseases

  General Clinics

  Common Skin Problems

  DEENT Problems

  Respiratory System and Heart Problems

  Gastrointestinal Problems

  Genito-Urinary Problems

  Infectious Diseases

  Common Medical Conditions

  Trauma and Emergency

  Patient Care Skills

  Trauma and Emergency

Maternal and Child Health (MCH)

Problems of Women

Child Care

Family Planning (FP)

Diseases of Infants and Children

Prenatal and Postnatal Care

Labor and Delivery

Community Health

Community Environmental Health

Community Family Planning

Community Nutrition

Working with Communities*

Training Mid-Level Health Workers to Train CHWs*

Community Health Workers

Primary Health Care for CHWs*

First Aid*

Diarrhea and Dehydration

Nutrition

Hygiene

Clean and Safe Normal Delivery

High-Risk Pregnancies

Community Cooperation

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* In early stages of preparation.

- Technical Guidance in Project Design and Preparation of Project Identification Documents (PIDs) and Project Papers (PPs)
- Curriculum Adaptation Workshops
- Teacher-Training Workshops
- Preceptor-Deployment Workshops
- Continuing Education Workshops
- Management Workshops (analysis of PHC support systems)
- Evaluation Workshops
- Orientation of Long-Term Advisers
- Support of Long-Term Advisers
- International MEDEX Workshops
- Short-Term Consultancies.

Appendix E

CONTRACT WITH UNIVERSITY OF HAWAII: STATEMENT OF WORK

ARTICLE I - STATEMENT OF WORK

A. Objective

The Objective is to complete the development of the MEDEX technology started in Phases I and II and to provide technical assistance to selected LDCs in the design and operation of integrated MEDEX primary health care systems.

B. Description

1. In order to carry out this program, the MEDEX technology will consist of the following:

a. A set of guidelines for planning, implementing, managing, and evaluating a low-cost, integrated primary health service delivery system appropriate to the specific needs of an LDC.

b. A prototype set of competency-based training modules for:

(1) training MEDEX and community health workers in preventive, promotive, and curative health areas,

(2) mid-level management requirements of rural primary health care systems, and

(3) continuing education requirements of MEDEX and community health workers.

c. The process methodology for transferring and adapting the above to individual countries (e.g., primary health care seminars, workshops in curriculum adaptation, mid-level management, tutor-training, training-site management, and continuing education.

d. During Phase III, the contractor will establish a network of U.S. institutions having domestic MEDEX experience to increase the U.S. response-capability to LDCs requesting technical assistance in implementing MEDEX primary health

Appendix E

CONTRACT WITH UNIVERSITY OF HAWAII: STATEMENT OF WORK

Contract No. AID/DSPE-C-0006

TABLE OF CONTENTS

SCHEDULE

The Schedule, on pages 1 through 22, consists of this Table of Contents and the following Articles:

GENERAL PROVISIONS

The General Provisions applicable to this contract consist of form AID 1420-23C, entitled "General Provisions - Cost Reimbursement Contract with an Educational Institution," dated 7-1-76, and form AID 1420-23D, entitled "Additional General Provisions - Cost Reimbursement Contract with an Educational Institution," dated 7-1-76.

care systems. The prime contractor will sub-contract with network institutions for the purposes of this contract.

2. The contractor shall provide the following specific services:

a. Exploratory briefings in LDCs:

(1) The contractor shall conduct a series of visits to requesting LDCs using two-man specialist teams to conduct informational briefings with AID missions and host officials. Target: Four to eight team visits each year, totaling approximately 30 visits for the life of the project, are expected.

(2) The contractor shall conduct in-depth seminars for Ministry of Health officials, health planners, and other leaders within the medical community on all or specialized aspects of the MEDEX methodology with the intent to assist LDC governments to reach a decision on whether to pursue a program for improving health delivery utilizing MEDEX approaches and technology. It is intended that such seminars will usually be conducted on-site in the host country; however, the contractor is authorized to conduct the seminar on its home campus in those instances where the expanded resources of the university are considered necessary and where the travel of host country national officials can be accommodated within the existing project budget or from other sources of funding. Target: Three seminars per year on the average, for a total of 15 during the life of the project, are anticipated.

b. The contractor shall draft, develop, and produce training modules and related teaching materials for the following four specific categories of training:

(1) MEDEX Training Modules: In countries where a decision is made to pursue a MEDEX primary health care program, field-test and refine 15 existing draft MEDEX modules, and draft, field-test, and refine at least five new MEDEX modules. Targets are for five new draft MEDEX modules. Drafts are to be completed during the first year, and all are to be ready for field-testing at the beginning of the second year.

