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A COMPARISON OF METHODS OF TRAINING PRESERVICE
AND INSERVICE PRIMARY HEALTH CARE WORKERS

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION
OF THE UNIVERSITY OF HAWAII IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF EDUCATION
IN EDUCATIONAL ADMINISTRATION
December 1981

By
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Charles Araki
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John Middleton
ACKNOWLEDGMENTS

Throughout the eighteen months since this study began, I have had the good fortune to receive advice and encouragement from many fine people. I am delighted to have the opportunity to acknowledge their contribution to the completion of the study.

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away from their families and friends to "process" this dissertation.

A final and special thanks to my husband Joseph who never doubted
that it could be done.
In order to contribute to the World Health Organization's goal of "Health for all by the year 2,000," the Government of Guyana and the Hawaii Health Manpower Development program entered into a bilateral agreement to train primary health care workers called Medex. This study was designed to test certain assumptions about the ongoing Medex training program in Guyana. The study had two major purposes; the first was to analyze the differential effects of two approaches to the training of the Medex in the area of community health assessment. The second was to perform a multi-variate analysis on selected personal characteristics of the trainees to determine whether these data had a significant relationship to success in community health training.

Three hypotheses were developed and tested. The first and second hypotheses tested for differences between the two groups on measures of community health knowledge and interview skill after they had participated in the instructional program. The third hypothesis investigated the relationship between selected background and personal characteristics of the subjects and their achievement on the instruments measuring knowledge and skill acquisition.

The methodology employed in this quasi-experimental study was a comparison of methods of delivering community health instruction to two groups of Medex trainees. The two instructional modes were designated as the independent variables in the investigation and the scores on the tests of community health knowledge and interviewing skills were the dependent variables. The groups received instruction and were tested
both for knowledge acquisition and for skill development in the area of community health assessment.

An instrument titled the Knowledge Test Forms A and B was developed from the previously determined objectives of an instructional module on community health. This instructional module concentrated on ways to enhance the prevention of illness and the promotion of positive community health practices. The test administration schedule was designed to compare the knowledge gains and terminal knowledge acquisition of the two groups in accordance with the first hypothesis.

A second instrument titled the Situational Interview Test (SIT) was developed to measure the trainees' ability to obtain and record pertinent community health information during a simulated household interview. The SIT was devised to test the second hypothesis and was administered after all training sessions were completed.

To test the third hypothesis, selected background and personal characteristics of the thirty-four (34) inservice and seventeen (17) preservice Medex who comprised the sample for this study were examined to ascertain the relationship between these characteristics and training performance. The background information consisted of data regarding age, sex and previous education and health experience. Three measures of personality and intelligence were used. The Cattell Test of "g" Culture Fair was the intelligence measure. The Rotter Scale was administered to ascertain the degree of internal or external locus of control. The Budner Scale provided data regarding tolerance of ambiguity.
These data were analyzed using the following statistical procedures. T tests and analysis of covariance were used to identify differences between the groups on the scores of the Knowledge Test. T tests were employed to test for differences between the groups on the SIT. A multiple regression analysis was computed to measure the strength of the relationships between the subjects' background and personal characteristics with their scores on tests of knowledge and skill acquisition.

The major findings of the study were 1) the preservice group had a significantly higher mean score on the Test of Knowledge, 2) the preservice group was able to obtain and record significantly more information on the SIT than the inservice group, 3) there were statistically significant relationships between measures of achievement, and background and personal characteristics.

Based upon the findings, the following conclusions were warranted with regards to the Guyana Medex 1977-81 preservice and inservice training programs in community health.

1. In teaching the Community Health Module the method which consisted of guided instruction with feedback to students and the opportunity for peer interaction resulted in superior performance, when compared to a prescribed but independent and self-regulated set of learning experiences.

2. In preparing Medex to perform the prevention oriented activities of community health assessment, provision should be made for field-based practice. The field practice should be scheduled soon after the knowledge acquisition sessions.
3. When planning programs for inservice community health assessment instructional experiences that engage the participants in active skill application experiences should be included, as these experiences appear to be more effective in facilitating the development of assessment skills than passive knowledge transfer activities alone.

4. Carefully structured and experiential learning activities in the Community Health Module are helpful in the development of knowledge of prevention among the Medex trainees.

5. The prediction of trainee success in community health assessment is materially aided by knowledge of a trainee's personal characteristics which may be adduced prior to their selection for training.

The study developed and tested a procedure for data collection and analysis which could be used by community health program managers to make decisions about the selection of personnel, and content and structure of preservice and inservice training. In addition the study demonstrated that systematic analysis of data may result in: 1) more precise decisions regarding curriculum content, structure and methodology, 2) greater precision with regard to the sequence of community health training and the balance between curative and preventive instruction for preservice and inservice trainees, 3) the selection of trainees who will more readily benefit from the program.
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This chapter contains the introduction to the study and the statement of the problem. The introduction includes a discussion of the theoretical framework, and a description of the context and background of the study. The specific statement of the problem includes the hypotheses and ancillary research questions to be studied and a discussion of the limitations of the study.

Introduction

Theoretical Framework

In order to make appropriate decisions related to duration and kind of training, administrators of primary health training programs need information regarding the knowledge and skills of trainees. The data generated by this study were designed to provide a basis for the acceptance, rejection or modification of decisions to structure the delivery of training services. The study was conducted to provide data regarding preservice and inservice training effectiveness in the bilateral agreement between the Medex Training Program in Guyana, South America and the Health Manpower Development Program at the University of Hawaii. An outcome of the agreement was one-hundred and twenty-five (125) trained primary health care workers, designated Medex, to be in place by 1984.
Three theoretical and operational models have formed a framework for the hypotheses of this study. First, the social process theory as particularized by the Getzel-Guba served as the macro-context for the Guyana Medex Training Program. Second, the role of decision making in organizations as defined in Griffiths analysis of administrative behavior provided a description of the functions of training program managers. Third, the evaluation models of Astin and Stufflebeam served as a micro-context for the training program. These evaluation models contributed to the problem solving process by creating a feedback loop to provide program managers with refined data for use in making training decisions. Chapter I introduces these theories and models which are then elaborated upon in the Review of the Literature. (See Chapter II)

Getzel and Guba's model provides an analytical framework for understanding an educational organization as a social system for they have identified the major dimensions for studying people as they interact in the organizational setting. In this model, the nomothetic dimension represents the organizational elements of the social system; and the ideographic dimension relates the individual as a member of the social system. An understanding of the relationships between these dimensions assists in describing and defining the scope of the decision making process.

Griffiths' administrative theory also places the organization in the context of a social system by analyzing the relationships between the individual's role and the organizational environment. More specifically, in Griffiths' decision-making theory, problem resolution is considered the most critical administrative resource for regulating
and interpreting relationships within the organization and for providing momentum for the organization to achieve its goals within the larger social context.\(^5\)

The process of decision making enables administrators to formulate actions that are congruent with the needs and goals of the organization for which they have responsibility. The systematic process of problem resolution is one of the central characteristics of administrative effectiveness. Campbell stresses decision making by defining administration as "the way by which an organization makes decisions and takes action to achieve its goals."\(^6\)

One technique for studying decision making has been to separate the process into its component parts. For example, Griffiths established six steps in the decision-making process: (1) recognize, define and limit the problem; (2) analyze and evaluate the problem; (3) establish criteria and standards by which the solution will be evaluated or judged as acceptable and adequate to the need; (4) collect data; (5) formulate and select the preferred solution; and (6) put the solution into effect.\(^7\) Analysis of the components enables program managers to make rational training decisions by refining or eliminating idiosyncrasies within or among the steps. The relationship between the decision making process and its application in administrative practice has led to an emphasis on the development of a more precise definition of educational needs. Specification of the training goals and objectives to meet these needs is dependent upon an evaluation strategy.

There was an apparent need to design an evaluation system in Guyana which would provide critical information about inservice and preservice
training for program managers so that they could 1) facilitate the achievement of organizational goals and 2) consider alternatives in the modification of future program designs. Alkin, who has studied the effects of evaluation on decision making, defines evaluation as, "The process of ascertaining the decision areas of concern, selecting appropriate information and collecting and analyzing information in order to report summary data useful to decision makers in selecting among alternatives."^8

The design of an evaluation strategy and utilization of evaluation results is complicated. Stufflebeam contends that knowledge of both the decision making process and the methodology for relating evaluation results to decision making need further development.\(^9\) Since evaluation results have the potential for affecting decisions at all levels of the organization, Rossi perceives a need for administrators to develop and implement evaluation strategies as essential for the continued growth of an organization.\(^10\)

Evaluation models have been developed to describe the interrelationships of inputs, processes and outputs that are the basis for decision making investigations in educational programs. The models presented by Stufflebeam and Astin are based upon the premise that the educational system functions in a social environment and that rational program decisions are more likely to result if the interrelationships in the system are analyzed.\(^11\)

Viewed from the broad perspective of the Getzel and Guba social process model, the Guyana Medex program managers could not make the operational decisions required for short-term training program
The Griffiths decision making process could have provided an intermediate level model for structuring decisions. However, both models require evaluation data in order to utilize the decision making process as a means of adapting to the social system needs. The evaluation strategies developed by Astin and Stufflebeam provided the operational basis for identifying and evaluating the community health component of the preservice and inservice program. Astin's strategy specified the need for measurement of student outcomes by assessing entry and exit behaviors in educational programs. Micek suggested an extension of the action evaluation concept to utilize student outcomes as data in the planning process. Elfner utilized both student input and outcome data for program decision making. It appears that clarity of measurement and decision making is enhanced by the cumulative addition of data about student input and outcome that is relevant for planning purposes.

The Health Manpower Development Program at the University of Hawaii has implemented a management and training strategy for preparing health workers in developing countries such as Pakistan, Thailand, Guyana and Lesotho. The provision of training for primary health care workers in these countries necessitated the creation of an information gathering system that utilized an evaluation process to provide program managers with appropriate data for making decisions. The present study was a component part of an evaluation system utilized in the preservice and inservice training of health workers in Guyana, South America. This study was designed to test a method of utilizing student characteristics and performance information to guide program managers in making
decisions about the future training needs of Medex health workers and the instructional techniques that showed potential for increasing the effectiveness in meeting the organizational goals of the Guyana Medex program.

**Context of the Problem**

In many cultures, health services are characterized by the provision of treatment for sick people upon request. This approach to health care services, known as curative care, has proven to be an inadequate solution for remediating the predominate health problems of the community. Also, curative care has limited real progress toward decreasing the occurrence of many common and serious preventable health problems. Dr. Mahler, the Director General of the World Health Organization, underscores the critical nature of the problem.

Health services are clearly failing to reach out to those who do not have access to them. Over five million children annually defecate themselves to death. More than half of all child deaths can be traced to the vicious complex of a malnutrition and diarrhoeal and respiratory diseases. All these deaths are unnecessary...

In response to the failure that has resulted from reliance upon episodic curative care, the international health community, represented by the World Health Organization, has created a mandate for the development of programs that emphasize the value of a more comprehensive approach to dealing with the health problems of a population. This mandate is embodied in the definition of primary health care (PHC) that was developed during the International Conference on Primary Health Care, at Alma Ata, USSR, in 1978.
Primary health care is essential health care made universally accessible to individuals and families in the community by means acceptable to them, through their full participation and at a cost that the community and country can afford. Primary health care addresses the main health problems in the community, providing promotive, curative and rehabilitative services accordingly. These services include at least: promotion of proper nutrition and an adequate supply of safe water, basic sanitation; maternal and child care, including family planning; immunization against the major infectious diseases; prevention and control of locally endemic diseases; education concerning prevailing health problems and the methods of preventing and controlling them; and appropriate treatment for common diseases and injuries.

Educational institutions that have the responsibility for preparing health workers who can play an important role in implementing the Alma Ata mandate for primary health care. Traditionally, training programs for health workers have emphasized the development of workers who were skillful in providing curative treatment. As awareness grew and concern for the importance of preventive and promotive care deepened, training centers began to search for ways to revise their program goals and teaching approaches.

The United States Agency for International Development (USAID) took cognizance of the world scope of health problems by supporting a number of health development efforts. Among these is the Health Manpower Development Program at the University of Hawaii, which provides assistance to developing countries in establishing training programs for Primary Health Care Workers (PHCWs). The Hawaii Health Manpower Development Program has been training health workers since 1972. These workers are called Medex which means medical care extender, or more specifically, a non-physician who provides preventive, promotive and curative services.
Background of the Study

In 1976, the Government of Guyana decided to train a new type of health worker for the country. Through cooperation among the governments of Guyana, Canada, and the United States, a training program was begun in 1977. The staff of the Hawaii Health Manpower Development Program assisted Guyana in the design and preparation of the curriculum and the development of the teaching staff. The training center, established in Georgetown and staffed by Guyanese professionals, was given the task of training, supervising and providing continuing education to the new cadre.

In 1979, the Guyana Medex staff, in collaboration with the University of Hawaii consultants, reviewed the performance records of the first graduating class of Medex to determine the type of community services they were providing. This analysis revealed that approximately thirty to forty (30-40) percent of the illness suffered by people who sought help from Medex could have been avoided if changes in the environmental conditions and/or personal health habits had occurred. This analysis sensitized program managers to the high incidence of preventable problems in the communities served by Medex in 1979 and to their present lack of emphasis on preventive and promotive services. In keeping with their commitment to primary health care and the obvious needs of the community, the Guyana program managers were interested in improving the ability of Medex to provide preventive and promotive care. At the time this decision was made, the managers had no available evaluation data on preservice and inservice training to assist them in decision making.


Purpose of the Study

In order to ascertain how the Guyana Medex Community Health Module for preventive and promotive health activities could be effectively conducted, an evaluation design was required to determine how the 1981 preservice and inservice programs were organized and to identify guidelines for future problem solving by program managers. By 1) examining knowledge achievement scores in preservice and inservice instruction, 2) ascertaining interview skill achievement scores in community health, and 3) studying student characteristics, program managers would have a clearer understanding of the impact of their prior program decisions. The data collected while studying these three aspects of the Guyana training program would provide information concerning methods, duration, and sequence of training and indicate directions for changes in the program.

The purpose of this study was to evaluate the relative efficacy of two approaches for training inservice and preservice students and to determine whether knowledge of personal characteristics could enhance future trainee selection procedures. This information might assist the Guyana Medex program managers to develop strategies for future training programs in preventive and promotive health.

Statement of the Problem

The research question designed to provide the appropriate information was: Would a systematic comparison of data about learning performance and student characteristics of preservice and inservice Medex trainees, in Guyana, reveal differences that would indicate the
need for and nature of potentially appropriate changes in the Medex training program?

Hypotheses

The following hypotheses put the problem in a testable form:

H-1: There is no significant difference in the knowledge test achievement scores for community health assessment between subjects receiving training prior to graduation (preservice) and those who received training as graduates (inservice).

H-2: There is no significant difference in the situational test achievement scores for community health assessment between subjects receiving training prior to graduation (preservice) and those receiving training as graduates (inservice).

H-3: Predicting the post-test performance scores of Medex during the community health assessment portion of training is significantly related to knowledge of candidates scores in the following measurement instruments: Internal-External Locus of Control Scale, Intolerance of Ambiguity Scale, Test of "g" Culture Fair, and knowledge of personal and demographic information about the candidates such as age, sex, previous education as health workers and the number of years of previous work experience in hospitals and health centers.  

In Hypotheses One and Two, information comparing preservice and inservice training was the basis for data collection relevant to the timing of training and length of training. This comparison should provide program managers with data indicating how duration and emphasis could be balanced to achieve higher levels of knowledge and skills.
Hypothesis Three was generated to identify the profile of students who have the potential for high achievement. No available information in community health training has utilized data on the relationships among such student characteristics as experiential, demographic and personality factors to assist in the planning and administering of a training program.

Ancillary Research Questions:

To use the hypothetical data for decision-making supplementary information needed to be collected. This information is described in the ancillary research questions below.

A-1: There is no significant difference in the knowledge or situational post-test achievement of inservice subjects who functioned as preceptors for the preservice subjects and those subjects who were not preceptors.

A-2: There is a non-chance correlation between number of household interviews completed during the field practice session of instruction and the scores in the post instruction tests of knowledge and interview skill.

A-3: There is a non-chance correlation between scores in the post-instruction knowledge and interview skill tests among all the subjects who have received training in the community health assessment.

The first ancillary research question was chosen to increase the power of the research by investigating the possibility that factors other than the treatment were affecting the outcomes. The second
ancillary question was developed to gain further insight into the effects of the treatment upon performance. The third ancillary research question was designed to provide information about the relationship of knowledge acquisition and skill application.

Limitations of the Study

The subjects selected for analysis in this study were members of two intact groups of Medex employed by the Ministry of Health in Guyana between the years 1979-81. Careful analysis of the personal and demographic characteristics of these groups appear to support the conclusion that they were comparable for the purpose of this study. (see Chapter IV) Further, there were no significant differences in selected personal and demographic variables among Medex graduates of Classes 1978, 1979, and 1980, and the 1980-81 trainees who were represented in this study. This knowledge and Ministry of Health policy regarding candidate selection, support the assumption that future Medex will probably be similar to the present population of Medex. The study group of Medex was therefore assumed to be representative of the future population of Medex who will work for the Guyana Ministry of Health. This study may be generalized to this population.

The acceptance of intact preservice and preservice groups for investigation was essential to create information for program managers to use in making decisions about future instructional programming. The two groups entered the study with differences in their prior exposure to the instructional content. Therefore procedures and statistical analysis were designed to adjust for the differences in the groups.
An additional limitation arose from the Guyana staff decision requiring different numbers of household interviews for the preservice and inservice group during the field experience. In addition to the differences in interview experience that resulted from that requirement, the number of interviews completed within each group ranged considerably. This issue was considered important enough for separate analysis. Ancillary question three was developed to gain an understanding of the effects of this difference on the results of the study.

The study was further limited in its conclusions by: 1) a lack of postgraduate field observations which may provide additional information about the success of the training efforts; 2) analysis of student performance was limited to the preventive health module titled Community Health; 3) since the study was conducted for the Guyana Medex Training Program, generalizations beyond that program would be unwarranted.
NOTES TO CHAPTER I


5 Griffiths, Administrative Theory (1959), p. 89.


7 Griffiths, Administrative Theory (1959), pp. 93-109.


Thomas G. Coles, MEDEX/Guyana Class I, Assessment of Job Performance: Data Analysis & Trend Identification (Honolulu: John A. Burns School of Medicine, University of Hawaii, 1979), p. 1-89.


R. B. Cattell, and A. K. S. Cattell, Test of "g" Culture Fair Scale 2, Form A and B, (Champaign, IL: The Institute for Personality and Ability Testing, 1960).
Chapter II

REVIEW OF THE LITERATURE

A review of the related literature disclosed the following relevant areas: (1) decision making and evaluation in educational administration; (2) current efforts in the development of primary health care programs; and (3) training methodologies for preparing primary health care workers.

Decision Making and Evaluation in Educational Administration

The Role of Decision Making in Administration

Day-to-day function of administration involves a constant flow of decisions related to the management of the persons in the organization, the forms and processes of the organization, and the interaction of the organization and the environment. Decision making is the driving force of the organizational system. Decision making is essential for determining the organizational goals, identifying the objectives for meeting those goals, specifying the procedures for achieving the objectives, and evaluating the final effectiveness of the organization. Organizations are built around a system of decision making that has a pervasive influence on the planning and implementation of programs to meet the organizational goals. An understanding of decision making therefore is essential for understanding an organization.¹
The Getzel and Guba social process model is an extension of the earlier social systems work of Talcott Parsons, adapted to the realistic problems faced by managers. The relevance of administration as a social process is clearer when administrative strategy is described as functioning within the general context of a social environment that has two major dynamic elements, the individual and the institution. In this model, the behavior of the institution within the larger social environment is the result of the interplay among the individual, the organization, and the environment. Administrative behavior is the result of the interaction between the organizational role assignment for a given position in the organization and the strategies and processes that the individual uses to interpret his organizational role. Differences in strategies for decision making are understood in the context of this social process and are strongly affected by the particular style of the individual manager.

Social process theory provides a framework for understanding the behaviors of individuals within the organization. Griffiths' theory is a problem solving strategy to guide decision making within the general framework of the organizational environment. In Griffiths' application, emphasis is placed on the decision making process in the control and direction of the organization, and the transactions that occur within the organization.

In human relations theories of administration, the personal style and motivation on the individual are of primary concern in the analysis of group dynamics and the administrative processes. Argyris and Herzberg are concerned with the effects individual development and
interpersonal relationships create within the organizational and environmental context. Griffiths discusses the behavior of the individual within the context of the individual's role in the hierarchy, his power and responsibility for decision making, and his perceptions of the transactions that occur in fulfilling decision-making responsibilities. Barnard stresses the importance of an executive's responsibility to initiate decisions in response to the needs of the situation:

Out of his understanding of the situation, which depends upon his ability and initiative, and on the character of the communication system of his organization, it is to be determined whether something needs to be done or corrected. To decide that question involves not merely the ordinary elements but the executive's specific justification for deciding.

Andrew and Moir emphasize the importance of the administrative processes being responsive to the state of the environment: "It is obvious that the success or failure in meeting system objectives is dependent not only on the choice which the decision maker makes, but also the state of the environment which he is operating."

Evaluating Organizational Effectiveness

The effectiveness of an organization is controlled by the administrative process and the quality of decisions that have directed the activities of the organization. Efforts to establish measures of organizational effectiveness have been inconclusive. Cameron reviewed the literature to assess the progress of researchers in identifying criteria for measuring organizational effectiveness. Although considerable effort has been made to identify a process for ascertaining
organizational effectiveness, definitions of effectiveness are often vague:

In short, organizational effectiveness may be typified as being mutable (composed of different criteria at different life stages), comprehensive (including a multiplicity of dimensions), divergent (relating to different constituencies), transpositive (altering relevant criteria when different levels of analysis are used), and complex (having nonparsimonious relationships among dimensions).

Cameron concludes his review with the following comments:

Much of the lack of cumulativeness in past effectiveness research has resulted from confusion over what conceptual referent or effectiveness domain has been applied when referring to organizational effectiveness, and from the wide variety of types and sources of criteria used to indicate effectiveness. The emphasis on one best definition of organizational effectiveness that has been common in past literature has not advanced the development of studies of organizational effectiveness either theoretically or empirically. The present study applied definitions of effectiveness that could be used for decision making purposes. Barnard established the guidelines for establishing effectiveness parameters in his definition: "We shall say that an action is effective if it accomplishes its specific objective aim. We shall also say it is efficient if it satisfies the motives of that aim." Dunnette, Latham, and others have investigated means of evaluating the effectiveness of managers. They have concluded that managers who are effective decision makers can best be judged by applying measures of their performance in general and their decision-making ability in particular. A variety of performance measures has been developed by these authors to prepare managers to cope with their responsibilities and to evaluate their job performance.
Although decision making occurs in a complex transactional environment, Simon emphasizes the need to maintain a perspective based on the reality of the process:

The task of "deciding" pervades the entire administrative organization quite as much as does the task of "doing" -- indeed, it is integrally tied up with the latter. A general theory of administration must include principles of organization that will insure correct decision making, just as it must include principles that will insure effective action.

Griffiths has clarified the decision process by establishing a situational context for decision making: 1) the action of decision making is a judgement based upon information that results in some altered future action; 2) decisions are totally pragmatic in that their value is dependent upon the success of the consequent action; 3) decisions are valued on the degree to which goals are attained.

These principles about the nature of decisions are applied to the following basic assumptions about administrative theory:

1) Administration is a generalized type of behavior to be found in all human organizations. 2) Administration is the process of directing and controlling life in a social organization. 3) The specific function of administration is to develop and regulate the decision making process in the most effective manner possible. 4) The administrator works with groups or with individuals with a group referent not with individuals as such.

Decision Making in Educational Programs

Eugene Craven has analyzed the decision making process in higher education. His conceptual framework for describing the nature and role of information systems in decision making contains applications of the decision making characteristics in an educational setting. Craven's work and other relevant literature is presented in the following discussion of the characteristic aspects of decision making.
Areas of decision making within the hierarchy. Craven specifies planning, operations and management as useful descriptors for the scope of decision making responsibilities that exist within the structure of organizations.

As one looks at organizations, generally and institutions of higher education, specifically, three types of decision making activities are discernable; operations, management, and planning. Operational activities are those focusing primarily on routine day to day detained transactions within an organization such as payroll, accounting, purchasing, disbursing and inventory. Management activities are those that provide for the general control of routine operations. Planning activities are directed at the short and long range development of program and policy direction of the institution. 

Need for information to guide decision making. The nature of information required for decisions at the various organizational levels is different, but all levels of activity require information for rational decisions. Guba and Stufflebeam define educational evaluation as "the process of obtaining and providing useful information for making educational decisions." They advocate a total evaluation system for providing the information necessary for decision making. Their system provides for systematic context, input, process, and product evaluations.

Reliance upon ad hoc evaluation studies can prove to be an ineffective and inefficient means of providing information for decision making within a system. Rather, educational systems should have well functioning evaluation programs which provide a dynamic baseline of information about the system. Such an evaluation program should meet the regular evaluative information requirements of the system, and should be responsive to emergent needs for idiosyncratic data.

Importance of systematic data collection. The information necessary for decisions at all administrative levels should be generated
in a routine and systematic fashion. Craven proposes an information decision model that contains four levels: 1) a core data base including data about students, curricula, facilities, personnel, a finance, and environment; 2) analytical tools including models for program profiles, enrollment projections, resource requirements and flows; 3) generated information including calculations, comparisons, estimates and projections, and simulations; 4) evaluation for extensiveness, effectiveness, efficiency, and benefits. An information system established with these four elements will generate the information required for decisions in planning, management and operations. 20

Levels of planning and decision making. In the earlier description of decision making within the hierarchy, Craven proposed that decisions for organizational planning occur primarily to establish broad policies. Fargo, Apffel, and Laine suggest that planning is an inherent part of managerial responsibility at all program levels:

The planning process involves a continuum from macroplanning to microplanning. The macroplan requires assessment of national and local needs and demands, involvement in manpower planning across disciplines and services, providing an implementation design with short- and long-range measures of cost effectiveness. The microplan must assess the budget requirements at all levels, the staff required to perform specific jobs and a task analysis of each service within an organizational plan that will ensure a development in line with geographic and programmatic priorities. The microplan needs to be concerned with organizational linkages, logistics and supply, standardization of procedures, training, services and evaluation, as well as providing for supervision and in-service training to ensure quality control and efficiency in the delivery of services. 21

Establishment of program priorities. Decision making is most effective when the administrator has an opportunity to analyze and set
priorities for the many factors that can and have affected the desired program outcomes. Griffiths' assumption that evaluation is a requisite for rational decision making is supported by Simon, Andrew and Moir, and Scriven, all of whom specify the need for obtaining information to assist in decision making and suggest the need to establish criteria for evaluating the information used in guiding decisions.22

Utilization of evaluation. Systematic evaluation models include measures of program inputs, processes, and outputs for assessment in determining the efficiency and effectiveness of organizations in meeting prescribed goals.23 Scriven reminds managers of the importance of the monitoring process in addition to evaluating program outcomes in their decision making responsibilities.24 In a recent study, Locatis, Smith, and Blake investigated the effect of evaluation information on decisions and found that information, especially negative information about program efforts, has an effect on decisions.25 Alkin describes the role of evaluation as a mechanism for obtaining decision making information. "Evaluation is the process of ascertaining the decision areas of concern, selecting appropriate information and collecting and analyzing information in order to report summary data useful to decision makers in selecting among alternatives."26

Drucker, in a pragmatic approach to evaluation, concentrates on the use of performance results in the evaluation process. He established six principles to achieve effectiveness: 1) define the mission; 2) set clear objectives and goals; 3) establish priorities of concentrations, responsibilities and timeliness; 4) define measurements of performance;
5) use measurement as feedback on performance; 6) establish organized audits of objectives and results.²⁷

In summary, the characteristic aspects of the decision-making process that have emerged from the literature include:

a) Decision making is essential for directing and restructuring organizational activities at all levels of the hierarchial structure.

b) Decision making requires the collection of critical information.

c) Decision making is dependent upon the development of a routine and systematic approach to data collection.

d) The decision making process is applied to planning at all levels of the organization.

e) Decision making is enhanced by establishing priorities that provide direction for program activities.

f) Decision making will benefit from systematic and comprehensive utilization of evaluation.

Evaluation of Educational Programs

Since the 1960s, the use of systematic evaluation for decision making in social programs has been stimulated by the development and application of evaluation research methodology.²⁸ Educational evaluation can be accomplished using the evaluation models described by Stufflebeam or Astin or some variation of the systems approach to decision making such as those described by Kaufman, or Andrew and Moir.²⁹ In these models, the educational events are categorized in a linear fashion with a provision for feedback to facilitate analysis of
effects and interrelationships within the system. In Stufflebeam's model, the categories are labeled context, input, process and product. Astin has eliminated the context component and labels the others as input, operations, and outputs.

