HEALTH PROJECT MANAGEMENT

A MANUAL OF PROCEDURES
FOR FORMULATING AND IMPLEMENTING
HEALTH PROJECTS

by

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HEALTH PROJECT MANAGEMENT: AN OVERVIEW

BASIC CONCEPTS

The purpose of this manual is to offer health planners and administrators a set of procedures for managing — that is, planning and carrying out — health projects. The project formulation procedures (Part I) are designed for use in planning health projects; the project implementation procedures (Part II) are meant to be used when projects are carried out.

The readers of this manual will find many of these procedures familiar. They will nevertheless notice some differences between the health project management method and traditional management approaches.

One feature of this method is the rigor and logic of the sequence in which the procedures are carried out. Each step is intended to result in at least one concrete, well-defined "product" (for example, a document, a definite decision taken, or a set of data) which is then used in subsequent steps; in other words the "product" of one step of the method becomes a building block or "input" to a later step.

Other distinctive features of the method stem directly from the special characteristics of health project management, as opposed to the management of ongoing health services. A health project as defined here is a temporary intensive effort to set up and put into operation a new or revised service (or programme) that will, it is believed, result in the reduction of specific health and health-related problems. This "intensive effort" takes the form of a coordinated set of activities with well-defined objectives and target dates for their achievement. Once the project objectives have been achieved — once the service or programme is set up — the project disbands, leaving the service or programme to operate on its own. Typical examples of health projects are the construction of a water supply system, the recruitment and training of a new type of health worker, and the initiation of a malaria control programme.

As Fig. 1 illustrates, the idea for a possible health project can arise in a number of different ways. A decision must then be made by the responsible governmental agency (usually the Ministry of Health) whether to undertake project formulation, that is, whether it is advisable to apply the project formulation procedures to analyse the perceived problems and design a strategy for their reduction. (Criteria for deciding on the suitability of project formulation in a given situation will be found in the Introduction to Project Formulation, page 6.) If this decision is positive, the next step is for the responsible agency to establish the terms of reference for the formulation and to set up a formulation team. Over a period of two months, this team analyses the present and future health situation specified in the terms of reference (including important factors outside the health sector) and designs strategies for improving the situation. The procedures for these analytical and design activities are given in Part I of the Manual. The end product of project formulation is a project proposal that summarizes the results of the analyses performed, describes one or more strategies for making specified innovations or changes in the health services" to reduce the target problems, and sets out a detailed project plan for implementing the proposed strategies.

The proposal is then submitted to the relevant ministries (and external assistance agencies, if appropriate) for a decision on whether to approve and fund the project. If this crucial decision is positive, one moves into the phase of project implementation as shown in Fig. 1.

---

1The formulation team may, of course, conclude from its analyses that the best strategy for dealing with the target problems would be to make changes outside the health services or outside the health sector altogether. Raising the age of marriage to 25, for example, may be considered to be the best available strategy for slowing population growth. If its terms of reference are broad enough, the team would in such a case proceed to design the details of that strategy and plan for its implementation.
Just as project formulation is done by a formulation team, implementation is carried out by a project team, whose members are normally drawn from the various governmental units collaborating on the project. Primary responsibility and authority for organizing the project activities, assigning them to various team members, and seeing to it that they are done as planned rests with the project manager, who undertakes this task by following the procedures spelled out in Part II of the Manual. Throughout the project the manager monitors the progress being made in reaching project objectives. When these objectives have been attained the project can be terminated -- it has done the work for which it was created.

A final word is in order concerning objectives, which may well be the most distinctive feature of a health project. Every project has short-term project objectives relating to desired innovations or changes in health and health-related services; for example, "To construct one water supply system" or "To recruit and train 150 village health auxiliaries". The important point to bear in mind is that these short-term objectives are only stepping-stones to the achievement of longer-term objectives -- the reduction of selected health and health-related problems. The latter are in fact the starting point for project formulation; only after examining important health problems and the factors influencing them could the formulation team conclude, for example, that recruiting and training 150 village health auxiliaries would be the best approach to reducing infant deaths from gastroenteritis from 75 to 25 per 100,000 by 1979. In a sense, problem reduction is also the endpoint and ultimate justification for the health project. But while responsibility for achieving the project objectives lies with the project team (which normally disbands once they have been attained), the problem-reduction objectives usually lie outside the control and even the lifespan of the project. One of the final tasks of the project team may thus be to ensure that a mechanism for monitoring progress in problem reduction is set up in the ongoing health services or programme initiated by the project.

INSTRUCTIONS FOR USE OF THE MANUAL

The Manual is structured as follows. Health project management has been broken down into 16 main steps, each of which is described in a chapter bearing the same number. The project formulation procedures constitute steps 1-9 (Chapters 1-9); they form Part I of the Manual. Part II of the Manual is constituted by the project implementation procedures, steps 10-16 (Chapters 10-16).

The main steps corresponding to the chapters are further subdivided: step 4.3 means the third step of Chapter 4, while step 4.31 would be the first sub-step of step 4.3.

All chapters follow the same pattern. The first page is a large flow chart depicting the sequence of steps (and sub-steps) within the chapter. The steps and sub-steps, numbered as described above, are indicated by a simple rectangular box:

```
3.3

GENERATE POPULATION PROJECTION
```
Products bear the same number as the steps that produced them but are illustrated with a somewhat different symbol:

\[ 3.3 \]

**POPULATION PROJECTION**

At the top of the second page in each chapter there is a small simplified flow chart showing exactly where the step lies in the overall formulation or implementation process (indicated by a heavy line). This miniature flow chart is followed by a set of introductory questions and answers that emphasize the purposes of the step, the products it is expected to produce, any dangers or pitfalls that should be watched for, and other relevant information and advice.

The chapter proper follows the same sequence of steps as illustrated on the large flow chart. How to do each step and sub-step is explained in full. Where necessary, figures depicting possible formats for documenting the main products are given.

Lastly, the authors have created a fictitious example of a health project formulation and implementation. Relevant portions of the example are recounted at the end of each chapter. While this illustration has been fabricated from a variety of project experiences and materials, none of the data or situations described are factual. They do, however, represent typical conditions and results, and it is hoped that by referring to the illustration readers will find it easier to understand how the procedures described in this Manual can be applied.

Special typographical devices have been used in this Manual to facilitate comprehension:

- Products when mentioned in the text (and illustration) are underlined with a dashed line and precede the product number:

  \[ \text{population projection}, 3.3 \]

- In contrast, steps are referred to as follows:

  \[ 3.3, \text{Generate Population Projection} \]

Note that initial capital letters are used for the step title and that the title follow the step number.

- The "Illustration" material at the end of each chapter has been printed in a special light-looking typeface to distinguish it from the main text:

  "The suggestion to hold the formulation grew out of country health programming."

The Manual also includes a glossary and a list of abbreviations for terms and abbreviations not in common use or used in a special sense here.

** ***
INTRODUCTION TO PROJECT FORMULATION

Part I of this Manual on health project management could have been called "Project Planning"; it could have been called "Health Strategy Design"; or it could have been called "Generating Proposals for Health Development". "Project Formulation" was chosen as the title because only a term as vague as "formulation" can encompass all of the above plus the other work that the procedures are intended to cover.

The purpose of Part I is to provide the planners of health investments with a set of procedures that might introduce a bit of rationality into what is so often an irrational planning and decision-making process. Further, it is hoped that by following these procedures health planners will be able to convince others, notably the providers of the sought-after investments, that they (the planners) know what they are talking about.

Project formulation can be characterized in two words - hard work. The fact that a logical sequence of steps is outlined, some of which utilize techniques of systems analysis and modern management, should not mislead the reader into thinking that this is a quick and easy method for producing bullet-proof proposals. A good deal of information must be reviewed, structured, and manipulated. A great deal of thinking must be done by intelligent, experienced, practical people for this method to yield its full benefits. This being said, it is felt that the formulation method has features that can help ensure that reasonable proposals for improving the state of health of a given population can be produced in a reasonable amount of time (two months) through the concentrated efforts of a handful (6–8) of dedicated people.

SPECIAL FEATURES

Some of the features that distinguish this approach are becoming widely known and sought after by professional planners. Rarely, however, are they described in a manner that enables them to be used by people who are too busy to take long courses. Often, too, planners shy away from using them because they appear to require an accuracy and completeness of data that simply does not exist in true operational settings.

The formulation procedures presented in this Manual are designed to be used in typical development situations with the data and manpower currently available. Some of their more important features are:

(1) A structured approach for information collection and analysis that is designed to yield products of immediate usefulness.

(2) A practical systems approach to defining problems and discovering potential solutions. The most notable aspect of this approach is that it requires health planners to look outside the health sector when analysing the current situation and considering approaches for problem reduction.

(3) An insistence that analysis and design should be oriented towards the future health situation and not simply deal with current problems.

(4) A dedication to the use of objectives - in planning, monitoring and control, and evaluation. These objectives include the desired amounts of problem reduction, targeted amounts of services or other types of activity, required changes or additions to the service system (project objectives), and desired results from individual project activities (activity products).