(2) Management Training Modules: Draft, field-test, and refine five training modules pertaining to management and logistics operations under conditions in (1) above. The focus of the training will be (1) the needs of MEDEX and mid-level Ministry of Health personnel (80 percent) and (2) the formulation of policy and operating regulations to be promulgated by high-level MOH planners and decision makers (20 percent). Targets: Second year, 1; third year, 2; fourth year, 1; and fifth year, 1.

(3) Community Health Worker (CHW) Training Modules: Draft, field-test, and refine eight CHW modules under conditions in (1) above. Modules will be designed and organized for the use of MEDEX as teachers of CHW trainees. Targets are for eight CHW modules in draft. All are to be drafted in the first year. Testing and refinement shall be carried during the remaining LOP.

(4) Continuing Education Materials: Design, draft, and test two modules to be used in a structured program geared to convey refresher information or higher levels of competency to graduate MEDEX and graduate CHW personnel. Modules are to be experience-rated by LDC MEDEX graduates with field experience and evaluated in problem-solving design seminars convened for this purpose. The modules that are developed are in turn to be used and tested in the continuing education workshops described in (c)(6) below. Targets

for convening seminars, workshops, and development of drafts: Second Year, 1 draft module and 1 seminar; third year, 2 workshops; fourth year, 1 draft module, 1 conference, and 2 workshops; fifth year, 5 workshops.

c. Technical assistance and leadership in conducting training programs and project planning in LDCs shall be provided as follows:*

(1) Technical guidance in project design to USAID missions and/or host governments in those LDCs where a decision has been made to pursue a MEDEX primary health care program.

(2) Curriculum Adaptation Workshops: Technical assistance to adapt prototype training modules and materials to country-specific primary health care needs and translation of materials into local languages where needed. Target: Up to eight workshops, one for each country which selects the MEDEX technology approach.

(3) Teacher-Training Workshops: Instruction to familiarize host country teachers in competency-based training methodology and materials. Target: Up to eight workshops, one for each country selected.

(4) Management/Logistics Workshops: Training to instruct MEDEX personnel in administrative/management requirements and logistical support needs of rural primary health care systems. In addition to

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* Note: Implementation of country programs is not provided as a funded service element through this contract, though core staff and technical assistance outputs are available to regional bureaus and USAID missions with their funding travel and per diem expenses for contractor's staff. This applies to those activities taking place following PID approval of a country project. Prior to PID approval, this contract will provide funding for all technical assistance costs to missions.

trained manpower, the workshops will provide the means for integrating MEDEX management technology with indigenous management practices. Target: Up to eight workshops, one for each country selecting the MEDEX technology approach.

(5) Preceptor-Deployment Workshops: A final training phase to structure clinical training experience of MEDEX; the pre-assignment of MEDEX to rural health centers; and teaching physician preceptors how to use and supervise MEDEX manpower. Target: Up to eight workshops, one for each country selecting the MEDEX technology approach.

(6) Continuing Education Workshops: A means to address the need for in-service training, and to maintain the clinical acumen of MEDEX graduates and the proficiency of graduate community health workers on a continuing basis. This program will utilize and refine the module products cited in (b)(4) above. Target: Up to eight workshops.

(7) Evaluation Workshops: An essential process to develop and refine the operational approach involved in data collection for the end-of-project evaluation and to assist in a mid-project operational assessment resulting in timely feedback to ensure continual progress.

d. Network strengthening and strategizing: Creation of institutional arrangements with linkages designed to function after the withdrawal of AID supports shall be accomplished as follows:

(1) Mobilization of U.S. MEDEX expertise and experience through a network organization of U.S. universities with MEDEX experience, funded through subcontracts between the prime contractor and the participating universities.