Recently, Cooley and Lohnes proposed a model for assessing the effectiveness of a program in bringing about desired learning that was dependent upon the following factors: 1) learning opportunity, 2) motivation, 3) structured presentation of activities, ideas, and information, 4) instructional events. Providing such information to program managers can help to ascertain the effectiveness of the program and program components.

In determining the efficiency and effectiveness of organizations in meeting prescribed educational goals, systematic evaluation models include measures of program inputs, processes, and outputs for assessment. Evaluation of student performance is an essential element in the program planning process of an educational institution and a necessary parameter in measuring the effectiveness of the educational process. Current investigations call for a more systematic approach to this important element in educational decision making. Astin's evaluation model specifies the assessment of student inputs, such as talents, pretests, the means and environment of the learning process, and the student's performance. In his model, Micek recommended using student outcome evaluation information as data in planning. The planning framework developed by Elfner included analysis of student input and outcome evaluation variables in the planning process.
Means for using student data to define and refine program policy and implementation strategies has been carefully investigated. Langbein compared the value of using aggregate student and environmental data with the use of unique estimates of these factors, in program evaluation. She contends that because individual properties are not manipulatable, estimates of their impact on achievement must be separated from estimates of environmental properties of the learning situation. Further, she supports the need for simultaneous assessment of individual and contextual data to enhance the specificity of analysis. In an evaluation of school effectiveness, Wiley compared the amount of schooling to personal characteristics variables and achievement outcome variables in an effort to produce useful policy planning information. In an analysis of the utilization of evaluation research, Agarwala-Rogers recommended that evaluation be integrated into every stage in the operation of a program. She found that design and process evaluation were less threatening and therefore more likely to be utilized by program managers. Leinhardt described recent innovation efforts in evaluation that included the requirement for instructional process information to be utilized with outcome data in evaluation models. She concluded, "The outcomes of such research may inform the researcher which strategies lead to different levels of implementation; which features of a program are more likely to be implementated as planned; and which undergo revisions." It appears that clarity of measurement is enhanced by the cumulative addition of input and output data as relevant for planning purposes.
Evaluation of Educational Programs for Health Workers

Katz defines program evaluation as a "process of making informed judgments about the character and the quality of an educational program, or parts thereof." An evaluation framework is required to collect information about the context, character and effects of a training program for health workers. By studying the relationships both within and between the elements of a program, the manager will make informed decisions about the program achievements and failures. The following program elements described in the Katz evaluation model for educational programs to prepare health workers were included in the framework for evaluating the inservice and preservice community health training for Medex in Guyana:

1) Context and objectives: the situational context of the program and the objectives that reflect the specific program context.

2) Characteristic of students: information about student knowledge, skill, attitude, and predispositions.

3) Training processes and resources: data and descriptions about the student experience as he goes through the instructional activities and processes.

4) Program effects: assessment of the effects of training on student and graduate performance.

The World Health Organization (WHO) diagram presents in schematic form, the various aspects of program evaluation included in Katz's earlier description, and the main interrelationships which should be examined when establishing an evaluation system:
Katz and Fulop have applied the evaluation process described in Figure 1 to an analysis of programs for training primary health care workers. Their analysis resulted in the identification of seven major issues to be considered in the improvement of primary health care worker training. The following four are most salient to the present study:

1) How can the content of an educational program be identified, or what should the student be expected to learn?
2) How can the process by which the student is helped to acquire the requisite abilities be made optimally effective and efficient?

Figure 1

Evaluation Components and Their Interrelationships

3) How can student and teacher performance, as well as of the program as a whole, be evaluated and hence further the improvement of learning, of teaching and of the program?

4) How should students be selected to optimize the effectiveness of the learning opportunities provided and maximize the likely usefulness of the graduates in the provision of health care?\(^{39}\)

In the present study, information about student performance and characteristics is analyzed. As an outcome of the study, the program managers were provided with a data base about preservice and inservice training that will enable them to make more rational decisions about community health training and serve as a model for future program planning efforts.

The Development of Primary Health Care Programs

The Structure of Primary Health Care Services

Despite major technological advances that have had great impact on the reduction of morbidity and mortality, the scope for improving health services remains great. According to the World Bank, preventable health problems in developing countries continue to have a profound effect on morbidity and mortality.\(^{40}\) Recently, a study of health conditions reported by Halfan Mahler who is the Director General of WHO, revealed a slowdown in the reduction of morbidity and mortality in the world.\(^{41}\) WHO has embarked upon a program to direct the attention of governments to the need for continuing their efforts to improve the health of their nations. The goal of this campaign was to stimulate awareness of the need for new health initiatives and assist nations to develop strategies for improving health. The slogan "Health for all by the year 2,000" has
been used to mobilize and direct interest in the program. Mahler has explained his theme in this way:

"Health for all" means that health is to be brought within reach of everyone in a given country. And by "health" is meant a personal state of well-being, not just the availability of health services -- a state of health that enables a person to lead a socially and economically productive life. "Health for all" implies the removal of the obstacles to health -- that is to say, the elimination of malnutrition, ignorance, contaminated drinking-water, and unhygienic housing -- quite as much as it does the solution of purely medical problems such as a lack of doctors, hospital beds, drugs and vaccines. 

At the Alma Ata conference of 1978, a strategy, dubbed primary health care, was developed to assist in planning for more equitable allocation of health resources. The report of this conference explains that the success of the primary health care strategy is dependent upon a health system that is responsive to the health needs of the people. 

Mahler defined the foundation components of a primary health care system:

The three prerequisites of primary health care are thus a multisectoral approach, community involvement and appropriate technology, and it is on primary health care that all health programmes and the health infrastructure should be built. This strategy turns the individual, the family and the community into the basis of the health system, and it turns the primary health worker, as the first agent of the health system that the community deals with, into the central health worker.

Primary health care efforts are directed toward providing the whole population with essential health services. A multitiered, decentralized structure has been suggested as the solution to the problem of inadequate coverage that presently plagues many government health systems. In a multitiered system, primary health care is the first point of contact between the community and the organized health system.
WHO provided an explanation of the relationships between the levels of health services:

Primary health care is the hub of the health system. Around it are arranged the other levels of the system whose actions converge on primary health care on a continuing basis. At the intermediate level more complex problems can be dealt with, and more skilled and specialized care as well as logistic support provided. At this level, more highly trained staff provide support through training and through guidance on practical problems that arise in connection with all aspects of primary health care. The central level provides planning and managerial expertise, highly specialized care, teaching for specialist staff, the expertise of such institutions as central health laboratories, and central logistic and financial support. 45

The structure of health services created by a decentralized primary health care effort is usually depicted as a pyramid. The central administration of health care, represented by the Ministry of Health (MOH), is located at the peak of the pyramid. A decentralized structure of health services emphasizes the allocation of Ministry resources to support the provision of primary and intermediate health services to the population.

In this pyramid, specialized health care is provided at centralized national institutes. Primary and intermediate care is provided at rural or local hospitals and health centers. Primary health care provided in community dispensaries and health posts.

The Alma Ata conference participants developed a list of characteristics of primary health care to assist member nations in defining their health policies. The need for comprehensive health services at the primary health level is emphasized in the documents prepared at Alma Ata, which state, "primary health care addresses the main health problems in the community, providing promotive, preventive, curative and rehabilitative services accordingly." 46
In Figure 2, Habicht provides insight into the levels of health services needed within the community and the interactions required to create and maintain a primary health care system that is responsive to individual and family needs at the community level. Habicht describes the services that are required at the community level in order to serve adequately the health needs of families. He also displays the flow of information required to ensure that services are appropriate.
Fendall explains the different types of expertise required at each level of service in a primary health care system:

Health services need to be provided according to a progressive system of increasing expertise in knowledge and skills from periphery to centre — from front-line care to base hospital care. Whereas the demand at the periphery is for simple, quantitative services, the requirements at referral levels are for sophisticated, technologically advanced care.

The results of a recent study highlight the benefits of providing health service that emphasizes prevention. Berggren reports preventive services project in rural Haiti that had a remarkable impact on mortality.
Mortality rates fell progressively during five years, to levels only one fourth as high as the national estimates. The fall in mortality was associated principally with services that prevented deaths due to tetanus, malnutrition, diarrhea, and tuberculosis. The total program of hospital and village health services saved 495 years of potential life per thousand population per year. Most of the saving was attributable to preventive services.

Manpower to Serve Primary Health Care Needs

In many health systems, the government is responsible for the preparation, guidance and support of primary health care workers whose services link the community to that health system. There is a growing trend to utilize non-physician health workers in a decentralized primary health care system since the centralized physician dominated health system has not been a satisfactory answer to the health problems of developing countries. The current solution to inadequate health care services relies upon a tiered management and supervisory system that utilizes both physicians and non-physicians to provide primary health care.\(^5\)

Habicht noted, if properly managed, a decentralized non-physician health service could change the pattern of health care.

The acceptance of the once radical concept that non-physicians may provide primary medical care is due to the obvious need in many communities for such care in spite of inadequate resources. Primary medical care must involve the family and the community to be successful, it must permit appropriate referrals within a medical system to be effective and the quality of care must be assured by the training and supervision of the primary health care worker.\(^5\)

The history of the use of auxiliaries to provide health care is well recorded. Fendall, Elliot and Dorozynski all give excellent historical summaries of various auxiliary programs. They recount how auxiliaries have been used over four centuries in societies that are as diverse as Russia, Jamaica and Fiji.\(^5\) Historical reports of health
services in Guyana explain that non-physician health workers have been trained to serve on a health team since 1895 when the first dispensers were sent to Pomeroon River district to control an epidemic of yaws.\textsuperscript{53}

Emphasis presently is upon appropriate utilization of non-physician health workers rather than their acceptance as providers. Flahault considers the potential for community development activities: "The medical assistant can and must be used as an element of community development. The medical assistant in the community often becomes a prominent person who is respected and listened to because of his better than average education and his effective techniques."\textsuperscript{54}

Fendall stresses the preventive and promotive role of the primary health care worker:

Disadvantaged people want relief from pain, care when sick, and advice on pregnancy and child care. Their needs are for the conquest of communicable and vector-borne diseases, a stabilized and less wasteful fertility pattern, and relief from undernutrition and malnutrition. Much of the impact must be directed towards the younger age groups.

The manpower problems that can be alleviated by utilization of non-physicians are related to distribution, as well as to the absolute numbers of workers available for service. The lack of personnel and the inappropriate distribution of health services has motivated health officials to renew their interest in training and deploying non-physicians to supplement health manpower resources. This alternative is very attractive since the cost of training and salaries is considerably lower than for physicians, and non-physicians are considered more amenable to placement away from urban centers. Storms
provides a description of the important services provided by auxiliary workers.

Today, auxiliary health personnel are providing primary care services in the community and assisting in clinics and rural health centers. They are reaching people who have been unable to get modern health care, particularly the poor and those who live in rural areas. These auxiliary workers are known by many different names in different countries.

Bennett offers a strategy for community assessment through investigation of the social, cultural, economic, psychological and environmental factors contributing to the health problems. Harney indicates the need to include socio-economic data along with vital statistics. Figure 4 uses these indicators to display the contrasts between the health profiles of developed and developing countries.

In 1978, a health sector analysis was conducted in Guyana to determine the objectives of a project to strengthen the health system. The quantitative analyses contained in health sector analysis suggest that a profile of health conditions in Guyana would be located between those of the developed country and the developing country on the following figure.

Monekosso suggests that primary health care services designed to meet the needs of a developing country as described in Figure 4 would include programs for improved nutrition, water supply, sanitation, maternal and child care, prevention and control of endemic diseases, immunization, health education and treatment for common diseases and injuries. The health interventions recommend by Dr. Monekosso were component parts of the objectives for the Guyana Rural Health Systems
Project to attend to the need for emphasis on both prevention and treatment of disease.

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<th>Indicators</th>
<th>Developing Country</th>
<th>Developed Country</th>
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<tr>
<td>Average income per head</td>
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<tr>
<td>Life expectancy</td>
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<td>communicable diseases</td>
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<tr>
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<td>Good</td>
</tr>
<tr>
<td>Literacy rate</td>
<td>Low</td>
<td>High</td>
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</table>

Figure 4
Profile of Health Indicators for Developed and Developing Countries

Source: Lenore Harney, "Primary Health Care and Development," paper presented at the Workshop on Primary Health Care at Saint Lucia, West Indies (June 7-13, 1981)

Once clearly defined health needs were established, the implementation of a training program was the Guyana Medex Program's next task. Standard has identified manpower development for primary health care as one of the "most important aspects in the delivery of primary health care and health coverage to meet community needs" and has called for the development of training programs relevant to the community needs. Katz and Fulop directed attention to the issues surrounding
the preparation of personnel to serve as primary health care workers. After surveying twenty educational programs for health workers, they found problems common to all the programs in: 1) planning and implementing community oriented programs, and in 2) effective utilization of problem solving educational processes. The Katz and Fulop study identified certain issues as barriers to the continued development of training programs. The issues that were particularly applicable to the Medex training program in Guyana are listed below:

1) our conception of "health" is much less refined than our conception of "disease" -- hence it is easier and more comfortable to work within the latter framework; in consequence, there are problems in providing sufficient emphasis on health and health promotion within the faculty's programme.

2) techniques of evaluation (student assessment) are still grossly imperfect in their ability to measure the student achievements which are of particular importance in innovative programmes;

3) generally speaking, there is a lack of learning materials suitable for the implementation of these new approaches;

The Preparation of Primary Health Care Workers

Competency-Based Training

In his discussion of the functions of educational programs in developing countries D'Aeth has identified the requirement for trained manpower as a primary responsibility of the educational system. Programs to train personnel for the health services are included among the essential training efforts of the educational system. Educational approaches used by developed countries often serve as models for developing country programs, thus traditional approaches for preparing health workers are often duplicated in developing countries.
In a discussion of competency-based education for health personnel, McGaghie explains that traditional approaches to the preparation of physicians have been based in theory, as has the training for other health workers. In traditional theory-based approaches, an attempt is made to transfer total knowledge of a particular content area. During training, the success of a student engaged in this type of learning is dependent upon his ability to prioritize and synthesize the information presented to him. After graduation, job performance is dependent upon his ability to select and apply the knowledge and skills that were transferred during training. Other characteristics of traditional theory-based education for health workers as summarized by Bryant, include: high capital investment costs, high level technology requirements, high educational level entry requirements for students, sophisticated facilities, extensive numbers of well-trained support personnel. In summary, these programs require a commitment of human and material resources beyond the capability of most developing countries.

Dr. Harold Drayton provided the following description of the Caribbean experience with theory-based training programs in his paper, "Appropriate Manpower Development for Primary Health Care."

This "theory-based" approach to education with of course some considerable dilution of content, and some selection of what is deemed to be "relevant" - has usually been employed in the design of educational and training programs for health workers other than doctors. And since the orientation of medical education has been curative and hospital/institution-based, so too has been the basic education of the nurse, the laboratory technician, the physiotherapist, the O.T., etc.

If indeed, Primary (or Essential) Health Care is to be made accessible to all, then our assumptions and our entire approach to
the education and training of Health Personnel must necessarily be radically different.

Competency-based training has been adopted by training programs for health workers in a number of settings as an alternative to traditional theory-based training. Micronesia, Thailand, Pakistan, Guyana and Lesotho have chosen to use competency-based training for health workers. The principles that guide the development of a competency-based training program have been defined for teacher education programs by Howsam and Houston, and Elam. The general application to training program design is explained by Davies. The recommendations of these authors are included in the following description of steps in the development of programs for health workers.

1. The training objectives are defined after the training needs are assessed and the job requirements (tasks) are clearly defined.
2. The training process emphasizes the transfer of knowledge and skills required for specified job activities.
3. Student success is measured against a specified standard (criterion evaluation).
4. The instructional process is designed to be responsible to variations among students' entry level skills, knowledge, rates of learning and effective learning modalities.

Each step in the development of a competency-based training program is more fully described in the following paragraphs.

Step One. A careful analysis of the job is prerequisite to the development of training curriculum in a competency-based training system. During the process of defining job tasks, the scope of
responsibility and interaction with other workers becomes obvious. The following methods are commonly used to specify tasks: observations of workers, reviews of existing job descriptions, and interviews of health workers and personnel planners.

**Step Two.** The objectives for the training program are derived from the specified job tasks. Once a job has been analyzed into its major tasks, the duties that are required to accomplish the tasks are specified. The duties associated with a particular job enable the specification of terminal objectives for the training program. Segal, Hickerson, and Smith provide precise guidelines for deriving training objectives specifically for the training of health workers. The enabling objectives that guide student learning experiences are elicited from these more general objectives and address the specific knowledge and skill acquisition required to perform the job related duties. Detailed descriptions of the process for evolving training objectives from a job description are provided by Segal, Hickerson and Middleton. O'Byrne and his colleagues provide the following example of the process.

The organization and conduct of child care services may be one of the many tasks of a health worker; and one of the duties he/she will need to perform could be participation in a disease-prevention program by immunization. The skills which would be essential to the safe performance of this duty would be the ability to give immunizations against T.B., Diptheria, Whooping Cough, tetanus and polio; and to record immunization data on a clinic record card. The essential complementary knowledge required would be about immunization procedures; types of immunizations; the age recommended for immunizations; care and storage of vaccines; and possible side effects and/or cautions.

**Step Three.** Evaluation of a student's ability to perform job related skills is an essential element of competency-based training
programs. Pasquariella and Whishik define competence and comment on the importance of measuring competence in health worker training:

In most training programs the emphasis for the trainee is on developing competence in subject content usage and application rather than on content recognition and recall. This is because what the trainee is able to do with the subject material will contribute more toward his subsequent "on-the-job" effectiveness than will simply being able to remember it on demand. Thus for purposes of assessing trainee achievement and training impact, subject matter competence is defined as the trainee's expected ability to perform specific operations on, and make specific application of, the subject material that was encountered during a sequence of training instruction.72

In competency-based training programs, criterion referenced rather than norm-referenced measures are used to judge the students success in attaining the prescribed competencies. Glaser provides guidelines for understanding the differences between norm-referenced and criterion referenced measures.

What I shall call criterion-referenced measures depend upon an absolute standard of quality, while what I term norm-referenced measures depends upon a relative standard ... Underlying the concept of achievement measurement is the notion of a continuum of knowledge acquisition ranging from no proficiency at all to perfect performance. An individual's achievement level falls at some point on this continuum as indicated by the behaviors he displays during testing. The degree to which his achievement resembles desired performance at any specified level is assessed by criterion-referenced measures of achievement or proficiency. The standard against which a student's performance is compared when measured in this manner is the behavior which defines each point along the achievement continuum.73

The word criterion is used by both Popham and Glaser to refer to a domain of behaviors and to the need for referencing student test performance to a well-defined domain of behaviors measuring an objective.74 These measures become the basis for the development of performance tests. Popham defines a criteria-referenced test as one used to ascertain an individual's status with respect to a well-defined
behavior domain." Glaser and Nitko provide another definition: "A criterion-referenced test is one that is deliberately constructed to yield measurements that are directly interpretable in terms of specified performance standards."

Criterion referenced evaluation requires testing instruments for measuring complex behaviors. Although criterion referenced written tests of cognitive knowledge are useful tools for determining student progress, other performance measures are also used. In addition to knowledge tests, interviews, rating scales, role play, gaming, simulations and situational tests are useful for specifying student attainment of performance outputs. In commenting on performance evaluation techniques, Frederiksen advocates the method of "eliciting lifelike behavior in situations which simulate real life" as the most desirable technique for performance evaluation. He further suggests that observing real life behavior although closest to the ultimate objectives of instruction, is rarely a good technique for evaluation because of the lack of control over the testing situation.

Step Four. Competency-based training is a process of assisting students to attain mastery of specific objective outputs. This process will be facilitated if the instructor has knowledge of the entry level performance of the students before scheduling learning events. Ausubel asserted, "If I had to reduce all educational psychology to just one principle, I would say this: the most important single factor influencing learning is what the learner already knows. Ascertain this and teach him accordingly."
Feedback and remediation involves a process whereby precise, relevant and valid evidence is gathered and reported to the student. This provides information regarding what has been achieved and what is still to be accomplished. Evidence provided by Katz and Fulop, and Zahorik support the powerful contribution of feedback and corrective procedures to learning effectiveness and student performance. By employing these two procedures, the instructor will be able to direct students' activities in ways that suit individual learning styles.

A competency-based program requires a systematic training approach which utilizes sequenced curriculum, programmed to teach specific job tasks and evaluate the trainees' performance to the level of criterion attainment. An advantage of competency-based training over traditional medical training is that the specific performance of individual students and training groups can be directly related to actual functioning on the real tasks required in the field setting. McGaghie, and his associates, reviewed the efficacy of curriculum development in medical education and they concluded that competency-based training is not only an appropriate technology but also an important process for students and teachers. "The simple fact is that most medical teachers have been trained to think and act not as educators but as content experts." Although McGaghie and his colleagues are speaking to medical education in general, their arguments also apply to training of non-physicians as discussed in Drayton's paper.

In the adaptation of this approach for use in a developing country, the limited availability of physicians, the limited economic and human resources and the particular presenting
problems would all suggest that a competency-based approach might have particular efficacy in the preparation of primary health care workers.

As described earlier, programs to prepare auxiliary workers have been an integral part of the health system of many countries for a long time. Only recently has there been technical backup for these training programs. Maurice King, described the support required for manpower training programs. These support needs include the preparation of appropriate texts, availability of teaching materials, and educational methodology courses for teachers of auxiliaries. He suggests that technical reinforcement for health development has been weakest in auxiliary training.

**Student Assessment**

Student assessment is an essential element in the competency-based training process. In implementing training programs for Primary Health Care workers, educators have sought to collect information about student progress on a regularly scheduled basis throughout the training curriculum. Assessment instruments have been developed and utilized for guiding and monitoring student progress. Although the literature describes the implementation of training programs for primary health care workers and emphasizes the need for utilizing student assessment for program decisions, descriptions of programs that have systematically incorporated student input, process, and output information into the program decision making process are not available. The Medex program in Guyana has provided an opportunity to analyze the use of information about preservice and inservice trainee assessment in order to assist
program managers in decisions about the design and implementation of community health training.

According to McGaghie, procedures for determining the profile of health workers from entry to follow-up measures of performance in the training environment have not been systematically applied in medical schools. This situation also seems true of training efforts for intermediate level health workers. Managers of competency-based training programs for community health assessment need to ascertain which prospective trainees could most benefit from the training experience and further need to determine which intelligence and personality characteristics are most amenable to successful performance on a particular competency-based training experience. Katz explains the value of analyzing student characteristics when assessing the effectiveness of training programs:

It is impossible to assess a programme, and particularly its effectiveness, without some knowledge of the characteristics of students when they start the training. Clearly the students' knowledge, attitudes, values, or predispositions are important factors affecting not only their receptivity to training but also many features of the training institutions.

A description of students starting training is necessary for all evaluation. Firstly, both the evaluator and the training staff need to know whether students begin training with relevant knowledge and skills, and whether they have the requisite ability to learn. Secondly, training may be more effective for some students than for others. In the final analysis of data (effects of training) information on initial differences between students can help to explain differences in performance after training. Thirdly, personal and social characteristics of students may influence their effectiveness in the ultimate work situations. Fourthly, the value of any evaluation is enhanced if its results can be generalized, and future programmes will benefit by applying training procedures similar to those found effective here (or avoiding those found ineffective) once the similarity of the student populations can be established.
Assessment of Intelligence. Although measures of intelligence are no longer considered the major dimension of individual differences, intelligence is still a valuable element in the set of attributes that need to be considered when attempting to understand and predict human behavior. It is difficult though, to find a test that ascertains intelligence and has a standard measure that can be applied to a different cultural setting. In an attempt to respond to the need for a non-culturally biased measure of intelligence, Cattell developed the Culture Fair Intelligence Test based upon the work of Spearman and Thurstone who had established that a general factor of intelligence exists.

Successful performance on the Culture Fair Test of Intelligence is dependent upon the subject's ability to perceive relationships in shapes and figures rather than requiring that the subject have well-developed verbal abilities. Spearman's students began work on the Culture Fair Test in the late 1920's. Cattell and others developed and tested Culture Fair Tests on immigrant populations in 1974. Subsequent tests have taken place in China, Africa and India. The Culture Fair Test has compared favorably with tests that require verbal facilities when tested in cross-cultural environments. Studies suggest that the tests minimize the effects of cultural and social status differences.

Assessment of Personality Characteristics. Many personality tests have not been standardized on populations such as those considered in this study. Issues that arise in the selection of personality assessment instruments include the educational level of the students, the difficulties of administration, and the complexities of
interpretations. These factors render most personality measures ineffective in the cross-cultural context. The two scales considered to be of greatest relevance and utility in the present context were Budner's Tolerance-Intolerance of Ambiguity Scale and Rotter's Internal-External Locus of Control Scale.

There has been considerable interest, during the past two decades, in the concept of tolerance-intolerance of ambiguity. The attention that psychologists have given this concept derive principally from Frenkel-Brunswik. Much of the early research on the initial formulation of the concept was inconclusive until Budner established important empirical correlates. Intolerance of ambiguity has been defined by Budner as the "tendency to perceive (i.e. interpret) ambiguous situations as sources of threat." He pointed out that responses of individuals to stimuli take place at least two levels, in the realm of perceptions and feelings and that of natural and social objects, the phenomenological and the operative. His analysis of the possible reactions to perceived threat was that they could be categorized as evidence of either submission or denial. Such individual reactions range from repression and denial, through anxiety and discomfort, destructive or reconstructive behavior, to avoidance behavior. When such behaviors are elicited by an individual placed in an ambiguous situation, it is reasonable to infer that he or she is, in some way threatened and is, by definition, intolerant of ambiguity.

The Budner test can provide an indication as to the individual's adjustive capacity and consequently his ability to cope, or not to cope with new or complex situations. While one should not expect more than a
moderate degree of correlation between intolerance-tolerance measures and behavior in actual situations, the test can at least indicate the present predisposition of the individual. It is recognized that actual behavior in a given ambiguous situation will not be determined invariably by one's tolerance or intolerance of ambiguity, alone. There seems to be a high probability, however, that one's attitude will significantly influence one's behavior in such a situation over a long time.96

Internal-external locus of control refers to the extent to which persons perceive contingency relations between their actions and their outcomes. The construct of locus of control as derived from Rotter's social learning theory is defined as:

... an event regarded by some persons as a reward or reinforcement may be differently perceived by others. One of the determinants of this reaction is the degree to which the individual perceives that the reward follows from, or is contingent upon, his own behavior or attributes versus the degree to which he feels the reward is controlled by forces outside himself and may occur independently of his own actions ... a perception of causal relationship need not be all or none, but can vary in degree. When a reinforcement is perceived by the subject as following some action of his own but not being entirely contingent upon his action, then, in our culture, it is typically perceived as the result of luck, chance, fate, as under the control of powerful others, or as unpredictable because of the great complexity of the forces surrounding him. When the event is interpreted this way, by an individual, we have labeled this a belief in external control. If the person perceives that the event is contingent upon his own behavior or his own relatively permanent characteristics, we have termed this a belief in internal control.97

People who believe they have at least some degree or control over their environment have been called "internals." Those who believe that the outcome of their actions is determined by factors or agents extrinsic to themselves have been dubbed "externals." Research seems to
point in the same direction, namely that "internals" engage in more instrumental goal-oriented activities than do "externals". In fact, there is evidence that people are seriously handicapped by an external locus of control. A series of studies has shown that "internals" tend to be more alert to aspects of the world around them that can provide useful information for future behavior. Moreover, "internals" are more likely to take actions to improve the environmental situation. They also tend to place greater emphasis on skill or achievement reinforcements and show concern for their ability and especially for their failures and are less likely to be influenced by subtle persuasion. 98

**Summary**

Getzel and Guba have adapted the theoretic framework of the social system model to educational administration. Their work establishes a model for understanding the individual and the institutional interactions that occur within an organization to affect behaviors. Griffiths has identified decision making as the most important administrative process within the structure of an organization and points to evaluation as a major element in the decision making process. The collection and utilization of evaluation data by decision makers has been shown to improve the ability of an organization to achieve its goals. A systematic evaluation process that assesses inputs, processes and outcomes generates useful information for regulating and interpreting organization activities.
The current approach to improving the health conditions in developing countries emphasizes the implementation of primary health care programs with the goal of creating a healthful community environment and promoting safe health practices. The primary health care worker is an important member of the health team who has the potential for establishing preventive and promotive health programs at the community level. Programs for training primary health care workers based on traditional curriculum patterns have required resources beyond the capability of most underdeveloped countries. Thus, training programs for primary health care workers which seek to change the traditional curriculum patterns are applying competency-based training principles as they develop new training programs. The competency-based training approach requires the design of a systematic evaluation framework that includes assessment of students before, during, and after training as well as careful monitoring of the instructional process. The information generated from a well designed evaluation system should facilitate the development and maintenance of training programs in order to produce workers who are competent to provide the required health services.
NOTES FOR CHAPTER II


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47 Jean-Pierre Habicht, Assurance of Quality of the Provision of Primary Medical Care by Non-Professionals (Great Britain: Pergamon Press, 1979), pp. 68 and 67.