(5) A recognition that difficulties or obstacles will always arise to hinder the achievement of objectives, and a corresponding insistence on identifying such obstacles in advance so that they may be avoided. A method for identifying obstacles is therefore included.

(6) The designing of strategies for achieving problem-reduction objectives. Strategies encompass all the service changes felt to be necessary for reducing health problems. They also include techniques for changing public or professional attitudes,
organizational structures, methods of direction and control, and administrative procedures. In particular, strategies are designed to take advantage of the political environment or at least to avoid potential political obstacles.

(7) An emphasis on careful planning of the manner in which the revised or new services are to be implemented. It is suggested that management through a temporary project provides a means of getting implementation started - and finished.

**APPLICABILITY OF THIS METHOD**

Not every health planning assignment is important enough to justify project formulation. Generally speaking, the expenditure of time, money, and staff needed for project formulation is considered to be warranted:

1. when the assigned health or health-related problems have a high priority for solution;
2. when the problems have important political ramifications, making careful analysis and strategy design even more important than usual;
3. when either the problems or the strategy envisaged for reducing them (such as the creation of a new type of health worker or the inauguration of a new health programme) are new or unfamiliar in the sense of having been rarely dealt with by the standard governmental planning mechanisms; or
4. when the strategy envisaged would require the combined efforts of several different ministries, ministry divisions, or governmental agencies (such as the construction of a rural water supply system, which would probably involve the ministries of health, public works, and agriculture, as well as provincial governors, community development agencies, etc.).

**THE FORMULATION TEAM AND OTHER PARTICIPANTS**

When a planning assignment is judged important enough to deserve the full-time attention of 6-8 people for 8 weeks, the question arises whom to assign to the task. As mentioned earlier, they should be dedicated people, but they must also be qualified (experienced), available, and interested. Logically, they should be from the agencies, offices, and services that are responsible for handling the health problems to be addressed during the formulation. Above all they should be hard workers, willing to perform detailed calculations as well as to participate in major decisions.

This group of people, called the formulation team, should be led by a more senior staff member called the project formulation coordinator. His job is to manage the formulation effort. He reports directly to the office that is sponsoring or requesting the project formulation. This office is referred to as the Chartering Agency and will usually be the first governmental unit to receive the project proposal that results from the formulation. The Chartering Agency or the formulation coordinator may wish to involve other agencies in discussions about the problems being addressed, the objectives being set, and the strategies being considered for achieving the objectives. If so, a steering committee would be set up that would meet periodically during the project formulation to review the products of various intermediate steps and to offer guidance on questions of policy and priority.

Perhaps the most important feature of the formulation process, therefore, is that it requires the collaboration of all concerned. Barriers to communication and coordination that may exist within and between government units and any other agencies involved must be overcome at the outset for this planning method to work. People who in the past may have communicated
only through official memoranda are asked to work side by side during project formulation until solutions are found that are acceptable to all.

STRUCTURE OF PART I

Project formulation, and hence Part I, is divided into four phases:

(1) **Preparation (Chapter 1).** This first phase begins when the Chartering Agency concludes that project formulation is necessary. A coordinator is assigned, formulation team members are appointed, and relevant agencies are invited to place representatives on the steering committee. A training workshop is arranged and held in order to familiarize the formulation team (and possibly the steering committee) with the procedures that will be applied. The workshop also provides for clarification of the terms of reference that the Chartering Agency has written to set limits on the scope of the formulation assignment, for example, the health problems to be addressed and any potential strategies that should receive attention. Finally, the preparatory phase is used for making the necessary administrative arrangements (working space and clerical support) and for beginning the collection of data known to be necessary.

(2) **Analysis.** During the analytical phase the formulation team divides up into several small working groups in order to collect, structure, and analyse various categories of data pertaining to the current problems and their "environment", in the broad sense of the term. Chapter 2 deals with the way in which resources are currently allocated, managed, and utilized. It covers such subjects as organization structures and functions, how decisions are made, how routine business is administered, existing policies in the health sector and within the government, existing or planned priority programmes within the health sector and in other sectors, the quantities of various types of resources currently available and the amounts expected to be available in future years, and what health work is currently going on in the public and private sector, how effective it is and what it costs. In Chapter 3 the analysis focuses on current levels and past trends of diseases and conditions that fall within the terms of reference, social and economic conditions that have close relationships with the selected diseases, and the current and future demographic situation. Finally, in Chapter 4 these data are brought together in an attempt to identify the primary cause-and-effect relationships that constitute the health situation and to select and quantify the "critical" health problems of the future.

(3) **Design.** The third phase begins with the setting of problem-reduction objectives and the corresponding types and levels of service felt to be necessary for reducing the problems to the extent desired (Chapter 5). The next step is to identify any deficiencies in the current service system that might act as obstacles to the achievement of the targets and objectives just set (Chapter 6). Armed with these targets and an understanding of the likely obstacles to their attainment, the formulation team then devises alternative strategies for producing the targeted service activities and circumventing potential obstacles. After the advantages and disadvantages of each alternative are compared, the strategies considered most feasible are designed and described in sufficient detail for the proposal, and then costed (Chapter 7). The final step of the design phase (Chapter 8) is to plan the activities necessary for implementing the proposed strategies and to specify how these activities are to be managed. (The sum of all implementation activities required plus the management of these activities are referred to as the project.) The project activities are scheduled over a specified period and the resources required for their completion (principally manpower) are estimated.

(4) **Documentation.** The product of the final phase of formulation is a project proposal - a document that presents the proposed strategies, their costs, and benefits in a
manner that facilitates review by the various decision-makers and provides guidance
to the future implementors of the strategies - the project team.

The overall sequence of the project formulation steps is shown in Fig. 1. This is the
flow chart that appears in miniature on the second page of each chapter.

USE OF PART I

Part I is intended for use by people who are actually undertaking a formulation assignment. It can form the basis for the preparatory workshop and be used as a guide during actual form-

ulation. Users must regard it only as a guide, however, and must be ready to innovate their

own steps when the situation requires a deviation from what is obviously a very general approach. While the formulation procedures are presented in an apparently rigid sequence of steps, as

outlined above, it is both permissible and desirable to adjust them to suit the specific plan-

ning assignment. As will be explained further in step 1.7, careful thought should be given
to weighting the various steps when preparing the formulation schedule; some steps will need

more emphasis (and hence time and manpower), others less. It is felt, however, that all the

steps should be done to some degree to ensure a comprehensive job of analysis and design.

It should also be noted that while the steps of project formulation should be performed in

the sequence indicated, at some points the team will be carrying out several steps simultaneously, particularly during the analytical phase (see guidance on scheduling this phase, below). Another

point for the reader to bear in mind is that the method includes a certain amount of cycling or

looping back: that is, some steps are done initially and are redone later on when more inform-

ation becomes available. Strategies and targets, for example, are first set and may later be

revised in the face of excessive costs or other resource requirements.

FLOW CHARTS

The flow charts of Part I contain two columns in addition to the columns for the steps and

products. On the left-hand side there is a column labelled "inputs"; here are listed the

products or other items that are fed into each step, such as discussions with representatives of

relevant programmes, and products of previous formulation steps. The extreme right-hand

column labelled "points of use" indicates the future formulation or implementation steps where

the product in question will be used. The inputs, therefore, represent what is fed into the

step, whereas the points of use pertain to the product.

GUIDANCE ON SCHEDULING THE ANALYTICAL PHASE

If the formulation is to be completed within a reasonable period of time, many of the

analytical steps must be done simultaneously. The formulation team must therefore be divided

into several working groups, each responsible for one or more steps. The sequence in which

the steps are performed will vary somewhat with the situation and the amount of emphasis that

each step is scheduled to receive but the following guidelines are generally applicable:

1. None of the analytical steps should be begun until the team has the initial problem
   outline, 1.5, the terms of reference, 1.6, and the formulation schedule, 1.7 (products
   of the preparatory phase).

2. All analytical steps except 2.4, Describe Current Health Work, must be completed
   before step 4, Analysing and Projecting the Problems, can begin.

3. Step 2.1, Review and Describe Organization Characteristics, should precede step
   2.3, Estimate Future Resource Availability.
FIGURE 1. PROJECT FORMULATION STEPS

1. Preparing for Project Formulation
   - Analysing the Organisational Situation

2. Analysing and Projecting the Problems
   - Setting the Objectives and Targets
   - Identifying Potential Obstacles
   - Designing the Strategies

3. Analysing the Health, Socioecon., & Demographic Sit.

4. Writing the Project Proposal

5. Planning the Project

6. Writing the Project Proposal

7. Planning the Project

8. Writing the Project Proposal

9. Writing the Project Proposal
(4) Step 3.1, Select and Quantify Health Conditions, should precede both step 2.3, Describe Current Health Work, and step 3.3, Estimate Future Population.

(5) Step 2.4, Describe Current Health Work, may continue after the completion of step 4 even though the problem diagram, 4.3, and the problem projections, 4.6, are the end products of the entire analysis phase.