(2) Inclusion in the network of those institutions within LDCs which will have become centers of MEDEX expertise.

e. Evaluation Protocol:

A specific evaluation protocol will be produced within the first six months of this contract and submitted to AID/DS/HEA for approval. The protocol should cover such issues as (a) Effectiveness: Did the project achieve its planned targets as articulated in the logical framework? (b) Significance: Did the project make a substantial contribution to development? (c) Efficiency: Was the cost-effectiveness satisfactory? It will include methods for assessing improvements in the distribution of primary care providers and the increase in the accessibility of primary health care services to rural people.

f. Participation in Project Evaluation:

The evaluation of the contractor's performance will be conducted by AID with external assistance at the end of Year 3 and Year 5. An annual review and appraisal will also be conducted by AID at the end of Years 1, 2, and 4. The contractor will be required to provide a review of his experience and progress in producing the outputs and services required by the contract. At least four weeks in advance of any such review, the contractor will be advised in writing by AID of the specific topics and issues on which he is expected to report and instructions on his role in the review.

g. Special Provisions:

(1) Following approval by the AID/W contracting officer, the contractor is authorized to fund the costs of up to 48 man-months in salary, fringe benefits, and overhead for Year 1, and up to 60 man-months thereafter of manpower participation from those U.S. universities that may become part of the network. This manpower may be obtained through subcontracts between the prime contractor and the participating university. This will be done within

the totals and limits of the contractor's approved budget. Authority to shift funds from other budget categories for purposes of funding network manpower will be done only upon the prior written approval of the AID contract officer with the clearance of the AID technical officer. The contractor is authorized to convene two network group meetings for each year of the five-year contract and to fund the costs of travel and per diem for network representatives for individual sessions, not to exceed five days each. The AID Technicical Office, AID/DS/HEA, shall be notified when the meetings are to be conducted.

(2) Travel requested by the missions (e.g., for field services projects): Prior to making any visits to LDCs, the contractor will review the plans for the visit with DS/HEA, which will obtain the necessary clearances from the regional bureaus and the U.S. mission(s) concerned. Upon completion of the visit(s) and prior to departing, the contractor will orally brief the U.S. mission(s) as to the outcome of the visit. Within 30 days the contractor will submit a written report to the DS/HEA, USAID(s), and the regional bureau(s) concerned regarding preliminary findings and evaluation of the visit.

(3) If the travel is initiated by the contractor, the following procedure shall be followed:

Prior to making visits to LDCs, the contractor will review his plans with DS/HEA which is responsible for obtaining the necessary clearances from the concerned regional bureau(s) and/or U.S. mission(s). The contractor will keep the U.S. mission(s) fully informed of the proposed visits, ask for advice regarding timing and content of the visits, and initiate participation, if it is desired. The contractor will make all appointments and logistical arrangements.

He will submit copies of the trip report to the DS/HEA, U.S. mission(s), and the regional bureau(s), as appropriate, covering the findings and the evaluation of the LDC visit dealing with the MEDEX technology.

(4) Voucher Identification: In each instance of voucher (SF 1034) submission made by the contractor for payment hereunder, the following identification data will appear on the face of the voucher:

Contract: AID/DSPE-C-0006

Project No.: 931-1180

Project Office: DS/HEA

(5) Equipment and supplies required by the contractor will be obtained through U.S. suppliers.

C. Reports

1. The contractor shall submit three copies of all reports listed as being a product of the contract (administrative, progress, final and technical reports containing R&D findings) to the documentation coordinator, DS/PPU/EUI, Development Assistance, Agency for International Development, Washington, D.C. 20523, or to his designee. Such reports shall include a title page showing the title of the report, project title set forth in this contract (or grant), and the contract number. One copy of each report shall be clearly typed or printed on white paper so that it may be photographed to produce a microfilm master. Technical reports shall be accompanied by an author-prepared abstract.

2. The following specific reports are required:

a. Quarterly Technical Progress Report. This report will present a narrative summary of work performed, including

specific reference to the provisions numbered 1 through 4 of the "Specific Services to be Provided." The narrative will encompass major accomplishments, fiscal status, problems encountered, future plans, and any action believed required by AID. The fiscal data element in each report should include estimated subcontractor commitments concerning travel and consultant services to date. Quarterly reports are to be forwarded to AID on or about the 15th day following the end of each quarter. These reports should detail all domestic and foreign travel for core staff, network members, and consultants.

b. Final Report. The final report will cover in detail all work accomplished under the agreement, including final statements of status of teaching materials, guidelines, and related products required under the various task assignments of the contract.

c. In addition to the above reports, the AID liaison officer, chief, DS/HEA, may periodically request written data relative to contract performance or an oral briefing on any phase of performance or progress as may be required by AID.

d. All reports required under the contract shall be delivered to: The Chief, Health Delivery Services, Development Support Bureau, Agency for International Development, Washington, D.C. 20523. One copy shall be forwarded to the AID/W contracting officer.

e. The reports required above are in addition to those required under General Provision No. 12, "Reports," with the exception of subhead (a)(1) and (2).