A. Dorozynski, Doctors and Healers, (Ottawa, Canada: International Development Research Centre (IDRC) IDRC-043C, 1975), pp. 5-63.


65 William C. McGaghie and others, Competency-Based Curriculum Development in Medical Education: An Introduction, University of Illinois at the Medical Center, Chicago (Geneva, Switzerland: World Health Organization, 1978), p. 70.


81 McGaghie and others, Competency-Based Curriculum (1978), p. 70.

83 See Fendall, Auxiliaires in Health Care (1979), pp. 1-196; and Defreitas, Timehri (1944), pp. 61-65.


85 See Houston and Howsam, eds., Competency-Based Teacher Education (1972), pp. 35-55; and Davies, Competency-Based Learning, (1973), p. 35-85.


Chapter III

METHODOLOGY

This study was designed to determine the effects of student characteristics and instructional methodologies on the development of community health skills. The study had two distinct but complementary elements: a comparison of two training conditions as well as an analysis of the relationship between selected student characteristics and achievement. This chapter includes a description of 1) the population and sample, 2) the instructional procedures, 3) the data collection instruments and procedures, and 4) statistical methods used to analyze the data.

Description of the Population and Sample

The population consisted of the currently trained Medex health workers, those in training and those who will be trained through 1984 in Guyana, South America. When the study was conducted between May 1980 and March 1981, there were sixty (60) graduate Medex and seventeen (17) student Medex in the country. The sixty (60) graduates were members of three classes trained by the Guyana Medex Training Center in Georgetown, Guyana. This Center was established in 1977 by the Ministry of Health and during the period of this study was maintained through a collaborative agreement between the Government of Guyana and the United States Agency for International Development (USAID). The training center was contracted to train twenty-five (25) Medex per year until
1984, at which time the Government of Guyana is expected to continue the program without external assistance.

The Medex trainees were selected from among various health service personnel categories including; assistant nurse, ranger, single trained midwife, staff nurse, dispenser, and nurse-midwife. The procedure for trainee selection involved, 1) the publication and distribution of a request for applications from the Ministry of Health, which listed the eligible categories of personnel and included a request for experienced people with a history of good work performance willing to work in rural areas; 2) preliminary sort was made by the Ministry of Health to identify eligible candidates; and 3) interview of eligible candidates by officials from the Guyana Medex Training Program and other departments of the Ministry. This selection procedure was followed for the first four classes of trainees and there was no stated plan to change the selection process for future Medex classes. Given this circumstance, future classes of trainees were expected to be similar to those presently in training or already in service; therefore, this study will be generalized to the entire population of Medex trained through the year 1984.

The sample for the study was comprised of the thirty-nine (39) Medex employed by the Ministry of Health and seventeen (17) Medex students enrolled in the ministry training program in 1980-81. The thirty-nine (39) graduate Medex were the total number of Medex health workers providing health services in Ministry of Health facilities throughout the country and therefore eligible to participate in Ministry inservice training programs. This deliberately heterogeneous sample was
by definition not randomly selected; therefore it was necessary to analyze selected characteristics in order to identify any systematic selection bias among the groups and control for threats to the internal validity of the study. The following variables were selected for analysis; age, sex, previous education, years of experience in hospital, years of experience in health center, intelligence, the personality characteristics of locus of control and tolerance-intolerance of ambiguity.

These data were analyzed for differences using the t test to compare the data on age, years of experience in hospitals and health centers, and intelligence. Chi-square was used to determine differences in personality variables, previous training and sex. The analysis showed no significant differences between the groups on any of the variables and would indicate that the groups were comparable for the purpose of this study. A summary description of the two groups is presented in Chapter IV.

A Description of the Instructional Procedures Used to Train the Preservice and Inservice Groups

In this quasi experimental study, two instructional methods were compared. The independent variable was designated as community health instruction. The independent variable had two levels, the first was preservice instruction and the second was inservice instruction. The preservice condition consisted of three sessions: 1) classroom instruction followed by 2) supervised field practice, and concluding with 3) a classroom summary and design. The inservice condition
consisted of three sessions: 1) self-study 2) independent field practice and 3) classroom summary and discussion. The two conditions were identical in instructional content but different in the instructional modalities used to prepare the students. Figure 5 provides a description of the design used to implement the inservice and preservice instruction.

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<td>Second Instructional Session: Skill Practice</td>
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<td>Third Instructional Session: Presentation of Community Surveys</td>
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Figure 5

Community Health Instruction for Preservice and Inservice Groups, including Methods, Sequence and Time Allocation
Figure 5 shows that the training was so arranged that one common set of titles could be used to identify the procedures common to both groups. These procedures were further identified by their sequencing within the study by session. Under the column headed Treatment Groups are found the specific characteristics of the procedure used with a specific group.

Preservice Instructional

The first instructional session, titled knowledge transfer in Figure 5, was conducted in the classroom for a period of two weeks. The procedures for this session included: independent study of the written instructional materials for the Community Health Module; demonstrations of household interviewing techniques by instructors; simulated interview practice in the classroom; and an actual interview in a selected household.

The second instructional session, which was designated as skill practice, was conducted in the community for two weeks. To implement the session, the subjects were given interview questionnaires and written guidelines for conducting the household interviews. They were then assigned to communities at various locations throughout the country for two weeks with instructions to conduct at least twenty (20) household surveys. The household survey questionnaire is found in Appendix A. Each subject had one supervisory visit during the two week session in which the supervisor observed the subject and provided input about the subject's interviewing procedures.
The third instructional session, which was a summary of the community experience, was conducted in the classroom for a period of one week. In this session, the students presented summaries of their household surveys. The students and instructors discussed and critiqued each presentation.

**Inservice Instruction**

During the first inservice instructional session, knowledge transfer, the subjects studied the written instructional materials for the Community Health Module. The content of these instructional materials was the same for subjects in both the preservice, and inservice groups and is not reported here. In the second instructional session, skill practice, the subjects were given interview questionnaires and written guidelines for conducting household interviews in the community they served. They were instructed to conduct visits one day per week and to complete a minimum of fifteen (15) household interviews. The subjects in the inservice group had no supervisory visits during the skill practice session. The third instructional session, a report on the community survey, was conducted during a weekend seminar. The members of the group prepared summaries of their community experiences and selected presentations were discussed. The outline for the summary presentation (see Appendix B) was the same for the preservice and inservice groups.

**Trainers**

The instructional staff of the Medex Guyana training facility served as trainers in this study. Two physician trainers conducted the
classroom presentations and discussion sessions for the preservice subjects. One physician and five graduate Medex tutors conducted the individual site visits during the second instructional session for preservice subjects. The entire staff of seven participated in the summary discussions for both preservice and inservice groups.

A Description of the Development and Use of the Tests, Testing Procedures and Data Collection for the Dependent Variables

The dependent variables were based upon measures of the subjects' acquisition of knowledge about the Community Health Module and their skill at obtaining and recording interview information. Knowledge acquisition was measured by the subject's scores on a written test developed by the Guyana staff and University of Hawaii consultants from the objectives and content contained in the written materials provided to the subjects.

Both for training and evaluation procedures, interviewing skill was behaviorally defined as the ability to obtain health assessment information from an adult member of a household and record the information accurately. A measure of this skill was determined by analyzing information collected and recorded after a structured and controlled interview experience.

Development of the Knowledge Test

Since the instructional program was based upon a modular format of training, each module was designed to meet a specified set of objectives
derived from the competencies required for job performance. The knowledge tests were designed to meet the desired scope of information considered essential to performing the specified job related competencies that were necessary to accomplish the community health tasks.

Fitzpatrick and Morrison state that most tests are based upon an estimate of artificial performance. "The test constitutes an artificial performance in that the examinee would not be presented these stimuli nor carry out these responses anywhere but in the classroom or some similar place that is remote from the context where the knowledge or skill is to be applied." The test of community health knowledge was constructed to ascertain knowledge required for specific development of skills required in the work setting. This knowledge is outlined in the task analysis requirements and objectives for the job of a Medex health worker engaged in preventive and promotive activities in the community. The objectives for the module are found in Appendix C.

The construction of the test in this competency-based instructional program for community health was made by five members of the Guyana Medex training staff and consultants from the University of Hawaii who had intimate knowledge of the field-based requirements of the job. These experienced health workers and educators devised, critiqued, and revised the test items in line with the prescribed objectives for the Community Health Module. The group decided to create two comparable forms (A and B) of the knowledge test in order to reduce the learning effects of repeated performance. The content of the items on the two forms was comparable but changes in the item format, i.e. from multiple
choice to fill-in were made on Form B. The two forms of the test are found in Appendix D.

The procedures in test development described above follow the recommendations established by the American Psychological Association for content validity. "Content validity is evaluated by showing how well the content of the test samples the class of situations or subject matter about which conclusions are to be drawn." 6

Development of the Situational Interview Test

A simulated interview procedure called the Situational Interview Test (SIT) was developed to measure the ability of the subjects to obtain health assessment information during interviews. In the situational environment, the subject was expected to obtain health related information from an adult family member. Family history vignettes were developed which specified and delimited the information available in the simulations.

The material for the situational vignettes had been obtained from previously reported case histories of Guyanese families. This material was developed into three vignettes each containing information about the following aspects of family health: mother's health, children's health, nutritional status, personal hygiene, insect control, family planning practice, housing, human waste and refuse disposal and water supply and utilization. All of these subject areas had been elements of the curriculum for both the preservice and inservice groups. To further validate the content of the vignettes each one was reviewed and revised by Guyanese health workers who were experienced in performing health
assessment interviews. The scripts for the vignettes are contained in Appendix E.

Role Training for the Situational Interview Test

Six staff members from a separate training unit within the Ministry of Health were selected to serve as actors and play the role of a family member during the Situational Interview Test. The actors were trained in three separate sessions. The first training session was used to provide the actors with the following information: an overview of the situational test procedure, the specific role of the actor, and the purpose of the study. The actors were given a family history script and instructed to review and memorize their assigned script in preparation for the second training session. The second training session was used to dry run the actual implementation of the situational test. First, a brief review was given to the actors. Second, the actors were informed of the rules for subject and actor behavior during the interview. The remainder of this session was devoted to having the trainers role play the interview situation. During role plays of the testing condition, the entire test sequence was followed. As two actors played the roles of the family member and the student, the other actors served as observers. Afterward, the observers gave feedback and discussed the role play in terms of how accurately the actor responded to questions from the subject. All the actors had the opportunity to role play both the subject and family member.

The third session was used to assess the actor's familiarity with the script for his role. Each actor was asked to write the information
about his part on the record which was developed as the measurement instrument for student performance. The six actors who completed this record with 100% accuracy were considered competent to role play during the Situational Interview Test.

Preparation of Subjects for the Situational Interview Test

The subjects were trained to participate in the situational test. This training, which was the same for both groups, was conducted the day before administration of the Situational Interview Test. Each subject was given guidelines for the Interview Instructions which contained a description of the purpose of the interview, the procedures to be followed during the interview, the role of the actor, the role of the subject, and the post interview recording procedure. The interview instructions are contained in Appendix F. The interview process was reviewed and discussed with the subjects. Following the training session, a short written posttest was administered to ascertain information about their understanding of the interview procedures. (Appendix G) Individual remediation was given to subjects in both groups who responded incorrectly to questions on the test.

Procedures for the Situational Interview Test

The subjects were randomly assigned to one of the six staff members who portrayed a member of one of the three "families" created for the situational test. Each interview was conducted in a private office set aside for this purpose. The interviews were tape recorded. Subjects were instructed to take notes for use in filling out the post interview record.
When the subject entered the interview room, he/she exchanged greetings with the actor and received Interview Notes which contained a review of the interview procedure and information about the "family" to be interviewed. The Notes provided socioeconomic and environmental information about the family and the community in which the family resided. The subject was given five minutes to study the information during which time the actor remained silent. After five minutes, the actor started the tape recorder and instructed the subject to begin the interview. The actor terminated the session after twenty (20) minutes. The Interview Notes may be found in Appendix H.

Weighting of the Situational Interview Test

The eighty-seven (87) individual test items were assigned weights by a panel of experts. The method for weighting the test items was developed by employing the non statistical rational approach reported by Fitzpatrick and Morrison. In this approach, expert judges are asked to estimate the relative importance of each item in relation to the overall aims of the test. Seven Guyanese health workers who had a history of community health experience were selected to weight the items on the test. The experts included four public health nurses, two physicians and one dispenser. These expert judges assigned a score of importance from one to three to each of the eighty-seven (87) items covered on the test. A score of one was assigned to those items not considered essential, two to those items considered desirable but not essential, and three to items perceived as essential. The form used for expert weighting is in Appendix I. The weighting for a given item on the
situational test was determined by applying the mean of the scores assigned by the experts to that item. The subjects received a total test score and scores for each of the nine categories.

Expert weighting of the eighty-seven (87) test items also resulted in aggregated mean weights for the nine categories contained in the test. Ranked according to the means, the categories reflected the relative importance assigned by the seven experts. Agreement between experts regarding the importance of each category was determined by using the Spearman Rank Order correlation statistic.

Data Collection for the Situational Interview Test

The interview record was completed immediately after the interview. The record contained eighty-seven questions related to the health status of the family. These questions were divided into the nine categories of information taught during community health instruction: mother's health, children's health, family planning, housing conditions, water supply and utilization, personal hygiene, human waste and refuse disposal, nutrition and insect control. The record was completed by answering each question with the information obtained during the interview. There was no time limit for completing the record. The Situational Interview Test record is found in Appendix J.

To determine raw scores for the tests, the interviewer received one point for each correct response and no credit for incorrect or unanswered questions. The transcripts of the interview tape recordings were compared with student records as a cross check to control for
guessing. Information which had been entered on the record sheet but
had not been obtained during the interview was not accepted.
Information which had been obtained but was not recorded on the
interview record was ignored since the objective was to obtain and
record information collected during the interview.

**Data Collection for the Knowledge Test**

The treatment groups completed two written tests of knowledge
during the study. In a comparison of preservice and inservice
instruction, the problem of selection differences related to previous
exposure to instruction must be addressed. The knowledge test sequence
was designed to take the possibility for such a difference into
consideration. Therefore, the first knowledge test was administered at
the time when the two groups were judged most likely to be similar. The
treatment groups completed a written test of knowledge on two occasions
during the study. Knowledge Test A for the preservice subjects was
administered after the completion of the first instructional session.
The inservice subjects completed the same knowledge test prior to
participating in their first instructional session. This testing
sequence provided the best opportunity to control threats to internal
validity due to previous experience. Previous experience could have
affected performance since the subjects in the inservice group had been
exposed to portions of the content of the module during their earlier
preservice training experiences, and the preservice subjects had not.
Testing the preservice group both before and after the two week
knowledge transfer session was an alternative, but it was decided that
administrating an additional test to the preservice group prior to the first instructional session might threaten validity because of testing effects. Knowledge Test B was administered to both groups the day before the Situational Interview Test. Knowledge test results were reported as percentage correct.

Data Collection for the Intelligence Test

The Cattell Culture Fair Test was evaluated for construct validity by correlating the scale with measures of fluid intelligence. Using factor analysis, Cattell showed that the Culture Fair Test had a relatively high loading (.78) on the fluid intelligence factor. MacArthur and Elley reported the Culture Fair test loaded highest (.75) out of seven on a fluid intelligence factor. The Culture Fair Test has shown to load higher on the general intelligence factor than on the achievement factor on a factor analysis study by Morrison and Rosomer. Content validity has been investigated by Downing and others who obtained the relationships between the Culture Fair Intelligence Test and other intelligence tests. In Downing's study, the Culture Fair Test correlated above the r=60 level with Pintner IQ, WISC Verbal IQ, WISC Performance IQ, and WISC Full Scale IQ. Curtis and others reported that scores on the Culture Fair Test correlated only moderately with scores on tests of achievement such as the Metropolitan Achievement Test (MAT) and the California Achievement Test (CAT). This finding added to the evidence that intelligence accounts for only twenty-five to fifty (25-50) percent of the variance on achievement scores.
Reliabilities for the Culture Fair Test have been obtained by Schaie using the Spearman Brown formula. He found a test retest reliability coefficient to be $r = 0.80$ using fifty-seven (57) subjects for total test scores. In two other studies of groups numbering 200 and 450, test retest reliability coefficient, using the Spearman Brown formula, were $r = 0.82$ and $r = 0.85$.

All subjects completed Scale 2, Form A and B of the Culture Fair Test which was administered by specially trained members of the Medex staff. The training consisted of instruction and practice in test administration and the tutors were considered competent after they were able to administer the test without deviations from the written instructions. The Culture Fair Test was administered both to individuals and groups of subjects and the results were scored by the researcher.

**Data Collection for Personality Scales**

The best way of obtaining an accurate estimate of the degree of tolerance or intolerance to ambiguity would have been to observe the subjects over an extended period as they responded to ambiguous real life situations. However the practical limits of a research study such as this precluded such an activity. Consequently, an approximation of these behaviors was determined by using an attitude scale. Since tolerance of ambiguity refers to an evaluative process within the individual rather than to overt behavior, a measure of attitudes and values was probably of as much intrinsic value as inferences drawn from
observed behavior. Therefore, the use of Budner's scale provided information that permitted prediction of how the individual Medex was likely to react to an ambiguous situation.

The Budner test was selected as a viable indicator of personality traits on the basis of its apparent reliability and validity. Guilford determined that the 16-item scale was shown to be free of such artifacts as acquiescence and social desirability. A test and re-test study over a period of from two to four weeks obtained a split half correlation coefficient of $r=.85$. The validity of the test was confirmed by interjudge agreement on ratings of respondents' intolerance of ambiguity. Measure of acquiescence or "agreement response set" yielded no significant correlations with the scale. Edward's Scale of Social Desirability also revealed no significant correlations with Budner's scale. Comparison with three other scales for measurement of intolerance of ambiguity (Princeton scale, Coulter Scale, Walk Scale) pointed to the Budner Scale as the preferable instrument.

The Budner test is a sixteen (16) item scale with a total scoring range of sixteen to one hundred twelve (16-112). Respondents checked off one of six response categories for each item: strongly, moderately or slightly agree and strongly, moderately or slightly disagree. On the positively worded items strong agreement was scored seven moderate agreement six, slight agreement five, slight disagreement three, moderate disagreement two, and strong disagreement one. Scoring of negatively worded items was in the reverse direction. All omissions were scored four. Total scores were dichotomized at the median to
identify tolerants (below the median) or intolerants (above the median). 18

The self-administered Budner scale took approximately 15 minutes to complete but had no time limit. Directions for completion accompanied the scale. The scale which required only a brief introduction was useful for individuals as well as groups. The test items, as written, harmonized well with the cultural and training situation of Medex in Guyana and the level of English employed in the scale corresponded very well with the comprehension level of Medex. The Rotter scale was selected to measure the characteristic, locus of control. By analyzing the results of the subjects responses to the questions on the scale, the subjects are categorized as having an internal or external locus of control. 19 The reliability of the scale was attested to by studies undertaken by Rotter, Lefcourt, and Joe. 20 An internal consistency coefficient (Kuder-Richardson) of .70 and sample retest reliability coefficients, after one month (r=.60 for males, r=.83 for females) were considered acceptable. As far as the criterion of validity was concerned, the studies cited above indicated that the Rotter Scale was, in fact, sensitive to individual perceptions about internal-external locus of control and that there were individual differences in these. Correlations with Marlowe-Crowne Social Desirability Scale yielded results which substantiate the validity of the Rotter Scale. 21

The relevance of Internal-External Locus of Control to the situation of Medex was assumed since success in preventive and promotive tasks depended in part on the initiative of Medex in the field. It was expected that while working in the community, Medex would be more
effective if they would take action to improve the environment around
them, determine their future behavior from cues emanating from the
environment, perfect their skills and retain their integrity despite
subtle influences that tend to erode it. The characteristics that are
considered desirable for Medex are classified as internal by Rotter.

The Rotter scale is a twenty-nine (29) item forced choice test
including six filler items intended to make the purpose of the test
somewhat more ambiguous. The score was the total number of external
choices. The total scoring range was one to twenty-three (1-23). The
subjects were classified as internal or external by dichotomizing the
scores at the median. Internal scores occurred below the median,
external scores above the median. The self-administered Rotter Scale
took approximately fifteen (15) minutes to complete but had no
established time limit. Directions for completion accompanied the
scale. The scale required only a brief introduction and was useful for
individuals or groups. The language level and content was appropriate
for Medex in Guyana.\footnote{\textsuperscript{22}}

\textbf{The Procedures for Statistical Analysis}

The data was subjected to four statistical procedures for the
purposes of analysis. Hypothesis One was tested by t test and analysis
of covariance. Hypothesis Two was tested by t test. Hypothesis Three
was tested by multiple regression analysis, and the ancillary research
questions were tested by t test and Pearson Product Moment correlations.
The analytical computations were performed using the programs contained
in the Statistical Package for the Social Sciences (SPSS) at the
University of Hawaii Computer Center on the IBM 370 Computer. The data
was coded and key punched on cards to prepare for analysis. Program
control cards were prepared to direct the desired analyses.

**Statistics Used in the Analysis**

The t test was used to determine if significant mean differences
existed between the two groups. A t value was obtained using the
following formula for independent samples. Where homogeneity of
variance was present the following pooled variance was computed.\(^23\)

\[
s^2 = \frac{(N_1-1) S_1^2 + (N_2-1) S_2^2}{(N_1-1) + (N_2-1)}
\]

The sample variance for the difference of sample means is:

\[
s_d^2 = \frac{S^2}{N_1} + \frac{S^2}{N_2}
\]

t corresponding to the difference in sample means is computed:

\[
t_d = \frac{(\bar{x}_1 - \bar{x}_2) - U_1 - U_2}{s_d}
\]

Which under the null hypothesis \(H_0: (U_1 = U_2)\) reduces to:

\[
t_d = \frac{(\bar{x} - \bar{x}_2)}{s_d}
\]
Where homogeneity of variance was not present the formula using separate variance estimates was used. The separate variance is computed:

\[
t = \frac{(\bar{x}_1 - \bar{x}_2) - (U_1 - U_2)}{S_1^2/N_1 + S_2^2/N_2}
\]

Analysis of covariance was used to determine the amount of variance in the test scores, the dependent variables, that was explained by the main effect or independent variable after the affects of the pretest (covariate) were removed from the analysis. The procedure renders F ratios for the covariate, the main effect, and the explained variance. These F ratios were then interpreted for statistical significance at the .05 level.

The formula for determining the F ratios in this analysis was:

\[
F = \frac{SS_A/(k-1)}{SS \text{ error}/(N-k)} = \frac{MS_A}{MS \text{ error}}
\]

Stepwise multiple regression analysis was used to assess the joint or combined effect of the independent variables regarding student characteristics on the dependent variables, knowledge test and situational interview test, and to assess the contributions of each of the independent variables. The regression or prediction equation containing two independent variables looks like this:

\[
y' = a + b_1x_1 + b_2x_2
\]
Where \( Y \) stands for the predicted score for any individual in the sample studied, and \( a \) stands for the constant. \( X_1 \) and \( X_2 \) stand for values or scores on the two independent variables. \( b_1 \) and \( b_2 \) are called the regression coefficients, and they express the relative weights of the two independent variables in the prediction.\(^{26}\)

The test statistic employed by SPSS for the overall test is:

\[
F = \frac{SS_{\text{reg}}/k}{SS_{\text{res}}/(N-k-1)} \frac{R^2}{R^2/k} = \frac{(1-R^2)/(N-k-1)}{(1-R^2)/(N-k-1)}
\]

Where \( SS_{\text{reg}} \) is the sum of squares explained by the entire regression equation, \( SS_{\text{res}} \) is the residual (unexplained) sum of squares, \( k \) is the number of independent variables in the equation, and \( N \) is the sample size.\(^{27}\)

Spearman Rank Order Correlation was used to determine the level of agreement among the seven experts. It was the judgment of these experts, concerning the importance of the Situational Test items, that resulted in the categories being ranked. Agreement among the seven experts was analyzed to compare the individual expert ranking to the aggregate ranking. Spearman's \( r_s \) used in this analysis is defined as:

The sum of the squared differences in the paired ranks for two variables over all cases divided by a quantity which can perhaps best be described as follows, it is what the sum of the squared differences in rank would have been had the two sets of rankings been totally independent. The formula to compute Spearman \( r_s \) is\(^{28}\):

\[
r_s = 1 - \frac{6 \sum_{i=1}^{N} d_i^2}{N^3 - N}
\]
Statistical Procedures for the Hypothesis and Ancillary Research Questions

Hypothesis One dealt with whether a significant difference at the .05 level existed between the preservice and inservice groups on the knowledge test scores. To test this hypothesis, a series of t tests between the group means were used. These analyses were computed in order to obtain difference information about the effects of the knowledge transfer methods on learning and to assess the effects of experience and knowledge transfer on knowledge acquisition. The means of the test scores for the preservice and inservice groups were analyzed in the following manner.

1. Knowledge Test A for preservice subjects compared with the Knowledge Test A and Knowledge Test B for inservice subjects.
2. Knowledge Test B for preservice subjects compared with Knowledge Test B for inservice subjects.
3. Mean gain score between Knowledge Test A and Knowledge Test B for the preservice subjects compared with the mean gain score between Knowledge Test A and Test B for the inservice subjects.
4. Comparison of Test A - Test B mean gain for significance within each group.

Analysis of covariance was used to determine whether a significant difference at the .05 level existed between the preservice and inservice groups on the Knowledge Test B means when adjustments were made for the Knowledge Test A scores. This procedure rendered F ratios that were then interpreted for statistical significance.
Hypothesis Two analyzed whether a significant difference at the .05 level existed between the inservice and preservice groups on the situational test scores. A series of t tests were used to test for significant differences between the groups for the total weighted scores and for each of the nine categories on the situational test.

Hypothesis Three dealt with the prediction of post test achievement using selected personal characteristics of the subjects. A multiple regression analysis was performed to identify non chance relationships at the .05 level of significance between Intelligence Scores, Internal and External Locus of Control Scores, Intolerance of Ambiguity Scores, age, sex, previous education, years of previous work experience in hospitals, and health centers, for both groups and the scores on Knowledge Test B. A second multiple regression analysis was performed using the same independent variables and using the weighted scores on the Situational Interview Test as the dependent variables in the analysis.

The first ancillary research question dealt with the possible effects of contact between preservice subjects and certain of the inservice subjects. T tests were used to test whether a significant difference at the .05 level existed between the inservice subjects known as preceptors and the other inservice subjects on the scores for the Knowledge Test B and the Situational Interview Test.

The second ancillary research question was designed to measure the relationship between numbers of completed household interviews reported by the subjects and the scores for both Knowledge Test B and the Situational Interview Test. A Pearson Product Moment correlation was
computed between numbers of interviews completed and each of the two dependent variables to identify non chance relationships at the .05 level of significance.

The third ancillary research question dealt with the correlation between knowledge acquisition and interviewing skill. A Pearson Product Moment correlation was used to determine if a non chance relationship existed between scores on Knowledge Test B and total scores on the Situational Interview Test.

Summary

In this chapter, a description of the population and the sample was provided. The training procedures for each of the two groups were explained including time, sequence and duration of the instructional sessions. The data collection instruments and the procedures for data collection were described. Finally, the statistical routines used to treat the data were described. The t test was used to identify differences in mean achievement scores for knowledge and situational tests. Analysis of covariance was employed to identify differences in knowledge acquisition while controlling for entry level knowledge. Multiple regression analysis was employed to determine the effects of selected personal characteristics on knowledge and interview test scores. T tests were employed to determine the effects of contact between preservice and inservice subjects during the study. Pearson Product Moment correlations were used to investigate the relationship between numbers of interviews completed and the scores on knowledge and interview skill instruments. Pearson Product Moment correlations were
employed to determine the strength of the correlation between knowledge and skill achievement as measured by the testing instruments.
NOTES FOR CHAPTER III

1 Thomas D. Cook and Donald T. Campbell, *Quasi-Experimentation: Design & Analysis Issues for Field Settings* (Chicago, IL: Rand McNally, 1979), pp. 75-76.


24 Norman H. Nie and others, Statistical Package (1975), pp. 399-409.


This chapter contains four sections. In the first section, the descriptive statistics for the background and personal characteristics and of the subjects are presented. The second section is devoted to the analysis of Hypotheses One and Two. The third section deals with the Hypothesis Three and the final section contains the results of the analysis for the ancillary research questions.