Fig. 2 depicts the sequence and relationships of the analytical steps and how they might be distributed among three working groups. (The scheduling of this same distribution of work is illustrated on page 31 by means of a Gantt chart.)

It is important that the working groups communicate with each other as they work on their products. Occasionally, meetings of the whole formulation team should be called to familiarize all members with the progress and products of individual working groups.

GUIDANCE ON DATA COLLECTION FOR ANALYTICAL PHASE

The analytical phase (Chapters 2, 3, and 4) requires the collection and analysis of a great deal of information. In general, the team should concentrate on collecting data for specific uses; random and arbitrary information gathering must be avoided. Following are some guidelines that may be found useful:

(1) All requests for data to outside offices should be formulated in highly specific terms. They should be initiated from the coordinator to a senior staff member in that office.

(2) The team should use any and all sources of data, including institutions, private and professional organizations, assistance agencies, and commercial firms, in addition to government agencies.

(3) Any information collected for or generated by previous country health programming would be particularly relevant to most of the steps of analysis, and in fact may make some steps unnecessary.

(4) For collecting data, the formulation team should make use of people within the team and from cooperating offices who have had recent experience in collecting similar types of data. Such individuals have the necessary contacts and know about obscure but productive sources.

(5) For all data, the source and date should be recorded.

(6) In all categories of information, the data should be quantified to the extent possible. Non-quantified information must be described succinctly and explicitly.

(7) Frequently, more information is available from a variety of sources than can be used effectively in formulation. One of the purposes of the analytical steps is thus to select the most reliable and relevant data from among the many overlapping sources.

(8) When needed data are missing, the team must resort to estimates, extrapolations, and assumptions. The assumptions made and the statistical methods used must be recorded.

***
Figure 2. The steps of the analytical phase, and their distribution among three working groups.

1.5 Initial problem outline

1.6 Terms of reference

Working Group 1

2.1 Review and describe organization characteristics

Working Group 2

2.3 Estimate future resource availability

3.2 Analyse socioeconomic trends

3.3 Generate population projection

Working Group 3

Select and quantify health conditions

2.4 Describe current health work

2.4 Describe current health work

4

Analysing and projecting the problems (undertaken by the total formulation team)
CHAPTER 1.

PREPARING FOR PROJECT FORMULATION
1. Preparing for Project Formulation

**Inputs**

1.1 Hold chartering agency discussions

1.2 Make administrative arrangements

1.3 Begin data collection

**Steps**

1.1 Preliminary terms of reference

1.2 Appointment of team & steering comm.

1.3 Data assembled by category

1.4 Conduct training workshop

1.5 Create initial problem outline

1.6 Write terms of reference

1.7 Make formulation schedule

**Products**

1.1 Preliminary terms of reference

1.2 Appointment of team & steering comm.

1.3 Data assembled by category

1.4 Conduct training workshop

1.5 Initial problem outline

1.6 Terms of reference

1.7 Formulation schedule

**Points of Use**

1.3, Begin data collection
1.4, Conduct training workshop
1.5, Create initial problem outline
1.6, Write terms of reference

Subsequent steps as required

2. Analysing the organizational situation
3. Analysing the health, socio-economic & demographic situation

All subsequent steps

Steps 2-9
What activities are undertaken during the preparatory phase?

Preparation involves four main activities:

(a) Initial discussions are held within the Chartering Agency during which the decision to undertake project formulation is made, staff are assigned to the formulation, and other arrangements for it are begun.

(b) A training workshop is conducted in order to prepare staff for carrying out the formulation.

(c) Data collection begins.

(d) Arrangements for administrative and other support to the formulation are made.

What products are generated during this step?

In addition to the assignment and preparation of formulation team members for their work, the following products emerge from this step:

(a) A preliminary and then a final terms of reference, which specify what the formulation team is expected to produce and draw attention to aspects of the problem situation that deserve special consideration during formulation.

(b) A detailed schedule of the formulation activities to be undertaken, showing who is assigned to what activities.

(c) A preliminary outline of the problems to be addressed by the formulation team.

What are the most important inputs to this step?

(a) Relevant policies, decisions, and plans produced during preceding higher-level planning, such as country health programmes and five-year development plans.

(b) A general description of the idea or strategy (if any) that is to be expanded into a detailed project proposal.
HOLD CHARTERING AGENCY DISCUSSIONS

Discussions between officials of the Chartering Agency and experienced formulators (that is, persons who have participated at least twice in project formulation) must be held as a prelude to project formulation.

The first aim of these initial discussions is to determine, using the five criteria listed on page 6, whether the formulation method is appropriate for the planning task at hand. Some of the information on which this decision will be based must come from the Chartering Agency officials; other information should be provided by the experienced formulators. The officials should provide information on the following points:

(1) The nature of any perceived problems, the priority attached to their solution, the goals of the project, and how the project would fit into the country's overall development scheme.

(2) Decisions relevant to the project that have already been taken.

(3) Decisions that would need to be taken to proceed with project formulation and implementation.

(4) Known specifications that the project would have to conform to, such as existing national objectives or health strategies.

(5) Known political constraints or limitations on time or resources.

(6) The general political and organizational "environment" surrounding the assigned problems.

The experienced formulators, for their part, are expected to:

(7) Clarify the general concepts underlying project formulation, including the types of activities and the "products" that emerge from them.

(8) Explain that project formulation not only designs the products expected from the project but also plans how they should be produced (implementation planning).

(9) Discuss the organizational and managerial approaches available for implementation; these range from having the activities undertaken by an existing organization to creating a special project organization to do the implementation work. The potential value of creating a special project organization or team should be explained.

(10) Estimate the time and staff requirements for conducting project formulation.

(11) Describe the potential of project formulation for increasing the planning abilities of ministry and health service staff.

If this exchange leads to the conclusion that the formulation method is appropriate for the subject at hand, the substance of points 1-6 above should be recorded as preliminary terms of reference.

The discussion should then turn to the organization of the formulation. The following points should be considered:

(1) Which officer within the Chartering Agency will be responsible for the project formulation? (This senior person, usually at least a director in the health services, will probably be the chairman of the steering committee.)

(2) Who is to be the full-time coordinator of the formulation?
(3) Who are to be full-time members of the formulation team?

(4) Who should belong to the steering committee?

(5) When should the formulation be conducted, and are there any special scheduling considerations? Answering this question involves knowing:

(a) when the proposal is required for submission and decision-making;
(b) when there will be a minimum of activity competing for the attention of formulation team and steering committee members;
(c) whether the formulation will need to be broken into segments or phases in order to allow for (i) pauses for review and approval of the products of various steps; (ii) time for working groups to perform calculations, simulations, or detailed design; and (iii) unavoidable absences of key staff.

(6) Where should the formulation be conducted? When deciding on suitable office accommodations, the following requirements should be taken into consideration:

(a) proximity to decision-makers and policy-makers;
(b) proximity to sources of needed data;
(c) proximity to the relevant region or province, if the project is not country-wide;
(d) proximity to the normal duty station of the majority of formulation members;
(e) avoidance of team distraction by routine duties.

(7) What are the sources of administrative support for the formulation? In particular:

(a) support staff, such as secretaries, statistical clerks, drivers;
(b) funds for defraying expenses such as the cost of temporary secretarial assistance, documentation costs, travel and per diem of team members;
(c) vehicles, calculating machines, typewriters, duplicating machines, writing materials.

(8) Is the formulation viewed as part of a general effort to strengthen planning and management ability? If so, it is advisable to outline the general training plan, identifying the objectives and activities that are to be included in the training effort.

(9) Will it be necessary to hold a workshop during the preparatory phase to familiarize formulation team members with the formulation method? Usually a training workshop of one kind or another is needed if the majority of formulation team members have not had past experience in project formulation. If a workshop is necessary, the time and physical accommodations allotted to it should be indicated.

Any final decisions concerning the above questions should now be added to the preliminary terms of reference.

Subsequent organizational meetings within the Chartering Agency will be necessary to review progress in preparing for the formulation. The coordinator usually bears major responsibility for overseeing the preparatory activities, the most important of which are the appointment of members to the formulation team and the steering committee that is to guide it (step 1.2).
1.2 MAKE ADMINISTRATIVE ARRANGEMENTS

Throughout the preparatory phase, the coordinator and some of his support staff will have to complete the arrangements necessary for beginning and sustaining the project formulation. Following is a checklist of such arrangements:

(1) Contacts and formal requests/appointments for the assignment of:
   (a) full-time formulation team members, including experienced formulatorts who will conduct the training workshop and guide the actual formulation;
   (b) steering committee members;
   (c) external advisers (for the formulation method and/or technical expertise);
   (d) secretarial and statistical support staff;
   (e) part-time consultants from health services or training institutions relevant to the formulation subject.

(2) Accommodation
   (a) The workshop (see step 1.4) requires a conference room of sufficient size to accommodate all participants; training aids such as blackboards, viewgraph projectors, and maps of the project region are also needed. Relevant documents (preliminary terms of reference, 1.1, previously assembled data, guiding policy statements) and this manual should be provided to all participants in advance of the workshop.
   (b) The formulation requires several offices for working groups and the secretarial staff, a larger room for full formulation team sessions, and space for document storage, all adjacent to one another.
   (c) Visiting staff will require living accommodations.

