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PLANNING FOR HEALTH IN COLOMBIA:
CONFRONTING THEORY AND PRACTICE

DISSERETATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

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1975

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This study promotes a greater sensitivity to the health problems of developing countries, and the planning to alleviate these problems. This is important for humanitarian reasons. Another reason is equally important, however, and this involves learning from both health planning theory and practice. Many countries, both developed and developing, are searching currently for planning approaches that will provide solutions to their complex health problems. Their decisions regarding planning will benefit from increased knowledge of the theory and practice, and the present study strives to make such a contribution.

The character of this dissertation, especially its international focus, has resulted in the involvement of many persons and institutions. This author owes much credit and gratitude to all of them. The dissertation committee members, Professors Thomas N. Chirikos, Chairman, Martin D. Keller, and Samuel C. Kelley have been outstanding both in their personal assistance and in their classes. Professor Chirikos deserves further accolades because he has been not only a true mentor, but also a prime motivator due to his interest and experience in Latin American health planning. Early motivation and groundwork benefited from the help of the late Richard H. Schlesinger, Fred Yanni, and Gordon Cummings. Rafael Samper of Peace Corps/Colombia and Clinica Samper in Bogota has helped greatly throughout the entire period. Also, the faculty of the University of Valle Medical School, especially Dean Rodrigo Guerrero, and Peace Corps/Colombia deserve thanks for their support during the author's first stay in Colombia.
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CHAPTER I
INTRODUCTION

Development and Health Planning

Much has been said and written about the plight of countries whose socio-economic development has lagged behind that of the modernized, high-income nations. Even a cursory glance at the content of such analyses reveals a pervasive message—that the paramount need is to increase the understanding of the factors which contribute to the quantitative and qualitative growth of a society, and to find ways to intervene so as to enhance this development. The key words are understanding and intervention, with the former necessarily being the prerequisite for the latter.

Planning is founded on similar reasoning; yet, it should be apparent to both laymen and professional planners that programs frequently are implemented in the absence of an adequate understanding of the situation to be changed. Equally important is the finding that the reasoning on which such actions are based, and the process by which the actions are decided upon, is seldom explicit and analytic. At root, the problem is the absence of planning.

Improved health of a population has been viewed increasingly in recent years as a factor which promotes development, instead of hindering it. The role that health plays in increasing a nation's productive capacity must be greater than its effect on population increase if the
country is to benefit economically from a healthier population. There is some evidence that suggests this has happened; and health is now considered a priority in economic development programs. But this economic argument should not stand alone as the criterion for allocating scarce resources to and within the health sector. Other social considerations should provide additional support. The values supporting a healthy, happy, and productive population need not be contradictory.

In recent years it has also become increasingly apparent to observers of the health sector that the practice of health planning has often outstripped its theoretical base. All too often well-intentioned supporters of the concept of planning for improved health have plunged into operational efforts without first devoting the resources and time necessary to ensuring that sound concepts and methods were available and sufficiently developed to provide guidance for planning activities. In many instances, the result has been ineffective planning. A related problem is that the proposed health planning theories seldom question the relevance of their concepts and methods to the practice of health planning. One result has been that theory often has become too sophisticated for practice. What is missing is the confrontation of theory and practice so that health planning research will produce concepts and methods that are useful, and health planning practice will utilize them.

A Study of Health Planning

Case studies of health planning have been suggested by several authors as a means of developing the art and science of health
planning. The primary goal would be to highlight the gaps between theory and practice, and illustrate the operational problems, constraints, and accomplishments. The purpose of this thesis is to carry out such a case study in Colombia. The objectives are the critique of the current state of health planning in the type of context represented by Colombia, and the formulation of strategy recommendations for improving this practice. A further objective is to provide an empirical test for the health planning conceptual framework, recognizing that for theory to be meaningful it must confront practice. Mutual adaptation of theory and practice should result from this confrontation.

But to carry out such studies is difficult because there is no adequate health planning theory from which the evaluative criteria might be drawn. Only a few serious attempts have been made to evaluate health planning programs and, in general, these efforts have been of rather poor quality largely because of their limited focus. The criteria employed usually represent some aspect of the health planning program, thus providing only a partial picture. The most common focus concentrates on the structural or organizational aspects of the planning effort. Recent examples include works on the

Such organizational evaluations are predicated upon the implicit assumption that the context dictates the type of organization for health planning. Furthermore, it is assumed that once a planning structure is established in conformance to the context, the structure explains how health planning will be operationalized, i.e., what activities will be carried out. In short, the approach is to define planning actions through a heuristic process within the framework of the given structure and context of the health planning program. This is problematic because little effort is dedicated to developing the sound theoretical base that is needed if planning is to attain its objectives.

It is the contention of this study that a substantially different line of reasoning is required if health planning is to be evaluated, and be improved as a function of that evaluation. What is required is a specification of the characteristics of the process of health planning; more specifically, a statement of necessary planning activities, and the concepts and methods which contribute to carrying out these activities. Such a conceptual framework should be developed by drawing together the concepts and methods from those disciplines which relate to health and the delivery of health services, e.g. medicine,

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epidemiology, demography, economics, biostatistics, sociology, administrative science, education, political science. The preferred structure then should be derived from both the requirements of the health planning process and the constraints imposed by the particular social context. What should emerge from this reasoning is a conceptionsal framework of the process and structure of health planning.

Since there are few such studies, the present study must necessarily attempt to piece together a workable conceptual framework in order to achieve its objectives. Emphasis will be given to those concepts and methods that appear to be most relevant to developing countries. Such a framework provides the criteria for evaluating health planning programs, as in the case of regional health planning in Colombia.

Colombia was chosen for this case study because it represents a developing country with the characteristic needs and problems, including among others rapid population growth and urban in-migration, high rates of infant mortality, inflation and unemployment, and low per capita income. Yet, Colombia has demonstrated the capability for economic growth and social development, as indicated in certain regions where industrialization has proceeded at a fast and beneficial pace, and where quality social services are provided through various public sector programs. One of the major problems is the paradox between

these more developed regions and the substantially less advanced regions that constitute the large majority of the country and its population. Furthermore, because substantial in-migration into these more developed regions has occurred at a rapid pace, it is imperative that planning avert the degradation of these areas through the development of the impoverished areas.

The health sector of the Colombian economy has received a priority in governmental development plans during the past decade. This indicates acceptance of the potential role that expanded coverage and increased quality of health services can serve not only in improving the population's health, but also in promoting growth and development. As part of this increased focus on the health sector, the Colombian government has increased its commitment to health planning, recognizing that without planning it would be difficult for the expansion of the health sector to proceed with the direction and at a pace that contributes to overall development. The regional health planning that has been conducted subsequently by some of the public health organizations has reflected both a major commitment to planning, and the allocation of considerable resources to preparing health plans. The activities which have been carried out as part of this planning are the prime concern of the present case study.

**Objectives and Format of Study**

The present study addresses the problem of assessing health planning practice in a developing country with both conceptual and empirical tools. The descriptive and prescriptive results are presented as
follows. CHAPTER II develops an approach to health for use in developing countries. Toward this end, the key issues involved in health system analysis are evaluated and related to the activities of the health planning process. CHAPTER III identifies important contextual and structural aspects of health planning programs; they are examined in the Colombia case in order to assess the health planning capacity. The theoretical parts of Chapters II and III draw upon a critical analysis of the health planning literature and its related disciplines, and attempt to synthesize pertinent ideas into a conceptual framework.

This conceptual framework is then utilized to analyze empirically the practice of health planning in a Colombian region in CHAPTER IV. The activities of this regional program are analyzed by studying its published plans and related documents, supplemented by the observations of the author while providing full-time technical assistance to the program over a two-year period. The goal of this chapter is to identify strengths and weaknesses in the planning practice relative to the concepts and methods developed earlier. CHAPTER V then investigates the major effects of the health planning practice. Finally, CHAPTER VI summarizes the study and prescribes an innovation strategy designed to increase the ability of planning to ameliorate the persisting health and health system problems.

In order to lay the groundwork for the more detailed discussions which follow, the remainder of this introduction defines planning and community health, as well as their convergence in health planning and policymaking.
Dror defines planning as "the process of preparing a set of decisions for action in the future, directed at achieving goals by optimal means."\footnote{Yehezkel Dror, "The Planning Process: A Facet Design", in Planning, Programming, and Budgeting, ed. by F. J. Lyden and E. G. Miller (Chicago: Markham Publishing Company, 1969), p. 99.} Expanding on this definition, planning may be viewed as a process of systematic analysis of alternative ends and means as an informational base for the promotion of change through effective and efficient resource allocation.

For working purposes, planning may be conceived as an important input into the policymaking process.\footnote{The distinction between planning and policymaking is crucial, and the basis is the difference between analysis and decisions. Planning is conceived in this study as a staff function designed to conduct systematic analysis for policymaking. Conceptually, policymaking makes decisions based on this analysis, in combination with value judgements and points of view. This distinction draws heavily upon Schultze, see Charles L. Schultze, The Politics and Economics of Public Spending (Washington: The Brookings Institution, 1968), pp. 1-17, 55-76. A similar distinction between the functions of decision-makers and planners in the health field is promoted in Navarro, "Health Planning in National Development", pp. 18-32.} Essentially, planning is designed to make policymaking more rational. By policymaking is meant a process wherein decisions are made concerning preferred courses of action, particularly where resources are committed to alternative uses. Two points are noteworthy here: one is that this study is limited to the area of public policymaking, secondly, it is acknowledged that all dimensions of policymaking are not subsumed within this decision framework. It is important to bear in mind, for example, that plan
implementation often requires that policymakers design and support the
relevant legal system changes. This dimension, however, will not be
discussed. By rationality then is meant that resources are committed
as means toward explicit ends only when the output of such an alloca-
tion is understood and valued above alternative uses.

The planning process may be defined as the following set of activ-
ities: (1) evaluation of relevant operating systems; (2) definition of
goals; (3) analysis of alternative courses of action for reaching
goals; (4) implementation of chosen courses of action; and, (5) evalu-
ation of these selected courses of action after their implementation.6
Such a set of activities should be iterative, as the evaluation activ-
ity provides new information for problem identification. The activ-
ities should also be highly inter-related, meaning that each activity
influences both the following and the preceding activities. Further-
more, these planning activities should be closely coordinated with the
policymaking process in health system decision-making -- shown diagram-
atically in Figure 1-1.7

Conceptually, these activities are generic to planning, although
clearly the specific concepts and methods utilized will vary, as will
the structure, in different situations. This variance is created by
the planning context, i.e., the physical and social setting in which

6For one of the best statements of social planning theory, see
Alfred J. Kahn, Theory and Practice of Social Planning (New York:
Russell Sage Foundation, 1969). Also see, Gerald Rosenthal, "Plan-
ning in the Health Care System," in Systems and Medical Care, ed. by

7See Henrik L. Blum, Planning for Health (New York: Human
Health Planning Process

- System Evaluation
- Goals Definition
- Alternative Program Analysis
- Implementation
- Program Evaluation

Health Policymaking Process

- General Health Goals
- Problem Identification
- Health System Goals and Objectives
- Program Selection and Promotion
- Program Evaluation Decisions

FIGURE I-1

HEALTH SYSTEM DECISION-MAKING PROCESS
planning is done. Planning focuses primarily on the future, thus necessitating not only a description of the existing system but also an estimation of the parameters of that system at a future point in time. Such a focus enables planning to concern itself both with solving existing problems and preventing future ones.

Community Health

Community health has been defined by the World Health Organization (WHO) as the "state of complete physical, mental and social well-being" of the population. The community health system may be viewed as a set of dynamic interactions or relationships between the population and health resources utilized to promote health status. The complex nature of such health systems is a major challenge to planning. This complexity is manifested in the increasing evidence that the factors which limit health, and conversely those which promote or restore it, are most often multiple and varied.

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8 Dror has distinguished between the environment and structure of planning and the phases of planning, and thus the present study's view is similar. However, Dror uses the term "planning process" to include all of these aspects, so this study deviates from this point by using "planning program" to refer to all the aspects, and reserving process for a set of generic activities. See Dror, "Planning Process," p. 96.


epidemiology, which seeks ethnologic explanations of diseases and other conditions by elucidating an agent-host-environment profile, has reacted to this complexity through a "web of causation" concept, rather than seeking a specific causal agent.\textsuperscript{11} Most disease processes require such an approach, and the approach is useful to planning because it generates an increased number of alternative interventions.\textsuperscript{12}

Planning for health seeks to strengthen the role of the health system in improving health. Basically, health planning strives to understand the health system and implement changes. Thus, the complexity of the community health system provides the paramount challenge to planning. For this reason, the experience and intuition of health planners and other health professionals is an insufficient knowledge base. Planning must stimulate health and health services research to produce sound theories representing rigorous scientific thinking and the findings of both laboratory and field experimentation. Such theories then should become part of the conceptual foundation for planned intervention. This does not mean, however, that health action must be postponed until a specific causal agent is identified; rather, action may be based on a multiple causality, or risk-profile, model. The subsequent actions should become not only


\textsuperscript{12}For a very lucid statement of this position, see Reuel A. Stallones, Environment, Ecology, and Epidemiology (Washington: Pan American Health Association, Scientific Publication No. 231, 1972).
a planned intervention, but also an epidemiologic field experiment. Thus, the problem of coronary heart disease prevention is a good example of intervention action based upon a multiple causality model. 13

Health planning is comprehensive when all relevant means for reaching a health goal or objective are considered, and integral when the goals promoted reflect the community value structure. Regional health planning has as its area of concern the region and its health system. The region may be described as an area with relative homogeneity concerning geographic, economic, and social structure. 14

The regional health system involves the coordinated provision of personal and environmental health services, utilizing both general and specialty institutions and manpower. Therefore, the subject matter for the present study is comprehensive planning for health at the regional level. For brevity and convenience, the term health planning is used throughout. As mentioned above, the process is only one part of the health planning program, which is also comprised of the structure, context, and effects.


CHAPTER II
THE HEALTH PLANNING PROCESS:
A CONCEPTUAL FRAMEWORK

The health planning paradigm developed by the Center for Development Studies (CENDES) of the Central University of Venezuela in Caracas, with the assistance of the Pan American Health Organization, is the theoretical base for health planning in Latin America. This approach is important not only because of its pervasive influence in Latin America, but also because it stands as one of the most advanced conceptual treatments of the subject. But it does not provide an entirely adequate theoretical base for planning. Since one of the major reasons for the slow progress of health planning practice is the absence of an adequate health planning theory, i.e., one that presents what should be done in health planning along with the preferred concepts and methods for doing it, it seems worthwhile to examine the strengths and weaknesses of the CENDES approach in some detail.

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3 See, United Nations, World Health Organization, Statistical Indicators for the Planning and Evaluation of Public Health Pro
Accordingly, the general purpose of this Chapter is to evaluate the CENDES approach. The specific objective is to strengthen this approach by developing or reformulating those concepts which are judged to be deficient. The product of this work will be a conceptual framework of the health planning process that can be used as a template for evaluating planning practice in developing countries. In order to focus the discussion, an overview of the basic CENDES framework is presented. Then each major issue is examined in detail. Since what is important about CENDES is its conceptual material, most of the discussion is conceptual in nature. The methods by which these concepts are operationalized is assumed to be a somewhat distinct issue; consequently, it is of less significance to the discussion in this chapter.

Briefly stated, the CENDES methodology consists essentially of goals definition and program analysis. The planning task of defining goals is based on a health system diagnosis that focuses on diseases, the factors influencing their occurrence, and the cost of diminishing their effect on health status measured in mortality terms. Health goals are then established by selecting priority diseases. Thus, the foundation is provided for evaluating the health situation according to whether it would have been possible to achieve a higher level of health with the resources available.

This tradeoff issue is basic to the analysis of the means

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for attaining goals, the second major planning task. These means are expressed as a set of objectives for resource allocation, which are determined by accepting as a demand that must be met the existing level of services delivered to patients with diseases deemed non-vulnerable to the current health technology. The remaining resources are allocated to the vulnerable or reducible diseases according to cost/effectiveness criteria. Reducing costs by standardizing resources is a goal for the treatment of all diseases. Both a minimum and a maximum plan are prepared; the difference is that the minimum plan has the goal of maintaining the mortality rate for vulnerable diseases at the current level, while the maximum plan seeks to decrease this mortality to the lowest level technologically feasible. Both plans call for meeting the existing demand levels for non-vulnerable diseases.

**Goals Definition**

In defining health goals, decisions must be made on the preferred outputs of the health system. Two key issues are how the inputs and outputs are distinguished, and how the outputs are measured in operational terms. With this analytical foundation, a hierarchy of health goals is appropriate so that desired system outputs may be related to the means of attaining them.

**Input-Output Approach**

Health planning depends upon a thorough understanding of the subject being planned—the health system. By definition, a system
is "a complex of elements standing in interaction," or more simply a group of interrelated elements. Thus, any approach to planning in the health system should be founded upon the examination of inputs and outputs and their relationships. Essentially, a health system operates through the interactions of health resources and the population in efforts to improve health status. Two types of outputs are distinguished, health services and health effects. The distinction between these two output definitions is crucial because it demonstrates the alternative foci for goals definition. Focusing on health status as the system output, the effectiveness of the health system may be defined as the association of services and health status. The efficiency of the system refers to the service outputs and their linkage to health resources and the population.5

The measurement of inputs and outputs and their relationships is basic to the CENDES health planning paradigm, as is evident in the following statement:

For the purposes of planning it is not, however, enough to provide a simple list of the resources used to attack the disease. The basic data must be so organized that it will be possible to obtain some idea, for instance, as to the efficiency with


which the resources have been used and the reasons why, in some cases, they have not been employed more effectively.\textsuperscript{6}

CENDES represents the preferred approach to the application of the input-output concept in health planning. It recognizes that the primary purpose or goal of health actions is to improve the health of the population or some part of it, and that the services produced should be designed to meet this end. In other words, the services should be effective in health status terms. Thus, health status is the principal output of the health systems. But CENDES recognizes that health services also may be viewed as system outputs, although it relegates them to the role of intermediate outputs, processes, or throughputs. This attention to both the effectiveness and efficiency aspects of the health system is desirable for two reasons: first, efficiency problems often decrease the effectiveness or potential impact of health programs; secondly, efficiency is important in its own right because the ubiquitous scarcity of resources demands optimal productivity and utilization.

It should be noted that at least one major health planning approach also employs a system of focus via the input-output concept. This approach was developed by the Project Systems Analysis section of the World Health Organization (WHO/PSA).\textsuperscript{7}

\textsuperscript{6} Ahumada, and others, \textit{Health Planning}, p. 29.

\textsuperscript{7} See WHO, \textit{Project Systems Analysis, Health Project Formulation}, pp. 5.4-5.7. For another example, see William A. Reinke, "An Overview of the Planning Process," in \textit{Health Planning: Qualitative Aspects and Quantitative Techniques}, ed. by W. A. Reinke (Baltimore:
The number of health system contacts (services) needed to effectively reach a health status objective is determined, and a broad range of "constraints" are studied to explain the various efficiency aspects of the system operation that may block achievement of the service and health status objections.

Actually, there is broad agreement on the value of the input-output concept to the study of health systems, but the common deficiency is a narrow scope. Many studies define outputs in service terms, with some concentrating on the resources to service output relationship, i.e., productivity. Other efficiency-focused studies examine utilization, which is the population to services linkage. On the other hand, a number of analyses focus on effectiveness and define health objective functions. Furthermore,

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10 See A. H. Packer, "Applying Cost Effectiveness Concepts to
investigations of cost/effectiveness or cost/benefits, as well as most research that examines health needs and demand in relation to resources, are utilizing the input-output concept.\textsuperscript{11}

The fundamental concern with inputs and outputs in such a diversity of methods may appear surprising, but it is this commonality that offers health planning such a rich source of ideas and tools. Health planning theory must recognize this potential and organize such multidisciplinary concepts and methods into a system-focused model. If instead planning uses a framework which focuses narrowly on a subset of system relationships, viz., productivity or utilization, then important aspects of the health system may be ignored in statements of the desired situations. An approach similar to CENDES is needed to ensure that planning and policymaking consider in their goals definition the wide range of effectiveness and efficiency problems that characterize health systems.

Health Status Measures

Output measures and indices of effectiveness, however, have been a continual obstacle to health planning. Recognizing this, an extensive research effort concerning health status measures has emerged in recent years. This research demonstrates successive foci on mortality, morbidity, and functional ability. Only the latter is a positive indicator of health, and thus in line with the focus of the WHO definition of health mentioned earlier. Early attention centered on age and cause specific mortality measures. Mortality statistics continue to be the most commonly utilized health status indicator, largely because death registration is required in most countries. Morbidity indicates disease incidence and prevalence, and concentrates on classifying persons as sick.


Current research on health status measurement, however, focuses on functional ability, which goes beyond morbidity statistics by expressing the degree of disease impact in duration and severity dimensions, in addition to the incidence. In the less-sophisticated methods, functional levels are specified simply as the ability or inability to carry out one's normal daily activities (work, school, etc.). Population sample surveys are used to estimate the proportion of persons in each of the two categories, and the time lost from their normal activities, perhaps accompanied by an estimate of the monetary value of this lost time. More advanced methods define a variety of levels of functional ability. For instance, the following eleven levels are recommended in one study: well-being; dissatisfaction; discomfort; disability, minor; disability, major; disabled; confined; confined, bedridden; isolated; coma; and, death. Mortality and morbidity concepts are combined, since death is one of the included levels. A further development

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15Following the pioneering approach developed by the U.S. National Health Survey, a study of this type was done in Colombia. See Colombia, Ministerio de Salud Publica, Investigacion Nacional de Morbilidad—Resumen (Bogota: El Ministerio, 1966), and the literature cited.


17Fanshel and Bush, "Health Status Index," pp. 1029-1030.
regarding functional levels involves the use of observations over time or professional judgments to estimate the prognosis, i.e., the probability of transition from one level to another. Another refinement is the weighting of the levels by "the utility of that state as perceived by society".

In its definition of health goals, the GENDES framework employs mortality measures. This is a worthwhile focus in terms both of the health problems that characterize developing countries and data feasibility. On the one hand, mortality measures are quite sensitive to the health needs of the population for which interventions are planned. In developing countries, many common diseases are fatal in the young and working age population, including such diseases as respiratory infections, malnutrition, and gastroenteritis, especially when they occur in children. In a country like Colombia, where 43.2% of all deaths in 1969 occurred in children

For an illustration of the approach, although health care states and not functional ability states are used, see Navarro, "A Systems Approach to Health Planning," pp. 96-111.


under five years of age and the infant mortality rate was about three and a half times that of the United States, mortality statistics represent a substantial part of the population's health needs.

Certainly mortality indicates only a portion of the community's health needs. Morbidity and functional ability measures are sensitive to other components of these health needs. But the argument here is that the mortality measures indicate the most important problems in developing countries. Furthermore, planners in such a context should use available data, which is usually limited to mortality and clinical or institutional morbidity data. The use of other measures is not practical, since the data are costly to obtain. This is especially important when special studies which go beyond the operations of the health care delivery system are needed. Health planning must not be stalled while awaiting better data. Sufficiently important health needs can be indicated by disease and age specific mortality statistics; consequently, planning should assign priority to those diseases whose health status effects are substantial and can be reduced. If it does not, then the

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opportunity cost consists of those deaths that potentially could have been avoided.

The measurement of health status provides part of the information needed to identify the foremost health status-limiting conditions in a particular context. In short, attention should be directed to those conditions causing the greatest limitation of health status in the population. In the CENDES planning paradigm only the major diseases are selected for study because of the considerable time and planning resources needed to estimate the cost per death prevented and per case treated, the selected ways of expressing the resources to disease linkage. Incidence is one of the three selection criteria utilized, and it is defined as the proportion of deaths from a given disease to the total deaths. The CENDES method also employs the criterion of importance, which is essentially an economic consideration that involves comparing age groups. Younger age groups are assigned greater importance.

The CENDES approach dedicates considerable attention to a third criterion, whether or not the health status effect of a disease or condition may be reduced given the existing technology. This vulnerability concept distinguishes reducible and non-reducible diseases. Vulnerability is assessed by reviewing the current medical technology for preventing morbidity from a given disease or condition. A judgment then is made on whether prevention techniques are available, if so the disease is termed reducible.²³

There are two major difficulties involved in the CENDES application of the vulnerability concept. The first is its rather crude notion of prevention. Three levels of intervention should be recognized: (1) primary intervention or prevention, which seeks to block the convergence of the host, agent, and environmental factors that provide the stimulus for the disease; (2) secondary intervention, which diagnoses and treats the disease before clinical signs and symptoms are manifested; and, (3) tertiary intervention, which includes curative and rehabilitatory care.\(^{24}\) The CENDES focus on prevention ignores differences among diseases in their amenability to pre-symptomatic detection (secondary intervention) and to cure once the disease has advanced beyond manifest signs and symptoms (tertiary intervention). Certainly the vulnerability differences of such disparate diseases as glaucoma, respiratory infections, diabetes, and cancer should be recognized. Yet these diseases are lumped together in the "non-reducible" disease category in adaptations of the CENDES Method.\(^{25}\) Such an over-emphasis on primary intervention contrasts with the far more common situation in which the focus is on curative approaches, neglecting prevention. This study suggests analyzing each disease and the capability of the health system, comprehensively defined, to intervene at the earliest feasible level.

\(^{24}\)See Leavell and Clark, Preventive Medicine, pp. 19-28.

The second difficulty is the tendency in the method to be conservative in estimating whether preventive techniques exist for certain diseases. The most advanced findings of medical science and epidemiological research should be considered in such decisions. For instance, evidence was referred to above regarding the potential of programs for the prevention of coronary heart disease, but this disease is not deemed reducible in CENDES-based approaches. A related problem involves the use of categories which group diseases according to anatomical instead of etiologic considerations. "Diseases of the respiratory system" or "diseases of the sense organs" are categories which obviously include diseases of varying prevention potential. The vulnerability concept should be an important part of health planning theory, not withstanding these difficulties. The need for extensive epidemiologic research efforts in this area is clear.

Considering this discussion of the alternative health status measures, it is apparent that the research agenda of developed countries should not be transferred to developing countries. An example of the type of health measure that may be of most benefit to health planning in developing countries is the Q-Index developed by the United States Indian Health Service. This measure is based on data that are available, or relatively inexpensive to gather. The basic

26 Ibid., pp. 11-12.

concept in this measure is to identify a reference population, in which the health status situation is relatively satisfactory, and then compare it to the target or planned population in order to define health needs. Because the reference population represents health status levels actually achieved, the vulnerability of diseases is considered. The necessary data for this index are age and cause-specific mortality, institutional morbidity, and disability. All but the latter are usually available, and the disability data may be estimated by a simple household health survey on a sample of the population. The Q-Index should not be used by health planners in all situations. But it serves as an example of the type of health status indicator that appears to narrow the current wide gap between theory and practice.

While the CENDES framework does emphasize the importance of expressing goals for both the effectiveness and efficiency of the health system, its goals definition is not complete. To demonstrate the principal difficulties, and also to link the goals definition,

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29 Chen has developed a G-Index which adds emphasis to morbidity differences between the reference and target population, thus providing the further sophistication that may be necessary if mortality is not a major health status problem. This advance requires additional morbidity data, which makes it less applicable in developing countries. The change, however, appears crucial for planning in developed countries. See Martin K. Chen, "The G-Index for Program Priority," in Health Status Indexes, Berg (ed.), pp. 30-34.
activity to program analysis, the concept of a goals hierarchy is useful. At the most general level of the hierarchy, welfare goals express the factors which should be promoted to enhance well-being. At the next lower level, general health goals apply the values manifested in the welfare goals to the health sector. Examples include: equity in the distribution of health services; implementation of the most advanced technology; personalization of health care delivery; emphasis on early detection and rapid treatment of diseases; and, optimization of the health of the population of working age. Health system goals signify desired changes in the health system, and focus on a component or relationship in the health system. To illustrate: reduce mortality from tuberculosis; make renal dialysis services available to those who need them; develop monitoring systems for measuring atmosphere and water quality; and, increase the number of physicians per 1,000 population. Health objectives are quantitative, time-related expressions of health system goals in operational terms; for instance, decrease in one year the incidence of measles by 20 percent, deliver a given number of psychiatric consultations each month, or obtain 200 additional family practice physicians for a state during the following two years. Finally, program targets represent program-specific statements of desired output; for example, a program target for a school health program might be to give four health

education classes each year to all of the students.

Planning should assess the general health goals stated by policymaking by comparing them to the community's value structure. This is necessary because there may be resistance to the implementation of plans that do not reflect the desires and preferences of the community. CENDES does not pay adequate attention to the role of political and social factors in the success of planning endeavors.\(^\text{31}\)

Studies of the community's value structure, as well as information from other goal or policy statements, for example political platforms or the goals of development plans should be utilized by planning to determine if the stated general health goals are congruent with the existing value structure.\(^\text{32}\) Gaps and inconsistencies may be uncovered. To illustrate, in a developing country like Colombia where manpower is abundant, a major value is assigned to increasing employment opportunities. The failure to state a general health goal which opts for manpower solutions over technological solutions would represent a significant gap in the goals. Such gaps are problematic because they indicate the failure to include the

\(^{31}\) This is a common criticism of CENDES, for example see H. E. Hilleboc, A. Barkhuus, and W. C. Thomas, Approaches to National Health Planning (Geneva: World Health Organization, Public Health Papers No. 46, 1972), p. 67.

desired futures of the community and its political leaders in the planning. The recommended approach is to consider such values, and incorporate them into the goals statement, thereby promoting community support to implementing the resultant plans.