**Findings Related to the Background and Personal Characteristics of the Preservice & Inservice Subjects**

Prior to participation in this study, the two groups of subjects completed a biodata form and a series of tests. This information was used to identify systematic differences between the groups and to assist in the analysis of Hypothesis Three. The biodata information included age, sex, previous health worker training, and years of previous experience in health centers and/or hospitals. The Cattell Test of "g" Culture Fair was used to obtain information about the general intelligence of the subjects. Scale 2 Forms A and B were administered to all subjects. Two personality characteristics were chosen for analysis. Tolerance of ambiguity was measured using the Budner Scale for Tolerance-Intolerance of Ambiguity, and locus of control was measured using the Rotter scale for Internal External Locus of Control. The descriptive statistics for these personal characteristics
are presented as well as the results of t test and Chi-square analysis used to identify the preservice of significant differences between the groups on each of the variables.

**Background Characteristics of the Subjects**

Background and biodata information was obtained for all the preservice and inservice subjects as the initial step in determining the similarity of the two groups. The data was collected for thirty-four (34) inservice subjects and seventeen (17) preservice subjects. Five of the original thirty-nine (39) inservice subjects eligible to participate in the study were unable to complete the study due to geographical restraints. Therefore, all information on them was deleted from the analytical comparisons. The study was completed by thirty-four (34) inservice and seventeen (17) preservice subjects making a total of fifty-one (51) cases in the analysis of data. The subjects reported their age, sex, previous education as health workers and years of previous experience in hospitals and health centers.

Table 1 contains a description of the sex distribution in the two groups and the results of the Chi-square test used to measure association. The Chi-square was not significant indicating that the distribution of men and women did not differ in a systematic fashion. The number of men in each group is consistently higher than the number of women and the overall percentage of male subjects is sixty-seven (67), while the total percentage of women is thirty-three (33). Men are commonly employed as health auxiliaries in Guyana, perhaps because of
Table 1
Sex of Preservice and Inservice Groups by Number, Percent and Chi-Square Value

<table>
<thead>
<tr>
<th>Group</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Preservice</td>
<td>6</td>
<td>35</td>
</tr>
<tr>
<td>Inservice</td>
<td>11</td>
<td>32</td>
</tr>
</tbody>
</table>

the rigorous life style encountered when serving in communities outside
of an urban center. The request that Medex be willing to serve in
remote rural communities might also have effected responses to the
ministry request for candidates to enter the Medex training program.

The data reported on Table 2 describe the distribution of the
groups on the background variables age, years of hospital and health
center experience prior to entering the Medex training program. The t
test was used to identify differences between the groups on these
variables. There are no significant differences between the groups on
age, hospital and health center experience. The difference in the mean
age for the two groups is only slightly more than one year. Although
the age range for the subjects is between twenty-four(24) and fifty-four
(54) years, the distribution of age across the two groups is very
similar. There are no established age limits for applicants to the
program.
More of the subjects in both groups had been employed to provide health care in hospitals than in health centers. In addition, the average number of years as hospital based workers was considerably higher in both groups. The mean years of previous experience for Medex employed in hospitals was almost seven years whereas the mean years of previous experience for Medex who were employed in health centers was less than two years. Only twelve Medex reported previous health center experience. Most of these people were dispensers and health rangers and four of the subjects in this category had served in rural health centers for more than ten years.

Table 3 shows the previous health worker training of the inservice and preservice subjects. The data on this table was collapsed into three major categories to facilitate analysis. The categories were determined after identifying the hierarchy of training programs for
health workers. The category labeled Less Training than a Staff Nurse includes all subjects whose previous training prepared them for work as assistant nurses, single trained midwives and rangers. The workers in these categories receive less than three years of training. Members of the Staff Nurse category received three years of training. The category labeled More Training than Staff Nurse includes all members of the group who have had additional training to prepare for work as staff nurses, midwives or dispensers. Chi-square was employed to identify differences in these variables between the groups.

Table 3

Previous Health Worker Training of Preservice and Inservice Groups Categorized by Occupation Relative to Staff Nurse Including Number, Percent and Chi-Square Value

<table>
<thead>
<tr>
<th>Group</th>
<th>Less Training than Staff Nurse</th>
<th>Staff Nurse</th>
<th>More Training than Staff Nurse</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Preservice</td>
<td>5</td>
<td>29</td>
<td>5</td>
</tr>
<tr>
<td>Inservice</td>
<td>5</td>
<td>15</td>
<td>20</td>
</tr>
</tbody>
</table>

The data reported in Table 3 indicate no significant difference between the groups with regard to the type of health worker training they received prior to Medex training. The number of health workers in the two groups drawn from the staff nurse category was twenty-five (25).
Within the two groups, only ten (10) subjects received less training than staff nurse.

**Intelligence and Personality Characteristics of the Subjects**

Further investigation of the two groups was necessary to determine if significant differences existed between the groups, which might effect the outcomes of the study. To complete the analyses, general intelligence as measured by Cattell's Culture Fair Test and two measures of personality characteristics were obtained. Tests for tolerance of ambiguity as measured by Budner's scale and locus of control as measured by the Rotter scale were administered to the subjects.

In the results of the Culture Fair Test reported on Table 4, the raw scores and converted IQ scores for the two groups are provided by range, mean and standard deviation. Conversion tables were used to derive the Intelligence Quotient that was entered into the t test analysis reported on Table 4.

The results of the t test comparison of intelligence quotient between the two groups revealed that there was no significant difference in measured intelligence. The range data on Table 4 indicates that health workers varied greatly in their performance on a standardized measure of intelligence such as the Cattell. Four subjects scored fifty-seven (57) on the I.Q. test, and two subjects scored over one hundred (100). The subjects scoring fifty-seven (57) were fairly senior and had been away from the classroom environment for many years. The
scores were normally distributed as shown by the following measures; mean 84.30, standard deviation 11.13, and skewness -0.99 but, were generally lower than expected for a population with this educational background.

Table 4

General Intelligence: Cattell's Test of 'g' Culture Fair Raw Scores and IQ and T Test Results for Preservice and Inservice Groups by Range, Mean, Standard Deviation and T Value

<table>
<thead>
<tr>
<th>Raw Scores</th>
<th>Form A</th>
<th>Form B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range</td>
<td>Mean</td>
</tr>
<tr>
<td>Preservice</td>
<td>8-33</td>
<td>23.05</td>
</tr>
<tr>
<td>N = 17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inservice</td>
<td>10-34</td>
<td>23.24</td>
</tr>
<tr>
<td>N = 33</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intelligence Quotient</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>t value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preservice</td>
<td>57-101</td>
<td>84</td>
<td>12.49</td>
<td>-0.16</td>
<td>.872</td>
</tr>
<tr>
<td>N = 17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inservice</td>
<td>57-107</td>
<td>84</td>
<td>10.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N = 33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 5

Personality Characteristics for Preservice and Inservice Groups
Including Number, Range, Median, Mean, Standard Deviation, and Chi-square Value

<table>
<thead>
<tr>
<th>Group</th>
<th>Range</th>
<th>Mean</th>
<th>Median</th>
<th>S.D.</th>
<th>N</th>
<th>Range</th>
<th>N</th>
<th>Range</th>
<th>Chi-sq.</th>
<th>p</th>
</tr>
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<tbody>
<tr>
<td>Internal-External Locus of Control</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Preservice</td>
<td>2-17</td>
<td>7.06</td>
<td>6.30</td>
<td>3.17</td>
<td>10</td>
<td>2.0-7.6</td>
<td>6</td>
<td>7.6-14.0</td>
<td>1.73</td>
<td>.187</td>
</tr>
<tr>
<td></td>
<td>N = 16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inservice</td>
<td>1-15</td>
<td>8.36</td>
<td>8.33</td>
<td>3.58</td>
<td>14</td>
<td>1.0-7.6</td>
<td>19</td>
<td>7.6-15.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N = 33</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Tolerance-Intolerance of Ambiguity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preservice</td>
<td>48-87</td>
<td>67.35</td>
<td>69.66</td>
<td>9.11</td>
<td>7</td>
<td>48.0-66.8</td>
<td>10</td>
<td>66.8-87.0</td>
<td>.480</td>
<td>.488</td>
</tr>
<tr>
<td></td>
<td>N = 17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inservice</td>
<td>51-90</td>
<td>66.24</td>
<td>66.25</td>
<td>9.35</td>
<td>17</td>
<td>51.0-66.8</td>
<td>16</td>
<td>66.8-90.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The personality characteristics, locus of control and tolerance of ambiguity are reported on Table 5. The range, mean, median and standard deviation are provided for each group. To obtain a Chi-square value for the comparison of the groups on these two personality variables each set of scores was divided into dichotomous halves using the median score, a standard procedure for treating these data. The number, range and Chi-square value are also reported for the dichotomized data.

As shown on Table 5, the Chi-square result suggests a high probability that no difference exists between the groups on locus of control. The mean for the inservice group on locus of control is higher than the mean for the preservice subjects. The number of preservice subjects categorized as internal is larger than the number categorized as external. The number of inservice subjects categorized as external is larger than the number categorized as internal.

The results shown in Table 5 for Chi-square analysis of group differences on the variable tolerance of ambiguity, indicate that no significant difference exists between the two groups. The preservice group contained ten (10) subjects categorized as intolerant and seven subjects considered tolerant. The inservice subjects were almost equally distributed across the categories of tolerant and intolerant.

**Summary of the Findings for Background and Personal Characteristics**

Since the design of this investigation provided for the comparison of intact groups it was necessary to establish the comparability of the preservice and inservice subjects prior to the initiation of the study procedures. The data reported on Tables 1-5 indicated clearly that no
significant differences existed between the preservice and inservice groups on the background and personal characteristic variables that were selected for analysis.

The results of these analysis are also important when consideration is given to the expected profile of future Medex. Given that there are no changes in the selection procedures and that the candidate pool remains stable, it is expected that future Medex will be similar in the background and personal characteristics to those analyzed in this study.

Findings related to Hypothesis One and Two

Hypothesis One was designed to test whether training as a preservice or inservice condition made a significant difference in subject's knowledge about community health. The hypothesis stated in the null form is that:

There is no significant difference in the knowledge test achievement scores for community health assessment between subjects receiving training prior to graduation (preservice) and those who received training as graduates (inservice).

The results of knowledge testing were examined using a series of t tests and analysis of covariance to determine if a significant difference in the means of group scores existed and if that difference was related to the treatment conditions. The results of these analysis are shown on Tables 6-11.

The first t test analysis for significant differences in the mean scores of the preservice and inservice groups was performed to compare the mean score of the preservice and inservice groups for Knowledge Test A. The test was administered to the preservice subjects after
knowledge transfer instruction. The inservice subjects completed the test before the knowledge transfer experience. The results of the analysis are reported on Table 6.

Inherent in this field study comparison of preservice and inservice groups was the problem of selection differences related to previous exposure to instruction. To minimize the differences in previous experience, Knowledge Test A was administered when the inservice and preservice groups were judged most likely to be similar. The data reported in Table 6 indicate that the inservice group had significantly less knowledge than the preservice group at the time when they were deemed to be most similar.

Table 6
T Test Comparison of Knowledge Test A Scores
After Preservice Knowledge Transfer and Before Inservice Knowledge Transfer

<table>
<thead>
<tr>
<th>Knowledge Test</th>
<th>Mean</th>
<th>S.D.</th>
<th>Range</th>
<th>F</th>
<th>t value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preservice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N = 17</td>
<td>A</td>
<td>81.13</td>
<td>9.913</td>
<td>55-93</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inservice</td>
<td>A</td>
<td>73.77</td>
<td>10.556</td>
<td>48-93</td>
<td>1.13</td>
<td>2.38</td>
</tr>
</tbody>
</table>

at value significant at the .05 level

A t test comparison of the preservice and inservice mean scores was conducted using the scores for the knowledge test administered to the groups after both had, at a minimum, completed the instructional session
for knowledge transfer. In this analysis the Knowledge Test A scores for the preservice group were compared with the inservice group scores for Knowledge Test B. The results of this analysis are reported in Table 7.

After the preservice group had completed the knowledge transfer session and the inservice group had completed knowledge transfer and practice activities, the knowledge scores of the preservice group were substantively higher than the scores of the inservice group, but did not quite reach significance at the .05 level as shown in Table 7. This result suggests that three instructional activities were less effective in assisting the inservice subjects to acquire knowledge than the preservice knowledge transfer alone.

Table 7

T Test Comparison of Knowledge Test Scores
After the Knowledge Transfer Session Was Completed for Preservice and Inservice Groups

<table>
<thead>
<tr>
<th>Knowledge Test</th>
<th>Mean</th>
<th>S.D.</th>
<th>Range</th>
<th>F</th>
<th>t value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preservice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N = 17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>81.15</td>
<td>9.90</td>
<td>55-93</td>
<td>1.06</td>
<td>1.95</td>
<td>.057</td>
</tr>
<tr>
<td>Inservice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N = 34</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>75.52</td>
<td>9.63</td>
<td>42-90</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the final t test analysis of knowledge test scores, the means for each group on Knowledge Test B were compared for significant differences. At the time of testing, both the preservice and inservice
subjects had completed all instructional sessions included in the Community Health Module. The results of this analysis are reported in Table 8.

The results of knowledge test comparisons between the two groups after all instructional sessions indicated that the preservice subjects scored significantly higher than the inservice subjects at the .000 level. The results in Table 8 indicate that the preservice treatment was more successful in increasing the knowledge of subjects in the area of preventive health care.

Table 8
T Test Comparison of Knowledge Test Scores After Knowledge Transfer and Field Practice Sessions Completed by the Preservice and Inservice Groups

<table>
<thead>
<tr>
<th>Knowledge Test</th>
<th>Mean</th>
<th>S.D.</th>
<th>Range</th>
<th>F</th>
<th>t value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preservice</td>
<td></td>
<td></td>
<td></td>
<td>1.79</td>
<td>4.59</td>
<td>.000</td>
</tr>
<tr>
<td>N = 17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>87.68</td>
<td>7.2</td>
<td>72-97</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Inservice B 75.52 9.6 42-90
N = 34

*a t value significant at the .05 level

Further analysis was necessary to reject the null hypothesis since this analysis had not controlled for differences in scores on the first knowledge test and the groups had different histories of previous exposure to the subject matter. Additional analysis of the preservice and inservice performance on knowledge testing used t tests to compare
knowledge gain from Test A to Test B within each of the groups and to compare the mean gain scores of the preservice and inservice groups. In Table 9, the results of the comparison of the mean differences in the scores between Test A and Test B are shown for the preservice and inservice groups.

<table>
<thead>
<tr>
<th>Table 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>T Test Comparison of Test A, and Test B Mean Differences for the Preservice and Inservice Groups</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test A Mean</th>
<th>Test B Mean</th>
<th>Difference Mean</th>
<th>S.D.</th>
<th>t value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preservice</td>
<td>81.1</td>
<td>87.7</td>
<td>6.54</td>
<td>10.94</td>
<td>2.47</td>
</tr>
<tr>
<td>N = 17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inservice</td>
<td>73.8</td>
<td>75.2</td>
<td>1.39</td>
<td>12.24</td>
<td>0.66</td>
</tr>
<tr>
<td>N = 33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a t value significant at the .05 level

Analysis of the treatment effects on the groups was obtained by determining whether the knowledge gain of a group, as measured by the difference between Test A and Test B mean scores, was significant. Table 9 indicates that a significant difference at the .025 level existed between the mean scores on the two tests of knowledge for the preservice group. The inservice group difference was not significant.

The mean gain scores between Knowledge Test A and B for the preservice and inservice groups were compared to determine if a
significant difference existed at the .05 level. The results of this analysis are reported on Table 10.

Table 10

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>F</th>
<th>t value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preservice</td>
<td>6.54</td>
<td>10.94</td>
<td>1.25</td>
<td>1.46</td>
<td>.151</td>
</tr>
<tr>
<td>N = 17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inservice</td>
<td>1.39</td>
<td>12.24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N = 33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There was no statistically significant difference in the mean gain score comparisons between the groups as indicated in Table 10. However, the arithmetic difference in scores was considerable at approximately one half of a standard deviation. It is difficult to evaluate this result as the preservice group was handicapped in the analysis, having taken Knowledge Test A after the knowledge transfer session occurred. It is reasonable to believe that the mean gain score for the preservice group would have been higher if the test had been administered before the knowledge transfer session.

The analysis of the knowledge tests was completed by submitting the data to analysis covariance. In this analysis, the Knowledge Test B scores were evaluated for significance after adjustments were made for the differences in Knowledge Test A scores. The results of the analysis
of covariance, performed to control for the effects of Knowledge Test A upon the results of the post Knowledge Test B, are reported on Table 11. The findings indicate that the differences in the Test B scores were significant beyond the .05 level after the effects of the pretest differences were removed from the analysis.

This analysis was performed to identify differences in the knowledge test results between the two groups in order to confirm or reject Hypothesis One. The results of 1) analysis of covariance, together with 2) the t test results indicating a significant knowledge gain between the scores in Test A and Test B for the preservice group, and the 3) t test results indicating significant differences in the performance of the two groups on Knowledge Test B, have provided evidence for the rejection of Hypothesis One. The preservice subjects who were trained by the use of a guided instructional program had significantly higher mean scores on the knowledge test for the Community Health Module. Further discussion of these differences is presented in Chapter V.

The second hypothesis, stated in null form to investigate differences on the situational test achievement between subjects receiving the preservice and inservice treatments is that:

There is no significant difference in the situational test achievement scores for community health assessment between subjects receiving training prior to graduation (preservice) and those receiving training as graduates (inservice).

Analysis of the hypothesis was accomplished using the t test to compare the group means that were derived from the total weighed scores for the test. Further individual analysis of the nine categories within
Table 11

Analysis of Covariance for Preservice and Inservice Groups Using Knowledge Test B Score as the Dependent Variable, and Knowledge Test A Score as the Covariate

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>Percent of Variation Accounted for</th>
<th>D.F.</th>
<th>Mean Square</th>
<th>F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test A</td>
<td>783.597</td>
<td>14.2</td>
<td>1</td>
<td>783.597</td>
<td>10.455</td>
<td>0.000^a</td>
</tr>
<tr>
<td>Main Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>1203.665</td>
<td>21.8</td>
<td>1</td>
<td>1203.665</td>
<td>16.060</td>
<td>0.000^b</td>
</tr>
<tr>
<td>Explained</td>
<td>1987.262</td>
<td>30.1</td>
<td>2</td>
<td>993.631</td>
<td>13.257</td>
<td>0.000^c</td>
</tr>
<tr>
<td>Residual</td>
<td>3522.648</td>
<td>51.5</td>
<td>47</td>
<td>74.950</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>5509.910</td>
<td>100.0</td>
<td>49</td>
<td>112.447</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Group           | N  | Means | unadjusted deviation | adjusted deviation | \( R^2 = .266 \) |
<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Preservice</td>
<td>17</td>
<td>87.68</td>
<td>19.37</td>
<td>18.63</td>
<td>( R = .516 )</td>
</tr>
<tr>
<td>Inservice</td>
<td>33</td>
<td>75.52</td>
<td>-9.98</td>
<td>-9.60</td>
<td>( R = .516 )</td>
</tr>
</tbody>
</table>

^aF ratio significant at the .05 level
the test was accomplished using the same statistic. The results of the t tests are reported on Table 12.

Table 12

T Test Comparisons of Situational Interview Test Scores for Preservice and Inservice Groups

<table>
<thead>
<tr>
<th>Situational Test Scores (weighed)</th>
<th>Preservice</th>
<th>Inservice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N = 17</td>
<td>N = 34</td>
</tr>
<tr>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Total Score</td>
<td>92.94</td>
<td>19.44</td>
</tr>
<tr>
<td>Nutrition</td>
<td>13.16</td>
<td>7.39</td>
</tr>
<tr>
<td>Children's Health</td>
<td>19.89</td>
<td>7.48</td>
</tr>
<tr>
<td>Mother's Health</td>
<td>5.81</td>
<td>4.00</td>
</tr>
<tr>
<td>Insect &amp; Rodent Control</td>
<td>4.64</td>
<td>3.16</td>
</tr>
<tr>
<td>Water Supply &amp; Utilization</td>
<td>15.69</td>
<td>5.80</td>
</tr>
<tr>
<td>Family Planning Practices</td>
<td>8.35</td>
<td>4.67</td>
</tr>
<tr>
<td>Waste &amp; Refuse</td>
<td>8.32</td>
<td>4.02</td>
</tr>
<tr>
<td>Housing Conditions</td>
<td>6.82</td>
<td>4.15</td>
</tr>
<tr>
<td>Personal Hygiene</td>
<td>10.25</td>
<td>3.62</td>
</tr>
</tbody>
</table>

a t value significant at the .05 level
b Categories are listed according to their ranked importance as assigned by experts who weighted the individual items.
The results of t test analysis of the Situational Interview Test scores indicated that the preservice group obtained and reported significantly more information about the health of the family during interviews than did the inservice group as shown by the significant difference in total test score comparisons in Table 12.

The t test results of the categorical score comparisons provide more precise information about group differences in collecting and recording interview information. The preservice group scores were significantly higher at the .05 level in the following five categories: Mother's Health, Water Supply and Utilization, Waste and Refuse Disposal, Housing Conditions and Personal Hygiene. There were no significant differences in the scores between the two groups in the following four categories: Nutrition, Children's Health, Insect and Rodent Control, and Family Planning Practices. The mean weight of the items in a given category on the Situational Interview Test was assigned to the category. For example, the categorical weighting for Mother's Health was 2.78. The categories were then ranked by importance using the assigned weights. The differences between the inservice and preservice groups was more precisely interpreted by comparing the group differences for a given category to the expert rankings of the categories. The categories in which the preservice group received significantly higher scores were ranked third, fifth, seventh, eighth and ninth by the expert judges. The categories in which no significant difference in scores was reported ranked first, second, fourth, and sixth in importance by the expert judges.
Table 13
Individual and Aggregate Expert Ranking of Situational Test Categories by Rank and Mean and Spearman Correlation Coefficients for Reliability of Expert Ranking

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rank</td>
<td>Mean</td>
<td>Rank</td>
<td>Mean</td>
<td>Rank</td>
<td>Mean</td>
<td>Rank</td>
<td>Mean</td>
</tr>
<tr>
<td>Mother's Health</td>
<td>1</td>
<td>3.0</td>
<td>1</td>
<td>3.0</td>
<td>7</td>
<td>2.25</td>
<td>1</td>
<td>3.0</td>
</tr>
<tr>
<td>Children's Health</td>
<td>1</td>
<td>3.0</td>
<td>1</td>
<td>3.0</td>
<td>6</td>
<td>2.38</td>
<td>1</td>
<td>3.0</td>
</tr>
<tr>
<td>Family Planning</td>
<td>7</td>
<td>2.25</td>
<td>4</td>
<td>2.0</td>
<td>2</td>
<td>2.75</td>
<td>5</td>
<td>2.75</td>
</tr>
<tr>
<td>Housing</td>
<td>6</td>
<td>2.33</td>
<td>8</td>
<td>1.66</td>
<td>8</td>
<td>2.11</td>
<td>8</td>
<td>2.11</td>
</tr>
<tr>
<td>Water Supply</td>
<td>4</td>
<td>2.76</td>
<td>6</td>
<td>1.84</td>
<td>5</td>
<td>2.46</td>
<td>6</td>
<td>2.38</td>
</tr>
<tr>
<td>Personal Hygiene</td>
<td>9</td>
<td>2.09</td>
<td>7</td>
<td>1.72</td>
<td>9</td>
<td>2.09</td>
<td>9</td>
<td>2.09</td>
</tr>
<tr>
<td>Waste &amp; Refuse</td>
<td>5</td>
<td>2.66</td>
<td>8</td>
<td>1.66</td>
<td>4</td>
<td>2.66</td>
<td>7</td>
<td>2.22</td>
</tr>
<tr>
<td>Nutrition</td>
<td>3</td>
<td>2.93</td>
<td>3</td>
<td>2.86</td>
<td>1</td>
<td>2.86</td>
<td>4</td>
<td>2.80</td>
</tr>
<tr>
<td>Insect &amp; Rodent</td>
<td>7</td>
<td>2.25</td>
<td>4</td>
<td>2.00</td>
<td>2</td>
<td>2.75</td>
<td>1</td>
<td>3.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>r</td>
<td>.747</td>
<td>.860</td>
<td>.535</td>
<td>.864</td>
<td>.874</td>
<td>.610</td>
<td>.636</td>
</tr>
</tbody>
</table>

| Significance p = <.05  | .01      | .001     | .069     | .001     | .001     | .040     | .033     |

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The results indicate that the preservice and inservice training for community health assessment had a significant effect on the situational test scores therefore, null hypothesis number two stating that no significant differences exist between the inservice and preservice subjects on situational test achievement was rejected with regard to total test score achievement and for five of the nine interview information categories.

Reliability of Expert Judgment

The reliability of expert opinion regarding their rating of the importance of test items and categories was determined by performing a series of Spearman Rank Order correlations between the individual expert ranking of categories and the categorical ranking that was derived from the aggregate means. Expert opinion by rank and mean for each of the nine categories is reported on Table 13 along with the Spearman correlation coefficients between each expert ranking of categories and the aggregate ranking. The correlations of expert ranking indicate that with the exception of expert three, the only dispenser who participated as a rater of test items, all correlation coefficients between expert ranking and the aggregate ranking were significant at the .05 level.

Findings Related to Hypothesis Three

Hypothesis Three was designed to test the relationship of selected background and personal characteristics of the subjects and achievement in the knowledge and interview tests, and was stated as follows:
Predicting the post-test performance scores of Medex during the community health training is significantly related to knowledge of candidates scores on the following measurement instruments: Internal-External Locus of Control Scale Intolerance of Ambiguity Scale, and Test of "g" Culture Fair, and knowledge of personal and demographic information about the candidates such as age, sex, previous education and years of previous work experience in hospitals and health centers.

Two stepwise multiple regression analyses were performed to test Hypothesis Three. The first stepwise multiple regression was computed using personal characteristics as independent variables and the Knowledge Test B score as the dependent variable. The second multiple regression used the same set of personal characteristics as the independent variables and used the Situational Interview Test score as the dependent variable. The independent variables included: age, sex, previous education, years of experience in hospitals and health centers before Medex training, intelligence quotient as measured by Cattell's "Test of 'g' Culture Fair", Locus of Control as measured by Rotter's Internal External Locus of Control Scale, and Tolerance for Ambiguity as measured by the Budner Tolerance-Intolerance of Ambiguity Scale.4

The multiple regression analyses were computed to determine the regression equation, the multiple correlation coefficient and the squared coefficient of correlation. The regression equation indicates the best possible prediction of the dependent variable given the set of independent variables. The multiple correlation coefficient expresses the magnitude of the relation between the best possible combination of all the independent variables and the dependent variable. The squared coefficient of correlation explains the amount of variance in the
dependent variable accounted for by the regression combination of all the independent variables.\(^5\)

The independent variables were entered into the equation in order of their contribution to the explained variance until the F ratio was no longer significant at the .05 level for a given independent variable. The results of the multiple regression analyses are reported on Table 14.