(3) Other facilities
   (a) Equipment: typewriters, duplicating machines, calculators.
   (b) Supplies: writing tablets, graph paper, typing paper, stencils and stencil paper, pencils, rulers, stencil stylos, correction fluid.
   (c) Transport: vehicles and drivers for field visits.

(4) Finances
   (a) Funds for salaries of temporary support staff, travel and per diem and stipends of the team members and support staff, and supplies requiring local purchases.
   (b) Special budget request, if necessary, for obtaining the above funds and staff.

1.3 BEGIN DATA COLLECTION

During the preparatory phase the formulation team should begin to collect the data that are most likely to be needed during project formulation. Even before the workshop, the team can begin data collection by referring to Chapters 2, 3, and 4 of this manual, which indicate
the types of data normally needed for each step of analysis and the usual sources of such information. During the workshop more specific data requirements may be identified; these should be noted and, if possible, some effort should be made to begin collection before the analysis phase.

It is important to concentrate on assembling existing data and documents. Special-purpose surveys should be avoided. All requests for information to outside offices should be very specific and restricted to data that already exist in summarized form; cooperating offices should not be requested to embark on time-consuming collation or calculation.

More detailed guidelines for data collection were given on page 10.

1.4 CONDUCT TRAINING WORKSHOP

A variety of approaches have been used for training staff in the project formulation method and familiarizing them with the formulation assignment. The device that seems to have been preferred by past participants is a concentrated, practical training workshop with the following characteristics:

(1) **Purpose.** The primary purpose of the workshop is to prepare formulation team members for the detailed technical work they will have to do during project formulation. If the workshop is attended in addition by representatives of the Chartering Agency and members of the steering committee, it should familiarize them with the basic concepts of project formulation and give them some idea of the overall process. These individuals will in turn be able to provide information on the background of the formulation assignment. In this respect, the workshop offers an initial opportunity for discussions among the members of the formulation team and those who will be sponsoring and guiding the formulation.

(2) **Attendance.** The workshop should be attended by:

(a) members of the formulation team;
(b) senior representatives of the Chartering Agency;
(c) members of the steering committee;
(d) interested staff from collaborating offices and agencies.

(Those listed in (b) – (d) may attend only relevant sessions.)

(3) **Discussion Leaders.** Persons experienced in the application of the project formulation method should lead the workshop discussions. They may be from within the country, from other countries where the method has been applied, or from WHO formulation support teams.

(4) **Length.** The workshop should last 5-6 days or 10-12 half-days.

(5) **Content.** The workshop should consist of a combination of introductory reading on the concepts and basic steps of project formulation, presentation of simple illustrations, practical exercises, and group working sessions. A detailed workshop syllabus for periods ranging from 3 days to 2 weeks has been prepared by WHO.\(^1\)

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\(^1\)This unpublished document, entitled Didactic Material for Health Project Management, may be obtained on request to the World Health Organization, Avenue Appia, 1211 Geneva 27, Switzerland.
1.5 CREATE INITIAL PROBLEM OUTLINE

During the preparatory phase the formulation team must examine the part of the preliminary terms of reference, 1.1, that refers to the nature of the problem and expand it into an outline of the main problems to be addressed by project formulation. If a training workshop is held this work can be done at one of the sessions, using the technique of group discussion of critical problems as described in Chapter 4.

Later on, in step 4 (Analysing and Projecting the Problems), the team will make a final decision as to what problems are most critical and will prepare tables showing the present and likely future magnitude of those problems. The purpose of making a preliminary outline at this point is to narrow down the subject matter that must be researched and analysed by the formulation team during steps 2 and 3.

1.6 WRITE TERMS OF REFERENCE

The terms of reference are one of the most important products to come out of the preparatory phase. They describe in detail the subject assigned to the formulation team, lay down the policies that should be adhered to during formulation, indicate the various types of information that the Charting Agency expects to find in the final proposal, and provide general guidance for almost every step of analysis and design. A checklist of the information to be included in the terms of reference is given as Fig. 1.

The actual writing of the terms of reference cannot take place until both the formulation team and the steering committee have become familiar with (a) the formulation assignment, and (b) the formulation method described in this manual. Such familiarity is normally acquired during the training workshop, during which the team members explore the intent of the preliminary terms of reference, 1.1, that emerged from the initial Charting Agency discussions. These preliminary terms of reference, it will be recalled, did not contain all the information listed in Fig. 1, nor were they structured in a systematic way. They must therefore be restructured and completed to yield the formal terms of reference. For this work, it is best to set aside one or two half-days at the end of the workshop during which the terms of reference can be discussed and decided on jointly by the formulation team, the steering committee, and, if possible, representatives of the Charting Agency. The advantage of having the latter attend the discussion is that they can then immediately respond to any changes in the terms of reference proposed by the formulation team. If their attendance is impossible, a working group of the formulation team should be assigned to make a draft revision of the terms of reference incorporating all changes being recommended by the team. This draft would then be forwarded to the Charting Agency, which may or may not convene a steering committee meeting before deciding whether to accept the revision and returning an agreed form of the terms of reference to the formulation team.

1.7 MAKE FORMULATION SCHEDULE

A project formulation is by definition an endeavour with limited time and resources. It must therefore be carefully scheduled to make sure that the proposal is produced on time and contains all the information indicated in the terms of reference. Scheduling the formulation is important for another reason as well: it is a practical exercise in scheduling, which will help when the time comes to schedule the project proper (step 8).

\[1\] In the event there is no workshop, this work would be done at similar joint meetings of the same parties.
Figure 1. Checklist for Terms of Reference

(1) Who is sponsoring (chartering) the project formulation? (Clearly indicate the office/officer primarily responsible for chartering the formulation and other offices and agencies with an interest in the formulation subject.)

(2) What is the nature of the assigned problems? The nature of the problems to be addressed during formulation can be defined initially in terms of one or more of the following:

(a) disease groups, disease symptoms, or consequences of disease (death, disability);
(b) deficiencies in certain health services (health centres, hospitals, etc.);
(c) environmental deficiencies (unsafe water, high population density, etc.);
(d) problems of infrastructure (health laboratories, training institutions, medical supply system, information systems);
(e) administrative and/or organizational problems.

Additional specific characteristics include:

(a) population groups involved (age/sex categories, social or economic groups, occupational groups);
(b) geographic area involved (if the potential project is less than country-wide, or if particular areas -- urban, rural, underdeveloped -- are critical);
(c) epidemiological factors (specific incidence reduction targets, levels of concern, etc.).

(3) What time considerations apply to the project?

(a) By what date is reduction of the assigned problems desired? (Normally, this date coincides with the end of a plan period.)
(b) By what date must the project objectives be achieved?
(c) What is the target date for completing the project formulation?

(4) What resource limits exist for the project?

(a) Are there known budget limits within which any new or revised health services resulting from the project will have to operate?
(b) What are the money and manpower limits for the project implementation itself?
(c) What money and manpower limits exist for the formulation?
(d) Who is assigned to work (full-time, part-time) on the formulation team? What is the role of each participant, and to whom does each report? Where should requests for additional support of various types be addressed?

(5) What specific end products are expected from the formulation?

(a) Must there be analysis and detailed design of a pre-existing health strategy?
(b) Is there a need for certain types of budget information?
(c) Will external (assistance) organizations require information?
(d) Are other specific products expected, such as job descriptions, specifications for training curricula, information system descriptions?

(e) Is the formulation team expected to write a project proposal? What must this document contain? Is there a required format for its presentation? To whom should the proposal be submitted, and who should receive copies? By when must it be submitted?

(6) Among all the existing policies and objectives related to the formulation subject, which ones should be considered most binding when formulating the project? If portions of an existing policy document, such as a national health plan, are inappropriate, allowable departures from it should be indicated. (It is important to state unwritten (implied) policies as well as written ones.)

(7) Are there specifications for or limits to the scope of analysis and design to be done during formulation?

(a) Are there changes that cannot be considered -
   - to existing technology?
   - to existing staff, their functions, placement, or distribution?
   - to existing (health) service procedures?
   - to existing facilities, their design, function, placement, or number?
   - to overall (health) service administration, responsibility, organization, structure, and support systems (information, supply, training)?

(b) Are there changes that should be considered -
   - as suggested by recent policy statements?
   - to conform to a strategy that has emerged from recent country health programming?

(8) What existing or planned development programmes are relevant to the formulation subject? (Here one should consider specific programmes with which coordination is desired, or which may need the benefits of a project in the area under study, or which may alter social or economic conditions that in turn are likely to affect the extent of the assigned problems.)