Goals definition should focus the health system goals and objectives on reducing the health status-limiting effects of diseases. Then, upon the analysis of alternative programs, service and resource goals and objectives should express the means of attaining these health status objectives. Since it is not feasible to study all alternative programs in detail, the health status objectives direct the analysis to those system changes deemed capable of attaining these goals. Such is the conceptual approach that CENDES uses, but the methodologic application is deficient. The translation of health status goals to service or resource requirements is accomplished only for those diseases deemed reducible or vulnerable. This is problematic in light of the aforementioned conservatism and conceptual deficiencies in the method of classifying disease categories. For non-reducible diseases, existing demand levels are used to set service objectives, thus ignoring the recommended focus on health status goals.\(^ {33} \)

Alternative Program Analysis

The second principal planning task is to determine the preferred means for attaining selected goals. The key conceptual underpinnings

\(^ {33} \)Ahumada, and others, *Health Planning*, pp. 53-68.
for this programming task are the analysis of the health system's effectiveness and efficiency. The application of such analysis in developing countries necessitates the use of two important principles—comprehensive health system parameters, and systematic experimentation.

Effectiveness

Estimating the effectiveness of the health system or some component of it involves linking services to health status. Once health status is measured and the factors related to it are defined, the task becomes one of understanding how to diminish the health status limitations associated with different diseases or conditions. This involves identifying the specific services that may improve health. The degree, at least the relative degree, of this effect also must be estimated, since a variety of interventions must be compared.

One of the primary difficulties in studying effectiveness is the aforementioned characteristic of many health problems—there are multiple factors associated with the problem and the relative contribution of each is unknown. The CENDES approach establishes a firm foundation for such problem analysis by studying the factors associated with each major disease.²⁴ Accomplishing this involves determining the current state of epidemiologic and medical knowledge relative to the factors associated with the disease or condition, in addition to the aforementioned vulnerability estimate which identifies the

²⁴See Ahumada, and others, Health Planning, pp. 21-52.
various techniques available for effective prevention. Along with health services, four categories of health-related factors are identified as possible related factors: (1) population characteristics; (2) disease-causing agents; (3) physical environment; and, (4) the socio-cultural and economic environment.

Perhaps the best operational use of the effectiveness concept has occurred when epidemiologists have measured the changes in the incidence of infectious diseases after mass immunization or sanitation programs, e.g., against measles or typhus. Also, study populations have been utilized in experiments on the effects of new medical treatments, especially vaccines and drugs. The CENDES argument is to employ a similar framework in studying the effectiveness of health systems. To accomplish this, two concepts are important—service functions, and cost/effectiveness analysis.

Health Service Functions

The CENDES method employs a disease-specific approach to grouping services according to their function. The method uses instruments, activities, and techniques to link resources to diseases. The set of resources required for a particular function is termed an instrument. Aggregating further, activities are a series of actions performed to meet a specific health objective, and each activity is carried out by a specific instrument. Finally, the set of activities for attacking a disease is a technique. For example, physician hours are

35See Ahumada, and others, Health Planning, pp. 29-30.
instruments which produce the activity outpatient medical consultations, and, these consultations provide part of the curative technique for respiratory infections. This approach is commendable because of its disease focus, but it is limited because only two technique categories are utilized—prevention and cure.

Further development of the CENDES use of the analysis concept is needed to demonstrate the relative emphasis on each level of intervention, and the degree to which services are allocated to vulnerable and non-vulnerable diseases. This is the basis of the approach to the analysis of health needs and services developed by Reinke and his associates. In their empirical work in India, eleven functions are specified: medical relief, personal preventive services, maternity services, family planning, communicable disease control, environmental sanitation, mass population control, mental health, general health education, internal administration, and liaison. These functions link health needs and services; for example, the personal preventive services function relates such health needs as the birth rate, morbidity, infant mortality rate, immunization status, and nutritional status to such service types as family planning, routine exams, immunizations, and non-specific nutrition services. An estimate of effectiveness results

...by obtaining repeated measurements over time within this functional framework it may be possible to establish an evaluative process that will facilitate continuing

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adjustment of health services to changing health status by concentrating on the bridge between these two areas.\textsuperscript{37}

A disease-specific definition of health status problems or needs is a recommended extension of this functional analysis. Functions would be similar to those mentioned above, and some services would be related to several diseases. For instance, the health education function would link classes in home hygiene to a series of disease/conditions, including gastroenteritis, respiratory infections, parasitic infections, and accidents, among others. The functions chosen should recognize the levels of intervention discussed above. These levels reflect the progressively greater limitation on health status that characterizes the natural history of most diseases. Obviously optimum effectiveness occurs when the disease is prevented from occurring. Pre-symptomatic detection and cure, furthermore, should have a greater positive health status result than later intervention. Therefore, services with the function of primary or secondary intervention services should be given maximum support where possible.\textsuperscript{38}

Cost/Effectiveness Analysis

The advantages of early intervention is a concept reflected in cost/effectiveness studies.\textsuperscript{39} The distinction between types of

\textsuperscript{37}Ibid., p. 62.

\textsuperscript{38}See Williams and Jelliffe, Mother and Child Health, p. 3.

\textsuperscript{39}Cost/effectiveness and cost/benefit analyses are generally viewed as efficiency concepts, largely because the difficulty of measuring health outputs results in an emphasis on the cost side of the equation. But this study distinguishes effectiveness from
these studies lies in the measurement of outputs. Cost/effectiveness analysis generically consists of assessing programs or services by estimating their ability to meet a given objective, and comparing this to the related costs. When the objective is expressed in health status terms, the emphasis in empirical studies has been on mortality measures, most often expressed as years of life saved. Such information is obtained by examining case fatality, which involves the follow-up of service users and non-users. The case of chronic renal disease illustrates this approach. Three programs are considered: kidney transplant, hospital dialysis, and home dialysis. Using empirical data, a life table is constructed for a cohort of 1,000 people assuming they receive dialysis treatments and another for those receiving transplants. Average life expectancies after the intervention may then be determined.

Cost/benefit analysis is an extension of the cost/effectiveness paradigm that promotes a more complete enumeration of program outputs and requires the expression of benefits in monetary terms. But efficiency by recognizing that outputs may be viewed in alternative ways, not all of which refer to the recommended focus on health status outputs. Therefore, both cost/effectiveness and cost/benefit are concerned with the effectiveness aspect of the health system, if they view outputs in health status terms as recommended.


cost/benefit analysis is not feasible for general application in a developing context. The main reason is that the data requirements for the more comprehensive study of program outputs often cannot be met. Other technical reasons also intervene, including for example the difficulty of dealing with an unstable economy and a large unemployment rate.

In planning practice, the joint use of cost/effectiveness analysis and health status objectives to compare alternative programs or services is recommended. Such analysis should concentrate on the major diseases or conditions, defined by the size of their health status limitation and the vulnerability.

Cost/effectiveness analysis is a fundamental part of the CENDES methodology, as mentioned above. Specifically, the cost per person protected and cost per death prevented for reducible diseases, and the cost per cure for non-reducible diseases, are estimated. While CENDES should be praised for including the cost/effectiveness concept, its application leaves much to be desired. To estimate the cost per cure for non-reducible diseases, it is assumed that all persons treated are cured, which is obviously not true. The effectiveness question is ignored, citing the absence of the necessary research.

Estimating the cost per death prevented for reducible diseases necessitates epidemiologic data on the probability of death with or without the preventive services. Such data are seldom available, particularly regarding untreated fatality rates, which creates an

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42 See Ahumada, and others, Health Planning, pp. 16-17 and 31-40.
operational problem that CENDES recognizes and attempts to solve by making estimates based on what data exists. Health planning research should give priority to gathering such effectiveness data; meanwhile, planning should follow the CENDES example by applying the concept with its best estimates of these probabilities. But caution in the use of the analytic results is appropriate.

Empirical estimates of effectiveness should be promoted as the basis for arriving at health status objectives for vulnerable diseases and conditions, and their translation into service requirements. Few planning programs, however, have sufficient empirical information available to accomplish the translation of needs into the services required to meet them. Therefore, the subjective opinions of experts may be employed to define the effective services for certain health status problems. The planning focus is on selecting among alternative services, thus the relative rather than absolute effectiveness is of primary concern.

A common programming deficiency that exists even if the cost/effectiveness analysis is well-developed is the failure to consider interdependence among programs. This is the case with the CENDES method. For example, the use of physician manpower in a new

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44 See K. Feldstein, "Health Sector Planning in Developing Countries," pp. 139-163.
ambulatory care program may result in an insufficient number of physicians to carry out the hospital in-patient programs. Therefore, the selection of physician resources for the production of one service has an effect on the programming of other services. Mathematical programming techniques, because of their ability to incorporate constraints, have been utilized to account for such program interdependence. While such techniques and their data requirements are probably too sophisticated for immediate practice in developing countries, they point out the need to consider program interdependence.

To summarize, planning should analyze the linkage of health status levels and health services by describing existing and alternative services according to their functions in addressing the principal health status-limiting conditions, and estimating the ability of various services to attain a given level of impact on health status.

Efficiency

The efficiency of the health system represents the interactions of health resources and the population in the production of services. Planning should promote the selection of efficient services and programs, because many effectiveness problems are related to inefficiency, and also because the situation of scarce resources makes inefficiency unacceptable in itself. Three related relationships are involved: (1) productivity, by which is meant the relationship

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between resources and services, usually expressed in technical terms; (2) health service utilization, which is the linkage of services and the population; and, (3) resources availability, defined as the distribution of health resources in terms of the population. The CENDES approach, as well as most studies, is focused narrowly on a segment of these relationships, but this discussion demonstrates the importance of analyzing each of these efficiency aspects.

Productivity

Productivity studies seek to determine the capacity of the system to produce services. The basic task is to delineate the resources that are utilized in the production of a service or set of services. Expression of these resource inputs in monetary terms permits the analysis of service costs. Studies may also be concerned with examining alternative combinations of inputs to produce the service at a decreased cost.

The degree of detail with which the health services and their constituent resources are examined differs in productivity studies. The more sophisticated approaches specify the variety of personnel, facilities, and supplies involved in producing a service, including

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the support services such as laboratory, X-ray, and administration. The service outputs also may be specified in detail by differentiating types of services either by function, specialty, or place of delivery. For example, hospital services may be expressed by department, and physician office visits by medical specialty. CENDES uses a simplified approach, which is more practical in planning's early attempts at analysis since the data requirements are less stringent. Productivity is expressed as the number of activities produced per instrument. Resources or instruments are represented by that one resource which is most essential to producing the service; for instance, the physician hours for outpatient physician visits and the occupied bed-days for hospitalization. Activities or services are highly aggregated, neglecting the differences between types of physician visits for example. The CENDES approach also pays considerable attention to economic efficiency, which represents the expression of the productivity linkage in cost terms. Concern for minimizing costs while maintaining effectiveness constant is the basis for determining the resource composition for a standardized instrument.


48See Ahumada, and others, Health Planning, pp. 29-34.

49Ibid., pp. 31-40.
Unit costs are estimated for both preventive and curative services for each disease, and they are compared to that of the standardized instrument to estimate the degree of inefficiency. A problem exists because only operating costs are included, neglecting investment costs.  

Studying health system productivity in developing countries is limited by the existing data and the resources available to conduct special studies or establish new data-generating systems. Nevertheless, understanding the resource composition and costs of services is essential for system analysis. Suboptimal productivity should be recognized, as is the case when an inappropriate type, or an excess or deficient quantity, of resources are employed in providing services, holding effectiveness constant. Using physicians to apply immunizations is an example of a productivity problem, as is a shortage of transportation in a mobile vaccination program. Planning practice, therefore, should at least begin with the relatively simple models of production functions and cost analysis such as those promoted by CENDES.  

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51 For an example of a practical cost-analysis approach applied in Colombia, see Robert Robertson, Ricardo Pabon, and Bernardo Barona, "Costs of Health Services in Colombian Hospitals: Project Description and the Case of Costs at Candelaria," Cali, Colombia, 1974. (Mimeographed.)
Utilization

Analysis of the health services utilization addresses the problem of getting the persons who need services to utilize them. Two major issues should be studied: (1) the factors that distinguish users from non-users of health services; and, (2) the relation of existing patterns of service demand to the service requirements defined by health needs. While the CENDES approach does refer superficially to some of the concepts related to these two issues, its conceptual framework ignores them.

Concerning the first issue, whether or not the population utilizes a health service depends upon its perception of the necessity of this service and its ability to obtain the services it deems necessary. One of the few available planning-related studies of these phenomena in developing countries is the above-mentioned Indian study of two rural areas. Household interviews were employed to identify persons manifesting a need for medical relief services, and to determine the reasons for service non-use. The results indicated that nearly two-thirds of the non-users explained their actions in terms of the low priority consultation had in relation to other demands on time. The other major reasons included failure to find services (17.9% of the non-users mentioned this reason), and financial constraints (13.8%). Geographic accessibility was an obstacle in only about one percent of the cases. Such a study is appealing

53Ibid., p. 72.
because it is practical. There is a difficulty, however, regarding its relevance to existing problems. Apparently, the foremost problem in this case is the motivation of the population to seek care. But, because the motivation aspect precedes any accessibility concerns, it should be examined separately, not jointly. What is not apparent in the study’s results is the relative importance of each type of non-use problem. If the people were motivated, then what proportion of this group would then encounter problems of unavailability, financial constraints, and geographic inaccessibility? Analysis should provide such insights, because the solutions to motivation problems are different from those associated with accessibility. Attention should be concentrated on identifying that part of the population with health needs which does not utilize services. For instance, those who cannot afford the price of services, or those who do not view available services as worthwhile. Then planning should study the means of overcoming these problems.

The second issue in studying health service utilization relates service requirements based on an analysis of health status-limiting conditions to the service demand levels. Service coverage, intensity, continuity, and inappropriate use are utilization concepts that

should be considered in order to identify the relevant problems. Inappropriate use refers to the situation where health services are utilized when there is no existing health limiting condition or risk of such, or when the service used does not address effectively the existing condition or risk.\textsuperscript{55} The utilization review study is a method of measuring inappropriate use.\textsuperscript{56} The general methodology is to review service users and judge appropriateness based on medical criteria and the availability of alternative services. Based on such studies, various means for decreasing inappropriate use should be identified with the objective of freeing health resources for persons whose health needs may be effectively addressed.

Service continuity and intensity are closely related utilization concepts. Continuity refers to the set of different services needed to complete a patient's treatment regime. For instance, an effective maternal and child health program requires prenatal, childbirth, and postnatal services. A continuity problem exists if one aspect or another does not receive adequate attention. Intensity refers to the number of times a patient uses the same service in a given time period. In order to assess prenatal care, for example, it is important to know how many prenatal visits are made by each expectant mother.

\textsuperscript{55} See Donald O. Anderson, "Measurement of Use and Demand," in Uses of Epidemiology in Planning Health Services, Davis (ed.), p. 325.

Both continuity and intensity should be normatively defined based on an analysis of health needs and effectiveness, and then the resulting standards should be compared to the existing situation to identify problems.

Finally, health service coverage should refer to the linkage of service use to target populations. If 15,000 children under five years of age and of low socio-economic status are identified as high risks for malnutrition, for example, then the coverage of food supplement programs should be expressed using this denominator. The coverage concept has little meaning if the target population is not well-specified according to health needs.

Resource Availability

Analysis of resource availability involves specifying the human and physical resources employed in the health system, and describing them in terms of the population served. The more precisely the population can be defined, the more meaningful the study of resource distribution. To illustrate, if one-third of an area's population subscribes to a private, prepaid health service system, they should not be included in the denominator utilized to express the hospital beds to population ratio of the public health service. Once existing resource-population ratios are determined, adequacy may be assessed by comparing them to a standard resource ratio which should be defined based on the existing health needs and efficient productivity
This discussion promotes a model of health system efficiency which includes health services utilization, productivity, and resource availability. Such a broad definition is deemed necessary because of the variety of problems that characterize operating health systems and present obstacles to goals achievement. Few attempts at analysis include all of these aspects; thus, they present a biased view that results in a limited range of alternatives for improving the system's efficiency and effectiveness. The important concept is that changes should be considered at a variety of points in the health system's operations.

Comprehensive Parameters

Once health status is recognized as the principal output of the health system, the problem is to define the system parameters so that they are comprehensive enough to include the variety of factors that contribute to improved health status. In this manner, health planning has a better chance of developing effective services or programs. Health systems can be exceedingly complex, as mentioned above, largely because these factors are multiple and varied. A strength of the CENDES approach is its comprehensive definition of the health system parameters.  

For a review of studies which convert need to services and resources, see Donabedian, Medical Care Administration, pp. 596-617, and the literature cited therein.

See Ahumada, and others, Health Planning, pp. 40-41 and 50-52.
to gastroenteritis are identified in CENDES as follows: housing, particularly water and sewage services; level of education; rural-urban population distribution; hospitalization; outpatient medical consultations; housing inspection services; and inspection of other establishments. In the developed countries, the major disease problems are different; but they also require a broad definition of the health system.

The comprehensive focus in CENDES is supported by the increasing evidence that health variations in a population can be explained only partially by health service utilization differences, and that many services outside of the health sector play major roles in explaining these health variations. But, little has been done to specify which services from "other" sectors should be included in system analyses. For those diseases whose natural histories have been studied extensively by epidemiologists, such as tuberculosis and coronary heart disease, the important non-health sector services can be identified. The natural histories of many common diseases, however,

59 Ibid., p. 44.
60 For one of the few planning reports that employs such a comprehensive perspective, see Marc Lalonde, A New Perspective on the Health of Canadians (Ottawa: Ministry of National Health and Welfare, 1974), pp. 63-74.

are not understood well enough to permit such specifications. Clearly, more epidemiologic research is needed to identify factors related to the principal diseases of a particular context.

From the various studies of the environmental factors related to important health problems in developing countries, the types of potentially relevant control services may be identified. In general, there appears to be a consensus that the health system scope in developing nations would be deficient if it did not include, as a minimum, services in the following areas in addition to medical care services; nutrition; water and sewage systems; housing; food processing control; disease vectors control; accident prevention; and occupational health.

The CENDES framework is deficient because little attention is given to guidelines for the systematic identification of alternatives. While it is clear that a broad reading of CENDES will uncover the notion that alternative means of reaching objectives should be identified, the importance of this activity gets lost in the methodologic attention to identifying the most efficient resources for producing a standard instrument or service, i.e., instrumentation. CENDES does provide the groundwork for a comprehensive approach to identifying alternative means by its use of wide system parameters.

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64 See Ahumada, and others, Health Planning, pp. 29-34 and 56-58.
But guidelines are needed so that planning may be creative in its programming. Using the information generated from the system-focused analysis of factors related to effectiveness and efficiency problems, planning should be able to identify a series of ways of achieving health status goals. The call here is to employ a comprehensive focus in the identification of these alternative means. The crucial point is that planning must promote strategy decisions, and therefore encourage change. This means that the confrontation of long-range strategy issues is the necessary context for the short-term programming that is closely tied to the budgetary process.

Some program or service alternatives will refer to resources and services that are available in the system, others will be new. The planning "task is to master and build upon available experience while grasping opportunities for innovation and breakthrough." While effectiveness is the focal point, as expressed in the health status goals and objectives, the identification of alternative programs should not be limited to specifying effective techniques or services. In addition, planning must recognize that such services must be efficiently produced and utilized, and therefore this type of system change must also be considered. Efficiency concerns are also important in themselves since reducing costs is a legitimate objective if effectiveness is not sacrificed. CENDES promotes cost reduction objectives using the method of standardized instruments or resource sets. But the approach does not include a strategy for identifying

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the variety of possible resource combinations.

Policymaking should select the programs to be implemented. A related planning task is to formulate program specific targets and health system objectives in services and resource terms. These should be expressed in both real and monetary terms. This completes the goals hierarchy discussed above. Target formulation essentially involves the determination of the coverage of each planned program, the quantity of services of each type required for this coverage, and the quantity of human, physical and financial resources needed to produce these services with the selected program's production functions. To illustrate, a planned program may involve the use of a specific screening examination for detecting individuals in the high risk category for early coronary heart disease. Estimating the number of services for this program would involve gauging the population that is most highly susceptible, namely males in middle age. If available, studies of utilization of this screening technique may be utilized to provide further specification by estimating the proportion of this population that will probably respond to the availability of this service. This also may provide indicators of the need for additional services, e.g., health education programs, designed to increase motivation to utilize this type of screening. These population estimates then provide the basis for estimating the number of services needed for this screening program, which becomes the program service

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target. Knowledge of the production function for these services should allow estimates of needed resources, and these become the program resource targets. With these program-specific service, resource, and population quantities serving as program targets, their aggregation for all the programs yields health system objectives for resources and services.

Systematic Experimentation

Reaching the health status goals and objectives often necessitates changes in the existing health system. In many cases, these changes will involve more than merely expanding existing health programs by allocating additional resources. Often new health services and programs will be needed. Even if these changes represent the transfer of technology from another context, it is a tenuous assumption to suppose that if something is effective or efficient in one context, then it will be the same in another. This is a potentially dangerous assumption. What is needed is "systematic experimentation" to provide the information necessary to make decisions on the applicability of techniques. The basic concept is that a change or innovation should be implemented in a limited and controlled manner, in order that both the outputs and production process may be measured.

and evaluated. Cost/effectiveness analysis then may be based on the resulting empirical data; and, furthermore, feasibility analysis has the advantage of studying the constraints that actually present themselves, thus improving the capability of dealing with them.

Conducting field trials or limited applications of a particular system change is crucial in developing countries since a large part of the health technology has been produced in developed countries. A questioning attitude toward importing such technology is appropriate, and field trials provide a method of testing the applications in the new context.

**CENDES: An Appraisal**

This appraisal of the CENDES health planning paradigm has demonstrated both its strengths and weaknesses. On the positive side, CENDES employs an input-output approach to the health system, and recognizes the importance of defining goals in both health status and service terms. Mortality is emphasized in measuring health status, and priority diseases are selected based upon mortality criteria. In programming the means for achieving these goals, CENDES dedicates considerable attention to examining the effectiveness of services. This is accomplished by the functional analysis of the available services, and cost/effectiveness analysis. The productivity of the health system is also studied, with the objective of controlling costs by standardizing the resources used to produce health services. Finally, CENDES recommends a comprehensive definition of health system parameters, so that effective means may be employed.
Notwithstanding these conceptual strengths, there are major shortcomings in the CENDES approach that must be overcome by new ideas and activities. In goals definition, the assessment of disease vulnerability employs a rather crude notion of prevention and is conservative in its assessment of existing technology. This is a crucial defect because the goals for diseases deemed non-vulnerable are based on service demand levels, which is a poor proxy for health status problems and ignores the effectiveness issue. What is needed is the recognition of intervention levels and the consideration not only of the capability of preventing a disease from occurring, but also the amenability to pre-symptomatic detection and cure, and to cure once signs and symptoms are manifested. Then goals definition should concentrate on the major health status problems of the community, using service demand criteria only when effective intervention is not feasible. Another weakness in CENDES is the failure to study community values and assess health goals in these terms. By adding such a planning step, the political and sociocultural constraints to plan implementation can be confronted. In the programming activity, the CENDES concern with system efficiency is narrow because such service utilization concepts as coverage, intensity, continuity, inappropriate use, accessibility, and proper motivation to use services are not given adequate attention. Each of these utilization concepts should be related to the health needs of the population. Also, few guidelines are given in CENDES for the systematic identification of alternative programs or services. The recommended improvement is to use the information generated from a comprehensive, system-focused
analysis of factors related to effectiveness and efficiency problems to identify a series of ways of achieving stated health status goals.

This Chapter has focused on these deficiencies in the CENDES approach, and suggests concepts and methods that should fortify the approach and result in an adequate conceptual framework of the health planning process. Unless noted otherwise, this framework is what is referred to below as the template for evaluating the health planning practice in Colombia.
CHAPTER III
CAPACITY FOR HEALTH PLANNING IN COLOMBIA

Health planning programs may be evaluated in terms of their process, structure, context and effects. As discussed in the first Chapter, the present study is concerned primarily with the process of health planning. Structure and context are important, however, because they affect the capacity of a region to plan in ways similar to the above discussion. The organizational structure, however, must include certain elements. Whether or not a satisfactory structure can be created depends largely on the enabling and constraining factors imposed by the particular context.¹

This discussion begins with an overview of the contextual conditions in Colombia, and identifies key factors that determine the health planning capacity in the Valle region. The general conclusion is that there is sufficient capacity to plan in this region, although certain problems exist. Before proceeding, a brief comment is warranted on the research methodology of the case study.

¹Few studies of health planning have employed a view of contextual and structural aspects as promoted in the present study. For a conceptual base for such a perspective, see Elling, "Health Planning in International Perspective," pp. 214-234.
Research Methodology for the Case Study

This study examines, in case study terms, regional health planning as practiced by the State Health Service (Servicio Seccional de Salud) of Valle del Cauca, Colombia, over the period 1967 to 1974. This period spans the preparation of the Health Service's first health plan (for 1968-1972) to the development of the 1974 plan. Planning practice over this period is examined by two methods. First, planning documents have been analyzed for the entire period, i.e., published plans, supporting documents, and other published reports and documents relative to the nature and scope of the planning activity. Secondly, interviews and personal observation were employed. Informal, structured and unstructured, interviews were conducted with both present and former Health Service Personnel, and other persons indirectly involved in planning, e.g., university professors and health professionals at other levels or in other health subsectors.

Personal observations were indirect and relate to two time periods. The initial three-month period was during July through September, 1972, at which time the author completed an initial study of the Valle Health Service's planning. Later, the author worked from September, 1973 until the present as a volunteer member of the WHO Research Program in Comprehensive Health Planning. As discussed later, this program's efforts consisted of a comprehensive evaluation of the Health Service by a multidisciplinary research team, and the subsequent development and implementation of innovations. The personal observation consisted of indirect participation, for while the
author was not a part of the organization studied, he was accepted by the organization as a researcher and source of technical assistance. The interviews and participation were utilized in this study largely to validate and complement published sources of information. A conclusion based on these sources was that the documentation was generally complete and of good quality vis-a-vis the study objectives.

Planning Context

This section has two goals: to describe the physical and social setting of the Valle Health Service's planning program, and to investigate the role of certain contextual factors which support or impede planning.

Descriptive Overview

Colombia is a developing country with the characteristic problems, but it also manifests marked progress toward the more developed situation of the modern industrial countries. One of the twenty-two Colombian departamentos or states is Valle del Cauca, the focus of the present study. Located in the southwestern portion of the country, Valle is comprised largely of the rich agricultural valley lying along the Cauca River between the western and central ranges of the Andes Mountains. The state's western border is the Pacific Ocean, and this coastal region is mostly tropical jungle. Valle has been a

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2 The development of Colombia has been studied often; see, for example, World Bank, Economic Growth of Colombia: Problems and Prospects (Baltimore: Johns Hopkins University Press, 1972), and International Labour Office, Toward Full Employment--A Programme for Colombia (Geneva: International Labour Office, 1970).
leader in economic development among the Colombian states, but Valle still exhibits such problems as rapid population growth, extreme poverty, and poor health status.

In 1973, an estimated two and a third million persons lived in Valle, representing about 10.5% of the country's population. Nearly one-half of Valle population resides in the municipality of Cali. The population pyramid is a wide-based structure, depicting the high percentage (over 40 per cent) of the population that is under fifteen years of age. Annual population growth rates have been high, as indicated by the 3.2 per cent increase in 1969. Urban immigration is also occurring at a rapid pace, as demonstrated by the fast growth of Cali and other major municipalities of Valle.

The extensive poverty in Valle is indicated by the low income levels and high rate of unemployment. Information is available only for the Cali metropolitan area, where almost one quarter of the employed population earned less than 500 pesos (about twenty-five U.S. dollars) per month in 1969, and about 57 per cent earned less than 1,000 pesos per month. Furthermore, the average unemployment


rate was over eighteen per cent of the economically active population in 1969.7

The health status of the Valle population, and of the Colombian population as a whole, as measured in traditional terms is very poor related to the more developed American countries, for example; Venezuela, Argentina, United States, and Canada; but it is healthier than that of the less developed countries like Bolivia or Guatemala.8

The ten major causes of death in 1972 are shown in Table III-1. This table is based on a disease/condition classification system which utilizes 38 categories aggregated from the International Classification of Diseases, Adapted (I.C.D.A.).9 The underdevelopment of Valle is demonstrated by the presence of infectious intestinal diseases, respiratory diseases, malnutrition, and tuberculosis in this list. These and other important disease problems require strategies that favor prevention or early intervention, and which rely upon

7Ibid., p. 62.


9For a complete listing of these 38 categories see Figure IV-2.
### TABLE III-1
TEN LEADING CAUSES OF DEATH IN
VALLE, COLOMBIA—1972

<table>
<thead>
<tr>
<th>Disease Category</th>
<th>Number of Deaths</th>
<th>Rate per 10,000 Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>All categories</td>
<td>17,597</td>
<td>74.8</td>
</tr>
<tr>
<td>Ten Leading Causes</td>
<td>14,365</td>
<td>61.0</td>
</tr>
<tr>
<td>1. Circulatory System Diseases</td>
<td>3,058</td>
<td>13.0</td>
</tr>
<tr>
<td>2. Infectious Intestinal Diseases</td>
<td>2,920</td>
<td>12.4</td>
</tr>
<tr>
<td>3. Respiratory System Diseases</td>
<td>2,821</td>
<td>12.0</td>
</tr>
<tr>
<td>4. Malignant Tumors</td>
<td>1,402</td>
<td>6.0</td>
</tr>
<tr>
<td>5. Diseases of Primary Infancy</td>
<td>858</td>
<td>3.6</td>
</tr>
<tr>
<td>6. Malnutrition</td>
<td>849</td>
<td>3.6</td>
</tr>
<tr>
<td>7. Lacerations, Wounds and Foreign Bodies</td>
<td>716</td>
<td>3.0</td>
</tr>
<tr>
<td>8. Fractures and Trauma</td>
<td>693</td>
<td>2.9</td>
</tr>
<tr>
<td>9. Tuberculosis</td>
<td>557</td>
<td>2.4</td>
</tr>
<tr>
<td>10. Senility</td>
<td>501</td>
<td>2.1</td>
</tr>
</tbody>
</table>

multisectoral efforts. A large part of the deaths from such diseases may be avoided. One-fourth of all deaths in Valle in 1972 were from disease categories deemed reducible or vulnerable by the Health Service (see TABLE III-2). This proportion has remained stable since 1967. While the 1967 to 1972 trend demonstrates a large decline (45.1 per cent) in the death rate for infectious intestinal diseases, this category remains the predominant cause of death in the reducible group. In 1972, it was responsible for 16.6 per cent of all deaths and was the second leading cause of death in the population. Tuberculosis rates have also declined but remain high; and, the diseases preventible by immunization continue to be a significant cause of death. Furthermore, the classification of diseases as reducible is conservative since it excludes many diseases which may be prevented, or for which the health system can at least prevent death, particularly in the younger age groups. For example, accidents (categories 32, 33, and 34 in FIGURE IV-2) account for about nine per cent of all 1972 deaths and malnutrition about five per cent, but neither are considered reducible by the Health Service.