Appendix F

HEALTH MANPOWER DEVELOPMENT STAFF, UNIVERSITY OF HAWAII

Appendix F

HEALTH MANPOWER DEVELOPMENT STAFF, UNIVERSITY OF HAWAII

Dr. Richard Smith, Project Director

Dr. Rodney Powell, Associate Director for Planning

Dr. Mona Bomgaars, Associate Director for Evaluation

Dr. Eugene Boostrom, Planning Program Officer

Mr. John F. Rich, Expert, Health Training and Curriculum

Mr. Ernest E. Petrich, Adviser, Management Development

Mr. Thomas G. Coles, Medex, Trainer

Ms. Joyce V. Lyons, Curriculum Specialist

Ms. Marian D. Morgan, Health Educator

Mr. Frank White, Business Manager

Mr. David Alt, Project Manager, Pakistan and Lesotho

Mr. Suhil Mehra, Adviser, Communications Media

Mrs. Lorna Smith, Administrative Officer

Mr. Albert Neill, Management Adviser

Appendix G

QUANTITATIVE SUMMARY OF OUTPUTS: MEDEX PHASE III
(July 1, 1978 - December 30, 1980)

Appendix G

ACHIEVEMENTS AND PROGRESS: A REVIEW OF THE OUTPUTS

The first objective of the evaluation team was to evaluate the contractor's achievements and progress in the performance of the core contract. To complete this task, the team was asked to collect information on the following activities:

--exploratory briefings;

--primary health care seminars;

--technical guidance in project design;

--materials development;

--curriculum adaptation workshops;

--teacher-training workshops;

--management and logistics workshops;

--preceptor-deployment workshops;

--evaluation workshops; and

--reporting procedures.

This information has been used to prepare the following quantitative summary of outputs for the first seven quarters of the project and a qualitative assessment of the contractor's performance (see Chapter II).

A. Reconnaissance to LDCs

In the first seven quarters of the project (July 1, 1978 - March 30, 1980), six visits were made to LDCs.

- Dr. Richard Smith, the project director, attended the African Health Officers Conference on November 28, 1978. The conference was held in Kenya.
- AID/Nepal was visited between January 1979 and March 1979.

- The U.S. Ambassador to Burma was visited between January and March 1979.
- A trip was made to Ghana in May 1979. Project staff met with USAID and MOH representatives.
- Project staff visited Liberia in May 1979 and met with USAID and MOH representatives.
- Liberia was visited a second time on December 2-5, 1979.

B. Primary Health Care Seminars

Seventeen seminars on primary health care were held between July 1978 and December 1980.

- October 24, 1978, Washington, D.C.: The World Bank hosted a PHC seminar. Fourteen of the 30 economists who attended were from LDCs.
- March 26, 1979, Georgetown, Guyana: A PHC seminar was held for MOH officials, representatives of Guyana's public and private health sectors, and invited representatives of the USAID.
- July 19-20, 1979, Honolulu, Hawaii: Two Ghanaian officials attended a PHC seminar at the University of Hawaii, HMDS.
- November 1, 1979, Honolulu, Hawaii: Two Liberians attended a PHC seminar at the University.
- December 1979, London, England: Participants included representatives from Malaysia, Swaziland, St. Lucia, Fiji, The Gambia, Mauritius, and Barbados.
- May 27, 1980, Honolulu, Hawaii: The Honorable J. Adaijah, Member of Parliament, Papua, New Guinea, attended.
- May 31, 1980, Honolulu, Hawaii: A six-member Polish delegation from the Ministry of Health attended.
- June 1980, Abidjan, Ivory Coast: A PHC seminar was conducted for USAID/REDSO/WA.

- July 1980, Honolulu, Hawaii: A seminar was held for Dr. Malla, Ministry of Health, Nepal.

- August 1980, Dar Es Salaam, Tanzania: A seminar was held for staff of the Division of Community Medicine, University of Dar Es Salaam.

- August 26, 1980, Honolulu, Hawaii: A seminar was conducted for Mr. M. Isa, Ministry of Health, Indonesia.