(9) What are the formulation's relationships with other relevant agencies? (These include points of contact with cooperating agencies, sources of information from other sectors, and agencies or offices that should be kept informed of formulation progress.)
For reasons that will now be obvious, scheduling of the formulation cannot be done until the terms of reference, 1.6, have been completed. The terms of reference not only indicate what aspects of the formulation are most important (and will require more time and effort) but they also spell out the products that will have to be included in the proposal. By using this information and working "backwards" from the desired products, the formulation team now determines what activities will be required to generate each product and estimates how much time and manpower need to be allocated to each activity. Usually, there will be one activity for each formulation step, but where a step produces an extremely important product or takes a great deal of time it may be best to break it down into several activities.

At this point, in other words, the formulation team decides on the emphasis to be given to certain formulation steps and tailors the project formulation method to suit their special circumstances. For example, the terms of reference may demand that there be detailed analysis to determine the influence of an expanding petroleum industry on the assigned health and health-related problems. This would require more time to be scheduled for step 3.2, Analyse Socioeconomic Trends.

In another situation there may be great uncertainty about the amount of resources that might be allocated to the project and about the resistance to change expected from professional medical societies. This would imply that step 2.3, Estimate Future Resource Availability, and step 7, Planning the Project, should be performed in especially great detail. Another situation requiring tailoring of the method would be where country health programming had proposed the idea of creating a village health auxiliary as a new member of the rural health services. This would require giving considerable attention to the health problems such auxiliaries would be expected to deal with, and to the strategy for their recruitment, training, and supervision.

General points to bear in mind when adjusting the method are:

(1) Any strategy design felt to be less necessary for gaining approval of the project should be delayed until the early implementation period.

(2) Some design should not be undertaken if the formulation team lacks members with the required technical expertise.

(3) Given the limits on time and staff, allocating greater time and effort to certain steps or activities will mean that other steps will have to be done in less detail.

(4) While adjusting the method to the situation is encouraged, it should be remembered that the project formulation method is a set of analytical and design steps. The value of the method lies in the sequence, interrelatedness, and comprehensiveness of these steps. All are included for a purpose; all should be undertaken to some degree.

Fig. 2 and 3, pages 30 and 31, illustrate two possible formats for presenting the resulting schedule of formulation activities. To be useful, the schedule must contain the following information for each activity.

(1) activity number;

(2) activity title;

(3) scheduled start and completion dates;

(4) activity leader;

(5) other staff assigned to activity;

(6) nature of product emerging from the activity.
Careful attention should be given to deciding which activities can be done concurrently (by small working groups), which activities must precede or follow others, and which must be done by the whole formulation team. The unit of time used in the schedule is usually a day; most activities take between 2 and 10 days. Any holidays occurring during the formulation period should be indicated on the schedule.

A more detailed explanation of how to create a schedule can be found in Chapter 8.

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ILLUSTRATION - CHAPTER 1

The suggestion to hold the formulation grew out of country health programming. The country health programming group identified the following four areas as having priority:

(1) Provision of a revised and expanded basic health service that would:

(a) be administered and supervised at the district level;
(b) be supported by a system of community participation;
(c) provide in-patient, out-patient, and mobile service;
(d) utilize a community health auxiliary for local level service, support, and promotion;
(e) emphasize prevention (through an expanded programme of immunization), nutrition (through the dispensing of food supplements and vitamins), and health education for mothers and family planning.

(2) Expansion of a health manpower development programme that would concentrate on the recruitment, qualification, upgrading, and assessment of the following types of district health service staff:

(a) medical assistant;
(b) nurse-midwife;
(c) community health auxiliary;
(d) district medical officer.

(3) Expansion of the rural water supply and sanitation programme that would:

(a) initiate a massive scheme of community tube well installation;
(b) initiate a community-implemented latrine construction programme;
(c) design and implement a system of community-centred well and latrine maintenance.

(4) Provision of a provincial-level health management system with the following components:

(a) provincial health planning;
(b) implementation management;
(c) provincial health information system (health and health service monitoring and evaluation);
(d) staff in-service training and supervision;
(e) support services, including supplies management, laboratory service, emergency transportation, and vehicle and equipment maintenance.

The overall implementation strategy contained in the Country Health Programme suggested that the Ministry's Health Planning Unit should undertake a series of project formulations aimed at providing the design and implementation details of:

(1) the district health service programme,
(2) the district health manpower development programme, and

(3) the provincial health management system

in that order. The expanded rural water supply and sanitation programme was probably the responsibility of the Ministry of Public Works. The Country Health Programme also specified that the resulting projects should be carried out in one province to begin with. Province Eaks is chosen as the province of initial implementation.

Consequently, the Director-General of Health Services (DGHS) is now responsible for chartering a formulation on the subject of the district health service and its implementation in Province Eaks. Fortunately, there are four officers in the Health Planning Unit who have previously participated in a project formulation. On 25 January, the DGHS convenes a meeting with his assistant directors and the Deputy Director of Health Planning (step 1.1). The formulation assignment is discussed, as are the requirements and potential of the formulation method. The central issue is how broad or narrow to make the formulation assignment. The DGHS wishes to direct the formulation to the entire subject of the district health service, whereas the Deputy Director of Health Planning feels that in order to do an adequate design job, the assignment should be limited to one or two aspects of the service, such as facilities planning or the approach for obtaining community participation.

The conclusions from the initial meeting (which are written down as the preliminary terms of reference, 1.1) are as follows:

[1] The subject of the formulation is the district health service. It is one of the top four priority programmes in the forthcoming Five-Year Plan.

[2] The formulation team is to address the overall design of the service and the specific features requested in the Country Health Programme (CHP).

[3] The formulation team is to consist of 6 members of the Health Planning Unit, one provincial medical officer, two district medical officers, and one public health nurse (all but the Planning Unit staff are from Province Eaks where implementation will begin).

[4] The Deputy Director of Health Planning is assigned as coordinator of the formulation.

[5] A steering committee will be formed with representatives from the Ministry Divisions of Health Services and Hospitals, the Health Service Training Institute, the programmes of malaria, tuberculosis, smallpox, and family planning, and the Ministries of Community Development, Public Works, and Finance.

[6] A training workshop will be held to prepare the inexperienced members of the formulation team and to brief members of the steering committee.

[7] The workshop and formulation should begin as soon as the necessary arrangements can be made. The project proposal should be submitted to the DGHS in time for his review prior to budget submission (1 June).

[8] The team will work full time on the formulation until the proposal is completed. They will spend their time in both the capital and Province Eaks.

[9] The Planning Unit will provide secretarial support and transportation.

[10] A scheme should be devised to allow the probable participants of the next formulation (health manpower development) to observe the process.

Immediately after the initial meeting, the coordinator takes the following actions:

[1] Initiates letters of appointment to the members of the formulation team, to be
signed by the DGHS (step 1.2).

(2) Initiates letters of invitation to the offices to be represented on the steering committee (to be signed by the DGHS).

(3) Directs the experienced formulators on his staff to:
   (a) prepare a five-day workshop (WHO didactic material on project formulation is provided on request);
   (b) begin inventorying and assembling data known to be relevant to the formulation subject (much of the data used in CHP is relevant) (step 1.3).

(4) Reserves meeting and working rooms in the Ministry and the Provincial Health Office (step 1.2).

(5) Hires a temporary secretary for full-time support to the formulation (step 1.2).

Two problems immediately arise. (a) It is learned that the Provincial Health Officer (PHO) is soon to be reassigned and his replacement is not known. It is decided to appoint him to the formulation team anyway, and when his successor is named, to have the new PHO participate as well. (b) The family planning programme administrator expresses hesitance on becoming involved in the formulation. His quasi-governmental agency is due to receive a large amount of foreign assistance for carrying out a largely independent programme. The administrator is apparently concerned that the autonomy of his organization and programme may be challenged in the forum of the steering committee. The DGHS personally assures the administrator that his programme will remain intact, and that in fact his participation in the steering committee should ensure that conflicts between his programme and the district health service do not arise. The administrator agrees to participate.

The overall schedule is agreed on and the coordinator reports to the DGHS that the workshop is to be held on 18-23 February, with the formulation scheduled for the months of March and April. Approval is granted to proceed.

Before the workshop begins the participants indicate that they would prefer that the workshop be held in two weeks of half-days in order to allow them to clear up their other work before becoming involved full time in the formulation proper. This change is made and accommodation provided for the workshop in the provincial hospital.

The workshop is held from 18 February to 1 March (step 1.4). During the workshop the participants tentatively outline the critical problems that they feel should be addressed during the formulation (step 1.5). These are:

(1) Infant mortality;
(2) Overall mortality;
(3) High fertility;
(4) Risk of smallpox;
(5) Prevalence of malaria;
(6) Prevalence of leprosy;
(7) Incidence of immunizable childhood diseases;
(8) Malnutrition and its precursors;
(9) Accidents;
(10) Environmental conditions;
(11) lack of information on the health status of the people;
(12) inadequate public awareness of health problems;
(13) health service inefficiency;
(14) inadequate public access to health service;
(15) inadequate public and political support for health improvement.

In the last days of the workshop the formulation team along with the steering committee concentrate on specifying in very clear terms what products are to be produced during the formulation. These are as follows:

(1) Detailed description of the functions of the district health service, specifying the numbers and types of tasks to be performed at each facility level, particular attention being paid to preventive programmes of immunization, nutrition, and family planning.