Child health problems are paramount in the Valle population, as more than two-fifths of the deaths in 1972 occurred in children under five years of age, a group representing only 17.2 per cent of the population. Although infant mortality declined from 91.2 per 1,000

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10. The year 1967 is used as the baseline throughout this discussion of health status because for previous years a different grouping of diseases was employed thus making comparisons difficult.
### TABLE III-2

**DEATHS FROM REDUCIBLE DISEASES**

**VALLE, COLOMBIA—1967-1972**

<table>
<thead>
<tr>
<th>Cause</th>
<th>1967 Number of Deaths</th>
<th>1967 Percentage</th>
<th>1972 Number of Deaths</th>
<th>1972 Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>All categories</td>
<td>19,479</td>
<td>100</td>
<td>17,597</td>
<td>100</td>
</tr>
<tr>
<td>A. Reducible diseases</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Infectious Intestinal diseases</td>
<td>5,075</td>
<td>26.1</td>
<td>4,394</td>
<td>25.0</td>
</tr>
<tr>
<td>2. Tuberculosis</td>
<td>3,689</td>
<td>18.9</td>
<td>2,920</td>
<td>16.6</td>
</tr>
<tr>
<td>3. Rest of Infectious and Parasitic diseases</td>
<td>232</td>
<td>1.2</td>
<td>372</td>
<td>2.1</td>
</tr>
<tr>
<td>4. Tetanus</td>
<td>166</td>
<td>0.9</td>
<td>139</td>
<td>0.8</td>
</tr>
<tr>
<td>5. Helminthic Parasites</td>
<td>124</td>
<td>0.6</td>
<td>141</td>
<td>0.8</td>
</tr>
<tr>
<td>6. Measles</td>
<td>94</td>
<td>0.5</td>
<td>112</td>
<td>0.6</td>
</tr>
<tr>
<td>7. Whooping Cough</td>
<td>62</td>
<td>0.3</td>
<td>48</td>
<td>0.3</td>
</tr>
<tr>
<td>8. Diphtheria</td>
<td>51</td>
<td>0.3</td>
<td>25</td>
<td>0.1</td>
</tr>
<tr>
<td>9. Malaria</td>
<td>27</td>
<td>0.1</td>
<td>30</td>
<td>0.2</td>
</tr>
<tr>
<td>10. Polio</td>
<td>22</td>
<td>0.1</td>
<td>3</td>
<td>---</td>
</tr>
<tr>
<td>11. Syphilis</td>
<td>22</td>
<td>0.1</td>
<td>22</td>
<td>0.1</td>
</tr>
<tr>
<td>12. Rabies</td>
<td>9</td>
<td>0.1</td>
<td>4</td>
<td>---</td>
</tr>
<tr>
<td>13. Smallpox</td>
<td>3</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>14. Leprosy</td>
<td>---</td>
<td>---</td>
<td>11</td>
<td>0.1</td>
</tr>
<tr>
<td>B. Nonreducible diseases</td>
<td>14,404</td>
<td>73.9</td>
<td>13,203</td>
<td>75.0</td>
</tr>
<tr>
<td>Malnutrition</td>
<td>816</td>
<td>4.2</td>
<td>849</td>
<td>4.8</td>
</tr>
<tr>
<td>Accidents</td>
<td>1,366</td>
<td>7.0</td>
<td>1,885</td>
<td>9.6</td>
</tr>
</tbody>
</table>

live births in 1967 to 80.66 in 1972, the latter is still very high when compared to developed countries like the United States. The primary causes of infant deaths are infectious intestinal diseases, respiratory system diseases, diseases of the perinatal period, and malnutrition. Adding malnutrition to these diseases termed reducible by the Health Service, 47.5 per cent of infant deaths are reducible (see TABLE III-3). In the preschool group (one to five years), the principal causes of deaths are the same as those for infants, except that diseases of the primary infancy do not occur. But the magnitude of the problem is much less, since the mortality rate in 1972 for preschoolers was only 7.8 per 1,000 population compared to the infant mortality rate of 80.66 per 1,000 live births. In the preschool group 64.8 per cent of the deaths are from vulnerable diseases including malnutrition. Infectious intestinal diseases account for the largest part of the deaths, over one-third in both age groups. Deaths from respiratory system diseases represent over one-fifth of all deaths in each age group. This disease category is not listed as reducible; however, the predominance of those respiratory infections for which deaths are preventible as a cause of death in this category should lead to consideration of the category as largely reducible. While morbidity of such infections is difficult to prevent, certainly death can be avoided given existing health technology, particularly in young children.

To conclude, the analysis of morbidity statistics permits measuring the health of the Valle population in such a way that
<table>
<thead>
<tr>
<th>Cause</th>
<th>Population Under One Year of Age</th>
<th>Population One to Five Years of Age</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Deaths</td>
<td>Percentage</td>
</tr>
<tr>
<td>All Categories</td>
<td>4,855</td>
<td>100</td>
</tr>
<tr>
<td>A. Reducible diseases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Infectious Intestinal disease</td>
<td>2,026</td>
<td>41.7</td>
</tr>
<tr>
<td>2. Rest of infectious and parasitic diseases</td>
<td>1,616</td>
<td>33.3</td>
</tr>
<tr>
<td>3. Tetanus</td>
<td>162</td>
<td>3.3</td>
</tr>
<tr>
<td>4. Tuberculosis</td>
<td>98</td>
<td>2.0</td>
</tr>
<tr>
<td>5. Helminthic parasites</td>
<td>46</td>
<td>1.0</td>
</tr>
<tr>
<td>6. Measles</td>
<td>31</td>
<td>0.6</td>
</tr>
<tr>
<td>7. Whooping Cough</td>
<td>25</td>
<td>0.5</td>
</tr>
<tr>
<td>8. Syphilis</td>
<td>23</td>
<td>0.5</td>
</tr>
<tr>
<td>9. Diphtheria</td>
<td>18</td>
<td>0.4</td>
</tr>
<tr>
<td>10. Polio</td>
<td>6</td>
<td>0.1</td>
</tr>
<tr>
<td>11. Leprosy</td>
<td>1</td>
<td>---</td>
</tr>
<tr>
<td>12. Malaria</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>B. Nonreducible diseases</td>
<td>2,829</td>
<td>58.3</td>
</tr>
<tr>
<td>Respiratory diseases</td>
<td>1,124</td>
<td>23.2</td>
</tr>
<tr>
<td>Malnutrition</td>
<td>278</td>
<td>5.7</td>
</tr>
</tbody>
</table>

permits the identification of the principal problems, thereby providing the directions for health system actions. A high proportion of deaths, especially those occurring in young children, are avoidable. The health system obviously has played a significant role in decreasing mortality from some of these reducible diseases, but the impact is insufficient.

One of the most widely accepted organizational principles of health system experts is regionalization, and its implementation is a sign of the state of health system development.\(^1\) The regionalization concept involves levels of health care, with primary care delivered at the periphery of the system and super-specialty medical care provided at the center or apex of the system. Regionalization is a goal which receives priority attention in the health service, implying structural progress in attending the primary health needs discussed above. The following hierarchy of service levels has been implemented (see FIGURE III-1): rural health promoters;\(^1\) health posts; health centers; local hospitals; district hospitals; and a

\(^1\)See Bodenheimer, "Regional Medical Programs," pp. 1125-1166, and the literature cited therein; also see, Engel, Perspectives in Health Planning, pp. 17-24, and 70-86. For the Colombian statement on regionalization, see Colombia, Asociacion Colombiana de Facultades de Medicina y Ministerio de Salud Publica, Niveles de Atencion Medica Para un Sistema de Regionalizacion en Colombia (Bogota: ASCOFAME, 1969).

\(^1\)The health promoters work in the community and are trained to identify common health problems, especially in young children and mothers; to give health education; and to refer patients to health institutions. See Colombia, Ministerio de Salud Publica, Division de atencion Medica, Manual Para El Adiestramiento de Promotoras Rurales de Salud—Conocimientos Basicos (Bogota: El Ministerio, 1969).

FIGURE III-1

REGIONALIZED HEALTH CARE SYSTEM OF THE

VALLE HEALTH SERVICE—1974
university hospital. All of the health posts and health centers, which are ambulatory care institutions, are attached administratively to a local or district hospital. Each district hospital, furthermore, has administrative responsibility for all of the other institutions within its district. The ambulance and radio-telephone resources needed to facilitate inter-institutional referral of patients have been increased substantially in recent years. Also, plans for the regionalization of such specialty services as laboratories, orthopedics, and cancer screening, pathology, and treatment are in the implementation stage.\textsuperscript{13} While much progress is evident regarding this regionalized system structure, deficiencies in its operations are apparent, particularly with regards to efficient patient transfers and use of appropriate levels of care. This is demonstrated by the similarity of case mix in each institutional level.

Public Sector Control of Health System

Turning to the evaluation of key contextual factors, the political environment provides a good indicator of the ease with which regional health planning and policymaking may be implemented. Three aspects of this political support are selected for study: (1) public sector participation in the health system; (2) government decentralization; and, (3) community participation in health planning.

The Valle Health Service dominates the health sector in Valle, as indicated by its control of the majority of the health resources

and its responsibility for providing a broad range of health services to most of the state's population. For example, 57.7 per cent of the hospital discharges in Valle in 1972 were in the Health Service, as compared to 30.8 per cent in the Social Security System and only 11.5 per cent in the private sector. Environmental health services are almost entirely under Health Service auspices. The 1974 Health Service plan defined its target population as sixty per cent of the population in cities with more than 100,000 inhabitants, and eighty per cent in those with less than 100,000 inhabitants. This public sector control of the health system engenders much support for health planning, and is the most important aspect of the political environment from this viewpoint. Since a large part of the system is controlled by one administration, a relatively comprehensive set of services may be planned. Furthermore, the control of a large number and variety of institutions promotes the participation of their staff in the planning and implementation activities.

A consequence of this public sector control is that the Health Service's planning obtains the needed authority for its relationships with health policymaking and administration. This authority facilitates the completion of planning activities, including implementation. It also ensures that policymaking receives and considers the results of planning's analysis, and that the various institutions in the

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health system are responsive to planning activities. Planning's success in obtaining health services data from these institutions indicates this authority.

An increase in the priority assigned to the public health sector by the government is indicated by the percentage of the national budget allocated to health programs, which rose from six to eight per cent between 1966 and 1972. Considering government expenditures at the municipal, state, and national levels, about ten per cent of the total goes to the health sector. This increase reflects the growth of the Colombian Social Security Institute's (ICSS) health system. The distribution of these public health funds is inequitable, however, because over half of the amount goes to the ICSS system, whose subscriber population of employed and retired workers was only about 6.6 per cent of the total Colombian population in 1973. In Valle, this coverage by ICSS was about 12.6 per cent in 1973. This means that the health of the vast majority of the population is the target of a relatively small part of the public health budget, and that the Health Service as the primary public health agency continues to carry out its mandate with very limited resources.

Government decentralization and community organization are also important political factors influencing Valle's health planning.

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16 AID, Analysis of Colombian Public Health Sector, p. 154.

17 Ibid., pp. 90 and 149. For information on the Colombian Social Security health system, see Colombia, Ministerio de Trabajo y Seguridad Social, Instituto Colombiano de Seguros Sociales, Informe Estadístico—1973 (Bogota: ICSS, 1974). Note that subscriber and employer payments provide most of the funds for the Social Security Institute's health budget.
While the power in the Colombian government structure is concentrated at the national level, the political and economic strength of Valle and a few other states allows them to maintain relatively strong roles in directing their public health systems. For instance, the Valle Health Service is financed in large measure by the Valle lottery system. From 1966 to 1972 between forty and fifty per cent of the Health Service operating budget came from this source. More particularly, in 1969 forty-six per cent of the budget was contributed by the lottery, while only about eleven per cent came from the national government. In addition, the national government has been interested in decentralizing in several areas, including urban planning and the health sector. The existence of a Planning Office and Health Service in the Valle governmental structure is a sign of the bureaucratic decentralization that bolsters regional health planning.

Less support for state-level health policymaking is manifested in the political structure, however, because the Ministry of Health defines its policy as centralized policymaking and decentralized administration. Thus, the Ministry desires policymaking control over the regional level, a situation which has resulted in the generation of health goals and norms at the national level and their subsequent "acceptance" by the Health Service. This is problematic

18 See Valle, Servicio Seccional de Salud, Plan de Salud 1971, p. 27.

19This centralized policymaking has been sharply criticized recently by the Valle Health Service, see the viewpoint of the Secretary of Health (1971-1974) in "Decretos de Minsalud son Altamente 'Centralistas'," El Pais, Junio 26, 1974, p. 7.
because the analytic activities of the national planning programs are not well-developed, and there is no encouragement given to using the results of the regional planning. Thus, regional health priorities may not receive adequate attention at the national level. The lack of a major commitment by the Health Service to many of these policies is to be expected given such a national-regional division of policymaking. This is the case observed, as discussed below.

How a community is organized is another aspect of the political context that influences health planning. Community organization is basically "a process through which citizens can develop social structures responsive to their needs and consonant with their values." Plan implementation may be ensured by proper community participation. Also health system decision-making may be improved by taking "into account a variety of opinions, needs, priorities and resources." Community organization efforts in Valle have not developed sufficiently to contribute to community participation in the health planning process. Community boards (Junta Communal) or

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community action groups (Accion Communal) recently have been organized in many of the urban and rural communities. While these groups are developing as potential power structures, their support has been of a fluctuating nature and their accomplishments remain unstudied. 23

Shortcomings in Health System Decision-Making Process

Since planning is designed to provide analytic inputs into decision-making, the organization and process of this decision-making is crucial to health planning efforts. Accordingly, this section considers the separation of health policymaking, planning, and administration roles, health policymaking and health research capabilities.

Policymaking, planning and administrative functions are performed within the Valle Health Service by its central staff without distinct organizations or personnel for each activity. This study's framework proposes such distinctions in order to differentiate the tasks involved in each of these three functions. Separating the three processes should promote a more complete operationalization of the activities that comprise each process. The Health Service's failure to separate these functions impedes its planning and policymaking capacity. There is somewhat of a division in that the Governor and the Secretary of Health have the policymaking charge, while the Technical Coordinator and staff have the primary responsibility for planning and administrative functions. But this division is a tenuous

description of a practice which is characterized by a merging of these functions. This reflects the absence of a conceptual agreement on the distinction between analytic (planning) and decision (policymaking) activities. The result is a very poorly developed policymaking process, and an overemphasis on certain technical planning activities. Moreover, even those decisions that planning may stimulate will not be expected to carry the broad and powerful political commitment that is usually necessary for the implementation of system changes.

The difficulty caused by the merging of planning and administrative responsibilities in the Health Service is that planning is neglected. The planners also have overriding administrative charges that prohibit the allocation of sufficient attention to planning. As a result, planning has become a rushed activity carried out in the first few months of each year.

The policymaking process of the Valle Health Service, moreover, is not an explicit and distinct entity, rather its activities are enmeshed in the administrative and planning processes. For this reason, it suffers certain policymaking shortcomings.

This is reflected for instance in the decisions made by the Valle Health Service. Explicit decisions, those that appear in the health plans and related documents, concentrate on general health goals and health system goals. The following goals are illustrative: "restore the health of the sick in the shortest term possible through ambulatory and inpatient care; increase hospitalization and outpatient medical services to efficiently meet the demand; extend service
coverage; and, control gastroenteritis and reduce malnutrition."  

But such goals generally are not reflective of a regional planning and policymaking process. Instead, many of the Health Service's expressed goals reflect the mere acceptance of the goals expressed by the Ministry of Health.  

Despite these goals, the policymaking decisions on objectives reflect the acceptance of planning's narrow focus on utilizing existing programs to meet the demand for services, or in a few cases to attain coverage norms. Thus, many goals are not converted into specific statements of what is desired, and are not implemented. For example, the health status goal to reduce malnutrition is not translated into the level of effect expected on the incidence or prevalence of this disease, nor are the services or resources programmed for its attainment. Instead, the "attend demand" policy predominates, and the service objectives simply promote the continuance of the existing outpatient medical consultation and hospitalization services for treating malnutrition at their projected demand levels. These objectives represent a technical planning activity with only a minor policymaking role. Policymaking is subservient to planning when the desired situation is the reverse.  

Little challenge is offered to the structure of the health system,

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25 See, for example, Colombia, Ministerio de Salud Publica, Manual de Normas Generales (Bogota: El Ministerio, 1973).
and the "traditionalist-expansionist" focus dominates. In light of
the present study's approach, an additional category may be added to
those suggested. The "public health-rationalist" approach would
focus on health status and both the effectiveness and efficiency of
the health system.

Such a focus appears to be inappropriate in the Valle Health
Service since the existing programs do not confront effectively some
of the major health status problems in the assigned population. An
important example is the low priority given to primary health care
services in the present system. This is reflected in the grave
resource deficiencies at the periphery of the regionalized health
system, i.e., the health posts and centers, and the local hospitals.
But the principal health status problems in Valle, as discussed above,
require effective and efficient services at this level of the system.
Thus, a policy which expands the existing system tends only to aggra­
vate the problem.

The health system objectives of the Health Service indicate that
the planning is concerned with productivity, and in the latest plan
there is increased concern with service coverage. This represents

\textsuperscript{26} For a perceptive classification of policymaking in the health
field, see Roger M. Battistella, "Rationalization of Health Services:
Political and Social Assumptions," International Journal of Health
Services, II, No. 3 (1972), pp. 331-348.

\textsuperscript{27} Primary health care services are those services offered at the
point of entry into the health services system, see Vicente Navarro,
"Redefining the Health Problems and Implications for Planning Person­
al Health Services," HSMHA Health Reports, LXXXVI, No. 8 (1971),
pp. 718-719, and the cited literature.
some progress, but there are only a few signs of system changes or new programs relating to this concern. Among these indications are a new program which uses allied health personnel to promote or to deliver services, especially in rural areas and tuberculosis and venereal disease control programs; the incorporation of productivity norms into plans; efforts to shift from a traditional line budget to program budgeting; and a new system of institutional supervision and technical assistance. Nonetheless, such policy changes are minor compared to the general policy of meeting demand levels with the existing programs. Thus, existing modes of policymaking neglect health status and effectiveness, and the related analysis of service utilization, in its concentration on attending service demand.

One aspect of policymaking merits special emphasis. This is the strategy role. On the one hand, resource allocation decisions must be made which focus on efficiency given a determined level of resources. These are tactical decisions, which are tied closely to the budgetary process. But the strategy decisions do not accept the constraint of a fixed resource set, and thus they are more concerned with trade-offs, i.e., the relative value of investments in one area or program versus another. Policymaking and planning in many different contexts often neglect the strategy role, an observation which reflects the resource allocation bias of economic thought, the discipline which has been most involved in planning. This study emphasizes the importance of overcoming this tactical bias by insisting that policymaking utilize its decisions on health goals and programs, and
the analysis underlying them, to influence longer-range decisions. Such decisions confront the issue of the level of resources in the health sector, as well as the level of those services of other sectors which are related to health. 28

It is clear that the Health Service's policymaking and planning do not address strategy issues, since the consideration of alternative programs is neglected. This situation is reflected both in policymaking's short-term focus and close relationship to the annual budgeting process, and to the failure to define priorities among its multitude of stated general health goals and health system goals. Also, these goals do not play a major role in influencing objective-setting, which is based on demand levels and the assumption of a fixed supply of resources and financing. Specifically, the Health Service's policymaking generally has failed to define new strategies and then approach the Health Ministry or other sources of funding to request additional resources to implement them. Neither has policymaking made decisions which shift major parts of the existing resources to new strategies or programs. Instead, the resource base is quite stable and the allocations do not manifest significant changes in strategy. This practice relates closely to the Ministry of Health's attempts to control regional policymaking. What has occurred is that the Health Service avoids operationalizing many of the Ministry's goals, emphasizes tactical issues thereby neglecting its own policymaking process as a source of alternative goals or priorities, and

puts heavy emphasis on the technical activities of planning. The type of participants in this policymaking relates to this tactical and technical focus.

The major participants in the policymaking are physicians, with the exception of a sanitary engineer. These participants consist of the Secretary of Health and the top state-level staff members of the Health Service. The technical orientation of these participants is obvious, as these same persons also have the charge of carrying out the planning and administration. In theory, the Governor and the Board of Health have the principal policymaking roles, but the practice has indicated that there is little meaningful involvement on at least the part of the Board of Health. This Board, with representatives of the Ministry of Health, Valle government, Catholic Church, lottery system, and the University of Valle, appears to have the limited function of meeting briefly each year to give "rubber stamp" approval to the completed health plans. Policymaking, therefore, is accomplished by the top administrators of the Health Service, neglecting the political participation recommended in this study. National level health professionals participate indirectly in this policymaking through the establishment of the national health goals that usually are accepted by the Health Service.

Studies of community values were not encountered; hence, the range of value inputs into policymaking has been very limited. This also is reflected by the health professional domination. While citizens may influence policymaking indirectly through the political
nature of the positions of the Governor and Secretary of Health, citizen participation has not been implemented in either the policy-making, planning, or administration processes. In conclusion, the technical orientation of the policymakers contributes to the Health Service's emphasis on a narrow set of analytical planning activities, and to the neglect of the decisions that utilize the results of analysis and value assessments to determine policy.

The final point, and also important, regarding health system decision-making is the aid to planning provided by health and health services research efforts. Few regions of Latin America are endowed with the medical education and research capacity that exists in Valle under the auspices of the highly touted Medical School of the University of Valle. The philosophy of this Medical School has been to dedicate itself not only to medical education, but also to research and service delivery. The research policy that has been implemented includes major efforts in both medical and health services research. The demonstrated interest in the systematic diffusion of changes in health services organization into the health system is particularly

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29 See Bryant, Health and the Developing World, pp. 82-90. Gabriel Velazquez, "Colombia--Faculty of Medicine, University of Valle, Cali" in Medical Schools for the Modern World, ed. by J. Bowers (Baltimore: Johns Hopkins Press, 1970), pp. 155-170; and Alfredo Aguirre, "Community Medicine at the University of Valle," in Community Medicine--Teaching, Research, and Health Care, ed. by L. Willoughby and A. Newberry (New York: Meredith Corporation, 1970), pp. 51-65. This acceptance has been related in no small extent to the large quantity of funds invested by the Rockefeller Foundation, and other international foundations, in the University of Valle.
supportive of health planning. Recent focus has been on the
delegation of medical functions to allied health manpower. To the
credit of the Medical School, the major effort in health service re­
search has been planned and implemented in close coordination with
the Cali Health Department. Such coordination is lacking concerning
the medical science research, as the Health Service participation in
research policymaking is minimal. This deficiency manifests itself
in the common failure of the research efforts to address the preva­
llent health status problems in the Valle population. Finally, it
should be pointed out that a WHO program for health planning research
is another important source of aid for health system decision-making
in Valle.

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30 Most of the research of the Valle Medical School's Department of
Social Medicine has focused on health services. Commencing with a
multitude of small projects in the poor rural area of Candelaria and
in several urban poverty areas in the mid-1950's, this community med­
cine research and development has expanded into the PRIMOPS project,
which focuses on using auxiliaries in maternal and child health care,
and whose target population involves about 100,000 persons; see Uni­
versidad del Valle, Division de Salud, "Programa Interinstitucional
de Investigacion, Formacion de Personal y Prestacion de Servicios de
Salud a la Comunidad," Cali, Colombia, 1972. (Mimeographed.)

31 See Carlos San Martin, "Epidemiological Experiences in Over­
developed Sub-Countries," American Journal of Tropical Medicine and

32 After two years of initial work, the WHO Research Program in
Comprehensive Health Planning redirected its efforts in late 1972
toward a broad, in-depth analysis of both the performance and admin­
istration of the Valle Health Service. This analysis served as a
base for identifying and applying innovations, concentrating on
improving planning and administrative functions. But the implementa­
tion stage had not been reached before 1975, thus effects of this
research could not be expected to influence the Health Service's
operations. For a description of this project and its goals, see
Planning Structure

Certain requirements in the structural or institutional manner in which planning operates are apparent in light of the conceptual framework discussed earlier. As Kahn states, "a point of view about the logic of a planning enterprise inevitably carries implications with reference to the organizational structuring of such planning and its staffing." The structural aspects examined here include:

1. sanction for planning;
2. coordination among planning levels;
3. staffing.

Strong Sanction for Planning

The health planning sanction refers to the policymaking support it receives. The health planning program of the Valle Health Service benefits from a powerful sanction. At the national level, Colombia's will to plan for health has its roots in its approval of the Alliance for Progress' call for planning, expressed in the Charter of Punta Oeste in 1962. Since then, state and national decrees have set policies calling for health planning efforts. The policymaking of


Kahn, Social Planning, p. 305.


For the most recent decree, see Colombia, Ministerio de Salud Publica, "Decreto Numero 621 de 1974," Bogota, Abril 10, 1974. (Mimeographed.)
the Health Service has provided strong support to planning. The earliest planning policies focused on applying the CENDES health planning methodology; thus, they offered detailed operational guidelines. But later, when the Health Service judged much of this methodology of minimal utility, the planning policies became more general, offering less procedural directions. The most recent policies (1974), nevertheless, do support planning and communicate good understanding of the planning process. Considerable guidelines are provided for the planning, even though specific procedures are not stipulated. To illustrate, the following policy statements are included in the 1974 plan:

1. Continue the development of the practiced model of health programming utilizing flexible and feasible techniques that permit:
   ---interpreting the state's health policy
   ---applying national norms to the state situation
   ---determining the quantity of available resources
   ---programming according to available resources and desired goals in accord with norms and needs.
   ---establishing a balance between resources and needs
   ---allocating resources in agreement with the priority scale.

2. Establish a mechanism of evaluation and readjustments for the programming model, which assures its continuity and perfection.

3. Assure the participation of the different administrative levels in all of the planning phases.

4. Continue the implementation of program budgeting in each health district.

5. Integrate the health planning process with that of economic and social development.

6. Train personnel in aspects related to health services planning and administration.
7. Restructure the information subsystem to serve the goals of formulating, adopting, executing, evaluating, and reformulating the health policies and norms in the different levels of the Health Service.36

This legislative support for health planning has little meaning if the leadership does not give its active support. The technical leaders of the Health Service, represented by the Technical Coordinator, have provided planning's strongest support. At the Secretary of Health level, support also has been substantial, although largely through concurrence with the technical staff. This relates to the technical nature of the planning practice. There is a dearth of participation by community representatives and leaders in planning, which may indicate the lack of community sanction. However, as mentioned above, the political nature of the Secretary of Health position represents at least an indirect representation of the community. At the national level, the Ministry of Health manifests a will to plan that is supported by legislation and policies. In addition, the National Planning Office provides a strong sanction for health sector planning through incorporation of the health sector in the national development plans.

Progress in Coordination Among Planning Levels

Coordination among the different levels and types of planning is another key structural aspect of health planning. Several types

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36 Valle, Servicio, Seccional de Salud, Plan de Salud 1974, pp. 71-72. (Author's translation.)
of coordination are deemed salient: (1) coordination among national, regional, and local health planning; (2) intersectoral coordination; and, (3) coordination among development, human resources, and sectoral planning efforts.

Colombia's health planning has been operationalized in various degrees at the national and state levels, and in its three largest municipalities (Bogota, Medellin, and Cali). Considering the size of its health system, as well as geographic and demographic features, the Valle Health Service's planning may be conceived as a form of regional health planning. Such regional planning should be well-developed in Colombia because of the disparities in health status problems and health system development among the various states, as well as the state level control of major sources of health system financing. Thus, it is appropriate that the strength of health planning in Colombia is at the regional level. In Valle, for example, the technical development of health planning activities over the period studied has proceeded significantly beyond that of either the Ministry of Health or the National Planning Office. In other words, the national health planning is poorly developed, while the regional health planning, at least in Valle, has developed considerably.

The national health planning is conducted by the Ministry of Health and the National Planning Office. Only one attempt at producing a national health plan (1973) has been made.\textsuperscript{37} In addition,

\textsuperscript{37} Colombia, Departamento Nacional de Planeacion, \textit{La Politica de Salud}, pp. 47-267.
another related planning effort was conducted in conjunction with
the Pan American Health Organization (PAHO). This consisted of com-
piling the "Quadrennial Projections," which estimated the need for
international assistance for the public health system. There is a
close relationship between the regional and national health planners
since the Ministry of Health requires a formal presentation of the
Health Service plan each year, accompanied by a technical discussion
of its content. The results of the regional planning, therefore,
are well-known at the national level.

The coordination of state and national health planning exhibits
difficulties, however, primarily because the Health Ministry appar-
ently does not view the state plans as change vehicles. The result
is that the health goals recommended to the state, and the resource
allocation decisions at the national level, appear to bear little
relation to regional planning. The national health leadership seem-
ingly views planning as important primarily as a means of obtaining
foreign aid. But there is a reluctance to allocate resources based
on the plans of the regional and local levels. Rather, the national

38 See Colombia, Ministerio de Salud Publica, Proyecciones Cuadri-
enales. Also, see Juan J. Barrenechea and Charles L. Williams,
"Planning of External Assistance to the Countries: The Quadrennial
Projections," (Paper presented at the meeting of the American Public
(Mimeographed.)

39 For a detailed description of this process, as carried out in
1972, see Colombia, Ministerio de Salud Publica, Oficina de Plane-
acion, Guia de Evaluacion de Actividades Para Los Servicios Seccion-
level views its role as one of defining directions or goals, and calling upon the regions to continue to use their existing programs and focus on improving their productivity and lower costs. Such a practice discourages the confrontation of strategy issues at the regional level, and thus is related to the Health Service's emphasis on tactical issues.