In the multiple regression using Knowledge Test B as the dependent variable, locus of control score was the first variable used in the equation and it accounted for eight and three tenths percent (8.3) of the variance. The next variable, respondent's sex accounted for an additional seven and five tenths percent (7.5) of the variance above and beyond that accounted for by the variable locus of control. The third variable used in the equation was the tolerance of ambiguity score which accounted for an additional two percent of the variance. These three variables accounted for seventeen and nine-tenths (19.1) percent of the variance on the scores for the dependent variable, Knowledge Test B. Two additional variables age and intelligence quotient were entered but together these variables accounted for only an additional one and one-half percent (1.5) of the variance, therefore, the researcher chose not to include these variables in the equation given below. The other variables were not entered into the analysis during computation since the F ratios of these variables were not significant at the .05 level. The results of the regression analysis using personal characteristics to predict performance on Knowledge Test B indicate that seventeen and
### Table 14

Summary of Multiple Regression Analysis Using Personal Characteristics to Predict Scores on the Knowledge and Situational Interview Tests Administered After Instruction

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Knowledge Test Score</th>
<th>Situational Interview Test Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Multiple R</td>
<td>R Square</td>
</tr>
<tr>
<td>Internal-External Locus of Control</td>
<td>0.288</td>
<td>0.083</td>
</tr>
<tr>
<td>Sex of Respondent</td>
<td>0.398</td>
<td>0.159</td>
</tr>
<tr>
<td>Coded 1 = Male 2 = Female</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intolerance of Ambiguity</td>
<td>0.423</td>
<td>0.179</td>
</tr>
<tr>
<td>Age of Respondent</td>
<td>0.264</td>
<td>0.069</td>
</tr>
<tr>
<td>Sex of Respondent</td>
<td>0.343</td>
<td>0.117</td>
</tr>
<tr>
<td>Coded 1 = Male 2 = Female</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intelligence Quotient</td>
<td>0.389</td>
<td>0.151</td>
</tr>
</tbody>
</table>
nine-tenths percent (17.9) of the variance among the subjects on the Knowledge Test B score can be explained by the background variables, Internal-External Locus of Control, age, and Tolerance-Intolerance of Ambiguity. The prediction equation for this analysis follows:

\[
\text{Predicted knowledge test percent score} = Y' \\
Y' = 83.98 - .90 \text{ (IE)} - 6.6 \text{ (sex)} + .16 \text{ (Intol)}
\]

In the multiple regression using the Situational Interview Test score as the dependent variable, respondents age was the first variable accepted into the equation and it accounted for seven and nine tenths (7.9) percent of the variance in the scores. The respondents sex was the second variable used and sex accounted for an additional four and seven tenths (4.7) percent of the variance above and beyond that which was accounted for by age. Intelligence was entered next and accounted for an additional three percent of the variance. The total amount of variance accounted for by these three variables was fifteen and one-tenth (15.1) percent as shown on Table 14. Three additional variables were used in the equation, tolerance ambiguity scores, previous hospital experience, and previous health center experience, but together these variables accounted for only one and one-half (1.5) percent of the variance and therefore the researcher did not report them in the prediction equation that follows:

\[
\text{Predicted situational test score} = Y' \\
Y' = 168.2 - 2.0 \text{ (age)} + 14.6 \text{ (sex)} - .6 \text{ (IQ)}
\]
The remaining variables were not entered into the computation since their F ratios did not reach significance at the .05 level. The prediction equation for this analysis using age, sex and IQ accounted for fifteen and one-tenth (15.1) percent of the variance on the dependent variable, Situational Interview Test.

**Findings Related to the Ancillary Questions**

Several ancillary research questions related to the treatment conditions were posed in Chapter I. The first of these questions was designed to study the effect of contact between preservice subjects and the inservice subjects who worked at the health centers, and was stated as follows:

There is no significant difference in the knowledge or situational post-test achievement of inservice subjects who functioned as preceptors for the preservice subjects and those subjects who were not preceptors.

Contact between the inservice and preservice subjects during the preservice field experience was unavoidable since the preservice subjects were assigned to health centers served by graduate Medex. The graduates were not given any formal supervisory responsibilities for the students but were expected to introduce them to community members and to orient them to the social and physical structure of the community.

The analysis employed to probe the ancillary question was expected to identify differences between the subset of inservice subjects who assisted the preservice subjects and those who had no contact with preservice subjects. Separate t test analyses were conducted to compare the Knowledge Test B and Situational Interview Test means of the
subjects who served as preceptors with the inservice subjects who had no student contact. The results of these analyses are reported on Table 15.

Table 15

T Test Comparisons of Inservice Preceptors and Other Inservice Subjects for Knowledge Test B and Situational Interview Test Scores

<table>
<thead>
<tr>
<th>Inservice Groups</th>
<th>Knowledge Test B</th>
<th>Situational Interview Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Mean</td>
</tr>
<tr>
<td>Preceptors</td>
<td>14</td>
<td>78.80</td>
</tr>
<tr>
<td>Others</td>
<td>19</td>
<td>73.23</td>
</tr>
</tbody>
</table>

^a F significant at the .006 level therefore the separate variance estimate was used for the t value.

The results of the t test analysis of the Knowledge Test B and Situational Interview Test scores for inservice preceptors and other inservice subjects indicated that there was no significant difference in the performance of the two groups as shown in Table 15. The scores for
the preceptors were higher in both tests than those for the other inservice subjects but did not reach significance at the .05 level.

The second ancillary question was designed to determine if a significant relationship existed between the number of interviews completed during field practice sessions and measures of final performance and was stated as follows:

There is a non-chance correlation between the number of household interviews completed during the field practice session of instruction and the scores in the post instruction tests of knowledge and interview skill.

Pearson Product Moment correlations were computed to analyze the relationship between the number of interviews completed and scores on the interview and knowledge tests. The results are reported on Table 16.

The result of the Pearson correlations indicate that a non-chance correlation existed between interviewing experience and performance on the Knowledge Test B and Situational Interview Test procedures. As shown on Table 16, the correlation coefficient for the relationship between Knowledge Test B performance and interviews completed was $r=.52$. This relationship accounted for twenty-six (26) percent of the variation in the set of scores. The correlation coefficient for the relationship between Situational Interview Test scores and interviews completed was even higher at $r=.55$ accounting for thirty (30) percent of the variance. Since the preservice group was assigned and reported completion of more interviews during the field experience than the inservice group, the results suggest that the additional interview experience added to the superior achievement of the preservice subjects.
Table 16
Pearson Correlations between Interviews Completed and Performance on Knowledge Test B and Situational Interview Tests

<table>
<thead>
<tr>
<th></th>
<th>Knowledge Test B</th>
<th></th>
<th>Situational Interview Test</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
<td>r squared</td>
<td>p</td>
<td>r</td>
</tr>
<tr>
<td>Interviews completed</td>
<td>.52</td>
<td>.26</td>
<td>.000a</td>
<td>.55</td>
</tr>
<tr>
<td>N = 51</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a  r value significant at the .05 level

The third ancillary research question was designed to examine the relationship between achievement on the post instruction measures used to assess community health knowledge and interviewing skill and was stated as follows:

There is a non chance correlation between scores on the post-instruction knowledge and situational interview tests among all the subjects who have received training in community health assessment.

A Pearson Product Moment correlation was used to analyze the relationship between these two tests. The results of analysis indicate a statistically significant correlation existed at the .05 level. The correlation coefficient for this relationship was r=.34, and it accounted for ten (10) percent of the variance in the scores.

Summary

In this chapter, the findings related to the study were reported. In the first section, the descriptive information about the two groups
was presented and analyzed for significant differences. T tests and Chi-square analysis of the variables age, sex, previous health worker training, and previous work experience in hospitals and/or health centers, intelligence, locus of control and tolerance of ambiguity indicated that no significant differences existed between the groups at the .05 level.

In section two, the findings resulting from analysis of the data for the first two hypothesis were presented. These analyses included a series of t tests and analysis of covariance for Hypothesis One and a series of t tests for analysis of Hypothesis Two. Hypothesis One stated in the null form to investigate differences in knowledge test performance of the two groups was rejected since significant differences existed at the .05 level. Hypothesis Two stated in the null form to investigate differences between the two groups in the Situational Interview Test achievement was rejected since significant differences were found at the .05 level.

In section three, the findings for Hypothesis Three were reported. Stepwise multiple regression analysis was used to gain an understanding of the relationships among selected variables and test performance results. Regression analysis indicated that approximately eighteen (18) percent of the variance on the knowledge test and fifteen (15) percent of the variance on the interview test was accounted for by background and personal characteristics.

The fourth section presented the findings that resulted from analysis of the ancillary research questions. In these analyses, a t test and Pearson Product Moment correlations were performed. The first
ancillary research question stating that no differences existed between subsets of the inservice group was accepted. In the second ancillary question, a significant relationship, accounting for a substantial amount of the variance was found between interviews completed and the performance tests. In the third ancillary question a significant relationship accounting for a small amount of the variance was found between the knowledge and situational test scores.
NOTES TO CHAPTER IV

1. R. B. Cattell and A. K. S. Cattell, Test of "g" Culture Fair Scale 2, Form B (Champaign, IL: The Institute for Personality & Ability Testing, 1960).


CHAPTER V

SUMMARY, CONCLUSIONS AND IMPLICATIONS

In this chapter, a summary is made of the problems investigated, the methodology and statistical methods used, the limitations of the study, and the major findings. Then, the conclusions related to the major hypotheses and ancillary research questions are stated. The final section contains implications for program managers.

Summary

Several theoretical and operational models were used in formulating the hypothesis for this study. The Getzel-Guba model provided a valid conceptual framework for the global view of social process in administration, linking the organizational goals and the community health needs. However, the model is dependent upon a decision making process. The Griffiths model of administrative decision making provided a structure for linking data gathering and policy formulation. The decision making process requires specific operational data about the educational program in order to be effective. The evaluation strategies of Stufflebeam and Astin provide the basis for generating data for program analysis and evaluation. These models specify the utilization of data regarding student attributes, the instructional process and the effects of instruction.

This study was initiated to examine an instructional program in community health assessment for preservice and inservice training
groups. The purpose of the investigation was to ascertain whether a systematic approach to measuring student performance and characteristics would provide relevant data which could be used by program managers to structure curriculum and management decisions for future trainees.

**Problems Investigated**

To place the problem in a testable mode, three hypotheses and three ancillary questions were developed and tested. The first and second major hypotheses were developed to identify differences between the two groups' measures of community health knowledge and interview skill after participation in the instruction sessions. The third major hypothesis investigated the relationship between selected background and personal characteristics of the subjects and achievement on the instruments measuring knowledge and skill acquisition. Three ancillary questions were developed to obtain supplementary information about the instructional procedures. The first investigated the effects of contact between a subset of the inservice subjects and the preservice subjects on subsequent test performance. The second ancillary question probed the relationship between the numbers of household interviews completed by the subjects and subsequent performance on the tests of achievement. The third ancillary question was developed to investigate the relationship between scores on the tests of community health knowledge and interview skills.
Methodology Employed in the Study

To test the hypotheses of this quasi-experimental study a population to which the findings could be generalized was determined. A non-random sample was selected for study. A methodology was developed and implemented. Finally, appropriate statistical methods were applied to the data to generate the findings which were reported.

Population and Sample. This study was generalized to the population of Medex who were or will be trained in the Guyana Program through 1984. These Medex health workers, men and women, were personnel of the Ministry of Health, selected from among a pool of rural and urban health workers employed by the Ministry. It is anticipated that by 1984, one hundred and twenty-five (125) Medex will have been trained in Guyana.

The sample included the entire 1980-81 training class and all former trainees employed by the Ministry of Health and may be considered an intact group for the purposes of this study. The sample was comprised of thirty-four (34) inservice subjects who were graduates of the Guyana Medex Program and seventeen (17) preservice subjects, who were participants in the fifteen (15) month Medex Training program at the time of the study in 1980-81.

Procedures. The methodology employed in this quasi-experimental study was a comparison between two groups of students designated as preservice and inservice who were trained using two instructional methods. The groups trained under the two methods comprised the
independent variable in this study. The dependent variables were scores on repeated tests about their knowledge of community health and their scores on a situational test of interviewing skill.

The preservice and inservice groups received three instructional sessions to develop both knowledge and skill in community health assessment. The content of these sessions included knowledge transfer, field practice, and summary presentations. The Guyana Medex training staff of two physicians and five graduate Medex tutors provided the required classroom instruction and field supervision.

The groups were tested on their knowledge about community health at specified times during the instruction and at the conclusion of instruction using the Knowledge Test, Forms A and B. The Situational Interview Test for assessing interviewing skill was administered upon the conclusion of training. The dependent variables were based on the trainee's acquisition of knowledge about the Community Health Module and ability to obtain and record information during an interview. Knowledge acquisition was measured by the scores on Form A and Form B of the Knowledge Test. Competence in interviewing skill was measured by scores on the Situational Interview Test.

In addition to studying differences in background characteristics, the subjects in the study were administered three tests to measure personal attributes. Intelligence was measured using the Cattell Culture Fair Test. The Rotter scale was used to measure locus of control, a test that indicates the tendency of an individual to be self-directed or (internal) or other directed (external). The Budner test for measuring intolerance of ambiguity was used to characterize the
perceptions of the trainees with regard to an ambiguous situation. Background information was obtained with regards to age, sex, previous training as a health worker, years of previous experience in health centers and/or hospitals.

The data collected from the result of performance on the Knowledge Test Forms A and B, and the Situational Interview Test as well as the personal and demographic information were analyzed using the statistical methods described in the next section.

**Statistical Methods Used**

The background and personal characteristics of the subjects were analyzed using t test and Chi-square procedures to identify significant differences between the groups. Two methods of analysis were used to test the first major hypothesis. The first procedure used was the t test and the second was analysis of covariance. T test analyses were employed to determine whether there were significant differences between the two groups in their knowledge and skill related to the Community Health Module. T tests were also used to test the significance of knowledge gain over time within each group. Finally, t tests were used to test for significant differences in knowledge gains between the groups. Analysis of covariance was used to measure knowledge test score differences upon the completion of instruction while adjustment was made for differences in entry level knowledge of the groups.

The second hypothesis was analyzed by using t tests to compare the Situational Interview Test scores of the inservice and preservice groups. To analyze the third hypothesis, a multiple regression analysis
was computed to measure the relationship of the subject's background and personal characteristics with their scores in tests of knowledge and skill acquisition.

The first ancillary question was analyzed by using t tests to measure test score differences between the two subsets of inservice subjects who differed in their exposure to preservice subjects during the treatment. To analyze the second ancillary question, Pearson Product Moment correlations were used to determine the relationship between the number of household interviews completed by the subjects and test scores of knowledge and interview skill. The last ancillary question employed a Pearson Product Moment correlation to determine the relationship between scores on Knowledge Test B and the Situational Interview Test.

Limitations of the Study

The study was limited to assessment of community health knowledge and interview skills during and immediately following the instructional sessions, and no observations of work site or subsequent performance were made. Therefore, the conclusions about preservice and inservice training only apply to a specific aspect of the curriculum called the Community Health Module, and only as measured in the stated instructional environment.

It was necessary to use intact groups in the study therefore, threats to internal validity were controlled by analyzing the groups for differences in personal and background characteristics prior to conducting the study. Tests reported in the Findings Related to the
Background and Personal Characteristics Section of Chapter IV indicated that there were no significant differences between the groups on any of the selected variables. Thus, they were considered comparable for the purpose of this investigation. In spite of these efforts to control for potential differences between the groups, it is possible that the instruments chosen to measure the personal characteristics were insensitive to existing differences. It is also possible that there may have been systematic differences in the groups which were not identified in analysis of the two groups.

The preservice group was expected to conduct twenty (20) household interviews. However, the Guyana program administrator felt it was inappropriate to allow the inservice personnel to conduct twenty (20) interviews, instead the limit of fifteen (15) interviews was set for inservice Medex. The difference in interviews actually conducted by the subjects varied between and within the groups. The effects of these practice differences, which may have had an impact on performance are discussed in the finding section that follows but were not controlled for in the study.

**Findings**

Results of the statistical analysis of the data concerning the major hypotheses are presented in the following two sections: the first dealing with preservice and inservice performance on tests of knowledge and interviewing skill required for community health assessment; the second dealing with the relationships between the personal characteristics of the subjects and performance on the measurement
instruments for knowledge and skill. Findings related to the ancillary questions are presented in a final section.

Findings concerning preservice and inservice performance on measures of achievement. The first major hypothesis stated that there was no significant difference between the preservice and inservice subjects in a test of knowledge about the Community Health Module. To test this hypothesis, it was necessary to account for differences in the entry level scores of the groups while analyzing exit level scores. This was accomplished by performing an analysis of covariance. Further analysis was performed to compare entry and exit level test scores. This was accomplished by conducting a series of t tests to test for differences in the scores at various stages in the instructional process. The mean differences in knowledge gain within and between the groups were also analyzed using t tests.

Analysis of the data comparing the test scores of the two groups indicated that the preservice group scored higher on the Knowledge Test A and gained significantly more knowledge during the instructional process than the inservice group. In the analysis of knowledge gain between the Knowledge Test A and B, a statistically significant difference at the .05 level was found for the preservice group. The knowledge gain for the inservice group between Test A and Test B was not significant. The comparison of mean gain scores from Test A to Test B indicated that the preservice group mean gain was approximately one-half of a standard deviation larger than the mean gain of the inservice group but, this difference was not significant at the .05 level.
Further analysis of the knowledge test scores was accomplished using analysis of covariance to test for differences in the mean scores. There was a statistically significant difference beyond the .05 level between the two groups on the Knowledge Test B when the differences in Knowledge Test A scores were statistically removed from the analysis of Knowledge Test B scores. These findings confirm the existence of statistically significant differences between the two groups in knowledge about the Community Health Module therefore, the null hypothesis was rejected, as the preservice group had a significantly higher mean scores in the tests of knowledge.

The second major hypothesis stated that there was no significant difference between the preservice and inservice subjects in a test of interview skills conducted after the instructional sessions for the Community Health Module. The results of the Situational Interview Test were obtained by evaluating the records of the subjects which were completed after the interview. A t test was applied to the total score means of the two groups. The results of the analysis of the Situational Interview Test indicated that the preservice group was able to obtain and record more information during the interview than the inservice group. The results of the analysis were statistically significant beyond the .05 level therefore, the second null hypothesis was rejected.

Further investigation of the second hypothesis involved a comparison of the scores of the preservice and inservice groups for each of the nine information categories contained within the total test. This analysis provides more precise information about the differences between the two groups. The preservice subject's scores were
significantly higher at the .05 level on five of the nine categories contained in the test. There were no significant differences in the scores of the two groups in the other four categories. To evaluate these findings, it was useful to compare the results of the analysis for the categories with the overall rankings assigned by experts to the importance of each category. The information categories in which no significant difference existed between the groups were ranked in importance in the following manner:

<table>
<thead>
<tr>
<th>Expert Ranking</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nutrition</td>
</tr>
<tr>
<td>2</td>
<td>Children's Health</td>
</tr>
<tr>
<td>4</td>
<td>Insect and Rodent Control</td>
</tr>
<tr>
<td>6</td>
<td>Family Planning Practices</td>
</tr>
</tbody>
</table>

It appears that the inservice group did not differ significantly from the preservice group on three of the four health categories judged as most important by the expert panel. On the basis of these findings, the second null hypothesis was rejected for the total test as well as for the categories of Mother's Health, Water Supply and Utilization, Waste and Refuse Disposal, Housing Conditions, and Personal Hygiene.

Findings concerning the relation of background and personal characteristics to performance on measures of achievement. The third major hypothesis stated that there was a significant relationship between selected background and personal characteristics and performance scores on the instruments measuring community health knowledge and interviewing skill. To test this hypothesis, background information and the scores for tests of intelligence, locus of control, and intolerance of ambiguity were compared with the scores on Knowledge Test B and the
Situational Interview Test. The results of multiple regression analysis, using Knowledge Test B scores as the dependent variable, indicated that a significant amount of the variance at the .05 level is accounted for by the variables; locus of control, sex, and intolerance of ambiguity. In combination, these variables accounted for a total of seventeen and nine-tenths (17.9) percent of the variance in the knowledge test scores. The regression equation that resulted from the analysis predicts that men, with an internal locus of control, who are intolerant of ambiguity will have higher scores.

The second portion of the analysis for Hypothesis Three used the Situational Interview Test scores as the dependent variable and the same background and personal characteristics for the independent variables in the equation. The results of this analysis indicated that a significant amount of the variance, at the .05 level, in the interview scores was accounted for by the variables; age of respondent, sex of respondent and intelligence quotient. In combination, these variables accounted for a total of fifteen and one-tenth (15.1) percent of the variance in the situational test scores. In the regression equation that resulted from the analysis, women, who are younger, and who have a marginally lower IQ are predicted to have higher scores. The results of these analyses indicate that the third hypothesis, predicting a significant relationship between background and personal characteristics of the subjects and scores on measures of achievement, should be accepted. There are statistically significant relationships between measures of achievement and selected measures of background and personal characteristics and these relationships account for between
approximately fifteen (15) and eighteen (18) percent of the variance in
the test scores respectively.

Findings concerning the ancillary research questions. The ancillary research questions were designed to provide additional information to assist in analyzing the effects of the instructional process on student achievement. The first ancillary research question was developed to investigate the effects of contact, during the study, between preservice subjects and a subset of inservice subjects. In this analysis, the differences in test achievement between the inservice subjects who had contact with students and the other inservice subjects were compared. The results of the t test indicated that no significant differences existed between the two groups of inservice subjects on the Knowledge Test B and Situational Interview Test. Although the findings are not statistically significant, the test results of these two groups indicate that the inservice subjects who had contact with the preservice subjects had higher scores on both the knowledge and interview tests.

The second ancillary research question probed for a possible relationship between the numbers of household interviews completed by the subjects and the results of the tests to measure knowledge and interview skill. This ancillary question was important since the subjects completed different numbers of household interviews during their field experience. Pearson Product Moment correlations were computed to determine the strength of the relationship between interviews completed and each of the tests for measuring achievement. The results of the analyses indicated that the correlation between
interviews completed and Knowledge Test B results was $r = .52$, a statistically significant correlation beyond the .05 level. The amount of variance explained by the relationship is twenty-six (26) percent. The results of the Pearson Product Moment correlation between interviews completed and the score on the Situational Interview Test is $r = .55$, a statistically significant relationship beyond the .05 level. The amount of variance explained by this relationship is thirty (30) percent. The findings indicate that the number of household interviews completed by the subjects during field practice experience accounted for a significant amount of the variance in subject's scores for the knowledge and interview skill assessment measures.

The third ancillary research question was designed to examine the relationship between achievement on the post instruction instruments used to assess community health knowledge, and interview skill. A Pearson Product Moment correlation was computed using the Knowledge Test B scores and the Situational Interview Test scores. The Pearson Product Moment correlation coefficient for the relationship was $r = .34$. Although this relationship is statistically significant at the .007 level, only ten (10) percent of the variance between the scores, was accounted for by the relationship between knowledge of community health and ability to obtain health related information during interviews.

**Conclusions**

Based upon the findings of this study, the following conclusions are warranted with regards to the Medex Guyana 1977-1981 preservice and inservice training programs in community health.
1. **In teaching the Community Health Module, the method which consisted of guided instruction with feedback to students and the opportunity for peer interaction resulted in superior performance, when compared to prescribed but independent and self-regulated learning experiences.**

In prior community health training programs conducted by the Health Manpower Development program in Micronesia, Pakistan, Thailand and Lesotho, no organized study has been conducted to provide data for comparing the differences between preservice and inservice training approaches. This analysis of the differences between the preservice and inservice groups indicates that close supervision and guided instruction are preferable to allowing experienced Medex acquire information in a more independent manner. The inservice group, despite their familiarity with the health needs of the community, were unable to achieve at the level of the preservice trainees. The conclusion here would suggest to program managers the need for guided instruction, feedback and peer interaction to be more systematically programmed for both preservice and inservice instruction.

2. **In preparing Medex to perform the prevention oriented activities of community health assessment, provision should be made for field-based practice. The field practice should be scheduled soon after the knowledge acquisition sessions.**

The significantly higher scores in knowledge test performance of the preservice group appears to be related to the sequence of field instruction. The preservice group received field practice immediately following didactic instruction, thus it appears that they were better
able to link information and practice. This finding should suggest to program managers that knowledge and skill development in community health assessment are related and integrating this information results in higher performance scores.

3. In planning programs for inservice inservice training in community health assessment, instructional experiences that engage the participants in active skill application experiences should be included as these experiences appear to be more effective in facilitating the development of assessment skills than passive knowledge transfer activities alone.

The inservice group did not achieve a significant overall knowledge gain as a result of the independent instructional experiences. However, the inservice group did as well as the preservice group in certain aspects of the interview skill test. This could be related to the combined effects of household interview practice and work experience in developing the ability to prioritize health-related data. This finding would further suggest that skill acquisition was enhanced by experience.

4. Carefully structured and experiential learning activities in the Community Health Module are helpful in the development of knowledge of prevention among Medex trainees.

The development of awareness of preventive approaches to health care is an important requirement for primary health care workers. Since the same prevention content was given to the preservice and inservice group, this study presented evidence that the learning increment in favor of the preservice group was attributable to structured
experiential learning activities and feedback. Therefore, these approaches should be incorporated by program managers into the prevention curriculum.

5. The prediction of trainee success in community health assessment is materially aided by knowledge of a trainee's personal characteristics which may be adduced prior to their selection for training.

Analysis of training characteristics would indicate some background and personal characteristic variables which can contribute to success in community health assessment: age, sex, internal locus of control, intolerance of ambiguity, and IQ all accounted for significant amounts of the variance in measures of achievement. The achievement profile which was generated by the regression equation would suggest that attributes linked to knowledge acquisition are different than those linked to the acquisition of skills. The prediction equation for higher achievement on Knowledge Test B indicates that men, with an internal locus of control who are intolerant of ambiguity are most likely to perform well. The prediction equation for the Situational Interview Test indicates that young women with lower IQ scores are most likely to perform well. These data might be of value to program managers in selecting future Medex candidates for work in community health assessment.

Implications

The emphasis on prevention of illness and promotion of positive health practices in the training of primary health care workers has not
previously utilized evaluation data to ascertain differences in
effective ways of conducting preservice and inservice programs. As an
example, in the most recent international report on primary health care,
"The Training and Support of Primary Health Care Workers," there are
many reports on primary health care and prevention. However, it would
appear that none of the programs describe an educational management
strategy using a decision making process based upon the evaluation of
training. The findings of this study suggest a number of implications
for research and practice related to decision making in the area of
curriculum, teaching techniques, and organization and management.

**Implications for Curriculum**

The results of this study demonstrated the value of providing
community-based practical experiences in the development of knowledge
and skill in community health assessment. Future research should study
the impact of maximizing community contact experiences as an
instructional tool. A curriculum alternative for community health is to
schedule community contact prior to the knowledge transfer instructional
sessions. The scheduling of skill experience to precede knowledge
transfer sessions allows students to enter the instructional setting
equipped to share direct community relevant information about the health
needs and conditions of the community. This information would serve as
a foundation upon which students can selectively build a knowledge base
for community health assessment. It may be of value to know if this
suggested approach results in greater knowledge and skill acquisition
then the approach employed in the present study. The same strategy might be used in other aspects of the Medex curriculum such as history taking, epidemiology, and maternal and child health services.

This investigation indicated that students can be trained more effectively in community health assessment but the larger issue of the balance between preventive and curative curriculum elements was not answered by the current study. If preventable health problems are targeted as a major barrier to achieving "Health for All by the Year 2000," then the impact of the ratio between preventive and curative knowledge and skill development should be investigated. Many primary health care programs proport to be prevention-oriented and yet characteristically they commit only a small percentage of their curriculum resources to prevention.

This study would suggest the need for further investigation into the most appropriate sequence of preventive and promotive health content within the curriculum. The results indicate that early exposure of preservice students to preventive health considerations may establish a preventive frame of reference that can carry over as a characteristic of job performance. The trainee who experiences a heavy and early emphasis on curative approaches would probably not be as amenable to the kind of preventive orientation which is necessary to interrupt the cycle of preventable diseases.

Implications for Training Techniques

Future research should investigate the use of simulation as an instructional technique for Community Health Assessment. Simulation
appears to be an effective substitute for reality where financial, manpower and geographic constraints limit access to field experiences. Although in this study, role play was used as an evaluation tool, the simulated interview technique has potential as a teaching method which is presently underutilized.

The preservice students in this study were carefully monitored in a structured program which appears to be one of the factors that enhanced their knowledge and skill acquisition. Recognition of critical inservice needs might suggest the development of a strategy to insure that inservice instruction is adequately structured and carefully monitored by supervisors. Future investigation into the development of effective inservice programs for health workers deployed to remote rural work stations would be in keeping with a commitment to maintaining a well-qualified cadre of health workers.

Implications for Organization and Management

The evaluation of the Community Health Module provided information as to effective means of developing knowledge and skills. A broader application of this evaluation strategy would enable administrators to monitor the effectiveness of instructional modules prepared for the development of the competencies necessary for specified job performance. Further, both the Health Manpower Development Program and the local government are obligated to assess the overall effectiveness of the training program to meet the health goals of the country. The implication is that systematic data regarding program results are needed
for policy decisions directing the future structure, sequence and duration of training.

The data concerning the background and personal characteristics indicate that a profile of trainees who have potential for high achievement in community health assessment could be developed to guide the selection of candidates for Medex training. The implication is that efforts should be continued to refine and complete the equation for predicting success in the community health activities that prepare Medex for their preventive and promotive responsibilities.

It was useful to construct this study within a structure furnished by social process theory, decision making and evaluation which provided a context for the design of the research. Taken alone, Getzel and Guba's theory is far too global for the level of the current study, however, if a larger system study were done, the Getzel and Guba approach would probably have greater power. The Griffiths theory of decision making appears to be a useful process for understanding the power and structure of decision making strategies in organizations and hence contributed to this study design. However, Griffiths theory did not readily yield directional hypotheses which could guide practice. The structure of the Astin and Stufflebeam models appear to be more amenable to providing the scope of information required by managers in evaluating the effectiveness of program components. Applying this framework resulted in attention to information about student characteristics, performance and instructional processes that can contribute to program decisions. This study has shown that more precise information can result in: 1) data collection and analysis for decision
making about curriculum structure, content, and methodologies, 2) increasing awareness of the structural requirements for inservice training curriculum, 3) the selection of trainees who will more readily benefit from the program, and 4) providing an indication of how to structure the proportional relationship between preservice and inservice training so that decisions can be made for effective utilization of human and material resources.
NOTES FOR CHAPTER V


APPENDIX A

HOUSEHOLD INTERVIEW QUESTIONNAIRE
Call a meeting upon arrival at site and be introduced by Medex, teacher, health worker, Amerindian Captain or other.