(2) Detailed description of the nationwide configuration of the district health services that would provide the required number of facilities and staff by type.

(3) Detailed description of the system of administration and supervision within the district health service.

(4) Revised job descriptions of health staff at the district level and below to correspond with product (1).

(5) A protocol for the promotion of community participation in support of district health services.

(6) A protocol for the establishment and utilization of a "rural community health worker".

(7) Implementation schedules at two levels:

(a) a general outline of the activities and schedule for implementing district health services throughout the country;

(b) a more detailed schedule for implementing district health services within Province Eaks.

(8) A schedule of resource requirements at the national and provincial levels (for Province Eaks) showing:

(a) the number of new facilities and when they are required;

(b) the number of new staff to be trained and when they are required in the service;

(c) the overall recurrent and development budgets of the District Health Service up through the year of full national implementation.

It is agreed that the following will not be designed during the formulation but will be scheduled for the first phase of implementation:

(1) Detailed operating procedures for the facility, staff, and mobile teams.

(2) The details of the community participation programme.

(3) The details of the rural community health worker scheme, including their recruitment, training, supervision, support, and assessment.
After these products are agreed upon it is possible to finalize the terms of reference (step 1.6) and create the formulation schedule (step 1.7). The latter is illustrated in Fig. 2 by means of a network and in Fig. 3 by means of a Gantt chart.
**Figure 3. Project Formulation Activity Schedule (First Half)**

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<th>Working Group</th>
<th>Activity</th>
<th>WEEK 1 M T W T F S</th>
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CHAPTER 2.

ANALYSING THE ORGANIZATIONAL SITUATION
2. **ANALYSING THE ORGANIZATIONAL SITUATION**

**INPUTS**
- Terms of reference, 1.6
- Organization descriptions
- Discussions with organizational representatives
- Descriptions of procedures
- Discussions with administrators
- Discussions with programme and project managers
- Discussions with organizational representatives
- Policy diagram
- Discussions with organizational representatives
- Programme diagrams
- Discussions with organizational or programme representatives
- Initial problem outline, 1.5
- Terms of reference, 1.6
- Discussions with budget officers
- Budgets and inventories
  - Summary of organization, management, and decision-making, 2.1
  - Summary of policies and programmes, 2.2
- Disease statement, 3.1
- Service data
- Descriptions of procedures
- Discussions with service staff
- Resource projections, 2.3

**STEPS**
- **2.11 Review Organization Structures & Functions**
- **2.12 Review Administrative Procedures**
- **2.13 Review Implement Experience**
- **2.14 Review The Decision Process**
- **2.21 Review Relevant Policies**
- **2.22 Review Relevant Programmes**
- **2.31 Identify Resource Types and Quantify**
- **2.32 Generate Resource Projections**
- **2.41 Describe Current Outputs & Techniques**
- **2.42 Estimate Resource Utilization**

**PRODUCTS**
- **2.1 Review and Describe Organization Characteristics**
- **2.2 Review and Summarize Relevant Policies and Programmes**
- **2.3 Estimate Future Resource Availability**
- **2.4 Describe Current Health Work**

**POINTS OF USE**
- 4. Analysing and Projecting the Problem
- 6. Identifying Potential Obstacles
- 7. Designing the Strategies
- 8. Planning the Project
- 3.2 Analyse Socioeconomic Trends
- 5. Setting the Objectives & Targets
- 6. Identifying Potential Obstacles
- 7. Designing the Strategies
- 8. Planning the Project
What are the purposes and products of this step?

The analyses performed in this step are meant to give the formulation team a clear picture of the organizational "environment" in which the formulation and any resulting project will have to be carried out. Specific products of these analyses include:

(a) a graphic and functional description of the organizations and agencies most relevant to the formulation;
(b) a graphical depiction of the normal decision-making process;
(c) descriptions of past implementation experiences, focusing on reasons for past success and failure;
(d) a summary of the important policies and programmes of relevance to the formulation subject;
(e) a summary of the current and probable future levels of the resources that will most likely be needed for the project;
(f) concise descriptions of the major types of health work presently being applied to combat the health problems mentioned in the initial problem outline, 1.5.

Who should do these activities?

Steps 2.1, 2.2, 2.3, and 2.4 should be done by small working groups. Guidance on distributing and scheduling this work can be found in the Introduction to Part I, page 8.

What are the dangers in this step?

The main danger is that too much information will be available, much of it contradictory and unreliable. The team should avoid becoming submerged in extreme detail that may prove to be irrelevant and should concentrate on producing reasonable, informative summaries. In step 2.1 there should be an attempt to identify informal as well as formal organization structures and decision-making processes. In steps 2.2, 2.3, and 2.4 the team should pay more attention to actual expenditures and actual performance than to budgets, plans, and written procedures.

*
2.1 REVIEW AND DESCRIBE ORGANIZATION CHARACTERISTICS

This step consists of four sub-steps.

2.11 REVIEW ORGANIZATION STRUCTURES AND FUNCTIONS

With guidance from the terms of reference, 1.6, and from members of the Chartering Agency, the team members assigned to this step would first identify those organizations and agencies that will be participating in project implementation and/or carrying out the implemented health strategies on a continuous basis. Normally, these include the Ministry of Health (as a whole), the most relevant department or division within the Ministry, provincial and local governments responsible for providing relevant health services, and any other ministry likely to be directly related to the project, such as Public Works. It should be noted that elements of the private sector may fall into this category.

The structures of these organizations should now be described. The easiest approach is to use existing organization charts, amended as necessary to reflect any recent changes. The charts need not be extremely detailed. If the necessary charts do not exist, they must be drawn (with the advice of knowledgeable organization representatives).

The next task is to supplement the organization charts with brief functional descriptions. Such statements should define the limits of authority and responsibility, and describe such organizational characteristics as the degree of decentralization (how much decision-making authority is vested in lower levels or peripheral units) and the degree of integration (generalization versus specialization within directorates and operational units).

In addition to the formal organization structures, functions, and relationships, it is often important to identify the informal aspects of the same organizations, for example, the existence of small influential groups that are bound together by friendships and mutual interests.

Last, the team members must estimate the adaptability of each organization, that is, how much capability and willingness exist in each organization to adapt its structures and functions to the demands of new developments. This may be done by reviewing recent changes in the organization and the factors that brought them about.

The products of this step are:

1. relevant organization charts;
2. brief functional descriptions; and
3. notes on informal relationships and organization adaptability.

2.12 REVIEW ADMINISTRATIVE PROCEDURES

In this step the team reviews the routine administrative procedures that must be followed when planning and implementing major projects or programmes. (For obvious reasons, the team members must become familiar with those procedures relevant to the project they are formulating.) The standardized procedures most frequently of relevance include:

1. Submission of a proposal for inclusion in the national development plan or health plan.
2. The budgetary process, including budget preparation, submission, review, adjustment, approval, and allotment.
(3) The process of staff assignment, including post establishment, staff recruitment, selection, and assignment.

(4) The administrative aspects of the training process for the types of staff likely to be needed in carrying out the potential health strategies. (Details of training, such as the number of students that can be accommodated (the training capacity), the subject of the training course, and the time required to complete it, can be studied during step 2.3, Estimate Future Resource Availability.)

(5) The administrative aspects of facility construction, including design, site selection, tendering, and supervision of construction.

(6) The administration of the supply system (requisitioning, stock-keeping, and distribution).

(7) Reporting system requirements (epidemiological surveillance, health service operations, etc.).

(8) The process of requesting and administering foreign assistance, particularly with regard to those agencies which have expressed or are likely to express an interest in supporting the project.

In cases where relevant administrative procedures are already documented in manuals and official circulars, such descriptions should be collected and held for reference purposes. When a relevant process is undocumented, a representative of the pertinent administrative department should be asked to brief one or more formulation team members on the current procedures, and informal notes should be taken. It is important to record the average time required to complete each administrative process, and to be aware of planning cycles and submission deadlines. This information is needed when scheduling implementation activities in step 8.

2.13 REVIEW IMPLEMENTATION EXPERIENCE

Another subject related to organization functions and administrative processes is how implementation is usually managed.

It is not too early to examine how major projects and programmes have been managed in the past, and, if a variety of approaches have been used, to identify those which have been most successful. Typical questions that can be raised, particularly in regard to the more successfully implemented programmes, are:

(1) How were important projects or programmes organized? Were all activities performed by existing functional units or were special temporary "task forces" or project teams created?

(2) How were such projects controlled? Was there a high degree of centralized control within the Ministry, or was responsibility for implementation assigned to operational units? How much review and approval were required, and by whom, in order to make changes in plans or designs?

(3) How was technical and political support obtained from other ministries and institutions? How much promotion was required and how was it undertaken? (The word promotion in this manual means trying to enlist support for something, usually a new strategy. It covers a spectrum of activities ranging from highly formal letter writing and presentations to highly informal attempts at persuasion in a conversational setting. Promotion activities also include campaigns carried out through the mass media and directed at the public.)
(4) What problems arose and how were they resolved?