This failure to operationalize a planning process at the national level, and the failure to use the results of regional planning's analysis, means that national policymaking does not have the analytic base that is needed to make rational decisions regarding alternative ends and means for the health system. Thus, the Ministry's insistence on its approach to setting policy at the national level is inappropriate. This perhaps explains why the principal outputs of national policymaking are statements of health goals and norms, that seldom include priorities, and also why the Valle Health Service attaches little commitment to many of these goals, although it does express them in its plans. Little attention is given by either the national or regional policymaking to alternative means for putting these goals into practice.

Although a Health Service policy encourages planning at both the district and institutional levels,\(^40\) it has not been implemented. The Health Service is comprised of nine health districts, and there were forty-four hospitals under its jurisdiction in 1974. The

components of the state plan, i.e., system description and health objectives, are disaggregated to both the district and institutional level. That these levels do not draw up their own plans is problematic for two reasons. The most important is that the diversity of health system problems among districts may be ignored. Also, there is the tendency to resist plans that are imposed from higher levels and the result may be implementation failures.

The preparation of the 1974 plan emphasized solving this problem by requiring institutions to formulate their own service objectives. But what actually occurred was that the regional planners developed a series of planning questionnaires that were given to the institutions, and in these forms the key decisions for objective-setting already had been made, e.g., coverage levels and target populations. To illustrate, the number of infants to be covered by the outpatient medical services of the hospital in Cartago was specified at the state level and included in these forms as 2,653 by the Health Service, and applying the stipulated coverage norm of 100 per cent and the intensity norm of two consultations per infant produced an objective of 5,306 consultations.\(^4\) Therefore, the participation of the local administrators was mechanical. Nonetheless, at least a recognition of the value of participation is indicated, and even such minimal participation represents progress.

The municipality of Cali formally became a health district of the...

Health Service in 1972; however, prior to this the Cali Health Department existed as a distinct administrative entity. This separation was a major organizational problem, since it meant that an area with nearly one-half of the state's population did not come under the administrative and planning auspices of the Health Service. The Health Service, however, administered the hospitalization services in Cali, because the Cali Health Department did not include such services. Even with the recent integration, the Cali Health Department maintains significant autonomy. Although its planning has been coordinated with that of the Health Service, especially in recent years, some planning activities have been carried out independently. For example, the Cali Health Department has worked closely with the University of Valle in planning the aforementioned PRINefs health services research project. But there has been little coordination or communication regarding this project with the Health Service planners. This autonomy of the Cali area suggests that the control of the Health Service over a large part of the public health resources is minimal, since a major proportion of the health manpower is concentrated in Cali. For example, 44.7 per cent of the physician hours contracted by the Health Service in 1972 were for Cali.

Another salient type of planning coordination is intersectoral. Recalling the above discussion of the need for comprehensive system parameters, health planning requires communication and cooperation from such sectors as agriculture, education, and welfare. The Valle

\[42\] See page 99 of the present study.
Health Service has a policy of coordinating its health planning efforts with those of other related sectors and overall development planning. Yet little has been accomplished, as indicated by the failure to incorporate information from other sectors into the health planning process. While there is much of this information available in the Health Service, the practiced planning has not generated much interest in using it. Such coordination deficiencies help explain the focus of planning on the traditional health services system, especially hospitalization and ambulatory medical services.

The final point in this discussion of coordination concerns planning levels and the position of health planning. A planning hierarchy consisting of development, human resources, and sectoral planning efforts has been promoted, based upon the recognition that the overall development of an individual or society is a function of a number of diverse factors. The need for these levels is underscored by the recognition that goals and problems are multidimensional, and that they can be aggregated. Therefore, health planning should be closely coordinated with human resource and development programs.

Both the regional and national health planning programs in Colombia maintain good coordination with the national development program.

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planning effort. The Colombian government gave increased impetus to the health sector and health planning with the 1971 redirection of its national development planning. This development plan represented an increased emphasis on qualitative, welfare-orientated goals, postulating that improved social welfare should cause an increase in the effective demand of the lower income classes, and thereby enhance development. Thus, this planning distinguishes between physical capital programs and human resources programs and opts for the latter. Job creation is a main objective, which is to be reached by major efforts in urban development, especially low-income housing construction. Other objectives include the promotion of the export of commodities whose production is labor intensive; agricultural production and land redistribution; and income redistribution, largely through public sector efforts in primary education and public health.

The increased role of the health sector in this 1971 development plan demonstrates a recognition of the positive effects of health investment on the Gross Domestic Product, and on the distribution of wealth. Increases in the share of resources allocated to health and increases in their productivity are results that were explicitly sought through implementing this plan.

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46 Colombia, Departamento Nacional de Planeacion, La Politica de Salud, pp. 113-121.
Despite the importance of such rhetoric, a primary factor influencing the priority given to the health programs probably has been the availability of large health sector loans through the United States Aid for International Development (AID).

The Valle Health Service has developed good working relationships with the Valle Planning Office; nevertheless, the Health Service seldom has utilized task forces or special committees with inter-institutional members to carry out planning efforts at either the level of the health sector, other sectors, or development planning. An example of the problem that results is that the responsibility for planning to meet the nutritional needs of the population is assigned to the regional office of the Colombian Institute of Family Welfare, and is carried out with little Health Service participation. Health Service planners should at least be involved in this nutrition planning so that good communication between the two agencies is facilitated, especially since the principal activity of the Welfare Institute, a food supplement program, usually is carried out in the Health Service's health centers and hospitals.

To conclude, it appears that the structural potential exists to promote intersectoral approaches to planning for health, especially since the relevant agencies are all in the public sector. Yet the Health Service's planning has not demonstrated interest in taking advantage of this structural support. This relates to the limited

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Colombia received an AID Health Sector loan for 1973-1974 for about U.S. $24 million, and a second loan for 1975-1976 for about U.S. $17 million has been signed.
comprehensiveness of the health planning in the Health Service.

Educational Programs in Health Planning

Another pertinent aspect of the structure of health planning efforts is staffing. A principal issue concerns the capacity of the available educational programs to generate the needed health planning personnel. The type and quality of health planning training programs operating in a given context is a good indicator of the support provided to the planning process. Such programs should provide the multidisciplinary staff demanded by the activities of health planning. Furthermore, they should provide health planning executives that have the capability of coordinating and relating the inputs from all these pertinent disciplines. Such a planner is appropriately termed a "generalist health planner." 48

Colombia has several educational programs in health planning. These programs have become well established, and a large number of Columbian health professionals and non-professionals have graduated from them. Perhaps the primary benefit of these programs is their role in instilling an acceptance of planning in the health sector. Also, the public health focus is another important asset. This training, nevertheless, is typically of insufficient depth, which is indicated by the portrayal of planning as a relatively straightforward technical task that consists primarily of applying a "cookbook"

48 See the general discussion on health planning, staffing and training in WHO, Training in National Health Planning, pp. 12-33 and 42-45.
approach based on a narrow interpretation of the CENDES methodology. The political aspects are ignored both in the methodology and its presentation, which helps explain the overly technical focus of the Health Service's planning and policymaking practice, as well as that of many other CENDES-based planning programs throughout Latin America. Such a narrow and exclusive use of the CENDES method in training programs in Colombia has been a major obstacle to planning practice.

The health planning training that is available in Colombia is of two types: post-graduate, short-term courses in health planning; and the health planning classes which are part of the Masters in Public Health curriculum in several universities. In general, these courses are directed at producing generalist health planners, and utilize the CENDES health planning methodology as their primary conceptual base. They are also highly orientated toward practical experience, as indicated by the large proportion of curriculum time spent in planning programs and health institutions.

The National School of Public Health, located in Medellin, conducts most of the health planning training in Colombia. In its

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49 In addition, an informal and non-systematic review conducted by the present author of the student population in university graduate programs in health planning in the United States revealed that a significant number of Colombians have graduated from these programs. Several such graduates have been employed by the Valle Health Service and the University of Valle.

50 See Colombia, Ministerio de Salud Publica, Oficina de Planificacion, Diez Primeros Anos de la Escuela Nacional de Salud Publica--1964-1973 (Medellin: University de Antioquina, 1974), upon which this discussion draws heavily.
first ten years of operation, 1964 to 1973, the Master of Public Health (M.P.H.) has graduated 356 professionals, including physicians, dentists, nurses, and veterinarians. Of these, thirty-seven (about 10 per cent) were from Valle. This curriculum included only 105 hours in health planning, of which forty-five are spent in practical experience. An M.P.H. curriculum is offered with a specialization in health planning, but it is new and only two persons had completed it by 1974. This curriculum is similar to the recommendations made for training generalist health planners by a WHO Expert Committee. An eight to ten week course in health planning is also given at the National School of Public Health. The content focuses on the health planning methodologies, mainly CENDES, and on the health services system and its environment. Almost half of its curriculum hours are devoted to field work and practical experience. Six of the 101 Colombian graduates of this course were from Valle. Finally, health planning courses have been included in the training programs for such intermediate level personnel as statisticians and health administrative assistants.

51 All class hours are counted; for example, a two hour class that meets five times a week for six weeks represents sixty hours in the curriculum.


53 Expressive of the CENDES influence is the planning "workbook" used to guide practical efforts directed at producing a health plan. See Ospina, and others, Planificacion de la Salud—Modelo Decente. Other materials are more informal, but also stress the CENDES methodology. Also see, Fayad V. Canel, "Programacion de la Salud: Tecnicas y Procedimientos," Cuadernos de la Escuela de Salud Publica, Caracas, Venezuela, No. 9, 1967, pp. 1-82.
Health planning classes are also given at the graduate and pre-graduate level in the Department of Social Medicine of the University of Valle Medical School. The M.P.H. program is broad in scope, thus only limited attention is given to planning concepts and methods. The CENDES approach is prevalent, nevertheless. Also, some of the Valle health professionals have attended the PAHO training courses in health planning held outside of Colombia. 54

As indicated previously, a principal problem has been the history of teaching the CENDES methodology as a "cookbook" for planning, i.e., to be followed step by step, and without emphasizing that the approach has both strengths and weaknesses in its concepts and methods, and that need for supporting research is great. Criticism of the Valle Health Service "strong commitment" to the CENDES methodology has been substantial.55 Such criticism is warranted if it refers to this point. But a general condemnation of the use of CENDES is not justifiable since having such a conceptual guide, with its focus on both health needs and comprehensiveness, available during the initial stages of this health planning program was undoubtedly a large asset. The key point is that it helped get the planning process started, and paved the way for further development through successive iterations.

Planning is viewed by the Health Service as an administrative function to be carried out by the health administrators. Therefore,


55 See Hilleboe, and others, National Health Planning, p. 104.
a distinct professional staff does not exist for planning. Instead, the health planning committee is comprised of the section and program chiefs, and the Technical Coordinator serves as the chairman. These health administrators are either physicians, dentists, nurses, or sanitary engineers, usually with graduate training in public health. Additionally, most of them have completed a special course in health planning, as discussed above. Disciplines that are necessary for a multidisciplinary approach to health planning, but that are not represented on the planning staff, include demography, economics, biostatistics, sociology, health education, and political science. Some of the staff, however, have had at least some courses in many of these areas. Nevertheless, what is missing are the in-depth analytic and subjective inputs that one would expect from professionals in these disciplines. For example, the practiced planning activities reflect the absence of the inputs of an economist in cost and productivity analysis or a medical sociologist in the study of health service utilization.

These professionals are complemented by assistants, who are usually high school graduates with certain specialized courses. In this category is the health planning assistant who works full-time in planning, and the statisticians and administrative assistants. Since the latter are not directly involved in planning, they are best viewed as support personnel. All of these persons work at the state level. In addition, many hospitals have statisticians and administrative assistants who provide some support to planning, largely in data collection and organization.
The leadership for the health planning consists of the Secretary of Health who carries out the political functions, and the Technical Coordinator whose responsibilities are in the administrative and planning areas. The Technical Coordinator that has filled the position for the past five years fits the definition of the generalist health planner referred to above. Because the Technical Coordinator also has major administrative responsibilities, the problem that exists is that not enough time is devoted to the technical planning tasks.

In conclusion, while the training and educational background and the quality of the health planners in Valle Health Service is basically sound, what is at issue is their job functions. The major problem relates to the insufficient time assigned to the planning process. Given the level of administrative functions, an increase in planning staff is appropriate. The addition of a full-time health planning professional dedicated exclusively to planning activities is warranted as a minimum. Also, further strengthening by bringing in other disciplines should be sought, perhaps on a part-time basis.
CHAPTER IV
HEALTH PLANNING PRACTICE IN COLOMBIA

The health planning process carried out by the Valle Health Service is evaluated in this Chapter. Criteria from the conceptual framework developed above are used to evaluate the observed planning, thus providing a base for prescribing changes for improvement. Over the period 1967-1974, the Health Service has prepared plans whose annual iterations have concentrated on describing the health system, formulating health service objectives based on existing demand levels, and adjusting existing programs to meet these objectives. The formulation of health status goals and objectives, and the analysis of alternative programs, two important activities in this study's conceptual framework, are neglected (see FIGURE IV-1).

This Chapter reveals the evolution of planning in the Valle Health Service. As a summary, three planning phases are distinguished according to their basic planning criteria: (1) CENDES phase (1968), in which the key criteria were mortality reduction for vulnerable diseases and meeting demand for non-vulnerable diseases; (2) demand-based phase (1969-1973), in which meeting the projected demand for services was the planning focus; and, (3) coverage-based phase (1974), in which coverage norms specified the service requirements for age groups.

In the CENDES phase, the planning practice concentrated on
Accomplished only in a very limited fashion.

FIGURE IV-1

HEALTH PLANNING AND POLICYMAKING

IN THE VALLE HEALTH SERVICE
applying an expression of the CENDES methodology with little effort
given to adapting it to the Valle context. This perhaps explains
why the most difficult aspects, e.g., the cost/effectiveness anal­
ysis of each vulnerable disease, were discarded quickly. The demand-
based programming for non-vulnerable diseases that comprised part of
the initial CENDES phase was well-received, however, by the Valle
planners. Thus, this part of the methodology was extended to cover
all diseases in the demand-based phase from 1969-1973. A relatively
straightforward planning approach was developed, focusing on pro­
jecting past service demand levels and programming services so that
these levels could be maintained despite population growth. The
Health Service's practice has been deficient because it is concerned
almost exclusively with service levels and the efficiency aspects of
productivity and service costs. Consequently, system effectiveness
in health status terms, and the remaining efficiency aspects of utili­
zation and resource availability, have been ignored. In the final
year of the period studied (1974), the Health Service has attempted
to shift its planning focus toward service coverage. This would
represent progress, because when planning focuses on coverage, there
is a greater potential that the community health needs will be con­
fronted, than when it focuses on demand. Unfortunately this shift to
coverage-based planning has not been carried out, since the principal
1974 objectives are related more closely to demand levels than the
proposed coverage norms. It remains to be seen if future plans pro­
gress further toward implementing this coverage focus. Given this
brief overview of the Health Service's planning practice, the major planning issues are discussed in greater detail.

**Goals Definition**

The Valle Health Service utilizes a goals hierarchy consisting of general health goals, health system goals, health norms, health objectives, and program targets to define the directions for action in its health system. The latter three refer to the programming step, and their evaluation is deferred momentarily.

As expressed by the Health Service, general health goals represent the application of general values to the health system, without specific reference to any particular aspect of a system component. The general health goals formulated over the reference period are summarized in TABLE IV-1. This Table lists the goals stated in the 1974 health plan, and then adding the goals of the earlier plans (1973 to 1968) when they differed significantly from the 1974 goals. For instance, the 1974 plan included the general health goal to extend service coverage. The earlier plans also included general goals related to service coverage, but they are not expressed in TABLE IV-1.

Categorizing general health goals by their referent health system component, i.e., resources, services and efficiency, health status and effectiveness, or the environmental factors, reveals that the goals are integral in the sense that they pay considerable attention to each component, thus representing a system focus. This has been the case throughout the six planning iterations that stated
TABLE IV-1
GENERAL HEALTH GOALS
VALLE HEALTH SERVICE, 1968-1974

I. Health Status and Effectiveness
   A. Restore the health of the sick in the shortest term possible through ambulatory and in-patient care.
   B. Improve health and the quality of life.
   C. Health promotion in rural communities.

II. Environment
   A. Improve the quality of the environment in order to reduce disease incidence and other risks.

III. Health Services and Efficiency
   A. Extend service coverage.
   B. Place opportune, efficient, and integral health services within the reach of the assigned population, preferably the population not covered by other subsectors.
   C. Carry out actions of disease prevention.
   D. Satisfy the demand for services for non-reducible diseases.
   E. Identify and implement new methods and techniques of service delivery that assure ample coverage, high productivity, low cost, and sufficient quality of health care.
   F. Provide services of sufficient quality in an egalitarian manner.

IV. Resources
   A. Promote optimal utilization of manpower and physical resources.
   B. Maintain the quantity and quality of human resources needed for the timely and efficient care of the community's needs.
   C. Assign priority in investment plans to the needs of the regional hospitals.

V. Organization, Administration, and Planning
   A. Integrate the subsectors of Valle Health sector.
   B. Implement regionalization.
   C. Coordinate and supervise the activities of the Health Service institutions.
   D. Decentralize administration.
   E. Define clearly the population assigned to each health subsector.
   F. Incorporate the Health Service's programs into the Valle Development Plan as one of its most important programs.
   G. Formulate health plans.
   H. Establish program budgeting.
TABLE IV-1 (Continued)

V. Organization, Administration, and Planning (Continued)
   I. Improve information on service efficiency and costs.
   J. Rationalize decision-making.
   K. Insure participation of all levels in all the phases of planning.
   L. Implement an evaluation mechanism and readjustments for programming model.
   M. Coordinate with human resources forming institutions, training in agreement with Health Service needs.
   N. Create epidemiologic surveillance systems.

Source: Valle, Servicio Seccional de Salud, Planes de Salud. (Author's translation.)
health goals, as major changes in these general health goals have not been evident.¹

These general health goals should relate not only to system components, but also to community values. The planning task is to ascertain community values, i.e., the social preference function, and then analyze the congruence of the health goals with these values. This activity provides a check on policymaking that is designed to insure the consideration of these values. But there is no evidence that the Health Service has performed such analysis. The stated goals, however, are broadly focused and relate to most of the major problem areas in the health system. Consequently, the failure to study the community values explicitly creates little difficulty in this sense. But the principal problem with these goals is that they do not express priority decisions, i.e., which of these goals is to be attained first. It is here that the failure to consider value structures of the community and its political leaders causes a major problem, because information on the community's desires should be the foundation for priority-setting. Without such studies there is the high risk that major problems will be ignored, and plan implementation resisted. The avoidance of this priority question stems from the technical bias in the policymaking process and the lack of community participation in planning or policymaking.

¹The 1972 health plan did not contain statements of general health goals or health system goals, see Valle, Servicio Seccional de Salud, Plan de Salud 1972.
The health system goals expressed by the Health Service express system changes related to specific health problems. These system goals, which are summarized in TABLE IV-2, focus on a particular health status-limiting condition, service, resource or environmental factor. Thus, they are more focused than the general health goals. These goals concentrate on health status and health services. Again little change is evident during the period studied. This emphasis on the expression of health system goals in health status terms is commendable. But more is needed. These health status goals should focus on those diseases whose health status effects are substantial and can be reduced. Also, the other types of health system goals should be derived from the health status goals. More specifically, once the diseases and conditions that are to be the focus of the agency's efforts are specified, the service and resource goals should be established according to the planned approach to reaching these health status goals. In the Health Service's planning, the health goals do not provide such guidance, and no attempt has been made to link the various types of goals. This points to the Health Service's decision to base resource allocation decisions on the levels of health service demand, thereby ignoring most of its goals statement.

As expressions of desired policy direction of the Health Service, both general health and health system goals are remarkably complete in their system focus that emphasizes fulfilling health needs through the provision of efficient services. A principal difficulty, however, is that the goals may be unreasonable. This is because they
TABLE IV-2
HEALTH SYSTEM GOALS
VALLE HEALTH SERVICE, 1968-1974

I. Health Status
   A. Reduce the mortality of children and women in reproductive age.
   B. Collaborate in the reduction of malnutrition.
   C. Improve the diagnosis of community mental health problems.
   D. Reduce the mortality rate for uterine cancer.
   E. Maintain zero incidence of plague.
   F. Control or reduce gastroenteritis.
   G. Prevention and control of tuberculosis.
   H. Reduction of the incidence of venereal diseases.
   I. Prevention and control of acute communicable diseases through systematic vaccination.
   J. Protect the working population exposed to occupational health risks.
   K. Reduce the intoxications and deaths from the indiscriminate use of pesticides.
   L. Reduce the human diseases and losses caused by food contamination.

II. Environmental
   A. Reduce air pollution.
   B. Control the quality of water resources.
   C. Drug quality control.

III. Health Services
   A. Increase hospitalization and outpatient medical services to efficiently meet demand.
   B. Attend the service demand of chronic disease patients, promoting early diagnosis and opportune treatment.
   C. Promote the concept of progressive patient care in hospitals as a means of improving productivity and quality.
   D. Improve efficacy of hospital services.
   E. Provide chemotherapy services to all tuberculosis cases diagnosed, and test for tuberculosis all persons presenting respiratory disease symptoms.
   F. Improve psychiatric care services and access to them.
   G. Develop means of the integral protection of the family, including information and services relating to fertility and sterility.
   H. Provide family planning services in the context of maternal and child health.
TABLE IV-2 (Continued)

III. Health Services (continued)

I. Provide medical care to children with protein-calorie malnutrition.
J. Incorporate nutrition services into the health sector.
K. Increase the geographic coverage of dental services, and when this goal is reached increase the population coverage.
L. Increase dental education services.
M. Apply dental disease prevention techniques.
N. Promote health in rural communities through health promoters.
O. Establish adequate rubbish collection, transportation, and disposal services in cities with over 20,000 inhabitants.
P. Increase attention to food control services.
Q. Control and eliminate rabid dogs and maintain their eradication.
R. Implement a regional laboratory system.
S. Improve the quality of nursing care.
T. Provide maternal and child health care.
U. Provide systematic vaccination services.
V. Provide health education and community development services.
W. Provide in-home water and sanitation services.

IV. Resources

A. Meet the resource needs of the regional or district hospitals.
B. Locate at least one rural health volunteer (promoters) in each rural community of the state.
C. Increase the number of dental auxiliaries to extend coverage of dental services.
D. Generate professional and auxiliary laboratory personnel according to the needs of the laboratory service.
E. Carry out continuing education in the areas of health planning and administration.

V. Organization, Administration, and Planning

A. Incorporate tuberculosis control activities into the permanent programs of the institution.
B. Improve coordination between the Ministry's antimalaria program and the Health Service.
C. Restructure the information system to serve policymaking needs.

Source: Valle, Servicio Seccional de Salud, Planes de Salud. (Author's translation.)
are so complete, they are probably unfeasible. The difficulty is that priorities are not expressed. An illustration is the goal to attend the demand for existing services for non-reducible diseases, and at the same time stating goals to control such diseases as gastroenteritis, malnutrition, and venereal diseases. Clearly, the Valle Health Service does not have the resources to fulfill all of its goals, and probably has the capability for attaining only a small number of them. It is necessary, therefore, to determine which goals will be given priority for achievement during a given time period. With its expressed goals, the Health Service has stated a multitude of desired changes in the health system. The question of tradeoffs is not addressed, and this is the core problem.

Thus, two deficiencies in the goals definition activity are outstanding: lack of health status focus, and failure to determine priorities. The Health Service's early rejection of the CENDES method was a significant planning decision, since it represented the rejection of an attempt to address these deficiencies. The CENDES-based 1968 plan confronted the tradeoffs issue by establishing priority diseases. Essentially, the approach recognized that resources are limited, and that only the high priority diseases can be attacked in a given time period. Decisions were made on the most important diseases in resource allocation terms. In the 1968 plan, seven disease categories were stated for Valle in the following priority order:

1. Tuberculosis
2. Gastroenteritis, colitis, and enteritis
3. Tetanus
4. Malnutrition
5. Whooping Cough
6. Diphtheria
7. Dysentery, all forms

In the 1971 plan, which was the last plan to state disease priorities, the following five categories represented the priorities:

1. Infectious Intestinal Diseases
2. Tuberculosis
3. Malaria
4. Nematicide Parasites
5. Malnutrition

Only diseases deemed vulnerable to preventive services were eligible for this priority-setting. But this identification of disease problems had little meaning because artificial epidemiologic coefficients were utilized and problem analysis was ignored, as discussed below. This perhaps explains why these priority disease decisions apparently did not receive much attention, i.e., resources were allocated to the non-vulnerable diseases based on demand criteria, leaving little for attacking the priority diseases.

A planning study, implemented in Valle in 1972 by a group of eight graduate students of the German Development Institute also addressed the priority-setting issue. Their conceptual framework is similar to the framework of the present study. The initial part of the study consisted of the statement of twenty-three "health

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3There were changes in the disease categories utilized; Valle, Servicio Seccional de Salud, Plan de Salud, 1971, p. 57.

objectives," which represented a reduction of the 1,000 ICDA diseases according to data on the health status of the Colombian population. Also included were four indicators of social welfare, one each referring to education, income, jobs, and housing. Then priorities were determined using the Delphi technique and interviews with Valle health professionals. The following priority criteria were used:

1. Economic importance (two indicators)
2. Social importance (seven indicators)
3. Ambulatory and in-patient demand levels
4. Accessibility to preventive services
5. General service accessibility
6. Transmittability
7. Duration
8. Possibility of diagnosis
9. Lethality (mortality/morbidity)
10. Interdependence with other diseases
11. Mortality
12. Morbidity
13. Vulnerability

Each criterion was applied to each of the nineteen diseases objectives (the four social welfare objectives were not included in this goals priority exercise), and the resultant five priority diseases were as follows:

1. Infectious intestinal diseases
2. Other diseases not included in the eighteen specific disease categories
3. Respiratory system diseases
4. Parasitic infections
5. Tumors

The methodology and results of this study were presented to the Valle Health Service in 1972, but the subsequent health planning practice

5Ibid., pp. 77-78. (Author's translation.)
6Ibid., p. 79.
has not demonstrated signs of moving toward the health status and effectiveness framework that the study recommended.

Input-Output Approach

Examining the analytic mode underlying the practice of goals definition should focus on how the health system is defined and how health status is measured. It is apparent that the Health Service's approach to the health system addresses both the health status and health service outputs, as well as some of the relationships related to service production. Thus, a system focus is recognized explicitly. As discussed below, the health system description has followed the system focus of the CENDES health planning paradigm. Perhaps the best indication of this focus is the statement in the 1974 plan that the activity of plan evaluation assesses "the impact of the plan on the health situation, and...on the cost of the health activities and programs." Thus, the Health Service's decision to base its planning on health service demand represents a conscious rejection of the other aspects of the systems focus, viz., effectiveness and service utilization variables.

Health Status Measures

Mortality and demand morbidity are the health status measures utilized in the Health Service's planning process. Crude mortality rates for the state and its districts, and age and cause specific

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rates,\(^8\) are the selected means of expressing the mortality data. Also, these disease categories are classified as reducible and non-reducible as discussed above. This is a meaningful way of expressing mortality data, because it facilitates the consideration of the potential health status effects of the system. But in 1969, about 4,000 recorded deaths (an estimated 20 per cent of all the recorded deaths) were not tabulated by age or cause, therefore the mortality statistics for that year are poor. The quality of the mortality data can also be questioned because significant levels of under-reporting and non-physician certification of cause of death have been reported.\(^9\) Also, the paucity of autopsies signifies deficiencies.\(^\text{10}\) Even granting these problems, the data are of good quality relative to most developing countries, and this quality is improving. Such improvement is reflected in the decrease in the percentage of deaths in the "mal-defined, unknown, and senility" category; from 11.7 per cent in 1966 to 2.8 per cent in 1972.

A further comment is warranted regarding the thirty-eight disease categories utilized. These categories are based in many instances on anatomical similarities, and some categories represent a

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\(^8\)Only thirty-one disease categories were used in the first plan (1968).

\(^9\)Subregistration of neonatal deaths (11.2\%), infant deaths (5.2\%), and deaths in population under five years of age (3.7\%) was recorded in a study conducted in Cali, see Puffer and Serrano, Patterns of Mortality in Childhood, p. 33. Also see, Puffer and Griffith, Patterns of Urban Mortality, pp. 22-32.

\(^\text{10}\)As pointed out by John Daly, "Estudio del Sistema de Informacion del Sector Salud en Colombia," A Report to the U.S. A.I.D. Mission in Colombia, Bogota, May 1973, p. 10. (Mimeographed.)
large number of diseases, many of which have few similarities other than that they affect a particular body system. Further disaggregation and classification by similarity in causal or related factors would be a much improved method from the health planner's perspective, because it would facilitate the linkage of services to disease categories and the subsequent analysis of effectiveness.

In addition to mortality statistics, the Health Service utilizes cause-specific data on hospital discharges and outpatient physician consultations to indicate health status. Rates of discharges and outpatient consultations are expressed by the thirty-eight disease categories, using the total district or state population as the denominator. Since the population for which the Health Service is responsible is considerably less than the total population, such a practice is misleading. Such demand or institutional morbidity must be interpreted cautiously due to the often low utilization rates, particularly in the rural areas, and to the significant number of people utilizing the Social Security or private health systems.

In its planning practice, the Health Service has employed these service demand statistics to denote health status. Specifically, demand instead of mortality or other health status indicators is the basis for programming services. The practice is deficient because demand is a poor indicator of community health status in the Colombian context. Unattended health status problems do not influence

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this measure, since it is concerned exclusively with service users.
The magnitude of this problem is indicated by the results of a nation­
al health survey in Colombia in 1965-1966. This survey found that 387
persons per 1,000 population reported some illness during the two-week
period immediately preceding the interview, and slightly more than
half of these cases were reported as commencing during this two-week
period. Only twenty-three per cent of those reporting illness had
consulted any source of health care during the period. This implies
that the planning practice based on service demand has ignored a large
part of the community's health status problems.