It is suggested that some time be spent settling in and feeling comfortable in your new surroundings prior to confronting villages with items on the questionnaire.

You are required to interview at least 20 households. All questions must be answered by a member of the household over 16 years of age.

The following information will assist you in completing the questionnaire:

(1) Arm circumference of all children over 1 year and under 5 years must be tabulated as over 14 cm or 14 cm and less in the chart provided.

For immunization status, mark in the space provided a tick (fully immunized) a dash (not fully immunized) or a ? (don't know).

For working status of mother, put W or NW to show 'working' or 'not working.'

In questionnaire, state mode of travel.

(2) Questions 2-13 are self-explanatory. Tick (√) in box where provided.

If patient does not understand the terms (yellow eyes, etc.), you may rephrase question or use local terms but you must indicate on the questionnaire the term(s) used as substitute.

(3) On the map provided, plot the location of each house you visited in the community, and place the assigned house (case) member on each square representing a house.

In addition to the questionnaire, you must make as detailed a scrutiny as you can of the following: Note your comments on each of these topics on the back of the family questionnaire.

(i) Breast feeding patterns
(ii) Nutritional preferences or taboos
(iii) Agricultural activities
(iv) Waste disposal practices
(v) Water supply and purification
(vi) Pest invasion and control (flies, mosquitoes and rats)
(vii) Awareness and use of family planning methods
(viii) High risk pregnant women
Write a full report, using the above sub-headings.

You are reminded to be courteous in your approach at all times.
HOUSEHOLD QUESTIONNAIRE

FAMILY NAME: _______________________

1. a) Record the name and age of all children.
   b) Record the arm measurement of children 0-5 years of age.
   c) Record the immunization status of all children.
      Place a (✓) if immunized.

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Measurement (cm)</th>
<th>DPT</th>
<th>BCG</th>
<th>Polio</th>
<th>Comments</th>
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2. Are any members of the household presently suffering from the following problems? (Tick off)
   Diarrhea ___  Yellow eyes ___  Worms ___
   Fever ___    Cold ___    Skin rashes ___

3. If your child vomits or has diarrhea, what do you give him/her
   a. to eat  ______________  ______________
   b. to drink ______________  ______________

4. Describe the meals usually eaten by the family within a 24 hour period.

5. Do you breast feed your babies?  Yes ___  No ___
   At what age do you stop breast feeding?  ______________

6. Do you use any methods to help you space the births of your children?
   Yes ___  No ___
   Type: ___________________
7. Have you ever suffered from the following symptoms or problems during pregnancy?

- High blood pressure
- Swelling
- Anemia (weak blood)
- Sugar
- Fits

Environmental Factors

8. Water Supply

Tick off type of water supply

- catchment
- ground
- surface
- piped

9. Comment on quality of water supply; refer to your protocols for guidance.

10. Waste Disposal

Tick off type of waste facilities used by household.

- latrine
- water seal
- other describe: ______________________

Comment on the quality of waste disposal facilities; refer to your protocol for guidance.

11. Pest Control

Tick off the type of pest problem which exists.

- mosquito
- rats or mice
- fly
- cockroach
- other describe: ______________________

Comment on breeding areas and control methods.
12. a) Has any member of your household ever visited the Health Center?

   Yes  No  Don't know

b) If 'yes', tick off the purpose of the visit below.

   ___ sick visit
   ___ children clinic
   ___ visit for health education
   ___ prenatal clinic
   ___ other: ________________________________

13. Has a health worker visited your home in the last 6 months for any of the following reasons:

   Follow-up of illness  Yes  No  Don't Know
   Emergency  
   To talk about children  
   To talk about nutrition  
   To talk about sanitation  

14. Record the approximate distance from the Health Center to the house mode of travel and time taken to travel.

   Distance  Mode of Travel  Approx. Time
   0-under \(\frac{1}{2}\) mile  
   \(\frac{1}{2}\)-under 1 mile  
   1-under 2 miles  
   2-under 5 miles  
   Over 5 miles  ________________________________
APPENDIX B

OUTLINE FOR SUMMARY OF COMMUNITY SURVEY
OUTLINE FOR SUMMARY OF COMMUNITY SURVEY

1. Name of community
2. Area visited
3. Population
4. Total number
5. Total number of households in survey
6. % of children malnourished
7. % of children unimmunized
8. Number of pregnant women
9. % of high risk pregnant women
10. Comment on the following:
    a. What high risk factors do the pregnant women have?
    b. What high risk factors do the children have?
    c. What are some of the attitudes towards:
       - breast feeding
       - family planning
       - nutritional preference?
    d. What are some of the common illnesses prevalent in the area?
11. Conclusion:
    a. Choose a health aspect of the community which you feel is a particular problem and give your reasons.
    b. Present your ideas about a plan of action for solving this problem.
    c. If you have already initiated some activities to relieve the problem, please describe these.
APPENDIX C

COMMUNITY HEALTH MODULE OBJECTIVES
COMMUNITY HEALTH MODULE OBJECTIVES

The Medex Task: Participate in a program to assist community members to improve their environmental conditions and personal health practices.

Terminal Objectives:

The student will:

1. Obtain information about the health status and practices of the people in a selected community.

2. Identify those social and environmental conditions which, if changed, would improve the health of people in the community.

Enabling Objectives:

The student will:

1. Recognize what disease patterns provide indications of community health status: i.e., diarrhea, hepatitis, communicable disease.

2. Identify environmental factors which will effect the maintenance of a pure water supply.

3. Describe effective and safe means of human waste disposal.

4. Describe methods for pest control, e.g., flies, mosquitoes, rats, etc.

5. Describe the nutritional needs of children and pregnant women.

6. Explain the normal growth and development process for children.

7. Describe the social and medical factors which determine the potential for a child to be at risk of becoming ill.

8. Describe the benefits of immunization.

9. Conduct household interviews to obtain information about family health state.

10. Map a selected section of the community and display the following water sources, human waste disposal facilities, rubbish disposal facilities, potential breeding areas for insect and rodent pests.

11. Assess the quality of water supply, human waste disposal facilities, rubbish disposal methods and pest control efforts.
APPENDIX D

COMMUNITY HEALTH MODULE

KNOWLEDGE TEST FORMS A AND B
Name: ______________________
Date: ______________________

Questions 1 - 4:
Diseases associated with water and human excreta disposal are classified into the four groups listed below. For each, provide the name of one disease most commonly associated with that group.

1. Soil transmitted
2. Lack of water
3. Water borne
4. Water related insect vectors

Questions 5 - 8:
The cycle for water borne disease is diagrammed below.

Complete the disease cycle diagram by placing the letter of the step in its correct place on the diagram.

Steps in water borne cycle.

5. ___ unprotected water source
6. ___ untreated drinking water
7. ___ infected stool on the ground
8. ___ contaminated drinking water

True/False:

9. ___ Unwashed hands and contaminated articles are part of the transmission cycle for diseases classified as "lack of water" diseases.
10. The water borne disease cycle can be broken by proper disposal of excreta.

11. The water borne disease cycle can be broken by protecting water sources.

12. Hand washing is a useful personal hygiene measure for prevention of transmission. There are three times when hand washing assists in interrupting the disease cycle. Two are listed below. Fill in the third.

1. Wash hands after defecation
2. Wash hands before eating
3. Before preparing food

13. Review the following directions for map drawing. You will note that they are not in proper sequence.

   a. Plot the main roads, paths, rivers and lakes.

   b. Draw your margins and leave space at the top for pertinent information.

   c. Review the map you have drawn.

   d. Walk around the village and be sure you know it well.

   e. Add all other roads, rivers, streams, buildings, etc.

   f. Fill out the pertinent information at the top of the map.

   g. Number the houses in the village.

Select the correct sequence from those given below and circle the number of that sequence.

1. b, a, d, c, e, g, f
2. b, d, a, e, c, g, f
3. d, a, b, c, e, g, f
4. d, f, b, a, e, c, g
14. What is the most important nutritional factor to remember when discussing the feeding of infants under 4 months of age?

__ a. Begin feeding infants juices before 4 months of age.
__ b. Sterilize bottles before feeding.
__ c. Breast feed whenever possible.
__ d. Do not begin weaning foods before 4 months of age.

Questions 15 - 16:

Arm measurement is a useful method for screening children to identify malnutrition.

15. What is the age range of children who are to be screened using the Arm Measurement method?

____________________

16. What measurement (in cm) will you use to identify:

malnourished ___________

well nourished ___________

17. Which of the following are considered high risk factors for children? Tick off the correct answers.

__ a. measles __ e. twins
__ b. a cold __ f. death of mother
__ c. breast feeding __ g. eating of unpolished rice
__ d. death of grandmother __ h. vegetarian diet
    __ i. death of older sibling at age 2 years

18. Marian is 12 months of age and her mother is worried because she doesn't put words together into sentences as her cousin does. What is your advice?

____________________

19. List 4 indications of high risk for pregnant women.

a.
b.
c.
d.
20. Match the type of water source with the correct definition.
   a. spring or well __ catchment
   b. moving water such as a stream __ surface
   or river
   c. collection system from roof of building __ ground

Questions 21 – 26:

Please rate the following aspects of water supply systems.

You have identified a well as one major water source for the community. Upon inspection you note the following conditions. Please indicate next to each statement whether this is a good or poor condition.

21. ______ Nearest latrine is 25 feet uphill from the well.
22. ______ Water proof cement cover in place 2 feet high above the ground surface.
23. ______ Floating materials present on the surface of the water.

You are inspecting a river which is used as a source of drinking water. Rate each of the following conditions as good or poor.

24. ______ You notice a farmer using pesticide on his rice paddy which is next to the river.
25. ______ The only nearby community is downstream from the point of tapping.
26. ______ The community members drink water from the river without boiling.

The village you are visiting utilizes communal latrines. Upon inspection you notice the following conditions. Rate each condition as good or poor.

27. ______ The latrines are constructed 25 feet downhill from the drinking water supply.
28. ______ The surface of the excreta is one foot (12 inches) below the floor slab of the latrine.
29. List 4 (four) breeding areas for mosquitoes which are commonly found in villages.
   a.
   b.
   c.
   d.

30. Describe 2 (two) acceptable methods of garbage disposal.
   a.
   b.
1. Match the following diseases with the short descriptions: Write the letter corresponding to the description next to the appropriate disease.

- **Malaria**
  - a. transmission by the soil
  - b. droplet infection
- **Scabies**
  - c. lack of water for bathing/washing
  - d. lack of drinking water
- **Ascariasis**
  - e. water-related insect vectors
  - f. water-borne
- **Cholera**
  - g. congenital disease
  - h. direct contract with a sick person

2. The water-borne disease cycle can be broken in four ways. Explain briefly what advice you would give to people in the community to help them break this cycle:

   a. 
   
   b. 
   
   c. 
   
   d. 

3. Answer these questions briefly:

   a. Why is it important to wash the hands after defecation?
   
   b. How will proper disposal of feces break the water-borne disease cycle?
   
   c. For what reason should people wash their hands before preparing food or eating?
4. What nutritional advice would you give to the mother of a four-month old baby?

5. Is it useful to measure the arm circumference of a child aged 8?

6. A child has an upper arm circumference measurement of 12 cm. He is three years old. Is he malnourished, in your opinion?

7. Which of these children is at high risk? Write the letter R under the description of the child:

   CHILD A  CHILD B  CHILD C
   breast-fed  bottle-fed  breast-fed
   mother ill  mother ill  father ill
   parents poor  parents poor  parents poor
   bathed often  not bathed often  bathed often

   __  __  __

8. What advice would you give to a mother whose six-month old baby does not crawl yet?

9. Which of these factors would indicate high risk for a pregnant woman?

   __ having more than six children
   __ having more than four children
   __ having had several miscarriages
   __ being only 23 years old
   __ being over 30 years old
   __ not having antenatal care
   __ being over 35 years old

10. Give an example of each of the following:

    Catchment -
    Surface water -
    Ground water -
11. Supply the missing words in these sentences:
   a. A well is safe from contamination by human feces if it is more than 36 feet _______ of the nearest latrine.
   b. The waterproof cement cover of a well should be at least ___ feet above ground level.
   c. A well should be free of _______ materials on the surface of the water.

12. Complete these sentences:
   a. Drinking water should not be drawn downstream from places where _______ have been used.
   b. Drinking water should not be drawn downstream from a nearby ________.
   c. Drinking water drawn from a river should always be ________.

13. Answer the following questions:
   a. Why must a latrine be constructed no less than 36 feet away from or downhill of a well?
   b. Why should one stop using a latrine when the excreta in it reaches between two feet and eighteen inches from the top?

14. What might breed in places like these?
   - coconut shells
   - swamps
   - empty cans
   - holes in tree trunks

15. Name two ways in which garbage could safely be disposed of:
   a.
   b.
APPENDIX E

INTERVIEW VIGNETTES

HOUSEHOLDS A, B, AND C
INTERVIEW VIGNETTE: HOUSEHOLD "A"

NARRATOR: JOHN STEWARD

John Stewart is a 39 year old, married man who lives at Pinkstone, a small community of 130 inhabitants, situated 0 miles south of Rockstone on the Essequibo River. There are about thirty families in this village. John has lived there all his life. He supports his family by subsistence activities --- fishing, gathering, and raising cows and poultry. He is in good general health.

There is no health center in this village. When people are sick, they either treat themselves, go to a traditional healer, or see the PHN during one of her visits.

His wife, Carol, is 28 years old. She became pregnant for the first time at the age of fifteen and has been pregnant a total of seven times since that age. Out of these eight pregnancies, she had one miscarriage. One child was stillborn. One child died at the age of five of pneumonia. Four children survive --- 2 boys of 10 and 3 years of age respectively, one girl 8 years old and an 18 month baby. Carol works a few hours a day at the local store.

The wife had tuberculosis when she was 14 years old and took treatment for it for over two years. She is now described as being in "good health." As well as the child who died from pneumonia, her other children have had serious diseases. Both boys had pneumonia as babies and the 8 year old girl had rheumatic fever. At the present time the children are considered healthy, except for the 3 year old and the baby, both of whom have diarrhea. Their feeding has been reduced to "dry up" the diarrhea. All the children have scabies, but are receiving treatment.

Both parents have been conscientious about getting their children vaccinated. All children, except the baby, have received DBT immunization. None have received a polio vaccination, however. Again, all children, with the exception of the baby, have been vaccinated against smallpox. Only the baby has had the BCG vaccination, since the PHN helped deliver her.

John and his wife are both ready to use family planning methods but know very little about them and do not know where to get any advice. The couple use their version of the "rhythm method." The only other method John knows about are condoms and he does not know where he could get any. Both parents have decided that they do not want any more children. John's wife knows that the PHN gives family planning advice when she holds prenatal clinic, but she is reluctant to attend this, since she is not pregnant, and did not go to prenatal clinics during her previous pregnancies.
John describes the family house as being "only a small house." It has two rooms and is located on the outskirts of the community, near the river bank. It is very dilapidated. To make matters worse, the land on which the house stands is not well-drained. After heavy rains, stagnant water remains puddled around it for weeks.

Each room of the house has one small window for light and ventilation. The couple sleep in the inner room and the children occupy the outer room at night, the same room as is used for cooking during the day. Vegetation has been cleared in the immediate vicinity of the house in an attempt to lessen the nuisance caused by flies and mosquitoes. This was done on the advice of the visiting PHN.

The family gets its drinking water directly from the river, which is less than 100 feet away from the house. John's wife carries it to the house in plastic buckets. Water is stored in an uncovered 50 gallon oil drum. The water is not boiled or filtered before drinking or use in cooking. Clothes are washed in the river, at the same point where drinking water is drawn. The entire family bathes in this same spot. Dogs and cows wander a will near the river. They, as well as the children, defecate on the river banks. There is a pit latrine less than 100 feet away, uphill from the river.

Upstream from the family's water source, there is a village, about ten miles away. It is possible, therefore, that river water has been polluted by the wastes from the village upstream. Since there is no other source of water in the village except catchment from the roof during the rainy season this could cause problems.

In terms of personal hygiene, John and his family show little response to the PHN's efforts to change their behavior. Nobody in the family washes their hands after defecation, for example, and John's wife does not wash her hands before preparing food, unless they are grossly soiled by work in the garden. Vegetables that are to be eaten raw are summarily rinsed off in the river, to remove the earth from them, then shaken dry. John and his wife insist, however, that the children bathe, using soap and water, at least once a week, as they are accustomed to do themselves. In addition, of course, the children go swimming frequently.

Clothes and bedding are washed once a week at the riverside. The children have been taught to wash their hair thoroughly once a week, as the parents do. The house is swept out once a day, at least. To offset this, dogs and chickens wander into the house from time to time. Flies and mosquitoes are a constant nuisance in the house. Mice have been seen, more than once, near stored food.

John built a pit latrine for his family to use. Somebody gave him some timbers and he made a stout construction that is still in good repair. He did not include in his plans any provision for ventilation, however. The door is left open when the latrine is not being used, to help
prevent bad smells. Unable to afford cement, John was unable to build a concrete platform which would have aided in keeping the latrine clean. As it is, he makes no special effort to keep it clean. At present, the latrine is nearly full and John plans to dig another pit nearby, move the structure and fill in the existing pit.

Human excreta is used, untreated, for fertilizing the small kitchen-garden. No use is made of animal excreta, nor is it collected or cleared away from where it was deposited. Refuse is piled up behind the house and the pile is set alight usually once a month. The dwelling is surrounded by litter.

Rice is readily available in the village, as are sweet potatoes, plantain and bananas. Other energy foods that can be had are sugar, paw paw, and animal fat. Body-building foods that are available are fish, beef, chicken and eggs. For protective foods, the family has the choice of tomatoes, sweet potato leaves, cucumbers, okra and pineapple.

John and his family eat little fish, pes, and beef occasionally. They eat mostly sweet potatoes, plantain, bananas, rice and calaloo. They make salads from eddoe leaves. Although they have poultry, they elect to sell all their eggs so as to have cash to buy condensed milk, flour, condiments and other items. These items include the occasional bottle of whiskey or case of beer and candies for the children.

On her visit to the village last week, the PHN did armband measurements on all young children. She told John that the 3 year old boy's arm circumference was 13.5, suffering mild malnutrition. Since the baby is breast-fed, she declared that its nutritional state was satisfactory.

Children are usually weaned in this community at the age of two years, unless another baby is born before that time. The 3 year old boy is still bottle-feeding. His mother mixes boiled wheat flour with his condensed milk "to make it richer", but this is the only supplementary food he gets. His diet consists almost exclusively of sugar, milk and cereal. His mother has never heard of cereal porridge.

When children are sick, food is decreased or withheld. If small babies are unable to breast-feed, the mother would not have the idea to feed them with cup and spoon, but would put them on the bottle. The PHN showed Mrs. Steward how to make salt sugar solution to treat diarrhea, but Carol has forgotten how to prepare it.

Breakfast in this family usually consists of rice and pineapple, sometimes with fried plantain. At the only other meal of the day, in the evening, sometimes there is fish or beef, sweet potatoes, pineapple, bananas, eddoe leave salad and more rice.

Neither John nor his wife were aware that a pregnant or lactating woman needs more food than usual. There are no taboos connected with pregnancy.
As indicated before, flies and mosquitoes are very prevalent in this area. They breed in pools of stagnant water that collect after the rains, and in refuse pits and latrines. Mosquitoes, particularly, are very numerous along the river banks. The PHN encouraged John and his neighbors to clear vegetation from around the houses. They have attempted this, and have tried to drain off stagnant water, but they do not really have the tools to do the job.

John is aware that flies can cause red-eye, but he does not see the connection between flies and diarrhea. He is sure, however, that mosquitoes cause impetigo.
1. Personal Data:

Name: John Stewart
Age: 39 years
Marital status: Married
Occupation: Subsistence activities
General health: Good
Residence: Has lived in the community all his life
Wife or partner: Carol
Age: 28
Name of community: Pinkstone
Location: 10 miles South of Rockstone on the Essequibo River
Number of inhabitants: 130
Number of families: 30

Health facilities: There is no health center in any of these villages. If people are ill, they either treat themselves, go to a traditional healer or see the PHN during one of her visits.

1.1 Previous pregnancies: 7
1.2 Miscarriages: 1
1.3 Stillbirths: 1
1.4 General health

Had tuberculosis when she was 14. In good health now.

1.5 Age at first pregnancy

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<td>Given</td>
<td>Works in local store</td>
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2. Children:

2.1 Number of boys

2 - John, Hugh

2.2 Number of girls

2 - Lisa, Mary

2.3 Ages of boys

10 years, 3 years

2.4 Ages of girls

8 years, 18 months

2.5 Childrens' health history #1

2 boys had pneumonia as babies
1 girl had rheumatic fever

2.6 Childrens' health history #2

2.7 Childrens' present health

3 year old and baby both have diarrhea. (Feeding reduced to stop diarrhea.) All children have scabies. None are having treatment.

2.8 Deceased children

1 boy

2.9 Ages and causes of death

Died at age 5 of pneumonia.
Immunizations

2.10 DPT
All children, except baby

2.11 POLIO
No children have received

2.12 SMALLPOX
All children, except baby

2.13 TUBERCULOSIS (BCG)
None of children have received, except baby

3. Family Planning:

3.1 Attitude of person to FP
Would use family planning if he knew more about it. Does not know where he could get advice.

3.2 Attitude of wife or partner to FP
Would also like to use some form of contraceptive, but does not know where to get advice.

3.3 Methods currently used by couple
Rhythm method

3.4 Knowledge of other methods
Has heard of condoms, only.

3.5 Desired family size (husband)
Does not want any more children.

3.6 Desired family size (wife)
Does not want any more children.

3.7 Family planning services available
Visiting PHN gives advice to mothers at prenatal clinic.

3.8 Utilization of family planning services by couple
Wife did not attend prenatal clinic.

4. Housing:
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<th>4.1</th>
<th>Size of house</th>
<th>Small</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2</td>
<td>Number of rooms</td>
<td>2</td>
</tr>
<tr>
<td>4.3</td>
<td>State of repair</td>
<td>Very dilapidated</td>
</tr>
<tr>
<td>4.4</td>
<td>Location in community</td>
<td>On the outskirts of the community, near the river bank.</td>
</tr>
<tr>
<td>4.5</td>
<td>Drainage</td>
<td>The yard in which the house stands is badly-drained. Stagnant water remains for weeks, after heavy rains.</td>
</tr>
<tr>
<td>4.6</td>
<td>Ventilation</td>
<td>Each room has one small window.</td>
</tr>
<tr>
<td>4.8</td>
<td>Sleeping arrangements</td>
<td>The children sleep in the outer room and the adults in the inner room.</td>
</tr>
<tr>
<td>4.9</td>
<td>Cooking arrangements</td>
<td>Cooking is done in the outer room.</td>
</tr>
<tr>
<td>4.10</td>
<td>Vegetation around house</td>
<td>Has been cleared away on the advice of the PHN.</td>
</tr>
</tbody>
</table>

5. Water

| 5.1  | Washing clothes | Clothes are washed in the river, at the same point where water is drawn for drinking. |
| 5.2  | Drinking water (source and storage) | Drawn directly from the river. Stored in uncovered 50 gallon oil drum. |
| 5.3  | Distance of water-source from dwelling | Less than 100 feet. |
5.4 Carrying water  Wife carries it in plastic buckets.

5.5 Distance of water-source from nearest latrine  100 feet, uphill.

5.6 Filtering  Water is not filtered before it is used for drinking or cooking.

5.7 Boiling  Water is not boiled before it is used for drinking.

5.8 Other water sources in the community  Catchment from the roof during the rainy season.

5.9 Bathing  The entire family bathes in the river.

5.10 Protection of water source from animals  Dogs and cows wander at will.

5.11 Location of villages upstream  There is a village 10 miles upstream.

5.12 Pollution by insecticides  No spraying has been done.

5.13 Defecation near water source  Children commonly defecate on the river banks. Adults use latrines. Animals defecate near river.

6. Personal Hygiene

6.1 Availability of soap  Can be bought in the local store.
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6.2 Hand-washing after defecation</td>
<td>Nobody in the family does this.</td>
<td></td>
</tr>
<tr>
<td>6.3 Hand-washing before food preparation</td>
<td>Wife does this only if hands are grossly soiled.</td>
<td></td>
</tr>
<tr>
<td>6.4 Washing of vegetables to be eaten raw</td>
<td>They are rinsed in the river to remove earth.</td>
<td></td>
</tr>
<tr>
<td>6.5 Number of baths per week:</td>
<td>Children go swimming frequently. They bathe with soap once a week, as do adults. Newborn is bathed every day.</td>
<td></td>
</tr>
<tr>
<td>Husband</td>
<td>Wife</td>
<td>Children</td>
</tr>
<tr>
<td>6.6 Number of wash days per week (clothes)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6.7 Hair-washing</td>
<td>Husband washes his hair with soap about once a month. Wife and children wash their hair with soap each time they bathe.</td>
<td></td>
</tr>
<tr>
<td>Husband</td>
<td>Wife</td>
<td>Children</td>
</tr>
<tr>
<td>6.8 Cleanliness of house</td>
<td>The house is cleaned (floors swept) once a day.</td>
<td></td>
</tr>
<tr>
<td>6.9 Animals in the house</td>
<td>Dogs and children wander into the house from time to time.</td>
<td></td>
</tr>
<tr>
<td>6.10 Insects in the house</td>
<td>Flies and mosquitoes are a constant nuisance.</td>
<td></td>
</tr>
<tr>
<td>6.11 Rodents in the house</td>
<td>Some mice have been seen.</td>
<td></td>
</tr>
</tbody>
</table>
7. Excreta and Refuse:

7.1 Type of latrine used  Pit latrine

7.2 Cleanliness of latrine  No special effort is made to keep it clean.

7.3 Type of platform  None

7.4 Ventilation  No special arrangements have been made. Door is left open, when not in use.

7.5 Walls  In good repair. Timbers.

7.6 Capacity of latrine at present  Nearly full. When full, he intends to dig another pit alongside existing one and move structure over it.

7.7 Animal excreta  Not collected or used in any way.

7.8 Human excreta as fertilizer  Used regularly, but not treated in any way.

7.9 Refuse disposal  Refuse piled behind house. Burned about once a month. Much litter around dwelling.

8. Nutrition:


8.2 Body-building foods available  Fish, beef, chicken, eggs.
<table>
<thead>
<tr>
<th>8.3 Protective foods available</th>
<th>Tomatoes. Sweet potato leaves. Cucumbers, okra. (Family has small garden.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.4 Food preferences of family</td>
<td>The family eats little fish, and beef only on special occasions. They eat mostly sweet potatoes, plantain, banana, rice, calaloo, cucumber, eddoe leaves. They sell all their eggs to get cash to buy condensed milk and other needed products.</td>
</tr>
<tr>
<td>8.5 Foods &quot;imported&quot; into the community</td>
<td>Condensed milk, candies. Whiskey and beer. Flour.</td>
</tr>
<tr>
<td>8.6 Malnourished children in the family</td>
<td>On her last visit, the PHN did arm-band measurements on all the young children. She found that the 3 year old boy was suffering from mild-moderate malnutrition 13.5 cm arm measurement.</td>
</tr>
<tr>
<td>8.7 Breast-feeding</td>
<td>The baby is being breast-fed.</td>
</tr>
<tr>
<td>8.8 Bottle-feeding</td>
<td>The 3 year old is still bottle feeding (condensed milk) and receives only boiled cereals as supplementary foods.</td>
</tr>
<tr>
<td>8.9 Feeding with cup and spoon</td>
<td>Never done with youngest children. Sick children put on the bottle.</td>
</tr>
<tr>
<td>8.10 Supplementary foods for baby</td>
<td>Only boiled cereals.</td>
</tr>
<tr>
<td>8.11 Weaning</td>
<td>It is the custom to wean children at the age of two years, unless another baby is born before that.</td>
</tr>
<tr>
<td>Topic</td>
<td>Details</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>8.12 Cereal porridge</td>
<td>Has never heard of it.</td>
</tr>
<tr>
<td>8.13 Feeding sick children</td>
<td>Carol decreases or withholds food when children are sick.</td>
</tr>
<tr>
<td>8.14 Nutrition for pregnant or lactating woman</td>
<td>In this family, there is no notion that a pregnant or lactating woman needs extra food. No special taboos during pregnancy.</td>
</tr>
<tr>
<td>8.15 Preparation of oral rehydration fluid</td>
<td>Carol was taught the formula for salt sugar solution but has forgotten it.</td>
</tr>
</tbody>
</table>

9. Insect Vectors:

<table>
<thead>
<tr>
<th>Section</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.1 Prevalence</td>
<td>Both flies and mosquitoes are very prevalent in this area.</td>
</tr>
<tr>
<td>9.2 Breeding places</td>
<td>Pools of stagnant water that collect after rains. Many flies are seen around refuse pit and latrines. Mosquitoes numerous near river bank.</td>
</tr>
<tr>
<td>9.3 Control</td>
<td>PHN advocated clearing vegetation from around houses and draining stagnant pools. This has been attempted, but he has not the proper tools.</td>
</tr>
<tr>
<td>9.4 Insect vectors and causes of disease</td>
<td>Know that flies can cause red-eye. Does not think they cause diarrhea. &quot;Knows&quot; that mosquitoes cause impetigo.</td>
</tr>
</tbody>
</table>
HOUSEHOLD "B"

NARRATOR: ANNE HATHAWAY

Anne's husband James is 42 years old. They live in Eddyborough, a village of some 320 people, in the coastal region, 5½ miles inland from Gracetown. There are sixty families in this community. James works at a nearby sugar plantation. He and his family recently moved from Gracetown to the village, so that he could be nearer his work.