- September 1980, Honolulu, Hawaii: Dr. Philip Gowers, Ministry of Health, The Gambia, attended.

- September 30, 1980, Honolulu, Hawaii: Mr. Lobit and Mr. Mamane, Ministry of Health, Niger, participated.

- November 1980, Honolulu, Hawaii: Dr. C. Nobee, Canada, participated.

- November 7, 1980. Honolulu, Hawaii: Dr. Litsios, WHO, Geneva, attended.

- November 14, 1980, Honolulu, Hawaii: Dr. Y.T. Kuo, WHO/Figi, participated.

- December 8, 1980, Honolulu, Hawaii: Dr. Mejia, WHO, Geneva, took part in the proceedings.

C. MEDEX Modules

To date, the HMDS has developed 29 prototype modules for training mid-level health workers, 11 modules for community health workers, and 4 reference modules for mid-level workers. Some modules were written earlier but were updated during the period under discussion. In the first seven quarters of the project, the following MEDEX modules were drafted:

- Dental, Eye, Ear, Nose, and Throat
- Diseases of Infants and Children
- Gastrointestinal Problems
- Genito-Urinary Problems
- Labor and Delivery
- Common Skin Problems
- Respiratory System and Health Problems
- Community Environmental Health
- Environmental Sanitation
- Problems of Women
- Common Medical Conditions
- Infectious Diseases
- Trauma and Emergency
- Family Planning
- Prenatal and Postnatal Care
- Community Family Planning
- Child Care
- Community Nutrition
- Causes of Diseases
- Anatomy and Physiology

- Physical Exam
- Patient Management Skills
- Formulary
- Medical History-Taking
- Training and Field Reference Manual.

1. Management Modules

The following specific modules were developed for Guyana:

- Organizing and Managing Health Systems
- Utilizing Management Support Systems
- Evaluating and Planning Work
- Supervising Health Team.

Two new modules were drafted: "Drugs and Supplies Management Unit" and "Operations Reference Manual."

The following modules were revised:

- The Management Process
- The Health Services Team
- The Health Services Delivery System
- Program and Team Evaluation
- Planning and Scheduling Work
- Supervision and Performance Evaluation
- Assisting Health Team Members
- Management Information
- Communications

- Transportation
- Drug Supplies
- General Supplies
- Personnel Management
- Financial Management
- Facilities and Equipment.

2. Modules for CHWs

The following modules were drafted for training of community health workers:

- Diarrhea and Dehydration
- Nutrition
- Hygiene
- Clean and Safe Normal Delivery
- High-Risk Pregnancy
- Community Cooperation
- Common Clinical Problems
- Family Planning I
- Family Planning II.

D. Continuing Education

The first drafts of two prototype modules on continuing education needs of PHC workers were prepared for presentation at workshops held in Micronesia and Pakistan. Three workshops were held, two in Micronesia (the first on November 14-23, 1979, the second in June 1980) and one in Pakistan (November 1979).

E. Technical Assistance in Project Development

As stipulated in the contract, the HMDS is required to provide technical assistance in project development. To date, the contractor has assisted the following countries:

--Pakistan;

--Guyana;

--Lesotho;

--Cameroon;

--Micronesia; and

--Liberia.

F. Workshops

Workshops have been held in curriculum adaptation, teacher-training, management, preceptor-deployment, and evaluation.

- Two curriculum adaptation workshops have been held, one in Lesotho (January 14-25, 1980) and one in Guyana (March 1980).
- Teacher-training workshops have been held only in Pakistan (May 11-25, 1979 and October 5-18, 1980).
- Management workshops have been held in Guyana (July 18-29, 1979), Lesotho (November 26-30, 1979), and Pakistan (September 1980).
- A preceptor-deployment workshop was held in Pakistan on September 15-17, 1979.
- An evaluation workshop was held in connection with the mid-project evaluation, and in Pakistan (September 1980).
- A tutor-training workshop was held in Lesotho in July 1980.

F. Networking

The University of Hawaii has been requested to establish a "network" of additional universities that are capable of staffing and supporting MEDEX programs in LDCs. The members of the network are U.S. institutions with expertise in the methodology of competency-based training and the MEDEX design approach to the delivery of rural primary health care. The following institutions are members of the MEDEX network:

--MEDEX/Northwest, School of Public Health and Community Medicine, University of Washington, Seattle, Washington; and

--Nurse-Practitioner Program, Schools of Nursing and Medicine, University of North Dakota, Grand Forks, North Dakota.