In order to construct mortality and service demand rates, popu­
lation data are needed. Reasonably good population data have been
generated by the national census conducted by the National Statistics
Office (DANE), and these statistics form the basis of the population
profile used in health planning. This demographic profile consists of
age-specific population distribution by the nine districts and by
municipality, the population pyramid for Valle, and the urban/rural
distribution. Because this population profile does not focus on the
target population of the Health Service and does not contain informa­
tion on employment status, occupation, income and education levels,
it is inadequate from the planning perspective. Most of this data is
collected by the Census. These demographic factors are particularly

12Colombia, Ministerio de Salud Publica y Asociacion Colombiana
de Facultades de Medicina, Estudio de Recursos Humanos Para la Salud
y la Educacion Medica en Colombia—Métodos y Resultados (Bogota: Min­
important for such planning tasks as estimating health needs and health service demand. The failure to use such data indicates the Health Service's scant concern with such tasks. Instead, demand levels are accepted without question, and simple projections of past levels are used to set objectives.

Much attention was given to setting health status goals in the early GENDES-based phase, but it was abandoned in later plans. Some health status objectives have been expressed, however, in the more recent iterations of the Health Service's planning. For example, mortality or morbidity decreases for certain diseases or age groups are presented in the 1974 plan. Concerning diseases preventable by immunizations mortality reduction goals are expressed for measles, whooping cough, and tetanus, and morbidity goals for diphtheria, polio, and smallpox. For instance, the measles goals are as follows: 1974—15.4 deaths/100,000 population under five years; 1976—4.4; 1978—2.9; and 1980—2.4. Mortality reduction goals are also set for tuberculosis and enteric infections, but not for any of the other disease categories not preventible by immunizations. Goals are also established in terms of the general mortality rate reduction for four population age groups: women in fertile age; infants; children one to four years; and children five to fourteen years. For example, the goal for the infant mortality rate is 42.3 deaths/1,000 infants in 1974 decreasing to 21.2 in 1980. These health status objectives were established by projecting past mortality rates, in certain cases accompanied by intuitive estimations of the effects of health services. An example of such intuition is the estimation of the effectiveness of a mass

While these health status objectives represent attention to quantifying health status goals, they exhibit the same isolation that was discussed above regarding these goals. Clearly, the programming of resources has not been based on these health status objectives.

In summary, the Health Service's goals definition activity has stated a wide range of general health goals and health system goals. The analytic foundations exist for a goals definition activity that is in line with the proposed framework, because mortality statistics are employed and the input-output approach to the health system description reflects a system focus. But little progress is evident despite this analytic base. The goals definition does not focus on identifying those diseases or conditions whose health status effects are great and can be reduced. Priorities are not determined. A narrow focus on meeting the demand for health services is indicated by the neglect of health status goals as expressions of the desired directions for change, and the failure to link service and resource goals to the health status goals.

Programming Services and Resources

The planning process in the Valle Health Service has not included an activity which identifies and analyzes alternative means for attaining the stated goals and objectives. Instead, the principal policy is to attend the demand for services by merely expanding existing programs. Even the consideration of alternative ways of
meeting this demand is ignored. This neglect of an analysis of alternative programs is related closely to the regional policymaking's failure to accept the responsibility for making program selection decisions, and addressing strategy issues. The resultant tactical focus of policymaking and planning is one of the major deficiencies encountered in the present.

Objective-setting in health service and resource terms is the principal activity in the Health Service's planning process. This section analyzes this objective-setting activity, and then the failure to identify and analyze alternative programs is examined more closely by discussing planning's declining attention to system effectiveness, and the limited comprehensiveness of the employed health system definition.

Objective-Setting

The health planning practice of the Valle Health Service concentrates on setting service objectives based on past demand levels. To accomplish this, considerable effort is dedicated to analyzing the efficiency of the health system.

Efficiency Analysis

An awareness of all three of the system efficiency concepts, i.e., availability, productivity, and utilization, is demonstrated in the Health Service's approach to system analysis. But each is operationalized only in a limited fashion, and emphasis is given to the productivity aspects.

Service Data

To begin near the beginning, however, it is noted that the
analysis of productivity and utilization necessitates health service
data. The health service profile is the descriptive forte of the
Health Service's system description, which is to be expected since
data on service demand is the foundation of observed planning prac­tice. These service data are important because they have contributed
greatly to the Health Service's improved understanding of its health
system. The annual reports prior to the 1968 advent of planning dem­onstrate the previous lack of uniform service data. ¹³

The services description is based on the general approach pro­moted by the CENDES methodology. Intermediate and general services
are related to final services, which in turn are linked to programs
(pre-1974 plan) or target populations (1974 plan). These programs
are specified by techniques and disease categories. The categories
utilized for each descriptive level are presented in FIGURE IV-2.

Final services are defined in the Health Service's planning as
those most directly related to the community, while intermediate and
general services provide support for the final services. ¹⁴ The
services description in practice concentrates on final services.
Although activity and instrument measures are specified for inter­mediate and general services, few meaningful data are collected,

¹³ For example, see Valle, Servicio Seccional de Salud, Informe
del Secretario de Salud Publica Departamental al Senor Gobernador
del Valle del Cauca (Cali: El Servicio, 1963), and Valle, Servicio
Seccional de Salud, Informe del Secretario de Salud Publica Departa­
mental al Senor Gobernador del Valle del Cauca (Cali: El Servicio,
1965).

¹⁴ Ospina, and others, Planificacion de la Salud, p. 39.
INTERMEDIATE AND GENERAL SERVICES

1. Pharmacy
2. Laboratory
3. Pathology
4. Blood Bank
5. Radiology
6. Dietary
7. Laundry
8. Central Supply
9. Social Services
10. Administration

FINAL SERVICES

1. Hospitalization
2. Outpatient Medical Consultation
3. Dental
4. Nursing
5. Vaccination
6. Environmental Sanitation

FIGURE IV-2
CATEGORIES UTILIZED IN HEALTH PLANNING--
VALLE HEALTH SERVICE
<table>
<thead>
<tr>
<th>PROGRAMS</th>
<th>TARGET POPULATIONS</th>
<th>TECHNIQUES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Medical Care</td>
<td>1. Preschool</td>
<td>1. Preventive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Disease categories No. 1, 3, 4, 6, 9, 10, and 13).</td>
</tr>
<tr>
<td></td>
<td>2. School</td>
<td>2. Control</td>
</tr>
<tr>
<td></td>
<td>3. Women in Fertile Age</td>
<td>3. Curative (All disease categories except No. 8, 10, and 12 for which cases have not been identified in recent years).</td>
</tr>
<tr>
<td>2. Epidemiology</td>
<td>4. Adults and Aged</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Tuberculosis Cases</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. Venereal Disease Cases</td>
<td></td>
</tr>
<tr>
<td>3. Environmental Sanitation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\* 1974 plan only.  

FIGURE IV-2 (Continued)
DISEASE CATEGORIES

1. Tuberculosis
2. Syphilis
3. Infectious Intestinal Diseases
4. Helminthic Parasites
5. Diphtheria
6. Whooping Cough
7. Tetanus
8. Leprosy
9. Acute Poliomyelitis
10. Smallpox
11. Measles
12. Yellow Fever
13. Rabies
14. Malaria
15. Rest of Infectious and Parasitic Diseases
16. Malignant Tumors
17. Benign Tumors
18. Non-toxic Goiter
19. Diabetes
20. Malnutrition
21. Mental Disorders
22. Sensory Organ Diseases
23. Circulatory System Diseases
24. Respiratory System Diseases
25. Dental Diseases
26. Gastrointestinal Tract Diseases
27. Genital-urinary Tract Diseases
28. Complications of Pregnancy and Birth
29. Normal Delivery
30. Abortion or Miscarriage
31. Diseases of Early Infancy
32. Fractures and Trauma
33. Lacerations, Wounds, and Foreign Bodies
34. Burns and Poisonings
35. Other Diseases with Defined Diagnosis
36. Undefined, Unknown, and Senility
37. Healthy Consultations
38. Pregnancy Control

*Classified as a reducible disease.*

FIGURE IV-2 (Continued)
indicating the failure to program these intermediate and general services. Emphasis in the information system is on the number and costs of the relevant activity and instrument measures for each final service. The following list presents the measures utilized.

<table>
<thead>
<tr>
<th>Final Service</th>
<th>Activity</th>
<th>Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitalization</td>
<td>Discharge</td>
<td>Occupied bed-day</td>
</tr>
<tr>
<td>Outpatient physician consultation</td>
<td>Consultation</td>
<td>Physician hour</td>
</tr>
<tr>
<td>Dental</td>
<td>Unit of dental work (U.T.O.)</td>
<td>Dentist hour</td>
</tr>
<tr>
<td>Nursing</td>
<td>Unit of nursing work (U.T.E.)</td>
<td>Nursing hour</td>
</tr>
<tr>
<td>Vaccination</td>
<td>Applied dose</td>
<td>Vaccinator hour</td>
</tr>
<tr>
<td>Environmental Sanitation</td>
<td>Unit of inspector work (U.T.I.)</td>
<td>Inspector hour</td>
</tr>
</tbody>
</table>

Final service data is disaggregated by programs and subprograms, by specific types of actions performed by each final service, by district and institution, and by disease category (the 1968 plan only). The 1974 plan introduces a specification of this service data by population subgroups, demonstrating the increased interest in service coverages.

Total and unit costs for final services are specified; but, this cost information refers only to operating costs, neglecting investment costs. Final service costs are determined by allocating the costs of the intermediate and general services to the relevant final service. To illustrate, in the 1973 plan the unit cost per physician hour was determined using data on the direct costs of personnel and supplies, plus the indirect costs of the intermediate services of pharmacy,
laboratory, pathology, blood bank, radiology, and central supply, as well as those of the general services of administration, dietary, and laundry (see TABLE IV-3). This procedure, termed instrumentation, results in a useful expression of costs because it permits analysis of the cost components.

But problem identification using this cost information is neglected. There are only a few expressed statements of these problems. For example, the 1968 plan stated that "the cost of vaccinations...was relatively high at 2.58 pesos per vaccination." Comparisons have been made of the observed costs for final services activities and instruments at the institutional level to averages for the district or state. Inter-district comparisons and comparisons with the costs in the Social Security Health System also have been made. While this information provides a technical basis for identifying problems, there is a reluctance to state problems explicitly in cost terms. Perhaps this is because it is more difficult to establish cost norms, although the use of district and state averages connotes norms. One difficulty is the failure to analyze the costs of hospitalization and outpatient consultations by hospital levels. It should be apparent that a hospital discharge, for example, from a more sophisticated facility would involve greater costs, reflecting more advanced and complicated ancillary services among other factors. The practice of expressing final service costs by their components

### TABLE IV-3

**UNIT COSTS OF TWO FINAL SERVICE INSTRUMENTS**

**VALLE HEALTH SERVICE -- 1971**

<table>
<thead>
<tr>
<th></th>
<th>Hospitalization (Occupied bed-day)</th>
<th>Outpatient Medical Consultation (Physician hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct Costs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personnel -- physicians</td>
<td>13.99 pesos</td>
<td>44.75 pesos</td>
</tr>
<tr>
<td>-- nurses</td>
<td>2.73</td>
<td>1.96</td>
</tr>
<tr>
<td>-- other professionals</td>
<td>3.55</td>
<td>5.08</td>
</tr>
<tr>
<td>-- auxiliary nurses</td>
<td>21.78</td>
<td>13.92</td>
</tr>
<tr>
<td>-- other auxiliaries</td>
<td>0.13</td>
<td>2.22</td>
</tr>
<tr>
<td>-- administrative</td>
<td>0.90</td>
<td>2.31</td>
</tr>
<tr>
<td>-- service</td>
<td>0.78</td>
<td>0.27</td>
</tr>
<tr>
<td>Subtotal Personnel</td>
<td>43.86</td>
<td>70.51</td>
</tr>
<tr>
<td>Consumibles</td>
<td>8.20</td>
<td>5.17</td>
</tr>
<tr>
<td><strong>Total Direct Costs</strong></td>
<td>52.06</td>
<td>75.68</td>
</tr>
</tbody>
</table>

| **Indirect Costs**   |                                    |                                               |
| Administration       | 36.56                              | 30.59                                         |
| Dietary              | 15.52                              | 0.15                                          |
| Laundry              | 5.35                               | 0.56                                          |
| Pharmacy             | 13.34                              | 17.02                                         |
| Laboratory           | 3.22                               | 11.13                                         |
| Pathology            | 1.29                               | 2.17                                          |
| Blood Bank           | 1.04                               | 0.32                                          |
| Radiology            | 2.59                               | 5.65                                          |
| Central Supply       | 1.35                               | 0.32                                          |
| **Total Indirect Costs** | 80.26                              | 67.91                                         |

**Total Costs per Instrument**

| Hospitalization (Occupied bed-day) | 132.32 |
| Outpatient Medical Consultation (Physician hour) | 143.59 |

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*a Indirect costs are separated into two categories: salaries and supplies.

indicates at least the desire for the use of cost analysis to identify problems. But such explicit analysis is neglected.

The description of health services also includes the expression of the percentage of the overall operating budget spent for each final service, as well as for a category "central administration." In 1972, the breakdown was hospitalization—51.7 per cent; outpatient medical consultations—26.6 per cent; dental—4.2 per cent; vaccinations—0.6 per cent; nursing 4.6 per cent; environmental sanitations—3.5 percent; and, central administration—8.8 per cent. Again, no explicit identification of problems in these terms was encountered, indicating the lack of interest in such strategy issues as the relative investment in program types.

The health services description has been basically the same throughout the seven planning iterations, even though some of the specifics have varied. There is an observable evolution toward greater specificity, meaning that considerable disaggregation of services by subprograms or types of actions has been accomplished for the later plans. For example, the initial measures for dental and nursing services were not specified according to specific actions, like fillings vs. extractions or post-partum control vs. family welfare activities, as was done in the later plans.

The service data for each program and subprogram are expressed only in real terms, because the method utilized to estimate costs is not program-specific. This deficiency of program cost data has provided a major obstacle to program budgeting, but a cost information system which provides these data has been proposed and put into
experimental operation in several district hospitals.  

Productivity

With this understanding of how health services are described, the use of the productivity and utilization concepts may be evaluated. Productivity is operationalized using the CENDES method, i.e., the number of activities produced per instrument for each final service. For instance, the 1971 health plan stated that in 1969 in the Health Service institutions there was an average of 3.2 outpatient medical consultations per physician hour contracted for this service, 6.6 units of dental work (U.T.O.) per dental hour, and 3.8 vaccine doses applied per vaccinator hour (see TABLE 13-18). Such productivity measures are specified for each hospital and each district. Despite these statistics, most often productivity problems remain implicit. Even though health plans generally present data on productivity levels for final services, few comments accompany them. Productivity norms are set, and provide a standard of comparison for identifying problems. Thus, the elements for problem specification exist; what are missing are explicit policymaking decisions about which deviations in practice represent important problems. Analysis of the factors related to such deviations also is neglected. This attention to productivity demonstrates the operational commitment to the productivity goals mentioned above. This is one of the few types of stated goals

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17 The term actually used is rendimiento, which literally translates as yield or output; however, the English word productivity better conveys the concept as it is employed.
that have been operationalized in the programming activity.

Another expression of this health resource-to-services linkage is personnel time per final service instrument, which is determined both in real and monetary terms. In all of the plans, the number of minutes of physician, nurse, and nurse aid or auxiliary time per hospital bed-day is expressed, and commencing with the 1972 plan this concept has been expanded to include all six of the final services. This method is illustrated by the instrument "dental hour" for 1971, which was actually comprised of an average of nine nurse aid minutes and 67 minutes of other auxiliary personnel, in addition to the 60 minutes of dentist time. This resulted in a personnel cost of 50.79 pesos per dentist hour. While the personnel costs of the intermediate and general services are specified for each final service, as illustrated in TABLE IV-3, data are not available in real terms. Explicit problem statements in these terms have been rare. In one of the few exceptions, the 1970 plan stated that the "physician minutes per bed-day...continued the inequitable distribution by areas," and "nurse time continued very far from the norm."¹⁸ Thus, resource availability for services, and not resource availability in terms of the population, is the focal point. The population factor enters when service coverage is considered.

Utilization

Some measures of service utilization, by which is meant the

relationship of the population to health services, also have been included in the Health Service's analysis of efficiency. A critical problem exists, however, because the demand for services is viewed by itself. That is, demand and coverage are not examined in terms of the community's health needs, i.e., health status problems. Disease category-specific rates for hospital discharges and outpatient consultations are the demand measures employed by the Health Service, as mentioned above. Also, the percentage occupancy and average length of stay for hospitalization are employed indicators. An intensity measure is also applied to outpatient consultations by determining the ratio of the total number of consultations to those for the first time with a given diagnosis. For example, in 1971 there was an average in Valle of 1.3 consultations per consultant. Again, a deficiency is that problems are not explicitly identified in terms of these utilization measures.

The concept of coverage has received increasing attention in the system description. Coverage is specified for outpatient consultations, dental consultations, and vaccination. For example, in 1972 the coverage of outpatient medical consultations was 23.4 per cent, while the coverage of dental consultations was 3.9 per cent, each using the total population as the denominator thereby deflating the real measure. The denominator for vaccination coverage is the population under one year of age. A deficiency is the failure to specify the target population to be covered by the Health Service. Furthermore, this population should be defined based on health status criteria. Coverage of hospitalization, nursing, and environmental
sanitation services generally have not been expressed. An exception is that the coverage of the rural population with adequate water and sewage systems is determined. Since the 1974 plan utilizes coverage norms for each final service in its objective-setting, presumably future plans will include actual coverage for these services. But again this coverage is not defined in terms of the health needs of the target population.

This analysis of utilization exhibits further deficiencies because it has not included studies of the motivation of the population to use services or its service accessibility. Also, the relationship of health status needs to service demand has not been addressed, thus the concept of inappropriate use is not utilized. The Health Service also has not developed measures that reflect attention to service continuity, which represents an inconsistency with its promotion of regionalization since this policy demands information that may be used to evaluate the patient referral mechanism. Inter-facility record linkage is needed to generate such continuity data, but no efforts have been identified which address this subject.

Recalling the variety of goals referring to the aspects of health service utilization that have been stated by the Health Service, it is apparent therefore that only those referring to attending demand levels have received operational attention. The stated goals referring to coverage, integral services, and equity, for example, have been ignored.

Resource Availability

The concept of resource availability is employed to express the
relationship of health resources to the population. In general, its application is restricted to hospital beds and contracted physician hours. Few problems are identified explicitly in the health plans in resource availability or distribution terms. Some general problem statements are made utilizing the instrument measure of final services to indicate the host of resources used in service production. In the 1969 plan for example, the tables of information on occupied bed-days, physician hours, vaccinator hours, and other instrument measures, are accompanied by the observations: "This diagnosis...demonstrates that, along with the resource scarcity, there is...an inadequate distribution of resources." The standard of comparison apparently is the state or district average. This basis for problem identification represents planning progress, since it is more meaningful than the gross number of beds or personnel per 1,000 population.

It is not specific enough, however, to facilitate the use of resource goals as a basis for planning. A desirable extension would be to investigate which of the specific resources, for instance x-ray machines or nurse auxiliary personnel, involved in a final service instrument measure are poorly distributed, and which institutions or communities are involved. Also missing are attempts to relate resource availability problems to such variables as service coverage and demand levels. The neglect of descriptions of the availability of other physical and human resources in the health system points out the poor quality of the resource data profiles.

The health facility profile is limited basically to the number of facilities and beds, classified by regionalization levels. In the later plans, the programming for investments in hospital construction, remodelling, and equipment includes data on the number of beds, building space expressed in square meters, and space per bed for those facilities for which projects are programmed. Data from stock and equipment inventories exist in most hospitals, but these data are of limited quality and usually do not include such key concepts as operating condition or repair status. This inventory data is not aggregated at the district or state level, and evidence was not encountered that such data has been used in the planning process. The Health Ministry completed a comprehensive survey of health facilities in 1970 that included almost all of those in Valle, but the information collected has not been used by the Health Service.20

The health manpower descriptions concentrate on the use of personnel in service production. Extensive data are collected on personnel hours salaried by the Health Service, but no data were encountered on the number of personnel by types that represents the available manpower pool. This service-oriented manpower description is concerned primarily with providing the basis for analysis, as discussed above. In general, therefore, data on the available manpower and its characteristics, including training and continuing education services, is neglected in the health system analysis. Thus, such

important concepts as the distribution and grade of use of available resources cannot be applied for most resources. Again, the Health Service's planning has not utilized the results of several pertinent surveys conducted by the Health Ministry. Referring to the availability of financial resources, no expression or analysis of the per capita or per beneficiary quantity of money expended by the Health Service was encountered.

In addition to the above-mentioned concern with efficiency problems, the Health Service expresses problems in terms of the difference between the health service objectives and the observed service levels (see TABLES V-1 to V-6). This comparison is the extent of the program evaluation activity in the planning process. Since these objectives are based largely on demand, this type of evaluation reflects demand criteria. For example, the 1974 plan stated that 84.2 per cent of the 93,321 hospital discharges programmed for 1973 were actually delivered. Also, the program-specific objectives in terms of the number of final service activities are compared with the observed levels. The 1974 plan stated, for instance, that 551,130 outpatient medical consultations were delivered in 1973 by the maternal and child health program, or 80.9 per cent of the objective. Both

the program and the final service evaluations are made for each district and institution.

The absence of analysis that characterizes most of the problem types discussed above is also apparent here. First of all, there has not been a decision on the size of the percentage difference between the observed and programmed levels that constitutes a problem. Furthermore, no evidence was encountered of attempts to explain why the observed level differed markedly from the programmed level, as often occurred.

An important hindrance to meaningful problem identification is the shortsightedness of the Health Service's planning. This is reflected in the projections utilized. Population, mortality, and service demand are the only projections made, and they manifest only a one year focus. Mortality projections, as well as projections of hospital discharges and outpatient medical consultations, are made by disease categories. These projections are constructed by employing simple linear projections of the data for the five previous years. Physical or human resources, other final services, intermediate and general services, environmental factors, and such linkage as availability, productivity, or utilization, have not been projected or forecasted. Such a practice obviously contributes little to stimulate problem identification and analysis. Since most health system problems cannot be solved in such a short term (one year), this may explain the tendency not to identify them explicitly. Resource planning and attention to the system's effectiveness, both of which are neglected in the planning practice, obviously require a longer time
frame, usually at least five years.

Health Service Objective-Setting

The emphasis in objective-setting in the Valle Health Service is on expressing the desired level of final services. Basically, two approaches to formulating these service objectives are employed. The method utilized until the 1974 plan was demand-based, and the 1974 plan shifted somewhat toward a coverage-based approach.

An important part of both approaches to objective-setting is the use of health norms. Norms are expressed for such service aspects as productivity, hospital occupancy rates, amount of personnel time per hospital bed-day, average length of hospital stay for selected diseases, and coverage and intensity of certain services. TABLE IV-4 presents the norms for the 1974 plan. The fundamental norm for all services not addressed specifically is the previous year's demand level. Prior to the 1974 plan most norms were implicit and expressed the demand levels. But with the 1974 plan, many of the expressed norms do break away from the demand focus of the planning, and represent decisions on the service levels needed to attend effectively the population's health needs or to promote the efficient operation of the health system. For instance, the norm of one physician visit per year for school children represents a decision based on health needs and not on past demand levels. Such norms are designed to serve a function in setting service objectives. But they play an insignificant role in control or evaluation, since problems are seldom explicitly identified based on these norms, as discussed above.

In the pre-1974 method, the health service objectives comprise


<table>
<thead>
<tr>
<th>TABLE IV-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXAMPLES OF HEALTH NORMS</td>
</tr>
<tr>
<td>VALLE HEALTH SERVICE -- 1974</td>
</tr>
</tbody>
</table>

**Assigned Population**

- Municipalities with less than 100,000 population -- 80%
- Municipalities with more than 100,000 population -- 60%
- Exception: Assigned population for dental service -- 20%

**Coverage of Population Groups (Percentage of assigned population)**

<table>
<thead>
<tr>
<th>Group</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preschool</td>
<td>100%</td>
</tr>
<tr>
<td>School</td>
<td>80%</td>
</tr>
<tr>
<td>Women in fertile age</td>
<td>80%</td>
</tr>
<tr>
<td>Adults and Aged</td>
<td>80%</td>
</tr>
<tr>
<td>Tuberculosis control</td>
<td>100%</td>
</tr>
<tr>
<td>Venereal disease control</td>
<td>100%</td>
</tr>
<tr>
<td>Environmental control</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Intensity of Services (Per person covered/year)**

**Outpatient Medical Consultation:**

- Infants: 4
- One to four years of age: 3
- School: 1
- Women in fertile age:
  - --during pregnancy: 4
  - --post partum: 1
  - --family planning services: 2
- Adults and Aged: 1
- Tuberculosis control:
  - --new patients: 6
  - --old patients: 2
- Venereal Disease Control:
  - --Syphilis: 3
  - --Others: 2

**Nursing Controls:**

- Infants: 3
- One to four years: 2
- Pregnancies: 2
- Post-partum: 1
- Tuberculosis cases: 16
- Gonorrhea cases: 7
- Syphilis cases: 10
- Other Venereal diseases: 7

**Vaccinations:**

- D.P.T.: 2
- B.C.G.: 1
- Viruela: 1
### Intensity of Services (continued)

**Vaccinations:** (continued)

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polio</td>
<td>2</td>
</tr>
<tr>
<td>Sarampion</td>
<td>1</td>
</tr>
</tbody>
</table>

**Hospitalizations per X Consultations:**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preschool</td>
<td>15</td>
</tr>
<tr>
<td>School</td>
<td>25</td>
</tr>
<tr>
<td>Women in fertile age</td>
<td>2</td>
</tr>
<tr>
<td>Adults and Aged</td>
<td>15</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>20</td>
</tr>
</tbody>
</table>

**Environmental Sanitation Inspections (Per Assigned Entity/year)**

<table>
<thead>
<tr>
<th>Type</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Marketplaces</td>
<td>52</td>
</tr>
<tr>
<td>Restaurants</td>
<td>12</td>
</tr>
<tr>
<td>Educational Institutions</td>
<td>12</td>
</tr>
<tr>
<td>Non-hygienic Houses</td>
<td>4</td>
</tr>
</tbody>
</table>

### Costs

**Median by Institution Type**

### Productivity

<table>
<thead>
<tr>
<th>Activity</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultations per physician hour</td>
<td>5</td>
</tr>
<tr>
<td>Units of dental work per dentist hour</td>
<td>10</td>
</tr>
<tr>
<td>Vaccine doses applied per vaccinator hour</td>
<td>10</td>
</tr>
<tr>
<td>Units of nursing work per nurse hour</td>
<td>5</td>
</tr>
<tr>
<td>Units of inspector work per sanitation inspector hour</td>
<td>3</td>
</tr>
<tr>
<td>--food control and occupation health</td>
<td>2</td>
</tr>
<tr>
<td>--home sanitation, zoonosis, rat control</td>
<td>2</td>
</tr>
<tr>
<td>--basic rural sanitation</td>
<td>7</td>
</tr>
</tbody>
</table>

**Hospital discharges per occupied bed-day** | 52 |

### Hospital Occupancy Rate

70%

### Composition of Dental Activities (Percentage of Total Activities)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fillings</td>
<td>60%</td>
</tr>
<tr>
<td>Extractions</td>
<td>20%</td>
</tr>
<tr>
<td>Other Activities</td>
<td>20%</td>
</tr>
</tbody>
</table>

### Personnel Time Per Final Service Instrument

- **One Nursing Hour Per Physician Hour** in Outpatient Consultations
- **Three Nursing Hours Per Occupied Bed-day**

**Source:** Valle, Servicio Seccional de Salud, *Plan de Salud 1974.*

(Author's translation.)
what are referred to by the Health Service as "mathematical models," by which is meant the statement of objectives in terms of service levels for disease categories. For instance, the hospitalization objective for gastroenteritis in 1973 was 6,361 hospital discharges. Further specification is provided by stating these objectives for each of the three techniques, i.e., curative, preventive, and control, and for each district. Thus, for gastroenteritis the curative technique was programmed to consist of the aforementioned discharges plus 71,325 outpatient medical consultations. Additionally, prevention was to consist of 122,557 units of sanitation inspector work. The objectives are expressed in both real and monetary units, and for only one year in the future. TABLE IV-5 presents some further examples of these objectives. The method of determining these demand-based health service objectives varies according to the final service. Hospitalization and outpatient medical consultations are based on the demand levels of the past five years, employing simple linear projections. Vaccination service objectives are based on population projections and coverage norms, an exception to the reliance on demand levels. Dental, nursing, and environmental health service objectives are formulated based on the availability of resources, an approach that is only slightly different from using demand levels. The observed incidence of tuberculosis and venereal disease in the previous year is the base for medical and nursing service objectives in these areas.