The answers to these questions are important inputs for step 8.6, when the team will decide what approach should be used for implementing the proposed project.

2.14 REVIEW THE DECISION PROCESS

The group may be assisted in this step by key decision-makers or their representatives.

This step should begin with the identification of all the decisions that must be made in order to proceed from the planning stage through project implementation. Obviously, some of these decisions may already have been taken; these include:

1. the selection of certain health problems as needing priority attention;
2. the specification of the implementation approach;
3. possible strategies for problem reduction;
4. levels (minimum or maximum) of resources that may be allocated to the project;
5. the decision to undertake project formulation;
6. the designation of persons or units to be responsible for managing the formulation and/or implementation.

To predict what decisions remain to be taken, the working group must make an educated guess as to the possible outcome of the formulation, the changes it may propose in the health system, any national financial implications of these proposed changes, and the activities and manpower needed for implementation. The necessary decisions normally fall into the following categories:

1. technical decisions required in order to institute revised or new health strategies;
2. decisions pertaining to funding (amounts and sources);
3. decisions pertaining to the managerial approach to implementation and the speed of implementation;
4. decisions to modify or terminate a project after implementation has begun.

For each of the required decisions the group first identifies the organization level and decision-maker.

For each of the decisions at each level, the group then produces a list of the main criteria apt to be used by these decision-makers. Some will be relatively obvious and be contained in policy documents. The list of criteria for any given level will, in most cases, contain a mixture of influencing factors; for example, the Finance Minister may be likely to approve a particular project (a) because it will bring in foreign currency, (b) because it will support national policies, and (c) because he has confidence in the individuals in the division or ministry that is proposing the project. In preparing this list of criteria the group should try to identify, where possible, the nature of the influence of various pressure groups on the decisions to be taken (such as national or local medical associations, religious groups, external donors, the pharmaceutical industry, etc.). The list of criteria and influencing factors should be summarized by decision and by level.

If some of the critical decisions are related to scheduled events such as submission of the health plan or annual budget, these timing considerations should be noted. If some
decisions need to be taken in a predetermined sequence, this should be noted as well.

Lastly, the decision process pertaining to the present project should be summarized in the form of a brief narrative. This should be supplemented with (a) a schedule of decision events and (b) a flow diagram illustrating each decision, where, by whom, and when it is taken, and the types of factor that are likely to influence it. Together, the organization charts, administrative procedures, implementation experience, and the decision schedule and diagram constitute the summary of organization, management, and decision-making, 2.1.

2.2 REVIEW AND SUMMARIZE RELEVANT POLICIES AND PROGRAMMES

This step contains two sub-steps and results in one product, the summary of policies and programmes, 2.2.

2.2.1 REVIEW RELEVANT POLICIES

By means of the specific guidance on relevant policies provided in the terms of reference, 1.6 (see Fig. 1, paragraph (6), page 22) and with the assistance of government planners and administrators from the ministries concerned, statements of relevant national policies, priorities, and goals should be assembled for analysis. Such statements can be found in:

- international agreements, programmes, and goals;
- provisions of the national constitution;
- descriptions of ministerial functions, areas of responsibility, and interrelationships;
- constitutional functions and responsibilities of state and local administrations and special agencies;
- the national development plan (a good source of plans, policies, goals, and priorities);
- the national health plan (a good source of policies and targets);
- the Country Health Programme.

The terms of reference as a whole are used as a basis for deciding which policies are relevant, after which these policies are compiled into a list. Their precise relevance to subsequent steps of the formulation is determined on the basis of the following criteria:

(1) How will the policy influence the health problems assigned to the formulation? (Relevant for step 4, Analysing and Projecting the Problems.)

(2) What population group (mothers, infants, working-age males) does a high-level policy (goal) emphasize as needing problem reduction? What kind of problem reduction is to receive priority (deaths, disability, etc.)? (Relevant for step 5, Setting the Objectives and Targets.)

(3) Will a given policy make it easier or more difficult to change the existing health system? (Relevant for step 7, Designing the Strategies.)

(4) How will a given policy influence the manner in which new strategies can be implemented? (Relevant for step 8, Planning the Project.)

The list of policies and comments about their relevance to formulation will be abridged in step 2.22 and become part of the summary of policies and programmes, 2.2.
2.22 REVIEW RELEVANT PROGRAMMES

In this step existing or planned development programmes are similarly reviewed for their relevance to the formulation. The terms of reference (see Fig. 1, paragraph (8), page 22) may have drawn attention to programmes that the steering committee felt should be reviewed. Other programmes will probably come to light during this step. The following criteria should be used for deciding which existing or planned programmes may be relevant:

1. Is the programme likely to alter the level of one or more social or economic conditions closely linked to the problems being addressed in formulation?

2. Is the effectiveness of the programme likely to be hindered because of existing or predicted health problems that fall within the formulation’s terms of reference?

3. Are there any potential benefits to be derived from coordination between the programme and a project resulting from the present formulation?

Any programme satisfying one or more of the above criteria should be listed together with details of its purpose, scope, content, and relevance to the formulation.

At this point the lists of relevant policies and programmes and comments about their relevance should be summarized. They should then be reviewed for internal consistency and appropriateness. Contradictory or non-mutually supportive policies or programmes, or those that are obviously inappropriate for the formulation, should be pointed out when submitting this summary of policies and programmes to the steering committee, who will decide which policies are overriding and which programmes deserve greatest attention during the subsequent analysis.

2.3 ESTIMATE FUTURE RESOURCE AVAILABILITY

In this step, with its two sub-steps, the working group analyses the current and future health resource situation. They determine what types of resources are relevant to the formulation subject, quantify these resources by type and location, determine recent allocation trends, and, on the basis of these trends and other information, estimate how many resources of each type will be available throughout the plan period.

2.3.1 IDENTIFY RESOURCE TYPES AND QUANTIFY

The working group assigned to this step first determines what health resources are relevant to the formulation subject and deserves analysis and quantification. (A resource will probably be relevant (a) if it is currently being used in combating the health or health-related problems mentioned in the terms of reference, 1.6, or the initial problem outline, 1.5, or (b) if it is of potential use in a new or revised health service or programme that might emerge from the project formulation.) As many types of resources as are relevant are selected in each of the following categories:

1. budget expenditure;
2. health manpower;
3. health facilities; and
4. training institutions and other manpower sources.

A checklist of possibly relevant types of resources in each of these four categories is given in Fig. 1. Rarely will all the information or resource types listed need to be considered by the working group, but the list is helpful for ensuring that no relevant item is omitted.
FIGURE 1. CHECKLIST FOR NATIONAL HEALTH RESOURCE INFORMATION

(1) **Budget and Expenditure**

(a) Total government expenditure by sub-sector.

(b) Total health expenditure and budget for the past ten years, by ministry or agency. The categories used will depend upon which programmes and expenditure items are relevant to the formulation, for example: rural health services, maternal and child health, and family planning, immunizations and preventive services, drugs, facilities, and training.

(2) **Health Manpower**

(a) Number of staff, by ministry or agency, by type of facility, and by category. The categories must be established according to local terminology, but would usually comprise the following professional and auxiliary categories:

- Medical officer/auxiliary medical officer
- Nurse/auxiliary nurse
- Midwife/auxiliary midwife
- Laboratory assistant/auxiliary laboratory assistant
- Sanitarian/auxiliary sanitarian
- Dispenser
- Technician/auxiliary technician
- Other professionals (nutritionist, veterinarian, etc.)
- Other non-professionals (clerks, drivers, etc.)

(b) Total number of posts, by ministry or agency and category, over the last 5-10 years.

(3) **Health Facilities**

(a) Number of facilities by ministry or agency, grouped by type, for example: specialized centres, mobile units, dispensaries, peripheral hospitals, regional hospitals, central hospitals, specialized and long-stay hospitals, and laboratories.

(b) Past and present staff of these facilities.

(c) Capacity of facilities expressed in number of beds, consultations, home visits, major equipment (X-ray), laboratory tests.

(d) Planned and actual distribution of facilities by geographical and administrative areas.

(4) **Manpower Sources**

(a) Training institutions

- University medical, nursing, and technology schools: number, curricula, duration, capacity, number graduated over the last 5-10 years.
- Non-university schools: number, subject, duration, number graduated, over the last 5-10 years.
- Postgraduate training opportunities: type, number.

(b) Foreign manpower and technical assistance entering government service and private sector.
The relevant types of resources in each category are then compiled into a list. For each type, the working group would determine the level, number, or quantity of that resource presently available or in place (categorized by location—see Fig. 1), and the levels available over the past 5-10 years. Resources falling into the first two categories are most critical and should be analysed in greatest detail.

Administrators and budget officers from the ministries concerned should be the best sources of this information.

2.32 GENERATE RESOURCE PROJECTIONS

The purpose of this step is to estimate the future availability of the relevant health resources. Such resource projections will enable the formulation team, in subsequent steps (6, Identifying Potential Obstacles, 7, Designing the Strategies, and 8, Planning the Project), to estimate whether and how the resource requirements of a new or revised health service or programme will be met, and for which types of resource additional or alternative sources will need to be found or developed.