James had tuberculosis when he was a young man. Anne is 32 years old, is under treatment for anemia. James is in good health now. Anne became pregnant for the first time at 17 years of age. She has had a total of nine pregnancies. She lost one child as the result of a miscarriage, but she has never had any stillbirths. One child, a girl, died at age 7 from rheumatic fever.

There are seven remaining children -- 4 girls and 3 boys. The girls names are Anne, Joan, Mary and Mildred. The boys are named Peter, Andrew and John. The girls are aged 10, 8, 6 and 4 years. One of the boys is 18 months old. The two others are aged 5 and 2½. The oldest boy had appendicitis when he was 4 years old. One girl nearly died of pneumonia. The 2½ year old and the baby have diarrhea at present. The 2½ year old has impetigo. The ten year old girl has "yellow eye." Neither are being treated. Anne has never heard of using salt sugar solution for treatment of diarrhea. All the children have received DPT vaccination. Only the five year old has had the polio vaccine. Smallpox vaccination was given to all children. No children have been vaccinated with BCG.

James would willingly use some form of contraception, if it were provided free, but he certainly could not afford to buy. Anne is too shy to discuss the question of using contraceptives. At present, they do not use any method of childspacing. James has hard of condoms and IUDs as methods of birth control. He wants to have more children. His wife does not mind if she has several more. James agreed that Anne ought to go to a meeting the PHN holds for young mothers, whenever she visits, to get some advice. Finally, she went to one of the meetings.

Fortunately, the Hathaway family has a fairly large house, although it consists of only one room and has no windows. This means, of course, that he entire family sleeps together. Except in rainy weather, cooking is done outside. The house is in good repair, except that the roof leaks in times of heavy rain. Drainage is poor, since the house is located on lowland in the middle of the village. When it rains here, water collects around the house. After rain, the ground, including the floor of the house, remains soggy for at least a week. Vegetation has not been cleared away from the area immediately surrounding the house.

The family gets its drinking water directly from a standpipe near the road, 200 feet away, or from the pool around the standpipe.
It is the older children's job to carry it to the house. Water is stored in the house in uncovered buckets. Since the water is rather muddy, Anne filters it by pouring it through a cloth before it is used for drinking. She does not boil it, however. She does not think it can be contaminated, because the nearest latrine is some 150 feet away from where she draws her water.

The family does not bathe in the river. Water is carried to the house. Then each member of the family in turn bathes inside the house. Most people in the village keep their cows tethered so that they do not get near the river from which most people draw their drinking water. Dogs, however, are allowed to wander anywhere. There is a big village, some two miles upstream from Eddyborough. The river is the only other source of water available to the Hathaways. It is unlikely that the river water is polluted with insecticides, since no spraying has ever been done in this area.

The Hathaway children have been trained to use the latrine, but quite often they defecate near the river bank. Adults use latrines. Dogs defecate anywhere -- around the houses or near the river.

Soap is available in the village, but very expensive. It is brought upriver by individuals returning from Gracetown, and sold to the villagers at a profit above normal retail price. Soap is therefore used sparingly. James bathes every day about once a week. The baby, of course, is bathed daily. Hair gets washed once a week. The wife uses soap on hers, but James and the children do not, as a measure of economy.

The house is thoroughly cleaned once a week. This means that the floor is swept and all bedding put out to air. The family keeps the house looking fairly tidy. James will not allow any animals in the house, with the exception of the dogs, which are family pets. He has found it useful to have the dogs in the house, anyway, to take care of the occasional rat that has made its appearance. During the day, the house is relatively free from flying insects. Mosquitoes become a nuisance, at night, when the lamps are lit.

James built a pit latrine for the family to use, several months ago. It is now full. He estimates that it will take at least another six months before it is full. Unfortunately, the walls of the latrine are not very sturdy, since James has not much skill as a carpenter. The timbers with which he built it were not very solid in the first place. Although he knew the latrine should be ventilated, he forgot to plan for this. Because of unpleasant odors from the pit, he keeps the door of the latrine closed at all times. He does nothing special to keep the latrine clean. He makes no use of animal or human excreta as fertilizer.

The family throws its refuse into an open pit near the house. James
burns the refuse when the pit is full or overflowing, if he can get hold of some waste oil with which to start the fire off.

Food is not too plentiful in the village. Anything that one does not grow there is expensive to purchase. Some cornflour is available. Plantains can be had. Sugar has to be purchased. Eggs can be bought from the neighbors. Fish can be had for the taking. Mangos and Paw Paw are plentiful in the village. The family has two cows, one of which they will kill soon. Salads can be made from eddoe leaves and tomatoes. Tomatoes are often used in cooking.

The parents eat a lot of fish and chicken but hardly ever eat beef. Occasionally, the children are given eggs. Mostly, they eat tomatoes, eddoe leaves, cornmeal and fruit. The children get powdered milk mixed in with boiled cereal. About the only supplies that the family gets from outside the village are powdered milk and beer.

On her last visit, the PHN did arm-band measurements on all the children. She found that the four year old girl and the 2½ year old boy were suffering from mild to moderate malnutrition. Arm measurements less than 14 cm. The baby, fortunately, is being breast-fed. The 2½ year old boy is bottle-feeding (powdered milk). His mother gives him some boiled cereal in the bottle. This will be the only supplementary food he will get until he is three years old.

When the children get sick, their other only gives them food "if they want it." She has occasionally fed the babies, when small, with a cup and spoon as she was shown to do by the PHN.

The usual breakfast menu for the Hathaway family is fish (or sometimes eggs) bread and banana, or fried corn cakes. This same menu is offered again for the evening meal, often with eddoe leaf salad in addition. At noon, the family eats only fruit.

Babies are usually weaned in the village at about 18 months unless another baby comes along in the meantime. If this happens, of course, it means that the older baby will thenceforward be bottle-fed.

Neither James nor his wife are aware that women who are pregnant or breast-feeding their children need extra food. James has some idea that pregnant women and lactating mothers need extra vitamins, but has not heard of them needing other extra food. There are no special food taboos associated with pregnancy.

Both flies and mosquitoes are very numerous in this area. They breed in pools of water around the house, around the open refuse pit and the latrine. Mosquitoes are particularly plentiful near the river. James tried to drain the stagnant water lying around his house, but found he
could not do it without the active cooperation of his neighbor, who was unwilling to help. James is troubled about the flies because he knows that they can cause diarrhea and make food spoil. He is convinced that mosquitoes cause "blood-poisoning" and give people headaches.
HOUSEHOLD "B" HATHAWAY

INFORMATION GIVEN TO THE SUBJECT:

1. Personal Data:

Name: James Hathaway
Age: 42 years
Marital status: Married
Occupation: Works on sugar plantation
General health: Had tuberculosis when young
Residence: Recently moved to the community from the coast

Wife or partner: Anne
Age: 32 years
Name of community: Eddyborough
Location: In the coastal region, 5½ miles inland from Gracetown

Number of inhabitants: 320
Number of families: 60

Health facilities: There is no health center in any of these villages. If people are ill, they either treat themselves, go to a traditional healer or see the PHN during one of her visits.

<table>
<thead>
<tr>
<th>1.1 Previous pregnancies</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2 Miscarriages</td>
<td>1</td>
</tr>
<tr>
<td>1.3 Stillbirths</td>
<td>0</td>
</tr>
<tr>
<td>1.4 General health</td>
<td>Is under treatment for anemia.</td>
</tr>
</tbody>
</table>
1.5 Age at first pregnancy  17

<table>
<thead>
<tr>
<th>Given</th>
<th>Does not work</th>
</tr>
</thead>
</table>

2. Children:

<table>
<thead>
<tr>
<th>2.1 Number of boys</th>
<th>3 boys - Peter, Andrew, John</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2 Number of girls</td>
<td>4 girls - Anne, Joan, Mary, Mildred</td>
</tr>
<tr>
<td>2.3 Ages of boys</td>
<td>5, 2½ and 18 months</td>
</tr>
<tr>
<td>2.4 Ages of girls</td>
<td>10, 8, 6 and 4 years</td>
</tr>
<tr>
<td>2.5 Children's health history #1</td>
<td>1 girl nearly died of pneumonia. Oldest boy had appendicitis when 4 years old.</td>
</tr>
<tr>
<td>2.6 Children's health history #2</td>
<td></td>
</tr>
<tr>
<td>2.7 Children's present health</td>
<td>2½ year old and baby both have diarrhea. (Feeding reduction) 2½ year old has impetigo. 10 year old has yellow eyes. Neither having treatment.</td>
</tr>
<tr>
<td>2.8 Deceased children</td>
<td>1 girl</td>
</tr>
<tr>
<td>2.9 Ages and causes of death</td>
<td>Died at age 7 of rheumatic fever.</td>
</tr>
</tbody>
</table>
### Immunizations

- **2.10 DPT**: All children have received.
- **2.11 POLIO**: Only the 5 year old has received.
- **2.12 SMALLPOX**: All children have received.
- **2.13 TUBERCULOSIS (BCG)**: No children have received.

### 3. Family Planning:

- **3.1 Attitude of person to FP**: Would use contraceptives if they were free. Cannot afford to buy them.
- **3.2 Attitude of wife or partner to FP**: Is too shy to discuss the question of using contraceptives.
- **3.3 Methods currently used by couple**: None
- **3.4 Knowledge of other methods**: Has heard of condoms and IUD
- **3.5 Desired family size (husband)**: Wants more children.
- **3.6 Desired family size (wife)**: Does not mind having more children.
- **3.7 Family planning services available**: Visiting PHN has held a meeting for young mothers.
- **3.8 Utilization of family planning services by couple**: Wife attended meeting.

### 4. Housing:
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Size of house</td>
<td>Fairly large.</td>
<td></td>
</tr>
<tr>
<td>4.2 Number of rooms</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4.3 State of repair</td>
<td>Good repair except that roof leaks in heavy rains.</td>
<td></td>
</tr>
<tr>
<td>4.4 Location in community</td>
<td>In a &quot;dip&quot; in the middle of the village.</td>
<td></td>
</tr>
<tr>
<td>4.5 Drainage</td>
<td>Water collects in the &quot;dip&quot; after heavy rains and the land is soggy for at least a week afterwards.</td>
<td></td>
</tr>
<tr>
<td>4.6 Ventilation</td>
<td>There are no windows, but the door is usually left open.</td>
<td></td>
</tr>
<tr>
<td>4.8 Sleeping arrangements</td>
<td>The whole family sleeps in the one room.</td>
<td></td>
</tr>
<tr>
<td>4.9 Cooking arrangements</td>
<td>Cooking is done outside.</td>
<td></td>
</tr>
<tr>
<td>4.10 Vegetation around house</td>
<td>Has not been cleared away.</td>
<td></td>
</tr>
</tbody>
</table>

5. Water

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1 Washing clothes</td>
<td>The wife carries water to the house for washing clothes.</td>
<td></td>
</tr>
<tr>
<td>5.2 Drinking water (source and storage)</td>
<td>Drawn directly from the standpipe near the road or from the pool around the pipe. Stored in buckets (uncovered).</td>
<td></td>
</tr>
<tr>
<td>5.3 Distance of water source from dwelling</td>
<td>200 feet away</td>
<td></td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
<td>Details</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
<td>---------</td>
</tr>
<tr>
<td>5.4</td>
<td>Carrying water</td>
<td>Children carry it.</td>
</tr>
<tr>
<td>5.5</td>
<td>Distance of water source from nearest latrine</td>
<td>About 150 feet, uphill.</td>
</tr>
<tr>
<td>5.6</td>
<td>Filtering</td>
<td>Wife pours water through a cloth before it is used for drinking or cooking.</td>
</tr>
<tr>
<td>5.7</td>
<td>Boiling</td>
<td>Water is not boiled before it is used for drinking.</td>
</tr>
<tr>
<td>5.8</td>
<td>Other water sources in the community</td>
<td>The river</td>
</tr>
<tr>
<td>5.9</td>
<td>Bathing</td>
<td>The family bathes in the house.</td>
</tr>
<tr>
<td>5.10</td>
<td>Protection of water source from animals</td>
<td>Cows are tethered but dogs are free to wander anywhere.</td>
</tr>
<tr>
<td>5.11</td>
<td>Location of villages upstream</td>
<td>There is a village 2 miles upstream.</td>
</tr>
<tr>
<td>5.12</td>
<td>Pollution of water by insecticides</td>
<td>No spraying has been done.</td>
</tr>
<tr>
<td>5.13</td>
<td>Defecation near water source</td>
<td>Children commonly defecate near the river. Adults use latrine. Animals defecate near river.</td>
</tr>
<tr>
<td>6.</td>
<td>Personal Hygiene</td>
<td></td>
</tr>
<tr>
<td>6.1</td>
<td>Availability of soap</td>
<td>Is brought upriver by individuals and sold at a profit.</td>
</tr>
</tbody>
</table>
6.2 Hand-washing after defecation

Nobody in the family does this.

6.3 Hand-washing before food preparation

Wife does this sometimes, if she remembers

6.4 Washing of vegetables to be eaten raw

They are washed in a bucket of river water.

6.5 Number of baths per week:

<table>
<thead>
<tr>
<th></th>
<th>Husband</th>
<th>Wife</th>
<th>Children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>bathes every day. Wife bathes with soap once a week, as do the children.</td>
<td></td>
<td>Newborn is bathed every day.</td>
</tr>
</tbody>
</table>

6.6 Number of wash days per week (clothes) 1

6.7 Hair-washing

Wife washes her hair with soap once a week. Husband and children never use soap on their hair.

<table>
<thead>
<tr>
<th></th>
<th>Husband</th>
<th>Wife</th>
<th>Children</th>
</tr>
</thead>
</table>

6.8 Cleanliness of house

Cleanliness is done once a week.

6.9 Animals in the house

Chickens are kept out of the house, dogs live in the house.

6.10 Insects in the house

Flies and mosquitoes are a nuisance in the evening.

6.11 Rodents in the house

An occasional rat enters the house, but the dogs keep them away.

7. Excreta and Refuse:
<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1 Type of latrine used</td>
<td>Pit latrine</td>
</tr>
<tr>
<td>7.2 Cleanliness of latrine</td>
<td>No special effort is made to keep it clean.</td>
</tr>
<tr>
<td>7.3 Type of platform</td>
<td>None</td>
</tr>
<tr>
<td>7.4 Ventilation</td>
<td>No special arrangements have been made. Door is kept closed at all times.</td>
</tr>
<tr>
<td>7.5 Walls</td>
<td>Not in very good repair. Timbers.</td>
</tr>
<tr>
<td>7.6 Capacity of latrine at present</td>
<td>This is a fairly new pit. Should last another six months. Is presently full.</td>
</tr>
<tr>
<td>7.7 Animal excreta</td>
<td>Not collected or used.</td>
</tr>
<tr>
<td>7.8 Human excreta as fertilizer</td>
<td>Not used.</td>
</tr>
<tr>
<td>7.9 Refuse disposal</td>
<td>Refuse tossed into open pit. It will be burned when the pit is full, if he can get some waste oil to start the fire.</td>
</tr>
</tbody>
</table>

8. Nutrition:

<p>| 8.1 Energy foods available                   | Cornmeal flour, eddoe plantain, sugar, beef fat, mango, paw paw. |
| 8.2 Body-building foods available            | Beef, eggs, fish, chicken. |</p>
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3</td>
<td>Protective foods available</td>
<td>Eddoe leaves, tomatoes, cucumbers. Family has small garden.</td>
</tr>
<tr>
<td>8.4</td>
<td>Food preferences of family</td>
<td>The family eats a lot of chicken and fish, but hardly ever eats beef. Occasionally, the children are given eggs. They eat mostly tomatoes, eddoe leaves, wheat and fruit, and cornmeal. Children get powdered milk with their cereal.</td>
</tr>
<tr>
<td>8.5</td>
<td>Foods &quot;imported&quot; into the community</td>
<td>Powdered milk, beer</td>
</tr>
<tr>
<td>8.6</td>
<td>Malnourished children in the family</td>
<td>On her last visit, the PHN did arm-band measurements on all the young children. She found that the 4 year old girl and the 2½ year old boy are suffering from mild-moderate malnutrition. Arm measurement less than 14 centimeters.</td>
</tr>
<tr>
<td>8.7</td>
<td>Breast-feeding</td>
<td>The youngest is being breast-fed.</td>
</tr>
<tr>
<td>8.8</td>
<td>Bottle-feeding</td>
<td>The 2½ year old boy is still bottle-feeding (powdered milk) and receives only boiled cereals as supplementary foods, until he is 3 years old.</td>
</tr>
<tr>
<td>8.9</td>
<td>Feeding with cup and spoon</td>
<td>Has occasionally done this in the past with children who were sick, as advised by the PHN.</td>
</tr>
<tr>
<td>8.10</td>
<td>Supplementary foods for baby</td>
<td>Only boiled cereals.</td>
</tr>
<tr>
<td>8.11</td>
<td>Meals for children over 5 and adults</td>
<td>Breakfast: Fish or eggs, bread and bananas or fried plantain. Supper: fried plantain, fish and bread. Fruit at noon meal.</td>
</tr>
<tr>
<td>8.12 Weaning</td>
<td>It is usual to wean babies at about 18 months unless another baby is born.</td>
<td></td>
</tr>
<tr>
<td>8.13 Cereal porridge</td>
<td>Was told about it by the PHN and knows how to make it, but has never made it.</td>
<td></td>
</tr>
<tr>
<td>8.14 Feeding sick children</td>
<td>Food is only given to sick children &quot;when they want it.&quot; Anne has no knowledge of salt sugar solution for the treatment of diarrhea.</td>
<td></td>
</tr>
<tr>
<td>8.15 Nutrition for pregnant or lactating woman</td>
<td>The husband is vaguely aware that his wife should get extra vitamins during pregnancy and lactation. No special taboos during pregnancy.</td>
<td></td>
</tr>
</tbody>
</table>

9. Insect Vectors:

| 9.1 Prevalence                   | Both flies and mosquitoes are very prevalent in this area. |
| 9.2 Breeding-places              | Water collects in the "dip" around the house after rains. Many flies are seen around refuse pit and latrine. Mosquitoes numerous near river bank and in forest. |
| 9.3 Control                      | Husband has tried to drain the stagnant water around house, as advised by PHN. Cannot do it without help of neighbor, who is unwilling to cooperate. |
| 9.4 Insect vectors and causes of disease | Knows that flies can cause diarrhea and make food spoil. "Knows" that mosquitoes can cause "blood-poisoning" and "headache." |
HOUSEHOLD "C" PERTWEE
NARRATOR: ANGELA PERTWEE

Angela's husband has active tuberculosis, for which he is receiving treatment. They live with 25 other families, in the village of Lanboro, some 45 miles south of Pinkstone, on the Essequibo River. The population of Lanboro is about 150 inhabitants. Richard has lived here since he was a child when his parents moved to the village, from Pinkstone.

Because of his tuberculosis, Richard is unable to work. Angela works, however, at the local store. He does, however, manage to do odd jobs around his own house and tries hard to support his wife Angela and their 12 month baby and make life comfortable for them. Richard is 28 years old and his wife is 25. Out of a total of three pregnancies, one child survives. She lost one child because of a miscarriage. Another baby died at the age of eighteen months as the result of dehydration after gastro-enteritis. The baby, a girl, is suffering from the same condition, at the moment. Angela has never received instruction of preparing salt sugar solution to treat diarrhea. The baby's arm measurement is 13 cm.

Richard is somewhat worried, since the baby has not yet received any immunizations for DPT, Polio, or Smallpox. The baby received BCG vaccination since it was born in the health center at Gracetown. Both parents dream of having a large family of healthy children, and have high hopes that this baby will be followed by many more. Richard does not want to hear of family planning under the circumstances. His wife, however, admits openly that she feels weak and tired and is frankly afraid to have another child, since she would have difficulty coping with it. She would us some form of contraception if her husband did not object so strongly. Richard has heard of childspacing methods such as vasectomy, condoms and diaphragms, but rejects the use of them on the grounds that they are "unnatural." He wants to have at least three more children, preferably boys, while his wife does not really want to become pregnant again but could foresee having perhaps two more children, "to please her husband." Neither she, nor Richard know of any family planning services available and neither of them have ever received any counseling on the subject.

Although Richard considers his house to be "very small," it has three rooms. It is built on rising ground between the main part of the village and the pineapple farm. Consequently, the site is well-drained. The house itself is in good repair. In one of the rooms, there is a large, unglazed window. Since the baby is still small, the entire family sleeps in one room. Another room is set aside as the kitchen and the third room is used to store the few family possessions. There has been no need to clear brush around the house, since vegetation does not grow very high in its vicinity. Angela is not in good health and is
presently taking medicine for anemia. Since Angela is not too well, a
neighbor washes the family's clothes and bed linen, in return for small
favors. She does this in the river, in company of most women in the
village, usually once a week.

Drinking water is drawn from the Pertwees' well which is situated about
twenty feet from their dwelling. The husband carries water from the
well in small buckets, so as not to overtax his strength. He feels that
the well is safe from contamination because the nearest latrine (his
own) is about 20 feet downhill from the well. Water is not filtered
before it is drunk or used for cooking, nor is it boiled. This seems to
be the general practice in the village, which depends on a series of
wells, rather than the river, for its drinking water.

Nobody has made arrangements to protect the wells from animals. They
wander at will and urinate and defecate sometimes in the vicinity of the
well and often near the river. There is no other village upstream of
Lanboro to pollute the river with its wastes, however, and there is
little likelihood of pollution of the river by insecticides. Richard is
well-known in the village, though, for his liberal use of insecticides,
which he sprays regularly around the latrine, the refuse pit and the
well. The well seems safe from contamination from human excreta.
Richard and his wife use the latrine, and few children from the village
play in the vicinity of their house.

Soap is generally not available in the village. Richard brings back a
small supply, each time he goes to Gracetown for his tuberculosis
checkup. Neither he nor his wife wash their hands after defecation, but
she does wash her hands before preparing food. Any food that is to be
eaten raw is soaked in water for about an hour and then rinsed.

The couple bathes every day. For himself and his wife, Richard has
constructed a "shower" outside the house, out of half a 50-gallon oil
drum, supported on timbers. When they have soap, the wife washes her
hair every day. Richard washes his hair with soap about once a week.
The baby is bathed as often as is necessary -- at least once a day.

Richard's wife is house-proud and sweeps out the house very thoroughly
at least once, and sometimes twice or more, each day. Since the house
is kept so clean, no rodents have been seen. No animals are permitted
in the house. His wife insists that the house be kept free from flies
and mosquitoes, so Richard sprays the rooms regularly with "Flit" from a
hand pump.

The latrine that the family uses is of the pit type. The walls are
built of greenheart and are in need of some additional support since
they tend to lean over in one direction. There is no concrete platform.
An effort has been made to ventilate by making slits at the top of the
side walls. Richard cleans the latrine once a week by scraping the
earth around the pit with a shovel and covering excreta with a thin layer. The pit is about half-full and he has been thinking of using the excreta for fertilizer for a kitchen garden he proposes to make when he feels stronger. He has never considered using animal excreta as fertilizer, however. This is left to lie where it was deposited.

The other half of the oil drum has been perforated and is used as an incinerator. Refuse is burned in it once a week and Richard makes a point of clearing any litter from around the house at that time.

Richard and his wife eat some fish but never any beef. They eat pineapple, paw paws and lemons. They sell their chicken and eggs for cash, which enables them to buy their vegetables and some small luxuries, like powdered milk that they like to take in their coffee. They eat eddoe and sweet potato leaves, either as salads or as cooked greens and depend on rice cornflour or split peas as their main cereals. Thus, they make use of all the foods commonly available in the village, except beef.

The baby is being breast-fed. The PHN, on her last visit 2 months ago to the village commented that she seemed to be doing very well. However, against the nurses' advice, the mother plans to start bottle-feeding the baby in a few month's time to make sure that she gets "good milk" (powdered milk). She has never heard of feeding babies with a cup and spoon. She will not start giving the baby supplementary foods until she is about 18 months old. Since the baby has diarrhea, she has started to give her less time at the breast than usual, so as to "dry up the diarrhea." She expresses and discards the remaining breast milk, to be sure there is a good supply for the baby when it is well again. She does not know anything about feeding small children when they are ill. She has never heard of cereal porridge.

The usual breakfast for this couple is fruit with coffee. At noon they might eat rice and fish or shrimp and repeat this at night, adding a salad or cooked greens. Neither she nor Richard have ever heard that pregnant or lactating women need extra food. There are no taboos associated with pregnancy. She states firmly that even if she wanted to eat (she has lost her appetite) she would not do so, for fear of becoming obese and unattractive to her husband.

Flies and mosquitoes are very prevalent in the region of Lanboro. They breed mainly in the forest and along the river banks. There are many more in the village itself, fewer near the Pertwee house and, due to Richard's constant efforts, very few inside their house. Richard is vaguely aware that insects can be the vectors of disease, but he is not clear as to exactly what diseases they can spread.
HOUSEHOLD "C" PERTWEE

INFORMATION GIVEN TO THE SUBJECT:

1. Personal Data:

Name: Richard Pertwee
Age: 28
Marital status: Married
Occupation: Unemployed
General health: Has active tuberculosis
Residence: Has lived in the community since childhood
Wife or partner: Angela
Age: 25 years
Name of community: Lanboro
Location: 45 miles South of Pinkstone, on the Essequibo River
Number of inhabitants: 150
Number of families: 25

Health facilities: There is no health center in any of these villages. If people are ill, they either treat themselves, go to a traditional healer or see the PHN during one of her visits.

1.1 Previous pregnancies 3

1.2 Miscarriages 1

1.3 Stillbirths 0

1.4 General health Had rheumatic fever as a child - anemia
1.5 Age at first pregnancy 21

<table>
<thead>
<tr>
<th>Given</th>
<th>Works in local store</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Children:

2.1 Number of boys 0

2.2 Number of girls 1, Priscilla

2.3 Ages of boys -

2.4 Ages of girls 12 months

2.5 Childrens' health history #1 No abnormalities

2.6 Childrens' health history #2

2.7 Childrens' present health Baby has diarrhea (feeding reduced to stop diarrhea)

2.8 Deceased children 1

2.9 Ages and causes of death Died at age 18 months of dehydration (gastro-enteritis) (feeding reduced to "dry up" diarrhea).

Immunizations

| 2.10 DPT | Child has not received yet. |
| 2.11 POLIO | Child has not received yet. |
| 2.12 SMALLPOX | Child has not received yet. |
| 2.13 TUBERCULOSIS (BCG) | Child has received this. |
3. Family Planning:

3.1 Attitude of person to FP
Wants to have more children. Would not like to use contraceptives.

3.2 Attitude of wife or partner to FP
Is afraid to have another child because she is so weak and tired. Could not use contraceptives because husband would object.