Most of these methods of objective-setting are self-explanatory. The method employed for environmental sanitation service objectives
TABLE IV-5
EXAMPLES OF HEALTH SERVICE OBJECTIVES AND
PROGRAM SERVICE TARGETS
VALLE HEALTH SERVICE -- 1973

A. Health Service Objectives

<table>
<thead>
<tr>
<th>Disease Category</th>
<th>Technique</th>
<th>Number of Activities</th>
<th>Number of Instruments</th>
<th>Total Cost (Pesos)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Tuberculosis</td>
<td>Curative</td>
<td>1,197 discharges</td>
<td>56,520 bed-days</td>
<td>4,455,167</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18,348 medical</td>
<td>3,670 physician hours</td>
<td>481,081</td>
</tr>
<tr>
<td></td>
<td></td>
<td>consultations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preventive</td>
<td></td>
<td>142,441 vaccine doses</td>
<td>14,247 vaccinator hours</td>
<td>308,423</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td>134,427 units of nursing work</td>
<td>29,326 nursing hours</td>
<td>638,026</td>
</tr>
<tr>
<td>24. Respiratory System Diseases</td>
<td>Curative</td>
<td>6,334 discharges</td>
<td>42,606 bed-days</td>
<td>6,503,255</td>
</tr>
<tr>
<td></td>
<td></td>
<td>157,990 medical</td>
<td>31,598 physician hours</td>
<td>4,293,878</td>
</tr>
<tr>
<td></td>
<td></td>
<td>consultations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38. Pre-partum, and post-partum control</td>
<td>Curative</td>
<td>118,662 medical</td>
<td>23,730 physician hours</td>
<td>3,141,017</td>
</tr>
<tr>
<td></td>
<td></td>
<td>consultations</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>67,216 units of nursing work</td>
<td>18,739 nursing hours</td>
<td>407,692</td>
</tr>
</tbody>
</table>
TABLE IV-5 (Continued)

B. Program Service Targets

<table>
<thead>
<tr>
<th>Subprogram</th>
<th>Number of Activities (Units of Nursing Work)</th>
<th>Number of Nursing Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuberculosis Control</td>
<td>132,446</td>
<td>26,483</td>
</tr>
<tr>
<td>Venereal Disease Control</td>
<td>44,707</td>
<td>8,942</td>
</tr>
<tr>
<td>Education and Supervision</td>
<td>5,868</td>
<td>8,422</td>
</tr>
<tr>
<td>Growth and Development</td>
<td>102,548</td>
<td>20,517</td>
</tr>
<tr>
<td>Pregnancy Control</td>
<td>65,950</td>
<td>16,922</td>
</tr>
<tr>
<td>Family Welfare</td>
<td>28,007</td>
<td>5,573</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>379,526</strong></td>
<td><strong>86,859</strong></td>
</tr>
</tbody>
</table>

provides an illustration of the less obvious available resources
method. The number of environmental sanitation instruments, i.e.,
inspector hours, that will be available given the existing resource
levels for each month of the year being planned is the base. Then,
the instruments required to attend the "fixed demands" are determined
by noting the number of cattle ranches, milk transports, milk vendors,
pasturizing facilities, food factories, fixed and ambulatory food
vendors, market plazas, slaughterhouses, dogs for rabies control,
establishments requiring rodent control, schools, non-hygienic facto­
ries, aqueducts, and sewer systems that were under control in the
previous year, or are newly designated for control. For each type of
subject, norms exist for the number of inspector visits each year
(see the examples in TABLE IV-4). Multiplying these intensity norms
by the number of subjects determines the number of activities needed
to meet the fixed demand. These activities are converted to inspector
hours by applying productivity norms. In addition, four hours per
week are assigned to office work. The number of inspector hours
available is then compared to the fixed demand, and if the latter is
greater then the need for additional manpower is defined. If the
quantity of available inspector hours is greater, then the remaining
hours are programmed for the control of non-hygienic homes, and health
and hygiene education courses and conferences. The excess hours
available for such activities varies from month to month. Although
this method of objective-setting for environmental sanitation services

22 See Valle, Servicio Seccional de Salud, Seccion Saneamiento Ambiental, Sistema de Programacion, pp. 4-9, and Appendix.
uses demand criteria to a large extent, it differs from the strictly demand-based approach for hospitalization and medical consultations services because some services are not viewed as a demand that must be met. In particular, the level of available resources constrains the number of hours dedicated to two services, i.e., non-hygienic home control and health education.

Several deficiencies of this method are evident. The principal problem is that the sanitation services are not programmed in terms of the health status effects of those diseases which relate to environmental factors. In light of the major health status problems indicated above, the low priority of health education and inspections of the home environment is inappropriate. With the essentially demand focus that the method represents, there appears little hope of changing these priorities using this method. Another difficulty centers on the neglect of the strategy issues, and the consequent acceptance of existing resource levels. The recommended approach is to define what services are needed to attack priority health status problems, and then attempt to influence the production of manpower and physical resources so that these service levels may be attained.

What are referred to as "goals" in the Health Service's planning are actually program service targets. These are stated in terms of the number of final service activities and instruments for each program and sub-program. The primary difference between these "goals" and the "mathematical models" is that the former are not disease-specific. TABLE IV-5 presents an example of these program service targets using the nursing program. These targets are set using the
same methods as the health service objectives, and thus are subject to the same criticisms.

With the 1974 plan, the Health Service has initiated a change in its approach to setting health service objectives. The shift is from service demand to coverage as the basic planning criteria. The health service objectives defined consist of the number of persons to be attended and the amount of final service activities and instruments needed to achieve coverage norms. These objectives are expressed by type of service and by population sub-group. For example, TABLE IV-6 presents the service objectives for outpatient medical consultations. The objectives are formulated by each health institution utilizing the aforementioned forms and instructions supplied by the Health Service.

The planning approach employed in formulating these objectives is described by the Health Service as follows:

This operational model (of planning) contemplates the formulation of programs according to needs, which are determined by coverage norms resulting from the analysis of the health situation and the policies that are adopted for reaching a desired health level, and programming based on available resources.

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23 The methodology applied in the 1974 plan was developed at the national level in Colombia by the two top technical administrators of the Valle Health Service, while on a year's leave to the Ministry of Health. See Himbad Gartner A. and Jaime Lasprilla J., Propuesta de un Sistema Nacional de Planeacion, Programacion, y Normas (Bogota: Ministerio de Salud Publica, Documento RSSC-10, Estudio del Rediseño del Sistema Nacional de Salud de Colombia, 1973).
### TABLE IV-6
HEALTH SERVICE OBJECTIVES FOR
OUTPATIENT MEDICAL CONSULTATIONS
VALLE HEALTH SERVICE—1974

<table>
<thead>
<tr>
<th>Population Group</th>
<th>Population to Attend</th>
<th>Activities (consultations)</th>
<th>Instruments (physician hours)</th>
<th>Total Cost (pesos)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preschool</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>— infants</td>
<td>59,338</td>
<td>116,728</td>
<td>23,344</td>
<td>4,279,685</td>
</tr>
<tr>
<td>— one to four years</td>
<td>156,189</td>
<td>195,264</td>
<td>39,052</td>
<td>7,164,460</td>
</tr>
<tr>
<td>School</td>
<td>164,305</td>
<td>167,298</td>
<td>33,459</td>
<td>6,757,835</td>
</tr>
<tr>
<td>Women in fertile age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>— pregnancies</td>
<td>49,279</td>
<td>140,172</td>
<td>28,031</td>
<td>6,694,574</td>
</tr>
<tr>
<td>— post-partum</td>
<td>9,093</td>
<td>9,093</td>
<td>1,821</td>
<td>260,297</td>
</tr>
<tr>
<td>— family welfare</td>
<td>22,188</td>
<td>43,896</td>
<td>8,776</td>
<td>1,374,639</td>
</tr>
<tr>
<td>Adult and Aged</td>
<td>506,805</td>
<td>610,365</td>
<td>125,977</td>
<td>25,615,164</td>
</tr>
<tr>
<td>Tuberculosis Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>— new patients</td>
<td>1,345</td>
<td>4,035</td>
<td>806</td>
<td>122,341</td>
</tr>
<tr>
<td>— old patients</td>
<td>2,629</td>
<td>5,258</td>
<td>1,052</td>
<td>156,646</td>
</tr>
<tr>
<td>Venereal Disease Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>— syphilis</td>
<td>7,903</td>
<td>23,719</td>
<td>4,741</td>
<td>1,071,816</td>
</tr>
<tr>
<td>— gonorrhea</td>
<td>11,943</td>
<td>23,986</td>
<td>4,794</td>
<td>999,111</td>
</tr>
<tr>
<td>— others</td>
<td>4,773</td>
<td>9,646</td>
<td>1,902</td>
<td>350,199</td>
</tr>
<tr>
<td>Total</td>
<td>995,790</td>
<td>1,349,360</td>
<td>273,762</td>
<td>54,846,772</td>
</tr>
</tbody>
</table>

Source: Valle, Servicio Seccional de Salud, Plan de Salud 1974, p. 84.
...this demonstrates the difference between what can be done and what is needed, a balance that serves as a base for the reformulation of policies and norms; for establishing programs of recruiting personnel; and, for redistributing available financial resources, or for assigning resources.\textsuperscript{24}

Thus, the coverage-based objectives are set, and then decisions are required whether to try to reach that objective or to reduce it in light of the resource constraints.

The objective-setting defines the Health Service's assigned population, and applying coverage and service intensity norms (\textsc{Table IV-4}). Population projections are used to determine the size of the assigned population by age groups. In addition, the incidence of tuberculosis and venereal disease, based on the reportable disease statistics of the Health Service, is used to project the number of cases to be covered in 1974. The number of tuberculosis cases being treated as of August, 1973 becomes the 1974 objective for patients needing continued treatment.

This method of service objective-setting is best portrayed in an illustration. The total Valle school-age population (5-14 years of age) is estimated at 646,230 in 1974. Applying the assigned population norms of 80 per cent in cities of less than 100,000 population and 60 per cent in cities with more than 100,000, the assigned school age population is 481,282 persons. Then, applying the coverage norm of 80 per cent of this assigned population gives a figure of 385,025

\textsuperscript{24}Valle, Servicio Seccional de Salud, \textit{Plan de Salud 1974}, p. 8. (Author's translation.)
persons to attend. Objectives are then determined in activity and instrument terms by applying the service intensity norms and productivity norms. Continuing the illustration, the intensity norm is one outpatient medical consultation per year for the school age population, so 385,025 consultations are needed. With the productivity norm of five consultations per physician hour, the number of physician hours needed is 77,005 hours. The total cost of these activities and instruments is estimated by applying the unit costs incurred in 1973. Service objectives for dental, nursing, and vaccination services are established in a similar manner. The objective-setting for environmental health services continues to be resource-based as described above.

For hospitalization services, the number of activities (discharges) is determined by applying norms for the ratio of outpatient medical consultations to hospital discharges to the formulated consultation objectives. For example, for the preschool age group the norm is one discharge per 15 consultations; thus the objective of 311,992 consultations translates into an objective of 20,799 discharges.

One of the differences from the earlier method of objective-setting is the expression of objectives by population subgroups. Actually, this does not represent a major refocusing of the planning; rather, it is an increase in the specificity of the earlier program rubrics. For hospitalization and outpatient medical consultation services, the difference is that the general medical care category is now disaggregated into two categories—school age, and adults and
aged; and the maternal and child health care category breaks down into two preschool categories—infants, and one to four years—and then into three women-in-fertile-age categories—pregnancy, postpartum, and family welfare. Dental service goals are specified for three new categories, and all categories are differentiated for the population under and over 15 years of age. Vaccination, nursing, and environmental sanitation services goals maintain nearly the same categories in the two methods.

The establishment of the coverage norms represents progress toward the recommended health needs—based planning, meaning that the population's health needs are examined and a decision is made on the level of service coverage needed to address these needs. For instance, the norm of four consultations for 80 per cent of the infants in cities of less than 100,000 population and 60 per cent of the infants in those more than 100,000 manifests a normative goal based on a judgment of the needs of this population. An exception is the hospitalization norm, which reflects demand criteria. For example, the hospitalization norm for adults of one discharge per fifteen outpatient medical consultations represents past demand levels.

Many of these coverage-based service objectives, however, were adjusted in practice to reflect judgments of resource availability. Since an expected result of the earlier demand-based programming is that current resource availability is closely tied to past service demand levels, demand continues to be a greater influence on service objectives than coverage norms, especially in outpatient medical consultations and hospitalization. This observation is very important
since these two services receive such a large proportion of the Health Service's financial resources; viz., 78.3 per cent of the operating budget in 1972. Regarding outpatient consultations, applying the coverage and intensity norms expressed in the plan to the assigned population yields an objective that is 73 per cent larger than the objective actually stated in the plan (TABLE IV-7). Most of this difference is attributable to the difference in the one to four years of age population category. The hospitalization service objectives should be based on consultation objectives. Applying the norms for number of consultations per discharge to the consultation objectives expressed in the plan yields a discharge objective that is 55 per cent greater than that actually expressed in (TABLE IV-8). Applying the norm-based consultation objective instead of that expressed in the plan, gives a discharge objective that is 168 per cent greater than the one actually expressed. In contrast to these large differences between the objectives derived from the expressed coverage norms and those actually established in the plan, the 1974 plan's objectives for hospitalization and consultations are much closer to the demand levels observed in 1973 (TABLE IV-9). The 1974 objective for discharges is 13.7 per cent greater than the demand-level for 1973; and, the 1974 consultation objective is 10.8 per cent greater. These increases are generally consistent with those observed throughout the planning period.

In the nursing and dental service areas, however, the shift to coverage goals-based planning is real in the sense that the resultant service objectives bear a closer relation to the coverage goals than
TABLE IV-7

OBJECTIVE SETTING FOR

OUTPATIENT MEDICAL CONSULTATIONS USING COVERAGE CRITERIA

VALLE HEALTH SERVICE--1974

<table>
<thead>
<tr>
<th>(1) Assigned Population (plan)</th>
<th>(2) Coverage Norm</th>
<th>(3) Population to Attend-Norm (1 x 2)</th>
<th>(4) Population to Attend-Objective (plan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preschool</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--infants</td>
<td>62,330</td>
<td>100%</td>
<td>62,330</td>
</tr>
<tr>
<td>--one to four years</td>
<td>235,447</td>
<td>100%</td>
<td>235,447</td>
</tr>
<tr>
<td>School</td>
<td>481,282</td>
<td>80%</td>
<td>385,026</td>
</tr>
<tr>
<td>Women in fertile age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--pregnancies</td>
<td>73,269</td>
<td>80%</td>
<td>58,615</td>
</tr>
<tr>
<td>--post-partum</td>
<td>63,834</td>
<td>80%</td>
<td>51,067</td>
</tr>
<tr>
<td>--family welfare</td>
<td>56,452</td>
<td>80%</td>
<td>45,162</td>
</tr>
<tr>
<td>Adults and Aged</td>
<td>962,508</td>
<td>80%</td>
<td>770,006</td>
</tr>
<tr>
<td>Tuberculosis control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--new patients</td>
<td>1,345</td>
<td>100%</td>
<td>1,345</td>
</tr>
<tr>
<td>--old patients</td>
<td>2,629</td>
<td>100%</td>
<td>2,629</td>
</tr>
<tr>
<td>Venereal Disease control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--syphilis</td>
<td>7,903</td>
<td>100%</td>
<td>7,903</td>
</tr>
<tr>
<td>--gonorrhea</td>
<td>11,943</td>
<td>100%</td>
<td>11,943</td>
</tr>
<tr>
<td>--others</td>
<td>4,773</td>
<td>100%</td>
<td>4,773</td>
</tr>
<tr>
<td>Total</td>
<td>1,964,075</td>
<td></td>
<td>1,636,246&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> 64.3% greater than plan (4).

(Continued)
TABLE IV-7 (Continued)

<table>
<thead>
<tr>
<th></th>
<th>(5)</th>
<th>(6) Activities--</th>
<th>(7) Activities--</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intensity Norms</td>
<td>Norm-based (3 X 5)</td>
<td>Objective in Plan</td>
</tr>
<tr>
<td>Preschool</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--infants</td>
<td>4</td>
<td>249,320</td>
<td>116,728</td>
</tr>
<tr>
<td>--one to four years</td>
<td>3</td>
<td>706,341</td>
<td>195,264</td>
</tr>
<tr>
<td>School</td>
<td>1</td>
<td>164,305</td>
<td>167,298</td>
</tr>
<tr>
<td>Women in fertile age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--pregnancies</td>
<td>4</td>
<td>234,460</td>
<td>140,172</td>
</tr>
<tr>
<td>--post-partum</td>
<td>1</td>
<td>51,067</td>
<td>9,093</td>
</tr>
<tr>
<td>--family welfare</td>
<td>2</td>
<td>90,324</td>
<td>43,896</td>
</tr>
<tr>
<td>Adult and Aged</td>
<td>1</td>
<td>770,006</td>
<td>610,365</td>
</tr>
<tr>
<td>Tuberculosis control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--new patients</td>
<td>6</td>
<td>8,070</td>
<td>4,035</td>
</tr>
<tr>
<td>--old patients</td>
<td>2</td>
<td>5,258</td>
<td>5,258</td>
</tr>
<tr>
<td>Venereal Disease control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--syphilis</td>
<td>3</td>
<td>23,709</td>
<td>23,719</td>
</tr>
<tr>
<td>--gonorrhea</td>
<td>2</td>
<td>23,886</td>
<td>23,986</td>
</tr>
<tr>
<td>--others</td>
<td>2</td>
<td>9,546</td>
<td>9,546</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>2,336,292</td>
<td>1,349,360</td>
</tr>
</tbody>
</table>

b73.1% greater than plan (7).

### TABLE IV-8

**OBJECTIVE-SETTING FOR HOSPITALIZATION**

**VALLE HEALTH SERVICE—1974**

<table>
<thead>
<tr>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Consultations--Plan</td>
<td>Number of Consultations--Planning Norms</td>
<td>Norms for Consultations/Discharges</td>
<td>Discharges Plan and Hospital Norm</td>
</tr>
<tr>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
<td>(8)</td>
</tr>
<tr>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Preschool</td>
<td>311,992</td>
<td>955,661</td>
<td>15</td>
</tr>
<tr>
<td>School</td>
<td>167,298</td>
<td>164,305</td>
<td>25</td>
</tr>
<tr>
<td>Women in fertile age</td>
<td>140,172</td>
<td>234,460</td>
<td>2</td>
</tr>
<tr>
<td>Adults and Aged</td>
<td>610,365</td>
<td>770,006</td>
<td>15</td>
</tr>
<tr>
<td>Tuberculosis Cases</td>
<td>9,293</td>
<td>13,328</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>1,239,120</td>
<td>2,137,760</td>
<td>138,73^</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharges--Both Norms (2 X 3)</td>
<td>Discharges--Plan</td>
<td>Average Length of Stay</td>
<td>Bed-Days--Norms (6 X 7)</td>
<td>Bed-Days--Plan</td>
</tr>
<tr>
<td>Preschool</td>
<td>63,711</td>
<td>14,776</td>
<td>7</td>
<td>103,432</td>
</tr>
<tr>
<td>School</td>
<td>6,572</td>
<td>6,266</td>
<td>7</td>
<td>43,862</td>
</tr>
<tr>
<td>Women in fertile age</td>
<td>117,230</td>
<td>32,747</td>
<td>2</td>
<td>65,494</td>
</tr>
<tr>
<td>Adults and Aged</td>
<td>51,334</td>
<td>34,926</td>
<td>7</td>
<td>244,482</td>
</tr>
<tr>
<td>Tuberculosis cases</td>
<td>666</td>
<td>699</td>
<td>40</td>
<td>27,960</td>
</tr>
<tr>
<td>Total</td>
<td>239,513^</td>
<td>89,414</td>
<td>485,230^</td>
<td>578,188</td>
</tr>
</tbody>
</table>

^55.2% greater than plan (6).
^167.9% greater than plan (6).
^16.1% less than plan (9).

TABLE IV-9
COMPARISON OF ACTUAL ACTIVITY AND INSTRUMENT LEVELS WITH OBJECTIVES
VALLE HEALTH SERVICE--1973-74

<table>
<thead>
<tr>
<th>Instruments</th>
<th>1973 Actual</th>
<th>1974 Objective</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitalization</td>
<td>558,716</td>
<td>578,188</td>
<td>+ 3.5</td>
</tr>
<tr>
<td>Medical Consultation</td>
<td>a</td>
<td>273,762</td>
<td></td>
</tr>
<tr>
<td>Dental</td>
<td>68,649</td>
<td>107,000</td>
<td>+ 55.9</td>
</tr>
<tr>
<td>Vaccination</td>
<td>24,211</td>
<td>48,294</td>
<td>+ 99.5</td>
</tr>
<tr>
<td>Nursing</td>
<td>65,582</td>
<td>192,341</td>
<td>+ 193.3</td>
</tr>
<tr>
<td>Environmental Sanitation</td>
<td>187,488</td>
<td>222,365</td>
<td>+ 18.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activities</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitalization</td>
<td>78,614</td>
<td>89,414</td>
<td>+ 13.7</td>
</tr>
<tr>
<td>Medical Consultation</td>
<td>1,217,554</td>
<td>1,349,360</td>
<td>+ 10.8</td>
</tr>
<tr>
<td>Dental</td>
<td>552,832</td>
<td>1,020,000</td>
<td>+ 84.5</td>
</tr>
<tr>
<td>Vaccination</td>
<td>423,238</td>
<td>386,322</td>
<td>- 8.7</td>
</tr>
<tr>
<td>Nursing</td>
<td>308,240</td>
<td>681,827</td>
<td>+ 121.2</td>
</tr>
<tr>
<td>Environmental Sanitation</td>
<td>298,977</td>
<td>248,905</td>
<td>- 16.7</td>
</tr>
</tbody>
</table>

aData not available.

to past performance (demand levels). This contrasts with the finding regarding the hospitalization and outpatient medical consultation services. The dental activity objective is 84.5 per cent greater than the actual 1973 level, and the dental instrument objective is 55.9 per cent greater. Even more dramatically, the nursing activity and instrument objectives represent increases of 121.2 per cent and 193.3 per cent respectively. In light of the separation of resource objective-setting from that for services, it is doubtful that these large increases in the nursing and dental services will be attained.

Examining the increased nursing objectives reveals that the application of coverage norms to infants, children one to four years old, and pregnancies explains most of the increase. The 1974 plan states that the coverage of the dental program was 3.8 per cent in 1972. The coverage norm for the 1974 dental objectives is 20 per cent of the assigned population, and although it was not adhered to strictly in the objective-setting, a considerable increase in coverage was programmed.

Health Resources Objective-Setting

The planning process of the Health Service also has formulated health resource objectives for manpower training and physical capital investment. But the establishment of these resource objectives has been isolated from the health services objective-setting discussed above. Manpower training objectives state the number of persons to receive training courses in the coming year, according to the type of personnel and training. These courses are short-term, ranging from several days to one year, and involve continuing education of
professionals, and formation of allied health personnel, mainly auxiliary nurses and health promoters. The objectives for professional training are formulated considering the number of scholarships made available to the Health Service by the National Ministry or other organizations. For allied health personnel, Ministry goals and scholarship levels are utilized in conjunction with the personnel requests submitted annually by each institution to the Health Service. The health service objectives are expressed in terms of personnel time requirements, which may be utilized for comparison to the hospital's personnel request and adjustments made. Such an analysis, however, is not expressed in the planning documents; and the manpower training objectives in the plans do not appear to be strongly influenced by the health service objectives. For example, the difference between the 1974 nursing services objective and the 1973 actual level requires about 63 new nurse auxiliary equivalents, but the training objectives in the plan do not reflect this manpower need. The Health Service is not explicitly involved in planning the formation of such professionals as doctors and nurses, thus causing a major limitation on the range of its manpower planning.

Another type of resource objective utilized expresses future investment levels for the construction or remodeling of hospitals, health centers, public market places, slaughter houses, and water supply or sewage systems. There is considerable variation among

25 To convert nursing hours to nurse equivalents, it is assumed that 2,000 hours are worked by one person in a year.
the health plans concerning the types of construction projects for which objectives are set, and also the time frame varies from one to ten years into the future. Planning for hospital and health center construction and remodeling is one of the few examples of long-term planning by the Health Service. Construction plans for new facilities are generated at the state level, but must then go to the National Hospital Fund of the Ministry of Health for action. Emphasis in the facilities planning of the Health Service has been on finishing on-going construction projects, and equipping and upgrading existing facilities. Another basic guideline is to give priority to the eight regional hospitals. With these basic policies providing the decision guidelines, along with the inevitable consideration of the political pressures from local levels, the available financial resources are estimated and the priority investment projects are specified.

As an illustration of the investment planning, the 1974 plan specifies fourteen facilities investment projects, and sets the 1982 objectives for the number of beds in each institution. Only one project is to construct a new hospital— one of 300 beds for Cali. The plan specifies the amount of money already invested through 1973 in each project, and the amount needed to complete the project. Then, considering the financial resources that should be available largely from the State Lottery and the Ministry, investment objectives are set for 1974, 1975, and 1976. The amount necessary to complete projects beyond 1976 is also stated.

Investment planning for environmental sanitation projects is based similarly on estimates of available financial resources. These
objectives, however, are shorter range, usually only for the following year. The major projects are rural aqueducts and sewage systems, whose financing is through the National Institute for Special Health Projects (INFES) of the Health Ministry, with a small percentage to be supplied by the beneficiary community. Both the construction of new systems and the enlargement and repair of existing systems are included in the projects. Projects are developed based on coverage, by which is meant the number of persons without hygienic water or sewage systems that will benefit from the project. The political factor also plays a major role, both through political pressure on the Health Service and the success of political bodies in collecting the community's share of the project financing.

In light of this consideration of how the Health Service has programmed its health services and resources, it becomes apparent that only a few of the expressed efficiency and resource goals have received much operational attention (see TABLES IV-1 and IV-2). Those goals referring to satisfying the demand for services have been given operational preference. Other goals which have also been given considerable attention include increasing productivity, lowering service costs, and improving the information on productivity and costs.

In summary, objective-setting for health services and resources is the principal activity in the planning process practiced by the Valle Health Service. Service demand levels are the basis for setting service objectives, with the exception of the 1974 plan which gives greater emphasis to the use of coverage norms, especially for the dental and nursing services. Resource objectives are formulated
for manpower and facilities, and are based largely on estimates of financial resources for training and construction. A principal planning problem is the failure to translate service objectives into the resource levels needed for their attainment. This implies that problems will be encountered in implementing any significant increases in the service levels expressed in these objectives due to the failure to obtain adequate resources. Health status objectives have been established in terms of mortality reduction for selected diseases, but such objectives receive little attention and are not utilized to determine service or resource objectives.

Once the service and resource objectives are established, they are expressed for each institution in the published health plans. It is the responsibility of the institution to see that they are fulfilled, thus indicating the exclusion of an implementation strategy as a planning activity. Important parts of such a strategy include program budgeting, the participation of administrators and consumers in the planning process, and the analysis of feasibility as part of programming. In practice, the Health Service does poorly on all of these counts. This suggests the neglect of the implementation activity and implies that planned objectives may not be achieved if they deviate too far from those attained in the past.

Attention to System Effectiveness

An important question regarding the observed failure to study alternative programs is whether the analytical underpinnings exist for such a planning activity. A major part of this analysis, as promoted in this study's conceptual framework, should involve the
evaluation of the effectiveness of the health system. Estimating the
effect of services on health status was discussed earlier as perhaps
the most difficult aspect of health planning. But this does not
diminish the need to try to specify these linkages in practice. The
Health Service's planning devoted considerable attention to analyzing
effectiveness in its first Plan, but since then this concern has
waned. This declining attention to system effectiveness is a major
reason why planning fails to stimulate the consideration of changes in
the existing system.

The 1968 plan studied health needs and service effectiveness in
its attempt to apply the CENDES planning methodology. The CENDES cri-
teria of magnitude, vulnerability, and importance were utilized to
identify priority diseases. The practiced method considered only
those disease categories termed reducible or vulnerable, relegating
the remaining categories to demand criteria. Vulnerability meant
that the diseases were preventible given existing technology, and the
resultant dichotomous classification appears to have been more depend­
ent upon the guidelines of such organizations as the Pan American
Health Organization, than on research by the Colombian Ministry of
Health or the Valle Health Service. Furthermore, this vulnerability
assessment, which continues to be expressed in the plans, is quite
traditional because it is based solely on infectious or communicable
diseases, and does not reflect the recent research advances in epi­
demiology and public health.

Each vulnerable disease category was ranked based on magnitude
and importance. Magnitude was expressed as the number of deaths for
each disease and age category. Importance was assessed reflecting economic criteria, since the highest value in the priority-setting was assigned to the working age population. In the method employed, a value of 0.75 was assigned to deaths in the age category 0 to 14 years, 1.00 to that of 15 to 44 years, and 0.50 to that of 45 or more years. The quantitative statement of magnitude times importance was the numerator of the priority-determining fraction. The denominator was a cost/effectiveness estimate.

The analysis of costs and effects that was operationalized also was based on the CENDES method. Costs were determined for final services considering only operating costs. Effects were estimated in several manners: (1) persons attended; (2) persons protected; (3) cases cured; and, (4) deaths avoided. The number of persons attended in each of the thirty-two disease categories was used to measure the effects of curative techniques, and determining the cost per person attended was relatively straightforward. To estimate the cost per case cured, again referring to curative services, probabilities of cure with or without treatment were employed. The probabilities adopted by the Health Service were compiled by other organizations outside of Valle from surveys of experts, PAHO recommendations, texts and other references. Only fourteen of the thirty-two disease categories.

26. These coefficients differ from those presented in the CENDES method by giving greater priority to the working age population than the population under fourteen years; see Ahumada, and others, *Health Planning*, p. 27.

27. For an illustrative list of these probabilities, see Ospina and others, *Planificacion de la Salud*, pp. 87-88.
categories were used in determining costs per case cured, reflecting the decision that certain categories were not curable. This practice is a substantial improvement over the CENDES methodology as originally published, which assumed that each case treated was cured. Estimating the deaths avoided through preventive or curative actions also depended upon disease-specific probabilities of death with or without treatment. Again, this goes beyond CENDES, which estimates the number of deaths avoided only for those diseases which may be addressed by preventive services. For preventive services, the cost per person protected was also estimated. The assumption was made that each person receiving vaccinations was protected; and, for environmental health services it was assumed that each person newly covered by hygienic water and sewage systems was protected against certain diseases, for example gastroenteritis.