The network has been strengthened by the contractual agreements between the HMDS and the two U.S. universities.

To date, three conferences for members of the network have been held, two in Hawaii, the first in June 1979 and the second in October 1979, and one in Seattle, Washington, in October 1980.

G. Evaluation

The HMDS was specifically requested to develop an evaluation protocol during Phase III. The protocol was designed by HMDS staff and submitted to AID. The Agency endorsed this tool in July 1979.

As required in the contract, HMDS personnel participated in the mid-project evaluation of MEDEX.

QUANTITATIVE SUMMARY OF OUTPUTS: MEDEX PHASE III
(July 1, 1978 - December 30, 1980)

OUTPUTS	PROJECTED (By 6/30/81)	ACTUAL ACHIEVEMENTS
1. Reconnaissance to LDCs	12-24	11 Kenya, Nepal, Burma, Ghana, Liberia (2), Gambia, WHO, South Pacific, Lesotho, Guyana, Tanzania
2. Primary Health Care Seminars	9	17
3. Prototype MEDEX Modules Drafted	5 (new)	8 (15 completed under prior contract)
4. Prototype Management Modules Drafted	3	2
5. Prototype CHW Training Modules Drafted	8	8
6. Continuing Education		
a. Prototype Modules	2	2 (drafts)
b. Workshops and Seminars	3	3 Micronesia (2), Pakistan (1)
7. Technical Assistance in Project Development	6	6 Pakistan, Guyana, Lesotho, Cameroon, Micronesia, Liberia
8. Workshops		
Curriculum Adaptation	6	3 Lesotho (2), Guyana (1)
Teacher-Training	6	3 Pakistan (2), Lesotho (1)
Management	5	3 Guyana, Lesotho, Pakistan
Preceptor-Deployment	4	1 Pakistan
Evaluation	1	1 Hawaii
9. Networking		
Domestic	Approximately 3	2 University of Washington, University of North Dakota (2 conferences)
International Conferences	2	2 Held in Hawaii
10. Evaluation		
Protocol Design	1	Submitted to AID on Schedule
Mid-Project Evaluation		January 1981

PHC SEMINARS LOG

Date	Place	Audience	Presentor(s)	Reference
26 March 1979	Geo, Guyana	Guyana (MOH, USAID, public/private sector reps.)	RAS	QR#3 (Reported in QR#4)
19-20 July 1979	HNL	Ghana - Dr. M. Adibo, Dir., Div. of Plan'g; Dr. R. Asante, MOH	HMDS	QR#5
1 Nov. 1979	HNL	Liberia - Dr. K. Bryant, MOH; Dr. W. Bosyue, CMO	HMDS	QR#6
21-25 Jan. 1980	London (Common Wealth Secretariate)	Malaysia, Swaziland, St. Lucia, Fiji, The Ghambia, Mauritius, Barbados	RAS	QR#7
27 May 1980	HNL	Papua New Guinea - Hon. J. Abaijah, Member of Parliament	HMDS	QR#8
31 May 1980	HNL	Polish Delegation - 6 members Dr. Sliwinski, Dr. Szczerban, Dr. Jeljaszewicz, Dr. Retkowska-Mika, Dr. Jokubowski, Mr. Lauber	HMDS	QR#8
June 1980	Abidjan	Ivory Coast (USAID/REDSO/WA)	RAS	QR#8
August 1980	Dar es Salaam Tanzania	Staff of Div. of Community Medicine, Univ. of Dar es Salaam	RAS/MRB	QR#9
11 July 1980	HNL	Nepal - Dr. Malla	HMDS	QR#9
26 August, 1980	HNL	Indonesia - Mr. M. Isa	HMDS	QR#9
11 Sept. 1980	HNL	Canada - Dr. C. Nobee	HMDS	QR#9
30 Sept. 1980	HNL	The Ghambia - Dr. P. Gowers	HMDS	QR#9
30 Sept. 1980	HNL	Niger - Drs. Lobit and Mamane	HMDS	QR#9
7 Nov. 1980	HNL	WHO - Dr. Litsios	HMDS	QR#10
14 Nov. 1980	HNL	WHO/Fiji - Dr. Y. T. Kuo	HMDS	QR#10
8 Dec. 1980	HNL	WHO - Dr. Mejia	HMDS	QR#10

5/22/81