3.3 Methods currently used by couple
None

3.4 Knowledge of other methods
Has heard of vasectomy, condoms and diaphragms

3.5 Desired family size (husband)
Wants at least three more children, especially boys.

3.6 Desired family size (wife)
Does not want any more, really, but would have at most two more, to please husband.

3.7 Family planning services available
Does not know of any.

3.8 Utilization of family planning services by couple
None

4. Housing:

4.1 Size of house
Very small

4.2 Number of rooms
3
<table>
<thead>
<tr>
<th>4.3 State of repair</th>
<th>In good repair.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.4 Location in community</td>
<td>On a small rise between the village and the pineapple farm.</td>
</tr>
<tr>
<td>4.5 Drainage</td>
<td>The land is well-drained.</td>
</tr>
<tr>
<td>4.6 Ventilation</td>
<td>There is a large window in one of the rooms.</td>
</tr>
<tr>
<td>4.8 Sleeping arrangements</td>
<td>All three sleep in one room.</td>
</tr>
<tr>
<td>4.9 Cooking arrangements</td>
<td>Cooking is done in one of the rooms set aside for this purpose.</td>
</tr>
<tr>
<td>4.10 Vegetation around house</td>
<td>There is no tall vegetation in the immediate vicinity.</td>
</tr>
</tbody>
</table>

5. Water

<table>
<thead>
<tr>
<th>5.1 Washing clothes</th>
<th>A neighbor washes the clothes in the river, since the wife is not too well.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2 Drinking water (source and storage)</td>
<td>Drawn from a private well. Stored in buckets in the house.</td>
</tr>
<tr>
<td>5.3 Distance of water source from dwelling</td>
<td>20 feet away.</td>
</tr>
<tr>
<td>5.4 Carrying water</td>
<td>Husband carries it.</td>
</tr>
<tr>
<td>5.5 Distance of water source from nearest latrine</td>
<td>About 20 feet downhill.</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>5.6 Filter</td>
<td>Water is not filtered before it is used for drinking or cooking.</td>
</tr>
<tr>
<td>5.7 Boil</td>
<td>Water is not boiled before it is used for drinking.</td>
</tr>
<tr>
<td>5.8 Water sources in the community</td>
<td>Several wells.</td>
</tr>
<tr>
<td>5.9 Bath</td>
<td>The husband has rigged up a shower, using an oil-drum.</td>
</tr>
<tr>
<td>5.10 Protection of water source from animals</td>
<td>Animals wander where they like.</td>
</tr>
<tr>
<td>5.11 Location of villages upstream</td>
<td>There is no village upstream.</td>
</tr>
<tr>
<td>5.12 Pollut by insecticides</td>
<td>The husband sprays around the latrine, refuse pit and well regularly.</td>
</tr>
<tr>
<td>5.13 Defecation near water-source</td>
<td>Not applicable. Adults use latrine.</td>
</tr>
</tbody>
</table>

6. Personal Hygiene

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1 Soap</td>
<td>None available in village. Husband brings some back on rare trips to nearest town.</td>
</tr>
<tr>
<td>6.2 Hand-wash after defecation</td>
<td>Nobody in the family does this.</td>
</tr>
<tr>
<td>6.3 Hand-wash before food preparation</td>
<td>Wife always does this.</td>
</tr>
</tbody>
</table>
### 6.4 Washing of vegetables to be eaten raw
Wife lets them soak in water.

### 6.5 Number of baths per week:

<table>
<thead>
<tr>
<th></th>
<th>Husband</th>
<th>Wife</th>
<th>Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn</td>
<td>Wife</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>let them soak in water.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Husband</td>
<td>and wife take shower every day, with soap, when they have it.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wife</td>
<td>Newborn is bathed every day it is necessary.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 6.6 Number of wash days per week (clothes)
1

### 6.7 Hair-washing

<table>
<thead>
<tr>
<th></th>
<th>Husband</th>
<th>Wife</th>
<th>Children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wife washes her hair with soap when they have some -- usually once a day.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Husband</td>
<td>Husband normally washes his hair with soap once a week.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wife</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 6.8 Cleanliness of house
House is thoroughly swept out once a day and more often if necessary.

### 6.9 Animals in the house
No animals are allowed in the house.

### 6.10 Insects in the house
The house is sprayed often with "Flit" so that flies and mosquitoes are not much of a nuisance.

### 6.11 Rodents in the house
No rodents have been seen.

### 7. Excreta and Refuse:

#### 7.1 Type of latrine used
Pit latrine

#### 7.2 Cleanliness of latrine
He cleans it about once a week by scraping the earth around the pit with a shovel and covering excreta with a thin layer of soil.
<table>
<thead>
<tr>
<th>7.3</th>
<th>Type of platform</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.4</td>
<td>Ventilation</td>
<td>Ventilation slits have been made at the top part of side-walls.</td>
</tr>
<tr>
<td>7.5</td>
<td>Walls</td>
<td>Need additional support.</td>
</tr>
<tr>
<td>7.6</td>
<td>Capacity of latrine at present</td>
<td>About half full. He is thinking about using the excreta as fertilizer for a proposed kitchen-garden.</td>
</tr>
<tr>
<td>7.7</td>
<td>Animal excreta</td>
<td>Not collected or used.</td>
</tr>
<tr>
<td>7.8</td>
<td>Human excreta as fertilizer</td>
<td>Will be used when he has cultivated kitchen garden.</td>
</tr>
<tr>
<td>7.9</td>
<td>Refuse disposal</td>
<td>Refuse burned once a week in perforated oil drum.</td>
</tr>
</tbody>
</table>

8. Nutrition:

<table>
<thead>
<tr>
<th>8.1</th>
<th>Energy foods available</th>
<th>Cornflour, sweet potatoes, rice, sugar, split-peas, pineapples, paw paw</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.2</td>
<td>Body-building foods available</td>
<td>Fish and beef, shrimp</td>
</tr>
<tr>
<td>8.3</td>
<td>Protective foods available</td>
<td>Eddoe leaves, sweet potato leaves, cucumbers, lemon (family has no garden).</td>
</tr>
</tbody>
</table>
8.4 Food preferences of family

The family eats some fish. Chicken and eggs are sold for cash. They eat eddoe and sweet potato leaves, some rice and split peas, powdered milk is used for tea and coffee. Family never eats beef.

8.5 Foods "imported" into the community

Powdered milk

8.6 Malnourished children in the family

The baby is being breast-fed and the PHN on her last visit 2 months ago commented that she is doing very well. But present arm measurement 13 cm - malnourished.

8.7 Breast-feeding

Baby is being breast-fed.

8.8 Bottle-feeding

Mother plans to start bottle-feeding in a few months' time to make sure baby gets "good milk" (powdered milk).

8.9 Feeding with cup and spoon

Has never heard of doing this for small babies who could not breast-feed.

8.10 Supplementary foods for baby

Will start giving these when the baby is about 18 months old.

8.11 Meals for children over 5 and adults

Breakfast: fruit
Noon meal: rice, fruit
Supper: eddoe leaf salad, fish, rice, tea or coffee, split-peas, shrimp

8.12 Weaning

Mother plans to wean baby in about four to six months and then start her on the bottle.
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.13 Cereal porridge</td>
<td>Has heard of it from the PHN, but does not know how to make it.</td>
</tr>
<tr>
<td>8.14 Feeding sick children</td>
<td>Reduced feeding to stop diarrhea. Does not know about salt sugar solution for the treatment of diarrhea.</td>
</tr>
<tr>
<td>8.15 Nutrition for pregnant or lactating woman</td>
<td>The wife in this family has &quot;lost her appetite.&quot; Even if she wanted to eat, she would not eat extra food, for fear of getting obese. No special taboos during pregnancy.</td>
</tr>
</tbody>
</table>

9. Insect Vectors:

<table>
<thead>
<tr>
<th>Subsection</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.1 Prevalence</td>
<td>Both flies and mosquitoes are very prevalent in this area.</td>
</tr>
<tr>
<td>9.2 Breeding-places</td>
<td>Mainly in the forest or near river bank. Few flies or mosquitoes in the house itself.</td>
</tr>
<tr>
<td>9.3 Control</td>
<td>Husband sprays around the latrine, refuse pit and well, regularly, with DDT.</td>
</tr>
<tr>
<td>9.4 Insect vectors and causes of disease</td>
<td>Is aware that flies and mosquitoes can cause disease, but does not actually know which diseases.</td>
</tr>
</tbody>
</table>
INTERVIEW INSTRUCTIONS

The purpose of your doing this interview is to test:

1. Your ability to conduct an interview (in a role-play situation) with a community member. You will be judged on:
   a. the appropriateness of your questions,
   b. the kind of questions you ask, and
   c. the number of questions that you ask.

2. Your ability to remember, organize and use the information you obtain during the role-play interview. You will be judged on:
   a. how you answer written questions about the family of the person interviewed, and
   b. how many questions you have been able to answer.

Your Task:

1. Read the background information about the family and community. You will have 5 minutes to study this information.

2. Question the householder so as to find out all the important facts about their family in 20 minutes. The interview will end in 20 minutes.

Question Procedure:

1. You are of course only interested in things that have a bearing on the health of the family.

2. If you ask this person a question and he/she replies "I don't know", do not continue to question on that particular subject, but go on to another line of questioning.

3. You may take as many notes as you wish during the interview. Be careful though that you do not spend all your time taking notes instead of asking questions.

4. Your note sheet can be used while answering post interview questions. Be sure to write your name on the note sheet.
Post Interview Procedure:

1. Immediately after the interview you will be asked to record the information you obtained about the family.

2. Remember you may use your note sheet to assist you in filling out the record.
APPENDIX G

INTERVIEW PROCEDURE POSTTEST
INTERVIEW PROCEDURE POSTTEST

NAME: ________________________________       DATE: ________________

1. How much time will you be given to familiarize yourself with the background on the family and community?
   Answer:

2. How much time will you be given to conduct the interview?
   Answer:

3. What should you do if the person being interviewed, responds "I don't know" to your question?
   Answer:

4. What is the purpose of taking notes during the interview?
   Answer:
APPENDIX H

INTERVIEW NOTES

HOUSEHOLDS A, B AND C
1. Use this sheet to make notes to assist you in filling out the interview record.

2. Listed below is the essential information you need to begin the interview.

3. You have 5 minutes to review this information before beginning the interview.

4. The householder will not answer any questions until the 5 minutes have elapsed.

**Family Background:**

Person being interviewed: John Steward, age 39  Health: good Subsistence activities  
Occupation:  
Wife: Carol age 28  
Occupation: Part-time sales clerk at the local store  
Tenure: John has lived in Pinkstone all his life.

**Community:** Pinkstone  
Location: On the Essequibo River  
Population: 130 people  30 families  
General description: Pinkstone is a typical river community set a few hundred yards back from the river bank and sloping gradually to the sugar fields. Those who do not work on the plantation spend their time fishing and tending their cows and poultry.
Assume this is the rainy season and the ground in the community is a bit wet. Despite the drainage problems most people in the village have small kitchen gardens.

Health Services:

There is no Health Center in the community. If people are very sick, they travel to the Health Center in Rockstone 10 miles away.

Health Workers: The Public Health Nurse visits periodically, but self treatment is common for all but the most serious problems.

Physical appearance of the Stewards' yard:

1. The dwelling is surrounded by litter.
2. A pit latrine is visible behind the house.
3. There is standing water in the yard as it is the rainy season.

NOTES
INTERVIEW NOTES

1. Use this sheet to make notes to assist you in filling out the interview record.

2. Listed below is the essential information you need to begin the interview.

3. You have 5 minutes to review this information before beginning the interview.

4. The householder will not answer any questions until the 5 minutes have elapsed.

Family Background:

Person being interviewed: Anne Hathaway Age 32
Occupation: Housewife
Husband: James Age 42
Occupation: Sugar worker
Tenure: Moved to Eddyborough 3 months ago

Community: Eddyborough
Location: Coastal community
Population: 320 people 60 families
General description: Eddyborough is typical of many villages near the coast. Drainage of land is a problem during the rainy season. Drainage trenches exist but are congested with vegetation. The land around the village is mostly taken up with sugar plantation. Although there are some small farms in the region most people in the community have small kitchen gardens.
Health Services:

Health Center: Not in the community.

Health Workers: The Public Health Nurse visits periodically, but self treatment is common for all but the most serious problems.

Physical appearance of the Hathaways' yard:

1. There are pools of water in the yard and the ground is muddy as it is now the rainy season.

2. There is a pit latrine in the yard.

3. There is a refuse pit in the yard.

NOTES
INTERVIEW NOTES

1. Use this sheet to make notes to assist you in filling out the interview record.

2. Listed below is the essential information you need to begin the interview.

3. You have 5 minutes to review this information before beginning the interview.

4. The householder will not answer any questions until the 5 minutes have elapsed.

Family Background:

Person being interviewed: Angela Pertwee  Age 25
Occupation: Store clerk
Husband: Richard
Occupation: Unemployed
Tenure: Both have lived in the community since childhood

Community: Lanboro
Location: Essequibo River
Population: 150 people  25 families
General description: Lanboro is typical of river communities. The Pertwees' house is on relatively high ground near a pineapple farm. Most of the community is very swampy during the rainy season. Despite this, most people have small kitchen gardens in which they grow greens and provisions.
## Health Services:

<table>
<thead>
<tr>
<th>Health Center:</th>
<th>Not in the community</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Workers:</td>
<td>The Public Health Nurse visits periodically but self treatment is common for all but the most serious problems.</td>
</tr>
</tbody>
</table>

### Physical appearance of the Pertwees' yard:

1. There is no standing water and the ground is dry.
2. There is a latrine in the yard.
3. There is a well in the yard.
4. There is no visible refuse pit in the yard nor any litter.

**NOTES**
APPENDIX I

EXPERT WEIGHTING OF SITUATIONAL TEST ITEMS
APPENDIX I

EXPERT WEIGHTING OF SITUATIONAL TEST ITEMS

The topics listed below are those that would normally be covered by a Medex conducting a community and family assessment in Guyana. Please use the cards supplied to help you categorize these topics into sets weighted according to the importance you consider should be attributed to them.

Set 1 = Not essential information
Set 2 = Desirable information
Set 3 = Essential information

When you have assessed the relative importance of the topics please note their set numbers in the appropriate column. This will help us to score student responses.
EXPERT WEIGHT

TOPIC

MOTHER'S HEALTH

- Previous pregnancies
- Miscarriages
- Stillbirths
- General health of wife

CHILDREN'S HEALTH

- Number of children
- Ages of children
- Children's health history
- Children's present health
- Deceased children
- Causes of death
- Immunizations

FAMILY PLANNING

- Attitude to family planning of person interviewed
- Attitude to family planning of partner
- Methods of contraception used
- Knowledge of other contraceptive methods
- Husband's desired family size
Wife's desired family size
Family planning services available
Couple's utilization of family planning services

HOUSING
Size of house
Number of rooms in house
State of repair of house
Location of house in village
Drainage of site of house
Ventilation of house
Sleeping arrangements
Cooking arrangements
Vegetation around house

WATER SUPPLY
Washing clothes
Source of water
Distance of source of water from house
Method of carrying water
Distance of water source from latrine
Filtering of drinking water
Boiling of drinking water
Other sources of water
Bathing
Protection of water source from animals
Location of villages upstream
Pollution of water by insecticides
Defecation near water source

PERSONAL HYGIENE
Availability of soap
Hand washing after defecation
Hand washing before preparing food
Washing vegetables before eating them raw
Number of baths per week
Number of wash days for clothes per week
Hair washing
House cleaning
Animals in the house
Insects in the house
Rodents in the house

WASTE & REFUSE
Type of latrine used
Cleanliness of latrine
Type of latrine platform
Ventilation of latrine
Walls of latrine
Present capacity of latrine
Animal excreta disposal
Human excreta as fertilizer
Refuse disposal

NUTRITION

Energy foods available
Body building foods available
Protective foods available
Family food preferences
Foods imported from outside village
Malnourished children in family
Breast-feeding
Bottle feeding
Feeding infants with cup and spoon
Supplementary foods for baby
Weaning
Cereal porridge
Feeding sick children
Nutrition of pregnant and lactating women

INSECT & RODENT

Insect breeding grounds
Insect control measures
Insect vectors as cause of disease
APPENDIX J

SITUATIONAL INTERVIEW TEST RECORD
<table>
<thead>
<tr>
<th>QUESTION</th>
<th>WRITE YOUR ANSWER HERE</th>
<th>+</th>
<th>-</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 MOTHER HEALTH</td>
<td>1. _ 2. _ 3. _</td>
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</tr>
<tr>
<td></td>
<td>4. _ 5. _ 6. _</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1.2 How many times has she been pregnant?</td>
<td>7. _ 8. _ 9. _</td>
<td></td>
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</tr>
<tr>
<td>1.3 How many miscarriages has she had?</td>
<td>1. _ 2. _ 3. _</td>
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<tr>
<td></td>
<td>4. _</td>
<td></td>
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<tr>
<td>1.4 How many stillborn babies has she had?</td>
<td>1. _ 2. _ 3. _</td>
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<td></td>
<td>4. _ 0. _</td>
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<tr>
<td>1.5 What is her general health like?</td>
<td>If ill, describe condition.</td>
<td></td>
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<tr>
<td>1.6 What was mother's age at first pregnancy?</td>
<td>1. 15 yrs or less</td>
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<td></td>
<td>2. 15 - 20</td>
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<td>3. 20 - 25</td>
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<td></td>
<td>4. 30 +</td>
<td></td>
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</tr>
<tr>
<td>2.0 CHILDREN HEALTH</td>
<td>BOYS</td>
<td>GIRLS</td>
<td></td>
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</tr>
<tr>
<td>2.1 How many boys are there in the family, and how many girls?</td>
<td>1. _ 4. _ 1. _ 4. _</td>
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<td></td>
<td>2. _ 5. _ 2. _ 5. _</td>
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</tr>
<tr>
<td>2.3 What are the ages of the boys</td>
<td>BOYS</td>
<td>GIRLS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4 of the boys and girls?</td>
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<tr>
<td>QUESTION</td>
<td>WRITE YOUR ANSWER HERE</td>
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<tr>
<td>2.5 What serious illnesses have the children had in the past?</td>
<td>1. Rheumatic fever ___</td>
<td></td>
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<tr>
<td>2.6 Appendicitis ___</td>
<td>3. Pneumonia ___</td>
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<tr>
<td>2.7 What is the present health of the children like?</td>
<td>1. Eye problem ___</td>
<td></td>
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<tr>
<td>2. Diarrhea ___</td>
<td>3. Malnutrition ___</td>
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<tr>
<td>4. Skin P. ___</td>
<td>5. Fever ___</td>
<td></td>
<td></td>
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<tr>
<td>6. Worms ___</td>
<td>7. Other ___</td>
<td></td>
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<tr>
<td>2.8 Have any boys or girls in the family died?</td>
<td>BOYS Yes ___ GIRLS Yes ___</td>
<td></td>
<td></td>
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<tr>
<td>No ___</td>
<td>No ___</td>
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<tr>
<td>2.9 If so, what did they die from and at what age?</td>
<td></td>
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<tr>
<td>2.10 Which children have had these vaccinations?</td>
<td>AGE IMMUNIZATION</td>
<td></td>
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<tr>
<td>- DPT</td>
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<tr>
<td>2.11 - POLIO</td>
<td></td>
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<tr>
<td>2.12 - SMALLPOX</td>
<td></td>
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<tr>
<td>2.13 - BCG</td>
<td></td>
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<tr>
<td>3.0 FAMILY PLANNING</td>
<td></td>
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</tr>
<tr>
<td>3.1 What is the attitude of the person you interviewed to family planning?</td>
<td>WOULD USE ___</td>
<td></td>
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<tr>
<td>WOULD NOT USE ___</td>
<td></td>
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<tr>
<td>QUESTION</td>
<td>WRITE YOUR ANSWER HERE</td>
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<td>SCORE</td>
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<tr>
<td>3.2 What is the attitude of the partner to family planning?</td>
<td>WOULD USE ___</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>WOULD NOT USE ___</td>
<td></td>
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<tr>
<td>3.3 What method of contraception does the couple use?</td>
<td>Rhytym ___ Diaphragm ___</td>
<td></td>
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<tr>
<td></td>
<td>IUD ___ NONE ___</td>
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<tr>
<td></td>
<td>Condom ___</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3.4 What other methods do they know about?</td>
<td>Rhytym ___ Diaphragm ___</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IUD ___ NONE ___</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Condom ___</td>
<td></td>
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<tr>
<td>3.5 What is the husband's desired family size?</td>
<td>1. ___ 4. ___</td>
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<td></td>
<td>2. ___ 5. ___</td>
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<td></td>
<td>3. ___ 6. ___</td>
<td></td>
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<tr>
<td>3.6 What is the wife's desired family size?</td>
<td>1. ___ 4. ___</td>
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<td></td>
<td>2. ___ 5. ___</td>
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<tr>
<td></td>
<td>3. ___ 6. ___</td>
<td></td>
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<tr>
<td>3.7 What family planning services are available to this couple?</td>
<td>Ante-natal clinic ___</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Family planning clinic ___</td>
<td></td>
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<tr>
<td></td>
<td>NONE ___ OTHER ___</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3.8 Has this couple ever utilized FP services?</td>
<td>Yes ___</td>
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<tr>
<td></td>
<td>No ___</td>
<td></td>
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<tr>
<td>4.0 HOUSING</td>
<td></td>
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</tr>
<tr>
<td>4.1 How large is the house in which this family lives?</td>
<td>Small ___ Medium ___</td>
<td></td>
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<tr>
<td></td>
<td>Large ___</td>
<td></td>
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<tr>
<td>4.2 How many rooms are there?</td>
<td>1. ___ 2. ___ 3. ___</td>
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<tr>
<td></td>
<td>4. ___</td>
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<tr>
<td>QUESTION</td>
<td>WRITE YOUR ANSWER HERE</td>
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<td>SCORE</td>
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<td>-------------------------------------------------------------------------</td>
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<tr>
<td>4.3 In what state of repair is the house?</td>
<td>Good __ Average __</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Poor __</td>
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<tr>
<td>4.4 Where is the house located in the village?</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4.5 Is the land on which the house is built well-drained?</td>
<td>Good __ Average __</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Poor __</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.6 Is the house well-ventilated?</td>
<td>Good __ Average __</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Poor __</td>
<td></td>
<td></td>
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<tr>
<td>4.7 What are the family sleeping arrangements?</td>
<td></td>
<td></td>
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<tr>
<td>4.8 What are the cooking arrangements?</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>4.9 Has vegetation been cleared away around the house?</td>
<td>Yes __ No __</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Other __</td>
<td></td>
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<tr>
<td>5.0 ENVIRONMENTAL HEALTH</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5.1 Where are the clothes washed?</td>
<td>River __ House __</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Trench __ Stream __</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.2 From where is drinking water drawn?</td>
<td>Well __ Sandpipe __</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>River __ Catchment __</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Spring __</td>
<td></td>
<td></td>
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<tr>
<td>QUESTION</td>
<td>WRITE YOUR ANSWER HERE</td>
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<td>SCORE</td>
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</tr>
<tr>
<td>5.3</td>
<td>How far away is the drinking water source from house?</td>
<td>0-25 feet</td>
<td>26-50 feet</td>
<td>51-100 feet</td>
</tr>
<tr>
<td>5.4</td>
<td>How is water carried to the house?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5.5</td>
<td>How near is the drinking water source to a latrine?</td>
<td>0-25 feet</td>
<td>26-50 feet</td>
<td>51-100 feet</td>
</tr>
<tr>
<td>5.6</td>
<td>Is water filtered?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>5.7</td>
<td>Is water boiled before drinking?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>5.8</td>
<td>What other sources of water are there in the village?</td>
<td>Well</td>
<td>Standpipe</td>
<td>River</td>
</tr>
<tr>
<td>5.9</td>
<td>Where does the family bathe?</td>
<td>River</td>
<td>House</td>
<td>Trench</td>
</tr>
<tr>
<td>5.10</td>
<td>Is the source of water protected from animals?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>5.11</td>
<td>Is there a village located upstream of the community?</td>
<td>Yes</td>
<td>Distance</td>
<td>No</td>
</tr>
<tr>
<td>QUESTION</td>
<td>WRITE YOUR ANSWER HERE</td>
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<td>--------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>5.12 Is it likely that the water source is polluted by insecticides?</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.13 Do animals or people defecate near water source?</td>
<td>ANIMALS Yes</td>
<td>PEOPLE Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>No</td>
<td></td>
<td></td>
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<tr>
<td>6.0 PERSONAL HYGIENE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.1 Is soap available in the village?</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.2 Do members of the family wash their hands after defecation?</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.3 Does the wife wash her hands before preparing food?</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.4 What is done with vegetables that are to be eaten raw?</td>
<td>Washed</td>
<td>Not Washed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.5 How many baths do members of the family take each week?</td>
<td>1. 4. 7.</td>
<td></td>
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<td></td>
<td>2. 5.</td>
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<td></td>
<td>3. 6.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.6 How many times a month are clothes washed?</td>
<td>1. 3. Other</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>2. 4.</td>
<td></td>
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<tr>
<td>QUESTION</td>
<td>WRITE YOUR ANSWER HERE</td>
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</tr>
<tr>
<td>6.7 How many times a week do members of the family wash their hair?</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>6.8 How often is the house cleaned?</td>
<td>Daily __ Monthly __ Weekly __ Other __</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.9 Are animals allowed in the house?</td>
<td>Yes __ No __</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>6.10 Are insects in the house a nuisance?</td>
<td>Flies</td>
<td>Mosq.</td>
<td>Roaches</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>6.11 Have rodents (rats and mice) been seen in the house?</td>
<td>Yes __ No __</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.0 HUMAN WASTE DISPOSAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.1 What type of latrine does the family use?</td>
<td>Flush</td>
<td>None</td>
<td>Pit</td>
<td></td>
</tr>
<tr>
<td>7.2 Is the latrine kept clean?</td>
<td>Yes __ No __</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.3 What type of platform has been installed in the latrine?</td>
<td>Concrete</td>
<td>Wood</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>7.4 What arrangements have been made for ventilation of the latrine?</td>
<td>Window</td>
<td>None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QUESTION</td>
<td>WRITE YOUR ANSWER HERE</td>
<td>+</td>
<td>-</td>
<td>SCORE</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>-------------------------</td>
<td>---</td>
<td>---</td>
<td>-------</td>
</tr>
<tr>
<td>7.5 What are the latrine walls made of? Are they in good repair?</td>
<td>Material</td>
<td>Repair</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wood</td>
<td>Good</td>
<td>Concrete</td>
<td>Bad</td>
</tr>
<tr>
<td>7.6 How full is the latrine pit?</td>
<td>¼</td>
<td>3/4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.7 What arrangements have been made for the disposal of animal excreta?</td>
<td>Bury</td>
<td>Fertilize</td>
<td>Burn</td>
<td>None</td>
</tr>
<tr>
<td>7.8 Is human excreta used as fertilizer?</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.9 What arrangements have been made for refuse disposal?</td>
<td>Bury</td>
<td>Burn</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>8.0 NUTRITION</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.1 What energy foods are available in the village?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.2 What body building foods are available?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.3 What protective foods are available?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.4 What are the family's food preference?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QUESTION</td>
<td>WRITE YOUR ANSWER HERE</td>
<td>+</td>
<td>-</td>
<td>SCORE</td>
</tr>
<tr>
<td>----------</td>
<td>------------------------</td>
<td>---</td>
<td>---</td>
<td>-------</td>
</tr>
<tr>
<td>8.5 What foods are brought into the village from outside?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.6 Are any of the children in the family malnourished?</td>
<td>Yes ___</td>
<td>Ages ___</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.7 Is the baby being breast-fed?</td>
<td>Yes ___</td>
<td>No ___</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.8 Are, or will any of the children be bottle fed?</td>
<td>Yes ___</td>
<td>No ___</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.9 Does their mother know about feeding with a cup and spoon?</td>
<td>Yes ___</td>
<td>No ___</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.10 Are children given supplementary foods at the right time and the right kind of foods?</td>
<td>Yes ___</td>
<td>No ___</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.11 What do family meals usually consist of?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.12 At what age does this family intend to wean the newborn?</td>
<td>0-12 months ___</td>
<td>12-18 months ___</td>
<td>18-24 months ___</td>
<td></td>
</tr>
<tr>
<td>8.13 Has the mother ever heard of cereal porridge and how to make it?</td>
<td>Yes ___</td>
<td>No ___</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QUESTION</td>
<td>WRITE YOUR ANSWER HERE</td>
<td>+</td>
<td>-</td>
<td>SCORE</td>
</tr>
<tr>
<td>----------</td>
<td>------------------------</td>
<td>---</td>
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</tr>
<tr>
<td>8.14 What does this family feed their children when they are sick?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.15 Are the husband and wife aware that a pregnant or lactating woman needs extra food?</td>
<td>Yes __ No__</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.16 Does the mother know how to prepare salt sugar solution for treatment of diarrhea?</td>
<td>Yes __ No__</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.0 INSECT CONTROL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.1 Are flies and mosquitoes numerous in the village? Yes __ No__</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.2 Where do the flies and mosquitoes breed in the village?</td>
<td>Stagnant water __ Vegetation __ Refuse __ Excreta disposal __</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.3 What has been done to control the flies and mosquitoes?</td>
<td>Vegetation removed __ Pools drained __ Excreta covered __ Insecticide used __</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.4 Does the person interviewed understand what diseases are caused by insects?</td>
<td>Yes __ No__</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


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