Returning to the subject of disease priority-setting, the denominator of the priority formula was the cost per death avoided. To be eligible for this priority ranking, the disease had to have been previously classified as vulnerable (reducible). Then the decision was whether to use the cost per death avoided for preventive measures or curative measures. For example, for tetanus the cost per death avoided by preventive techniques was estimated to be 1,077.85 pesos, and by curative techniques it was 1,065.34 pesos. In general, the cost for preventive techniques was utilized if available. In two cases, malnutrition and polio, the cost for curative techniques was employed because no estimate was made of cost for preventive techniques. In the case of tetanus, the cost for curative techniques was
utilized, and no reason was given for this decision.28

This use of the CENDES method represents the recognition of effectiveness problems, and some analysis of them, and incorporates the concepts of vulnerability and levels of intervention. That the planning practice did address these issues is a positive finding. The analysis was not meaningful, however, because the past performance of the Valle health system was not assessed. Instead, general effectiveness coefficients that were developed outside of Valle were applied. To illustrate, consider the respiratory system disease category and assume that the projected number of cases is 1,009. The probability of cure with treatment is assumed to be 0.99, and without treatment to be 0.95. Applying the difference to the patient population yields about forty additional patients cured by having the treatment program. A similar exercise results in an estimated ten deaths avoided.29 While this example is taken from a planning text used in Colombia during the period in which the Health Service's 1968 health plan was prepared, and not from the plan itself, it demonstrates the problem. The point is that the past effectiveness of the health system in Valle in treating this disease category is not examined and compared to the non-Valle probabilities actually used in this planning step. Such cost/effectiveness analysis was included only in the planning that resulted in the 1968 plan.


29See Ospina, and others, Planificacion de la Salud, p. 84.
Following the CENDES guidelines, health services are described by their function. Three categories of techniques or functions are utilized—prevention, control, and cure (see FIGURE IV-2). While this is a commendable practice, it could be improved because the number of function categories is small and they do not reflect the full concept of levels of intervention. For instance, primary and secondary intervention functions are not distinguished. Another difficulty is that the categories are exclusive, e.g., all physician services are curative and all the nursing services have the control function. A more meaningful analysis would be promoted if the services were disaggregated at least by the three intervention levels. In this manner, for example, physician services for disease screening would be distinguished from curative services.

To conclude, the Health Service has related health services to disease categories using the CENDES methodology. This has been accomplished utilizing the concepts of vulnerability, service functions, and cost/effectiveness analysis. Such a linkage of services to disease categories represents a first step in analyzing service effectiveness. However, the analysis has not been carried further, since the recommended attempts to examine disease-specific health status variations in Valle and relate them to changes in levels of services delivered have not been operationalized. Furthermore, the current planning practice has discontinued this attention to effectiveness, because of the decision to further emphasize service demand levels. This lack of concern with effectiveness helps explain why planning fails to identify and analyze alternative programs. Setting
objectives based on demand levels apparently has created little motivation for changes in the health system.

Limited Comprehensiveness

Another important shortcoming in the observed planning practice is the limited comprehensiveness of the Health Service's definition of the health system. This is also a major obstacle to the analysis of alternative programs since the most effective means of intervening in many of the major health status problems in Valle are outside the Health Service's selected parameters. These health system parameters do include both environmental and personal health services, the latter of which includes both inpatient and ambulatory services. But the system definition is not comprehensive enough to include the health-related services of other sectors. Given the health problems indicated by the mortality statistics presented in TABLES III-1-3, the exclusion of such services hinders effective planning, since many of the indicated health status problems are best attacked by a comprehensive set of activities. The above-discussed lack of concern with effectiveness relates closely to this limited comprehensiveness. It should be noted that this problem of limited comprehensiveness is characteristic of most health systems, whether in Latin America or elsewhere. This is a primary reason why intersectoral efforts to attack such disease problems as malnutrition, accidents, tuberculosis, and parasitic infections are scarce.

The environmental profile prepared for the Health Service's planning indicates this limited comprehensiveness. The profile
concentrates on the coverage of water and sewage systems, and home or institutional hygiene. The proportion of the rural and urban populations with a water supply system is determined for each district, as well as that with a hygienic system for human waste disposal.

Participation in a national rabies control program in 1971 to 1974 led to the collection of data on the canine population and the coverage with rabies vaccine. Information on the sanitary condition of homes includes a categorization of each home as hygienic or non-hygienic. Also, for each home information is collected on type of water supply connection, type of sewage disposal system, and whether the kitchen is hygienic. This information is available only for those homes visited by the Health Service's environmental sanitation inspectors, and in 1972 the homes of only about one third of the Valle population were inspected. Information is also collected on the sanitary conditions of such institutions as milk and meat vendors, restaurants, public marketplaces, food factories, food storage areas, slaughter houses, milk processing plants, schools, industries, hotels, barbershops, and hospitals. Inspection coverage varies, but food-related institutions have the highest coverage.

Even granting that water supply and sewage disposal are perhaps the most important health-related environmental aspects in a country like Colombia, other environmental factors, such as garbage collection and disposal coverage, air and water quality, protein and

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30 See Valle, Servicio Seccional de Salud, Seccion Saneamiento Ambiental, Sistema de Programacion y Evaluacion (Cali: El Servicio, 1970), Cuadros 1 y 1A.
calorie availability, food quality, among others, are also important. The lack of these and other types of environmental data points to the incompleteness of this descriptive profile, and contributes to maintaining the relatively narrow health system parameters employed by the Health Service.

The conclusion of the Chapter, therefore, is that the Valle Health Service has implemented a health planning process that does not carry out all of the basic planning activities. The observed process focuses on achieving an improved understanding of the health system, but it does little to promote intervention. This understanding is generated by the health system description and the objective-setting based on service demand levels. Intervention is overlooked, as demonstrated by the general failure to state priorities or derive objectives from the stated goals and the neglect of alternative program analysis. The failure to evaluate existing programs explicitly in health status terms, as well as the system's operations in general in terms of both effectiveness and efficiency, is a basic deficiency which results in little motivation toward planned changes.
CHAPTER V

THE EFFECTS OF HEALTH PLANNING

An evaluation of health planning practice is not complete without investigating its effects. What has occurred in the health system of the Valle Health Service since planning began must be related to the practice of planning. Such an exercise may then generate prescriptions regarding how planning may be improved. The rationale underlying these prescriptions is predicated on the opportunity costs associated with current planning practice. The purpose of this Chapter is to assess the principal effects of planning by comparing observed effects to these opportunity costs.

In seeking to link changes in the health system to planning actions, the approach employed here is to examine the changes that are apparent over the period studies and to make a reasoned judgment concerning planning's role. Where it appears reasonable that planning has contributed to a positive health system change, then the planning is judged favorably. Where a planning deficiency is associated with the persistence of a problem, then the planning is deemed deficient and improvement is sought. It is not necessary to reach the precision of cause and effect relationships in studying health planning effects. The observed phenomena in this case study are much too complex to permit such a rigorous retrospective investigation. Furthermore, since the major part of the health information system of the Health Service was established concurrently with the planning, there is
little pre-planning health services data to which comparisons could be made.

Furthermore, this identification of health system changes is not exhaustive. Only those changes considered of primary importance and potentially responsive to planning actions are discussed. It is apparent, for example, that the data archives of the Health Service have been improved markedly during the period studied, and this relates to the information requirements imposed by the planning process. This change, however, is not discussed because its importance is relatively minor. Also, the problem of extremely slow hospital construction may be noted; but, this is an illustration of political and entrepreneurial behavior, and thus is not immediately vulnerable to changes in planning practice. This problem, therefore, is also not considered in the discussion below.

Productivity Improvements

Health planning practice in the Valle Health Service is characterized by its limited set of health service objectives relating exclusively to efficiency concerns such as productivity and costs. These characteristics reflect planning's focus on meeting the demand for existing services. Given such emphasis, it is reasonable to expect that planning's major effects have occurred along these dimensions. This is the case, as planning is linked closely to progress in service levels, productivity and costs. Progress is noted in the amount of services produced over the period studied, and these changes reflect the influence of the health service objectives. Productivity increases permit these growing service levels despite stable or
diminishing quantities of resources. Cost behavior reflects the productivity trends and exhibits evidence of control. These findings are best demonstrated by discussing each final service separately.

Hospitalization services have increased steadily throughout the planning period, but at a pace which barely matches the population growth. The number of hospital discharges is 20.2 per cent greater in 1973 than the 1966 base year (see TABLE V-1). This increase was accomplished in spite of the diminishing number of occupied bed-days, which fell 8.5 per cent from 1966 to 1973. Planning's objectives exhibit similar trends, although the desired increase in discharges is 42.7 per cent instead of the 20.2 per cent increase that was accomplished. The objectives for bed-days also show a large decreasing trend, although the 1973 objective is 8.7 per cent greater than the 1966 observed level. Increases in hospital productivity explain the increase in discharges despite the decreasing bed-days. From 1966 to 1972, the annual number of discharges per hospital bed rose from 22.0 to 31.6, and the average length of stay declined from 9.3 days in 1966 to 7.2 days in 1972. The relatively stable hospital occupancy rates support this interpretation of the role of the productivity increases. Such productivity improvements are also related to the observed progress in controlling hospitalization costs. While the adjusted cost per hospital bed-day increased 8.6 per cent from 1968 to 1972, the cost per discharge decreased 13.3 per cent. 1 But the

1The 1968 base year is utilized for cost studies instead of 1966 because of information deficiencies.
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital Discharges</td>
<td>65,379</td>
<td>66,471</td>
<td>65,177</td>
<td>68,953</td>
<td>71,110</td>
<td>77,918</td>
<td>79,495</td>
<td>78,614</td>
<td>+ 20.2</td>
</tr>
<tr>
<td>Coverage</td>
<td>32.7</td>
<td>35.0</td>
<td>33.8</td>
<td>32.7</td>
<td>35.0</td>
<td>33.8</td>
<td>32.7</td>
<td>35.0</td>
<td>33.8</td>
</tr>
<tr>
<td>Percentage Occupancy</td>
<td>55.8</td>
<td>65.1</td>
<td>62.9</td>
<td>62.9</td>
<td>61.1</td>
<td>63.7</td>
<td>62.1</td>
<td>5.1</td>
<td>66-72</td>
</tr>
<tr>
<td>Average Length of Stay</td>
<td>9.3</td>
<td>9.5</td>
<td>9.0</td>
<td>8.5</td>
<td>7.7</td>
<td>7.4</td>
<td>7.2</td>
<td>22.6</td>
<td>66-72</td>
</tr>
<tr>
<td>Productivity (Dischgs./Bed)</td>
<td>22.0</td>
<td>25.0</td>
<td>25.5</td>
<td>27.0</td>
<td>28.7</td>
<td>31.3</td>
<td>31.6</td>
<td>43.6</td>
<td>66-72</td>
</tr>
<tr>
<td>Average Cost per Bed-day</td>
<td>87.89b</td>
<td>86.45</td>
<td>107.54</td>
<td>100.36</td>
<td>95.43</td>
<td>+ 8.6</td>
<td>68-72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Cost per Discharge</td>
<td>793.07b</td>
<td>734.73</td>
<td>831.64</td>
<td>742.65</td>
<td>687.88</td>
<td>- 13.3</td>
<td>68-72</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Numbers in parentheses represent the ratio of actual levels to objectives.

Costs are in Colombian pesos adjusted to 1968 values (about seventeen pesos to one U.S. dollar).

Source: Valle, Servicio Seccional de Salud, Planes de Salud.
ascending productivity has not been great enough to increase the level of hospital discharges relative to the population and its growth, as indicated by the stability in coverage, i.e., the discharges to population ratio.

The outpatient medical services exhibit a pattern of changes similar to hospitalization. Services have increased steadily, as the number of consultations climbed 53.2 per cent from 1966 to 1972 (See TABLE V-2). Yet the number of physician hours has declined uniformly, and the 1972 level is 12.3 per cent less than that of 1966. Again, this behavior reflects the trends in planning's objectives. In this case, however, the implementation has exceeded planning's objectives, as the planned increase for consultations is 36.3 per cent, which is less than the 53.1 per cent increase actually achieved. Similarly, the decrease in physician hours parallels the objectives, and comparatively the planned decline of 21.1 per cent is larger than the 12.3 per cent actually observed. Productivity increases permitted this increase in consultations while physician hours were dwindling. In 1966, the number of consultations per physician hour was 2.3 but by 1972 the productivity has climbed to 4.1. This improved productivity is also linked to cost behavior. While the adjusted average cost per physician hour rose 38.5 per cent from 1968 to 1972, the cost per consultation was quite stable as it increased only three per cent in this five-year period. Such increased productivity and service levels have served to maintain relatively stable coverage levels despite the population growth. The number of consultations produced has climbed more rapidly than the estimated population increase.
<table>
<thead>
<tr>
<th>TABLE V-2</th>
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</thead>
<tbody>
<tr>
<td>OUTPATIENT MEDICAL SERVICES AND EFFICIENCY</td>
</tr>
<tr>
<td>VALLE HEALTH SERVICE 1966-1972</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Consultations</td>
</tr>
<tr>
<td>Physician Hours</td>
</tr>
<tr>
<td>Average Cost per Consultant</td>
</tr>
<tr>
<td>Avg. Cost per Physician Hour</td>
</tr>
<tr>
<td>Productivity (Consult/Hour)</td>
</tr>
<tr>
<td>Coverage (Percentage)</td>
</tr>
<tr>
<td>Intensity</td>
</tr>
</tbody>
</table>

Numbers in parentheses represent the ratio of actual levels to objectives.
Costs are in Colombian pesos adjusted to 1968 values.
Number of consultations per (patient) consultant.

Source: Valle, Servicio Seccional de Salud, Planes de Salud.
(53.2 per cent increase in consultations versus 19.2 per cent increase in population), but the coverage has increased only slightly (see TABLE V-2). One possible explanation is an increase in the intensity (number of consultations per consultant) of services, but the information for a definitive analysis is incomplete.

Dental services manifest a more erratic behavior than either hospitalization or outpatient medical services. The 1973 levels, nevertheless, exhibit large increases over the 1966 levels (see TABLE V-3). This irregular behavior indicates planning's lack of control, as do the large variations in the relationship between planned and observed service levels. The number of dental work units increased 67.5 per cent during this eight-year period, while the number of dental hours increased 28.8 per cent. Both of these increases follow the trend of planning's dental service objectives; however, the planned increases were much larger. For dental work units the planned increase is 130.4 per cent compared to the 67.5 per cent achieved, and for dental hours the planned increase is 47.3 per cent compared to the observed 28.8 per cent. As with the previously discussed services, the dental service has improved its productivity and this is a major factor related to the much greater increase in dental work units than in dental hours. The number of work units produced per dental hour increased from 6.2 in 1966 to 8.1 in 1973. Despite this substantial productivity increase, however, the adjusted cost per unit of dental work increased 23.3 per cent from 1968 to 1972, and the cost per dental hour increased 42.1 per cent during the same period. This cost increase is largely explained by the shift in the types of dental
TABLE V-3
DENTAL SERVICES AND EFFICIENCY
VALLE HEALTH SERVICE 1966-1973

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</tr>
</thead>
<tbody>
<tr>
<td>Dental Work Units (UTO)</td>
<td>330,037</td>
<td>309,516</td>
<td>444,518 (1.13)a</td>
<td>364,265 (0.82)</td>
<td>517,474 (0.71)</td>
<td>468,670 (0.89)</td>
<td>482,920 (0.73)</td>
<td>552,832 (0.73)</td>
<td>+ 67.5</td>
</tr>
<tr>
<td>Dental Hours</td>
<td>53,310</td>
<td>59,771</td>
<td>72,161 (1.47)</td>
<td>55,173 (1.00)</td>
<td>64,461 (0.71)</td>
<td>65,967 (1.00)</td>
<td>60,379 (0.73)</td>
<td>68,649 (0.87)</td>
<td>+ 28.8</td>
</tr>
<tr>
<td>Average Cost per UTO</td>
<td>7.76b</td>
<td>9.57</td>
<td>7.38</td>
<td>8.17</td>
<td>9.57</td>
<td>+ 23.3 (68-72)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Cost per Dental Hour</td>
<td>47.84b</td>
<td>63.16</td>
<td>60.68</td>
<td>58.06</td>
<td>68.00</td>
<td>+ 42.1 (68-72)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Productivity (UTO/Dental Hr.)</td>
<td>6.2</td>
<td>5.2</td>
<td>6.2</td>
<td>6.6</td>
<td>8.0</td>
<td>7.1</td>
<td>8.0</td>
<td>8.1</td>
<td>+ 30.6</td>
</tr>
<tr>
<td>Coverage (Percentage)</td>
<td>2.9</td>
<td>3.3</td>
<td>3.9</td>
<td></td>
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<tr>
<td>Percentage Extractions</td>
<td>42.3</td>
<td>31.0</td>
<td>31.7</td>
<td>19.3</td>
<td>32.0</td>
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</tbody>
</table>

aNumbers in parentheses represent the ratio of actual levels to objectives.
bCosts are in Colombian pesos adjusted to 1968 values.

Source: Valle, Servicio Seccional de Salud, Planes de Salud.
activities performed from extractions to the more costly services, like fillings. The percentage of work units devoted to extractions fell from 42.3 per cent in 1968 to 32.0 per cent in 1972. The consistently low coverage of dental service, notwithstanding the large increase in services produced, is also related to this change in activity types. The dental service coverage was only 3.9 per cent in 1972. Since a filling represents more work units than an extraction, the number of work units increases in the policy shift to the more complex activities, while the number of persons attended may remain relatively stable.

The vaccination service also manifests an overall increase in activities while instruments or resources are diminishing (see TABLE V-4). From 1966 to 1972, the number of doses applied increased 18.5 per cent, while the number of vaccinator hours fell 53.1 per cent. Like the dental service, the irregularity of the immunization service levels is notable in both real and cost terms, and this lack of control is also shown in the wide discrepancies between the planned and observed service levels. Yet the overall diminishing trend is clear. As with the aforementioned services, the observed trend is related to the trend in the planned service objectives. Although the objectives are also erratic, the planned increase between 1966 and 1972 in doses applied was 21.0 per cent, which is very close to the 18.5 per cent increase that occurred. For vaccinator hours, the planned decrease was less than that observed, 39.0 per cent versus 53.0 per cent.

The decline in vaccinator hours accompanied by the increase in doses applied indicates the observed productivity improvement, which
TABLE V-4
VACCINATION SERVICES AND EFFICIENCY
VALLE HEALTH SERVICE 1966-1972

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<tr>
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<tbody>
<tr>
<td>Doses Applied</td>
<td>422,137</td>
<td>720,760</td>
<td>673,964</td>
<td>435,247</td>
<td>372,290</td>
<td>422,497</td>
<td>500,272</td>
<td>+ 18.5</td>
</tr>
<tr>
<td>Vaccinator Hours</td>
<td>104,148</td>
<td>102,165</td>
<td>107,718</td>
<td>115,261</td>
<td>75,251</td>
<td>49,256</td>
<td>48,899</td>
<td>- 53.0</td>
</tr>
<tr>
<td>Average Cost per</td>
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<tr>
<td>Applied Dose</td>
<td>2.04</td>
<td>4.25</td>
<td>3.79</td>
<td>1.49</td>
<td>1.31</td>
<td></td>
<td></td>
<td>- 35.8 (68-72)</td>
</tr>
<tr>
<td>Average Cost per</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Vaccinator Hour</td>
<td>12.78</td>
<td>16.06</td>
<td>16.48</td>
<td>12.75</td>
<td>13.37</td>
<td></td>
<td></td>
<td>+ 4.6 (68-72)</td>
</tr>
<tr>
<td>Productivity</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>(Doses/Hour)</td>
<td>4.1</td>
<td>7.1</td>
<td>6.3</td>
<td>3.8</td>
<td>5.0</td>
<td>8.6</td>
<td>10.2</td>
<td>+148.8</td>
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<td>Coverage DPT</td>
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<tr>
<td>(Percentage)</td>
<td>16.2</td>
<td>20.8</td>
<td>6.3</td>
<td>11.6</td>
<td>26.2</td>
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<tr>
<td>Coverage BCG</td>
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</tr>
<tr>
<td>(Percentage)</td>
<td>13.5</td>
<td>12.0</td>
<td>8.0</td>
<td>11.4</td>
<td>23.2</td>
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<tr>
<td>Coverage Polio</td>
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<td></td>
</tr>
<tr>
<td>(Percentage)</td>
<td>16.1</td>
<td>12.1</td>
<td>10.5</td>
<td>15.1</td>
<td>28.0</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Coverage Smallpox</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>(Percentage)</td>
<td>12.2</td>
<td>9.2</td>
<td>6.1</td>
<td>9.9</td>
<td>24.8</td>
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</tbody>
</table>

\( ^a \) Numbers in parentheses represent the ratio of actual levels to objectives.

\( ^b \) Costs are in Colombian pesos adjusted to 1968 values.

\( ^c \) Coverages represent doses applied (second dose is for DPT and Polio) to infants per 100 live births.

Source: Valle, Servicio Seccional de Salud, Planes de Salud.
climbed from 4.1 doses applied per vaccination hour in 1966 to 10.2 in 1972 (see TABLE V-4). This increased productivity is closely related to the 35.8 per cent decrease in the adjusted cost per dose applied between 1968 and 1972. During the same period, the cost per vaccinator hour rose only 4.6 per cent. Examining the effect on coverage levels is complicated by information difficulties. Although it is apparent that the overall coverage of the Health Service's vaccination program has declined, because the population has increased faster than the increase in vaccinations applied, this observation is confounded by the knowledge that several national vaccination campaigns administered directly by the Health Ministry delivered a large number of services in Valle and these services are not included in the Health Service's data. Despite this analytic difficulty, as well as other information problems, one important finding is apparent. Although the overall coverage has decreased, the coverage of the infant population in Valle has increased. From 1968 to 1972, these coverages\(^2\) were extended as follows: D.P.T.--16.2 per cent to 26.2 per cent; B.C.G.--13.5 per cent to 23.2 per cent; polio--16.1 per cent to 28.0 per cent; and smallpox--12.2 per cent to 24.8 per cent.\(^3\)

Thus, an increasing proportion of the immunizations are applied to infants. Nevertheless, the coverages remain very low even in this population.

\(^2\) Coverage equals the number of doses given in year \(X\) to persons under one year of age divided by the number of live births in year \(X\).

\(^3\) Data not available for measles and other immunizations.
The environmental sanitation actions of the Health Service exhibit the most unstable behavior encountered in this analysis of final services (see TABLE V-5). The inability to achieve the planned levels of sanitation inspector work units is obvious, especially from 1970 to 1972. The overall tendency is to decline; from 1966 to 1973 the number of work units produced fell 38.6 per cent, and the number of inspector hours dropped 29.8 per cent. Both declines were greater than those programmed, which were 33.3 per cent and 18.5 per cent respectively. The similarity in the magnitude of the actual declines in these activity and instrument reflects the failure to increase productivity. Furthermore, problems of cost increases are apparent, as the adjusted cost per inspector work unit in 1972 is 133.3 per cent greater than the 1968 level. But the increase in the cost per inspector hour is relatively low at 14.6 per cent. The large productivity decrease from 1968 to 1972 (2.9 UH per hour to 1.4) is the principal factor related to this cost problem.

The information available for the nursing service is limited and does not permit analysis for the entire planning period because of changes in activity measures. Prior to 1970, the nursing service focused on home visits, thus the activity measure employed was nursing visits. Later, when the service expanded its range of actions, the activity measure was changed to units of nursing work (UTE), thus comparison with the earlier data is not meaningful. But several interesting findings do emerge from the limited analysis that is feasible (see TABLE V-6). The nursing service manifests an increase of 14.7 per cent in the number of units of nursing work produced from 1970 to
### TABLE V-5
ENVIRONMENTAL SANITATION SERVICES AND EFFICIENCY
VALLE HEALTH SERVICE 1966-1973

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Units of Work (UTI)</td>
<td>486,972</td>
<td>787,149</td>
<td>794,816</td>
<td>786,212</td>
<td>541,119</td>
<td>312,541</td>
<td>295,628</td>
<td>298,977</td>
<td>- 38.6</td>
</tr>
<tr>
<td>Inspector Hours</td>
<td>266,919</td>
<td>286,661</td>
<td>272,288</td>
<td>289,108</td>
<td>212,391</td>
<td>214,897</td>
<td>206,342</td>
<td>187,488</td>
<td>- 29.8</td>
</tr>
<tr>
<td>Average Cost per UTI</td>
<td>5.32(^{b})</td>
<td>9.01</td>
<td>6.57</td>
<td>11.63</td>
<td>12.41</td>
<td>+133.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avg. Cost per Inspector Hour</td>
<td>15.52(^{b})</td>
<td>19.45</td>
<td>16.74</td>
<td>16.91</td>
<td>17.78</td>
<td>+ 14.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Productivity (UTI/Hour)</td>
<td>1.8</td>
<td>2.7</td>
<td>2.9</td>
<td>2.7</td>
<td>2.5</td>
<td>1.5</td>
<td>1.4</td>
<td>1.6</td>
<td>- 11.1</td>
</tr>
</tbody>
</table>

*Numbers in parentheses represent the ratio of actual levels to objectives.

\(^{b}\)Costs are in Colombian pesos adjusted to 1968 values.

Source: Valle, Servicio Seccional de Salud, Planes de Salud.
### TABLE V-6

NURSING SERVICES AND EFFICIENCY

VALLE HEALTH SERVICE—1970-1973

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Nursing Units of Work (UTE)</td>
<td>268,833</td>
<td>399,850</td>
<td>283,130</td>
<td>308,240</td>
<td>+ 14.7</td>
</tr>
<tr>
<td>Nurse Hours</td>
<td>63,372</td>
<td>103,172</td>
<td>77,680</td>
<td>65,582</td>
<td>+ 3.5</td>
</tr>
<tr>
<td>Productivity</td>
<td>4.2</td>
<td>3.9</td>
<td>3.6</td>
<td>4.7</td>
<td>+ 11.9</td>
</tr>
</tbody>
</table>

*Numbers in parentheses represent the ratio of actual levels to objectives.*

Source: Valle, Servicio Seccional de Salud, Planes de Salud.
1973, and an increase of 3.5 per cent in the number of nursing hours. The trend is erratic but the increasing tendency is clear. The difficulty in attaining the planned levels of work units is also apparent. The planned service objectives for 1973 exhibit marked increases over the 1970 actual level, and the planned increases are greater than those actually achieved. For nursing work units, the 1973 objective is 25.7 per cent greater than 1970 observed level, as opposed to the 14.7 per cent increase actually achieved. On the other hand, the 1973 nursing hours objective is 6.6 per cent higher compared to the 3.5 per cent increase observed. Only a slight productivity improvement is noted—from 4.2 units of work per nursing hour in 1970 to 4.7 in 1972.

Several important general conclusions may be drawn from this service-specific analysis of service levels and efficiency measures. Increases are observed in the level of services (activities) produced in all of the final services except environmental sanitation, yet only outpatient consultations and dental services increased faster than the estimated population growth. In contrast, resource (instrument) levels characteristically declined, with only dental hours increasing significantly. This pattern of increasing service levels and concurrent diminishing resource levels is related closely to the productivity increases noted in all but the environmental sanitation activity. There is also some evidence of service cost control, a finding that is linked to the improved productivity. But this pattern of increased service levels, improved productivity, and progress in cost control, has not resulted in expanded coverage levels. Instead, the productivity increases contribute to relatively stable coverages in the face of
population growth. Planning's focus on existing service demand levels is associated with these low and unchanging coverages. Only the latest plan (1974) devotes much attention to normative statements regarding the coverage of health services.

Another type of general observation refers to the relationships between planning's objectives and the actual service or resource levels. Comparing the change from the 1966 base year to 1972 or 1973, the direction of the observed change was the same as that programmed. Only hospital bed-days was an exception. This signifies that the objectives influence the actual trends. But the service objectives tended to specify a larger increase than that observed, indicating implementation difficulties. When the ability to attain objectives year by year is examined, vaccination, environmental sanitation, and nursing services manifest the greatest problems.

In summary, planning is linked to some improvements in system efficiency; particularly to increases in the quantity of health services produced and to increased productivity, reduced hospital stays, and cost control. But problems of low levels of service coverage and large urban-rural differences in service utilization are serious.

Having examined the demand-based nature of the health planning practice in the Valle Health Service, and its linkage primarily to changes in the production of health services, the evaluation now shifts its focus to the difference between the observed practice and more effective practice as defined earlier in this study.

Community Health Improvements

The observed planning effects are of second order importance
given the kinds of important problems that might be confronted by the Valle Health Service. Of primary importance are the improvements in community health and development that should result from attacking the major health status problems. As demonstrated above, a large proportion of deaths in Valle are avoidable, which indicates deficiencies in the effectiveness of the existing health policies. The results of the planning practice, therefore, have been costly in the opportunity cost sense, because grave health status problems persist where improvements are feasible. If planning is continued as currently practiced, the expected results would be more of the same, i.e., increased productivity, probably extending to such services as nursing and environmental sanitation, so that service production may keep up with the population growth. This demand-based approach to planning that has been chosen by the Health Service planners is the easier route. Attending demand levels requires a much less sophisticated planning and policymaking process than attacking priority health status problems through improvements in system effectiveness and service utilization. Major improvements in health status levels are not expected from such demand-based planning, because (as seen above) service demand is a poor proxy for the health status needs of the Valle population.

Thus, the nature and scope of the Health Service's planning must be modified if it is to contribute to attacking the principal problems in Valle. The recommended strategy is to free the health plans from the tight constraints imposed by the current planning focus, so that the plans include a confrontation of effectiveness issues, and the
closely related service utilization problems. Such increased attention to health status should lead to an intervention focus that considers alternative means for meeting the health needs of the community.

This argument for a new health planning focus is based on the notion of opportunity costs. The cost of allocating resources in a manner that does not concentrate on community health needs and the effectiveness of services in meeting these needs has several aspects: (1) the lives that may be saved; (2) the sickness and disability that is avoidable; (3) the foregone effect on present and future labor force productivity; (4) the cost reduction from decreased utilization of highly sophisticated health services; and, (5) the community development implications of a health system that emphasizes primary health care.

Between 25 and 40 per cent of all deaths in Valle in 1972 were from reducible causes, depending on whether the Health Service's conservative classification of disease categories is accepted (see TABLE III-2). Thus, in this year the upper limit of this aspect of opportunity costs associated with the demand-based planning may be estimated at between 4,394 and 7,128 deaths. In short, between four and seven thousand deaths may have been avoided. Confining the argument to infants, between 2,026 and 3,178 deaths in 1972 were avoidable (see TABLE III-3).

Of course, such crude estimates serve only as a very rough indicator of the magnitude of the issue, since few health programs are completely effective. But quantitative estimates of these
effectiveness coefficients are difficult to obtain because of the
dearth of research results in a comparable context. The Health Ser­
vice's application of the CENDES approach in 1968 was criticized above
because the coefficients employed did not come from an analysis of
service effectiveness in Valle using epidemiologic field trials. Such
research is greatly needed, but the planners and policymakers should
not await these results before making decisions on future planning
directions. It is obvious that the magnitude of avoidable deaths is
great, and this is sufficient cause for change.

A specific case also illustrates the nature and magnitude of
opportunity costs. In 1972, there were 98 deaths from tetanus in the
Valle infant population. The health plan for that year established
service objectives for hospitalization and outpatient medical consul­
tations for infants based on the demand levels of this age group in
previous years. But these are not the most effective services for
avoiding deaths from tetanus, largely neonatal tetanus, as evidenced
by the continuing high mortality levels. The strategy for increased
effectiveness should be prevention through midwife training or mater­
nal anti-tetanus immunizations. While the effectiveness coefficients
are unknown, an assessment of current health technology certainly pro­
vides strong evidence that either of these prevention programs is
highly effective. The cost of not employing a planning approach that
generates effective tetanus prevention programs is therefore very
close to all of the 98 infant deaths observed.

But this opportunity cost argument is not confined to calling
attention to the number of lives that may be saved. Other health
improvements are involved. The recommended shift in planning focus should decrease morbidity and the associated disability. Although data deficiencies are an obstacle to expressing opportunity costs in these terms, it is apparent that for every death from a reducible disease, there is a larger number of persons with the disease that are sick and suffer activity limitations but do not die. For instance, employing the number of first-time users of outpatient medical consultations as a morbidity indicator, there were about seventeen episodes of reducible diseases in infants in 1972 for each infant death from these causes. Thus the estimate of the cost of not focusing planning on community health needs in this case is about 54,000 disease episodes in children less than one year of age. The extremely high morbidity in the Valle infant population is also indicated by the national health status survey conducted in 1965-1968. Over forty-one per cent of the Colombian infant population (432.5/1000 infants) was reported as sick during the two-week period prior to the interviews. While some improvement probably has occurred in the past five years, the continuing high infant mortality statistics suggest that it has not been substantial. It is important, therefore, that the Health Service realize that its current planning practice is associated with an opportunity cost not only of a large number of avoidable deaths, but also of a much larger number of avoidable disease episodes.

4See Colombia, Ministerio de Salud Publica, Estudio de Recursos Humanos Para La Salud--Resultados, pp. 80-81.
This argument is further strengthened by the socio-economic implications that saving lives and avoiding sickness have on community development. The goal is a healthy, productive population. Health should be viewed as an investment because health programs improve both the quality and size of the labor pool and yield a continuing return.\(^5\) Estimating the magnitude of this return usually involves specifying discounted future earnings. The value of the increase in potential labor force that would result by reducing the number of avoidable deaths, or by decreasing morbidity, in Valle is difficult to estimate. Research efforts are required that extend beyond the capacity of this study. The concept, however, is to use the discounted present value of potential earnings of the persons whose deaths would be avoided as a measure of their future productive yield.

Since many of the deaths avoided would be in the younger age groups, another factor to consider is the investment in the upbringing of the child.\(^6\) The investment in upbringing that is not "lost" due to early death is an effect of health programs. Also, healthy children benefit more from such investments as schooling.

The costs avoided by the decrease in the demand for certain services that results from preventing diseases also should be considered as a return on the health investment. For example, those diseases deemed reducible are best attacked by outpatient medical care and


such primary health services as immunizations and health education. It follows, therefore, that much of the estimated 4,554,740 pesos that were spent by the Health Service in 1971 for the hospitalization of infants with reducible diseases may have been avoided. Of course, this figure should be compared to the costs of the recommended programs that attack these diseases.

The proposed planning focus on health needs should lead to a shift to greater emphasis on preventive and primary health care services, and this should further community development in several ways. Beneficial effects on employment patterns should result from such policy changes. Instead of the relatively few jobs for highly trained and paid professionals (physicians, graduate nurses, medical technology specialists, and so forth) that characterize the Health Service's present pattern of institutional curative medicine, a shift to prevention and primary health care policies would create a much larger number of jobs requiring less investment in training and paying lower salaries. Nurse auxiliaries, health promoters, and vaccinators represent the types of jobs that would be created. These would be filled by persons from the middle and lower socio-economic strata of the community, thus having an income redistribution effect that should benefit the community in both economic and social terms.

Community development is also supported by the decentralization of the health system to the local level, an appropriate change given planning that focuses on community health. The local health center with its outreach workers is the key to the effective delivery of primary health care; and, in addition, these centers should be utilized
for other activities that relate to socioeconomic progress for the community. These activities may include, for example, primary and secondary education for children and adults, vocational training for mothers, community organization efforts, and family planning services. In general, the health center, with its community workers, serves as a contact between the population and the variety of services that are available in both the public and private sectors. To illustrate, the visit of a mother and her child to a health center, or the visit of a health promoter to the home, may result in that family becoming aware of existing agricultural extension services or sewing classes for mothers. Increasing agricultural productivity, or providing mothers with a marketable skill, certainly has positive effects on both the economic and social growth of a community.

Because the rapid population growth that characterizes most developing countries, including Colombia, is a problem of maximum importance, the relation between more effective health services and population growth must be examined. Although further empirical studies are greatly needed, there is evidence that the positive effect of health programs on population growth may be counterbalanced by including family planning services as an integral part of these health programs. A health system that concentrates on providing primary health care to all of the population is much more likely to be successful in

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8 Bryant, *Health and the Developing World*, pp. 98-104, upon which this discussion draws heavily.
promoting services to control the birth rate, than the existing institutional and curative-focused system of the Health Service. The behavioral changes needed to improve health are very similar to those needed to control the birth rate, and the policy shifts described above are designed to reach both ends.

In conclusion, the Valle Health Service is faced with the following choice. The current planning practice, with its emphasis on demand criteria, may be continued. Selecting this alternative opts for increased health service productivity, but has a high opportunity cost in terms of both health status and community development. Or the focus of planning may be expanded to confront the major health status problems, measured in mortality terms. This study strongly encourages this latter alternative, and prescribes a strategy for such improvements in the following Chapter.
CHAPTER VI

STRATEGY FOR IMPROVED HEALTH PLANNING

The analysis thus far has developed a conceptual framework of the health planning process, and employed this framework in the evaluation of the case of health planning in the Health Service of Valle, Colombia. This Chapter summarizes this analysis, and discusses a set of prescriptions for strengthening the current planning practice in the Health Service.

Summary

The conceptual framework of the health planning process organized a set of multi-disciplinary concepts and methods which contribute to carrying out planning in the health field. The framework was developed in ways that are sensitive to the health system problems faced by planning programs in developing countries, and to the technical constraints influencing their ability to plan. The framework is divided into two parts—goals definition, and alternative program analysis. Viewing the health system in input-output terms, goals definition focuses on health status because it is the principal output. Priority is given to those diseases whose health status-limiting effects are substantial and can be reduced. For developing countries, mortality measures are a practical and relevant indicator of health status. Secondly, the analysis of alternative means for attaining health status goals essentially involves studying the relationships
of the system components to the desired health outputs. Two types of
relationships are distinguished: effectiveness, defined as the linkage
of services to health status; and efficiency, defined as the interac-
tions of health services, resources, and the population. Studying
effectiveness involves describing health services by their functions,
and conducting cost/effectiveness studies. Studying health system
efficiency involves examining the productivity and utilization of ser-
VICES and the availability of resources. The alternative program
analysis activity in developing countries necessitates the use of two
important principles—comprehensive health system parameters, and
systematic experimentation.

The CENDES health planning paradigm represents one of the few
well-developed conceptual approaches to health planning. While the
CENDES approach is generally in accord with the conceptual framework
recommended in this study, several deficiencies are apparent. The
principal shortcoming is that the application of health status goals
and effectiveness studies is limited to those diseases whose morbidity
is deemed preventible given the existing health technology. For the
remainder of the diseases, service demand levels are accepted as plan-
ing objectives. This is a problem because the disease vulnerability
estimates neglect the consideration of the effectiveness of secondary
and tertiary intervention, and are conservative in their assessment
of health technology. Thus, too many diseases are deemed non-reduc-
ible and the demand criterion is overemphasized.

Several aspects of the structure and context of health planning
programs were identified as crucial for the support of the recommended
planning process in Valle. With respect to the context, indicators of the political environment and the process of health system decision-making were selected as most important. Aspects of the planning program's structure that must be supportive include the sanction for planning, the coordination among the types and levels of planning, and the educational programs that prepare health planning staff. The conclusion was that there is sufficient capacity to plan in this Colombian region. But there is the important problem of the poorly developed health policymaking process. To be of value to health decision-making, the planning process should be carried out parallel with a policymaking process which uses planning's analysis and a knowledge of community values to identify problems, state health goals, select programs, and evaluate programs. The practice is deficient because it neglects the distinction between analysis and decisions that is fundamental to such a decision-making process. The result is that policymaking decisions concentrate narrowly on one activity—goals statements. The "traditionalist-expansionist" focus of policymaking is manifested, and change is stifled.

The health planning process practiced in this Colombian region has not operationalized basic planning activities. Instead, the practice has concentrated on improving the Health Service's understanding of its health system by describing the system and formulating service objectives. Intervention is overlooked, as demonstrated by the failure to state priorities or derive objectives from the stated goals, and the neglect of alternative program analysis. The failure to evaluate explicitly the existing programs, as well as the
system's operations in general, is a basic deficiency which results in little motivation toward planned changes. Planning practice is based on the criterion of meeting the demand for existing health services. The demand focus represents the rejection of the health needs and effectiveness focus represented in the CENDES methodology and used during the first planning iteration. The principal shortcoming in the planning practice is the failure to focus on the population's health system in confronting these needs. This means that health needs should be compared to the existing service utilization as a means of identifying problems and defining ways of solving them. This is recommended as an alternative to the unquestioning acceptance of demand levels.

The effects of the Health Service's planning concentrate on increases in the quantity of health services produced, and such system efficiency improvements as increased productivity, cost control, and strengthened district hospitals. But the health planning process has been markedly ineffective in attacking the range of vulnerable diseases that are major causes of death, especially in young children. The appropriateness of some existing health policies is therefore questionable.

Recommended Changes in Planning Practice

While it is apparent that the planning operationalized by the Valle Health Service is associated not only with laudable progress in developing an understanding of its health system, but also with significant improvements in various aspects of service production, more is needed. Planning also should contribute to advances in the
effectiveness of the health system, as well as improved service utilization. To accomplish this, planning should develop a more critical approach to health system evaluation that concentrates on the analysis of alternative ends and means couched in effectiveness and efficiency terms. The prescribed planning innovations are twofold: first, planning should focus on community health needs in health status terms and the effectiveness of the system relative to these needs; second, planning requires a much stronger focus on intervention, i.e., alternative programs or system changes should be identified and compared. These innovations are discussed, along with the policymaking and other structural changes that will be necessary to implement them.

Focus on Health Needs

Planning in the Valle Health Service should focus on the amelioration of those health problems which represent the most common and vulnerable causes of death in the Valle population. The development of planning practice which employs such a health needs focus requires increased emphasis on several types of analysis and decisions. These matters were discussed above but are herein consolidated and illustrated.

Identification of the principal health status problems in the Valle population should be based on age, disease, and municipality-specific mortality statistics. Trends and geographic differences should be studied. In a manner similar to that analyzed above, planning should define the principal causes of death for each age group and assess the vulnerability of each cause to primary, secondary, or tertiary intervention. Once these health status problems are defined,
planning and policymaking should express health status goals which communicate the priority diseases for attack.

Tetanus illustrates this planning prescription. As noted above, (see TABLE III-2), in 1972 there were 139 deaths from tetanus in Valle, thus making it the fifth largest cause of reducible deaths in terms of the Health Service's classification of reducible/nonreducible disease categories. The number of deaths from tetanus has remained high, which indicates the ineffectiveness of the existing health system. When age-specific mortality statistics are examined it is found that 98 (70.5 per cent) of these tetanus deaths occurred in the population under one year of age (see TABLE III-3). This indicates that neonatal tetanus is the major problem. Further analysis indicates that the district of Buenaventura, which accounts for only 5.7 per cent of the state's infant population, accounts for 42 tetanus deaths in infants (42.9 per cent). Planning should classify all of these tetanus deaths as highly vulnerable to primary intervention (prevention), since several types of vaccination and education campaigns may successfully prevent tetanus. If planning and policymaking employ the effectiveness criterion as recommended, then attacking this tetanus problem may receive priority.

The analysis of the major health status problems is another important planning step that must receive increased attention in the Health Service. This analysis should employ an epidemiological approach that defines the factors related to the disease or condition by delineating its "natural history." Knowledge of these factors has two primary uses: to identify target populations; and, to suggest
means of intervening in the problem. The latter is discussed below. The target population should be defined in terms of those individuals who have a high risk of suffering the health status limitations of the particular disease or condition. As an illustration, the target population for efforts to control infectious intestinal diseases should represent persons with a high risk of dying from that cause. A decision that the high risk group consists of young children of poor socio-economic status living in rural areas is a useful expression of such a target group. More detail is preferred, however, such as the specification of which rural areas have the highest risks; for example, those without hygienic water supply systems. Such an approach to defining target populations represents a large improvement over the observed practice that accepts those who use services as the target population.

This problem analysis should include an evaluation of existing programs and their utilization as a factor which relates to health status problems. Two types of system deficiencies should be identified through this analysis: (1) utilization problems regarding existing services that are relevant in terms of the priority health status goals; and, (2) programs or services that are inappropriate given these goals.

Service utilization problems should include the coverage, intensity, continuity, and inappropriate use of services, as well as the population's motivation to use the services and their accessibility to them. The key point is that these utilization aspects are important primarily in terms of health status needs. To illustrate,
consider the malnutrition problem that was shown above to be a major health status problem in Valle. Planning should define what services are available to prevent this problem, and then determine their coverage of the target population defined according to the prevalence of the various levels of malnutrition. Then, the number of services, e.g., food supplements, received per user (intensity) should be estimated and compared to norms that are based on medical and nutritional criteria. These criteria also should be utilized to define what treatment regime is appropriate for each level of malnutrition; for instance, a regime may consist of food supplements and classes in nutrition and home hygiene. Evaluating service continuity involves examining what proportion of the users of food supplements also complete the health education classes, or vise versa. Another important aspect of the analysis is the determination of the number of service users who actually do not suffer from malnutrition. A related aspect of this concept of inappropriate use is whether or not the malnourished person consumes the prescribed food supplement.

While the aforementioned concepts are applied by studying the service users, other utilization concepts involve studies of the population. The various factors that influence the motivation of the family with malnourished members to utilize available services should be determined, along with estimations of the number of families in which such negative influences prevent service utilization. This information is crucial if education and other programs are to be designed to increase this motivation. Finally, accessibility problems should be uncovered, such as the long distance to the food supplement
distribution center or the economic burden caused by the fee for entering the supplement program. The recommended planning analysis of the malnutrition problem contrasts significantly with the Health Service's practice, which simply has projected the past demand levels for medical consultation and hospitalization services to establish service objectives. All of the aspects of the prescribed approach have been ignored in practice.

Another type of problem that requires the analysis of the factors related to health status problems concerns the appropriateness or logic of the existing health programs and services. Those disease problems which are not addressed by a program or service represent one aspect of the problem. For example, the Health Service does not have an accident prevention program, even though accidents are a major cause of reducible mortality. Another type of appropriateness problem exists when a disease is attacked by an inappropriate type of service, meaning that tertiary intervention receives more emphasis than primary or secondary prevention when the preferable situation is the reverse. To illustrate, the Health Service's policy is to address the problem of malnutrition by providing physician consultations and hospitalization services. Such a practice is inappropriate because malnutrition is more effectively addressed by such preventive efforts as health education and food supplement programs. The alternatives for primary prevention should be analyzed, since some types are preferred over others. For example, the application of anti-tetanus innoculations to pregnant women to prevent neonatal tetanus should receive less priority than programs to train the indigenous midwives in various
Further comments on the appropriateness of existing services and programs indicate the importance of this planning prescription in the Health Service. As discussed above, the health of the Valle population is lower than it might be by virtue of the large proportion of deaths from reducible diseases (see TABLES III-2 and III-3). Nevertheless, the Health Service allocates only a very small percentage of its operating revenues to preventive services. Using the Health Service's method of stating services by the techniques of prevention, control, or cure, the result is that only 8.7 per cent of the 1972 operating expenses were for prevention and control services. This percentage has been relatively stable since 1967 when planning commenced. Such a neglect of preventive services is a characteristic of most developing countries, and many developed ones. This points to the generalized ineffectiveness of health planning that does not focus on health needs and system effectiveness, both defined in health status terms.

Focus on Intervention

Once decisions have been made on priority health status goals, planning should direct its attention to the means of attaining them. A comprehensive list of alternatives should be prepared. Effectiveness should be the key criterion for selecting the most appropriate health programs, and emphasis should be on prevention and early intervention programs. The persistence of such appropriateness problems as indicated above supports the conclusion that planning in the Health Service has failed to give much attention to health system changes or
studying alternatives.

The programming strategy promoted in this study's conceptual framework is relevant to the needs of the Health Service's planning. The following programming concepts are crucial: (1) comprehensive health system parameters; (2) analysis of implementation constraints; (3) analysis of costs and effects; (4) systematic experimentation; and, (5) formulation of service and resource objectives. The needed progress regarding each of these points was discussed above, thus only a few comments are necessary here, largely as a matter of emphasis and illustration.

Identifying alternatives should not be constrained by the Health Service's narrow definition of system parameters. In light of the major health status problems, it should be apparent that the most appropriate services are primary personal health care, and such preventive services as environmental sanitation, health education, and nutrition. Services outside the health sector should be considered as means of attaining priority goals, and the needed organizational or structural changes necessary to implement the changes employing such services should be addressed in the feasibility analysis.

The delivery of primary medical care at the base or periphery of the regionalized system (see FIGURE III-1) suffers the serious problems of insufficient staff, equipment, and supplies. Of the Health Service's 44 hospitals, 25 (57 per cent) have less than 30 beds, and most of these small hospitals are so poorly equipped that they represent little advancement beyond ambulatory care facilities. This partially explains the low average occupancy rate (below forty per cent)
in the local hospitals. Because these hospitals and health centers have the responsibility of providing health care to the rural areas where the milieu is so conducive to the aforementioned major health status problems, this finding is critical. The Health Service's pattern of resource allocation to inpatient versus ambulatory care also reflects this problem. The 1969 distribution is representative—53.3 per cent of the operating budget to hospitalization and 26.5 per cent to outpatient medical services. In contrast, the Valle Social Security Institute's health system in the same year favored outpatient services—40.3 per cent to 39.0 per cent.

In identifying and analyzing alternatives for attacking health status problems, the concept of intervention levels should be kept foremost in mind. Planning should seek answers to such questions as: How can the occurrence of a specific disease or condition be prevented? How can the disease be detected before clinical signs and symptoms are apparent? Does such early detection result in a greater probability of cure? How can the disease be cured to avoid death or minimize other health status effects? How can persons with this disease be rehabilitated so that they may return to their optimal level of function?

A strategy for obtaining answers to the above programming questions in a short time and at a relatively low cost is to use groups of "experts" in structured meetings.¹

To promote feasibility as well as a broad range of alternatives, participants should be chosen carefully to include administrators and consumers of health services in addition to the technical experts. For example, the composition of a group with the charge of exploring ways to attack the problem of respiratory diseases in young children may include medical specialists in pediatrics and communicable diseases, general practitioners working in areas with high incidence of these diseases, health center and hospital administrators, public health nurses, rural health promoters, epidemiologists or public health specialists, nutritionists, social workers, professionals in health education, and mothers from areas of high incidence. Developing such a committee in practice is far from easy. But a problem focus should make the task more feasible. An objective should be to bring all of the participants together, because the interaction among the members should yield better results.

Since respiratory diseases in infants represents one of the most important causes of death in Valle, and also in most of the developing countries, it is employed in this section to illustrate the prescribed planning focus on intervention. Identifying alternative means for reducing the mortality due to respiratory infections is complicated by the complexity of the problem; nevertheless, it is apparent that prevention, early intervention, and non-health sector services must receive priority. Nutrition services and services designed to improve the home environment are very important non-specific

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2See Williams and Jelliff, Mother and Child Health Services, pp. 40-55, upon which this discussion draws heavily.
interventions because malnutrition is related closely to pneumonia and other respiratory ailments, and the exposure to cold and infections that results from a poor home environment also is related to the incidence of respiratory diseases. Furthermore, since low birth weight babies are very susceptible to respiratory problems, the wide range of interventions for controlling this factor should be considered. These services include, for example, family planning, maternal nutrition (food supplements and education classes), early detection and treatment of acute or chronic diseases and obstetrical problems, and control of home hygiene.\(^3\) Immunization programs for whooping cough and measles also help prevent the other respiratory diseases that may follow these diseases and cause death.

Other services are also crucial for lowering the death rate. Early treatment, usually by chemotherapy, is essential, which means that the coverage of primary health services must be extended to reach the vast majority of the poor population. Drugs should be provided at a cost which makes them economically accessible to the poor population. Medical consultations without the acquisition of the prescribed drugs are not effective. The sick child must also be cared for, thus good nursing care in health institutions, and training of the mother to provide such care in the home, are important. Such a comprehensive approach to identifying alternatives represents a major improvement over the Health Service's practice, which has failed to consider alternatives. Instead, this practice simply has continued to program

\[^3\text{Ibid.},\ p. 42.\]
its established consultation and hospitalization services according to the past demand levels.

To stimulate the consideration of changes, a five to ten-year planning time frame should be employed instead of the current one-year focus. The principal reason for this recommendation is that the major reducible disease problems are complex, and therefore their successful attack will require significant changes in the existing health system. These changes probably will require several years for their implementation, and their effectiveness may take even longer to become apparent. Thus, time constraints must be recognized. Also, the planning practice needs to break its close ties to the annual budgetary cycle that contributes to the almost exclusive focus on tactical issues. The longer time frame should promote the confrontation of the important strategy issues. The existing annual plans with their focus on service objectives should be continued, but they should represent adjustments of the longer term plan.

Given a comprehensive list of alternatives for attaining a given health status objective, the constraints to implementation should be specified for each alternative. This is a key step, since a utopian program proposal will do much to destroy any new found conviction in the value of analyzing alternative changes in the health system. Perhaps in the early planning iterations, preference should be given to those program changes which are under the financial control and implementation authority of the Health Service. The more difficult planned changes, especially those requiring intersectoral cooperation, should be considered as longer range efforts. For example, in
programming the attack on respiratory infections, it may be advisable to concentrate initially on improving the quality of the primary care services and expanding their coverage to include a large part of the rural and low socio-economic status population, instead of waiting for progress in intersectoral programs such as improving housing or nutrition. Efforts should be started following the more comprehensive tact, but an analysis of the existing constraints should make it apparent that such efforts will require a longer time for implementation. Other needed changes should not be held up while awaiting this implementation. Another important constraint in this illustration is the sociocultural resistance of much of the target population to utilizing the health system. If this is deemed a problem then it should be confronted as soon as possible by such alternative strategies as mass education campaigns through the public communications media or health promoters working in the communities.

Once several alternatives that are relatively feasible are identified, an analysis of their costs and effects is needed to provide an objective base for comparison. Policymaking should utilize the results of such analysis in its decision-making on program selection. As discussed above, effects should be estimated in health status terms. Cost analysis should consider the variety of alternatives that arise from a perspective of system efficiency similar to that promoted in the present study. What may be identified as one alternative

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4 The dearth of such studies in Colombia should be noted. For one of the very few studies, see Ralph Galewski, Actitudes y Comportamiento de una Comunidad Frente a la Enfermedad (Cali: Division de Salud, Universidad del Valle, 1973), pp. 1-46.
strategy, therefore, may actually emerge as a set of strategies, once such efficiency considerations as manpower substitution are included. In this approach, efficiency concerns are addressed in terms of their linkage to effectiveness, and not just in themselves. For instance, the follow-up in ambulatory care settings of infants with respiratory infections may be the strategy selected for lowering the death rate from this cause. Such efficiency alternatives as what type of health manpower will deliver these consultations, how much time will be allocated to each consultation, and how many consultations are necessary depends on effectiveness considerations. Particular attention should be given to employing paramedical personnel, given the maldistribution of physicians in Valle. This analysis of the efficiency aspects of the health system in view of its effectiveness is one of the major concepts promoted in the present study.

Policymaking should select program strategies based upon planning's analysis. In certain cases, more than one alternative may appear promising, or certain types of additional information may be needed before a final selection decision may be made. Attention then should be given to systematic experimentation with one or several alternatives, and their results utilized for decision-making. In the Health Service such a strategy of the preliminary application of system changes, perhaps by applying the change to one district, is especially important because many of the major health status problems will require substantial changes in the existing system. Also, the planning and administration practice has not been orientated toward changes. Such experiments will provide the opportunity to develop
experience in the activities related to the planning and implementa-
tion of changes. Another planning deficiency has been the lack of
program evaluation, and the promotion of field trials provides the
opportunity to build in data generation mechanisms that are designed
to aid evaluation.

Finally, the Health Service's program selection decisions should
be translated into service and resource objectives, which subsequently
permit the preparation of plans for the formation or acquisition of
the constituent human and physical resources. This will necessitate
increased emphasis on resource statistics in the system description
step of the Health Service's process, since the actual levels of re-
sources must be known so that the difference between them and the
objectives become the basis for the resource planning. Continuing the
respiratory infections example, assume that policymaking selects a
strategy of strengthening the primary health care in the poor areas.
Studies then must be made of the types and quantities of human and
physical resources that are needed to attend the respiratory infection
problems in a given population. Once these norms or standards are es-
tablished, then they should be used to evaluate the existing resources
in each geographic area. Then training, construction or acquisition
programs must be established to obtain the resources needed to make up
the difference between what is needed and what exists. Some recent
WHO investigations are relevant to this point, because they have
focused on developing "health care packages" that specify the most
appropriate and economical resource sets for addressing certain
health problems. 5

Changes in Planning Structure and Context

Implementing these improvements in the planning process of the Health Service involves several structural and contextual changes. The principal contextual obstacle to improving the Health Service's planning is the existing practice of health policymaking. Like planning, policymaking should focus on health needs and the relationship of the health system to them. As discussed above, the policymaking process should include a series of decision-making activities comprised of the statement of general health goals, problem identification, selection of health system goals and objectives, program selection, and program evaluation. The decisions relating to problem identification and program selection are largely ignored in the observed practice, and therefore must be initiated. Each policymaking decision should be synchronized with the corresponding planning activities. But the distinction between the planning and the policymaking should be emphasized.

In order to develop a functional policymaking process, less reliance on the Health Ministry as the source of policymaking decisions is necessary. It is not recommended that the Ministry relinquish its role in the Health Service's policymaking, for such a prescription would not be feasible without a major shift of authority. Rather,

5 This work is being done largely by Maurice King in Indonesia, see K. W. Rewell, M. H. King, J. Sulianti Saroso, "The Health Care Package," WHO Chronicle, XXIX, No. 1 (1975), pp. 12-18.
what is recommended is regional policymaking as an input into national policymaking. Certainly both the ability of the Ministry to override a regional decision and the suggestion of policy guidelines by the Ministry to the Health Service do not necessarily conflict with this recommendation.

The distinction between planning and policymaking will be strengthened if the present technical emphasis in the policymaking participants is diminished. The political nature of the decision-making should be developed, and perhaps the best approach is to redefine the role and composition of the existing Health Board. The role would be to carry out the aforementioned set of policymaking activities. Members should be selected by the state government to represent the variety of power sources in Valle. This probably would involve few changes in the existing membership, but active participation should be emphasized. If the director of the State Lottery System, for instance, cannot dedicate adequate time to this function, then he should appoint his representative and delegate the responsibility.

The recommended planning focus on health needs and the alternative means of fulfilling these needs requires strong support in terms of epidemiological and health services research. Such organizations as the Valle University Medical School must focus their research efforts so that they are congruent with the requirements of health planning. To accomplish this, there must be closer coordination between the research organizations and the Health Service. Since both the Health Service and most of the research organizations rely on the
Health Ministry for funding, the sanction for this coordination already exists. Perhaps the most feasible strategy is to form a research committee with representatives of the Health Service and the research organizations, and commence by addressing one high-priority health problem. The task would be to review the results of the existing research relevant to the problem, and to plan additional research if it is needed.

Furthermore, three parts of the planning structure require changes. First, the planning staff must be buttressed by adding at least one full-time professional health planner, and by establishing a formal planning section or office. Educational programs in health planning should deflate the CENDES-based "cookbook" approach presently emphasized, and focus on the conceptual planning issues. Secondly, greater participation of local-level hospital and health center personnel, and representatives of the community, is needed. Finally, inter-sectoral health planning committees should be used in planning to attack priority health problems in a comprehensive manner.

The conclusion of the present study, therefore, is that the confrontation of health planning theory and practice yields valuable guidelines for improving practice. This is important because the practice outstrips theory by attempting to carry out the difficult planning process without an adequate theoretical base for guidance. The conceptual framework developed in this study provides criteria for evaluating the practice of health planning in a Colombian region and suggests a strategy for improvement. While this evaluation of a single case of health planning practice does not permit the conclusion
that this study's conceptual framework is valuable to other health planning programs in developing countries or even in Colombia, the results do support a call for further studies of the practice in similar contexts. Also, this methodology of confronting theory and practice should be utilized to study health planning in other contexts, such as the more developed countries. This should yield a better understanding of practice, and thus improve the capacity for decisions on the directions for health planning research. It also should communicate theory to those involved in practice, thereby guiding practice toward progress in solving priority health problems.
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