The working group first analyses the data assembled and structured in step 2.31 so as to determine present resource allocation patterns and recent allocation trends. Trends, positive or negative, should be expressed in absolute numbers (not percentages). If responsibility for the future health service or programme will be divided among several agencies or administrations, it may be necessary to calculate resource allocation trends for each. It should be borne in mind that if past expenditures or allocations were erratic from year to year, the calculated trends may be of minimal value in predicting what resources will actually be available in future years.

The trends emerging from this analysis form only part of the foundation for the final resource projections. When generating the projections the working group must also take account of the following:

1. Programme budgets, which may exist for one or more future years, should be considered valid indicators of future resource availability only to the extent that spending has followed the budget in the past.

2. Projections must make ample allowance for future rates of inflation.

3. Administrators of training institutions should be able to predict their expected output with reasonable accuracy and also give some indication as to future expansion of their training capacity. Caution: In estimating how many new trainees will enter the health service, the group must take care to deduct the predicted number dropping out or emigrating.

4. Any other convincing evidence that there will be major departures from recent resource allocation trends should be looked for carefully in the summary of policies and programmes, 2.2.

5. Programmes for constructing and expanding health facilities are usually described in reasonably accurate capital expenditure documents but, again, past adherence to plans should be ascertained before assessing the validity of such planned expenditure figures.

6. With regard to manpower, there are often discrepancies between number of salaries budgeted, number of posts established, and actual number of staff filling the posts. Such discrepancies must be determined. In estimating future manpower availability greatest reliance must be placed on the actual numbers of people in the relevant posts.
The resulting information should be synthesized with the previously calculated trends to yield the resource projections, 2.3. These are presented in the form of a table (see Fig. 6 and 7, page 53) indicating the quantities of each resource, by type and location, that the group estimates will be available for each year of the relevant plan periods.

2.4 DESCRIBE CURRENT HEALTH WORK

The purpose of this step is to produce a clear picture of what is currently being done to prevent, reduce, or eliminate each of the conditions listed in the disease statement, 3.1. (The present step thus cannot be completed, or in some cases even started, before step 3.1.)

2.41 DESCRIBE CURRENT OUTPUTS AND TECHNIQUES

Taking up each disease in turn from the disease statement, the group identifies the most important and relevant operational outputs, that is, the units of preventive or curative services provided by the health sector and other sectors. Examples of operational outputs are immunizations, health education lectures, installation of water supplies, dispensing of oral contraceptive cycles, and well baby clinic consultations. The group then describes the most important techniques used in delivering each type of output. A given technique may be used to deliver more than one type of output (a clinic consultation, may, for example, result in both an immunization and a health education contact), and, conversely, a given output such as an immunization may be delivered by more than one technique (visits by school nurses, clinic consultations, and so on).

Next, one estimates the present rate of effectiveness of x outputs as currently delivered in preventing or reducing the relevant disease. With regard to population growth, for example, the dispensing of x cycles of oral contraceptives (output) by means of family planning consultations (technique) may be preventing one birth for every 5 women-years of practice (rate of effectiveness).

Current operating policies are then analysed. The rules, quantitative and qualitative norms and targets, and criteria currently guiding the application of techniques are recorded for each type of health work. An operating policy would define the eligible population group, state the targets (total as well as per unit of staff or facility), specify relevant timing or frequency requirements, and describe any operational relationships with other strategies. (A sample statement of operating policy in regard to family planning work is given in Fig. 8, paragraphs 1 and 2, page 54.)

Sources of information for this step include interviews with programme or service staff, visits to nearby clinics and other facilities, and the summary of policies and programmes, 2.2.

The information that should result from this step is summarized under items 1-4 in the Health Work Description Checklist, Fig. 2.

2.42 ESTIMATE RESOURCE UTILIZATION

In this step the group inventories and quantifies the manpower and facilities utilized in producing the most important outputs by means of the health techniques currently in use. The group should restrict its consideration to those resources most directly related to technical procedures, or those whose limited availability is considered to be the main obstacle to increased output or effectiveness of services. Even in its most condensed form, the estimate should specify:
(1) the man-years of critical staff, by type (percentage of staff time devoted to the relevant procedure, multiplied by number of such staff available);

(2) facility utilization in appropriate units (such as bed-days per year, clinic consultation hours, and drilling days per year; the proportion of facilities used for each procedure out of total facility utilization should also be stated);

(3) other critical resources, such as vehicle-miles or cyles of pills utilized for a given population per year.

This part of step 2.42 should be done in conjunction with step 2.3, Estimate Future Resource Availability, to ensure that the same categories of manpower and facilities are dealt with in both steps.

Next, the group estimates the administrative and other support requirements for each category of health work being considered. These include methods and sources of financing, training support, provisions for maintenance of facilities and equipment, and the overall budgetary allocations to each. In addition, the group should identify the persons responsible for directing and managing the services and support functions (see Fig. 2, paragraphs (6)-(7)).

The information collected in steps 2.41 and 2.42 should now be collated to make up the health work description, 2.4. This description should in addition include a calculation of the total outputs and total resource requirements for each category of health work considered. While these totals will obviously not include all costs of delivering the relevant services, they should cover the main expenses of dealing with the conditions listed in the disease statement. With these figures, the formulation team should be able subsequently to estimate the cost of expanded service operations based on the current techniques and managerial approaches.

A sample description covering one category of health work (family planning) is given in Fig. 8, page 54.

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Figure 2. Health Work Description Checklist

1. Health problems addressed (quantified).
2. Current operating policies: existing output targets, targets set during CHP, priority population groups, payment policies, legal requirements and restrictions.
3. Medical and health techniques applied: the techniques predominantly used with estimates of effectiveness for each.
4. Outputs provided: types of service, the amount of each provided in the current year, and the trend of service (% increase or decrease) over the past five years.
5. Resources used: for each type of resource the amounts available and actually utilized are estimated.
   a) Manpower - the amount of manpower usage by type is estimated in total, and, when appropriate, the time required for delivering one unit of output is also shown.
   b) Facilities - the location in which outputs are delivered and, if appropriate, the amount of facility utilization, for example, in bed-days.
   c) Special facilities and equipment required.
   d) Drugs and expendable supplies required in total and per unit of output (on average).
   e) Other resource requirements, such as health education material and transport costs for staff, patients, and specimens.
6. Organization and procedures: description of the following when deemed relevant:
   a) the various services and agencies that perform such health work and the nature of their activity;
   b) the channels of communication and supervision used for such health work within and between such agencies;
   c) financing arrangements and sources;
   d) other relevant procedures, including logistics.
7. Current provision for training: type, location, duration.
The members of working group 1 of the formulation team concentrate on three areas in their review of organization and management (step 2.1).

(1) Owing to several reorganizations in past years, there is some haziness as to governmental organization, structure, and relationships. In fact no current organization chart exists. The group reviews the functional descriptions of the various agencies felt to be relevant to the project (as contained in the government budget document) and interviews an official from the Prime Minister's office. They then diagram an abbreviated organization chart (Fig. 3).

(2) The expressed concern of the DGHS about the need for an effective approach to project implementation leads the group to review past efforts at difficult implementation assignments. They summarize these undertakings in an attempt to highlight the unique features of each programme that may have contributed to its success or difficulties. The information acquired about the Agriculture and Land Settlement Agency causes it to be listed as a potential coordinating agency during implementation.

(3) The decision process leading to implementation is discussed with a member of the Economic Planning Board and some staff from the DGHS' office. The group learns that decisions are not made but "grow" over time. They describe the overall decision process as they understand it in a chart entitled "The Growth and Flow of Decisions in Health" (Fig. 4). The persons with the greatest involvement in the critical decisions are identified and placed on a confidential list.

In the meantime, working group 2 begins its review of policies and programmes (step 2.2) with the use of two basic documents, the current Five-Year Development Plan and the recently approved Country Health Programme. With representatives of the Economic Planning Board and the CHP working groups, they review the policy and programme statements of both documents. The working group then extracts relevant statements pertaining to overall development and health, and prepares a summary (Fig. 5).

Further attention is then paid to (a) the Agricultural Development Programme, (b) the Migration and Resettlement Scheme, and, (c) the road construction programme in order to become familiar with their organizational approach and implementation schedule.

Finally, current operating policy of the basic health service is reviewed. Written procedures, directives, and job descriptions are the sources of policies such as (a) who is allowed to give injections, and (b) which services must be paid for, and (c) what are the criteria for hospital referral and admission.

Working group 1, after completing its review of policies and programmes, concludes that many of the national health resource data produced prior to and during country health programming are relevant to this project. As a result the following tables are extracted from the CHP document and compiled for use within an annex on health resource projection (step 2.3):

(1) Government health expenditures, 1967-1975, showing total, operating, and development funds; health expenditure as a percentage of total government expenditure; per capita expenditure on health; and the annual percentage increase (operating and development).

(2) Major health expenditure headings (services and programmes), with amounts for the years 1967-1975.

(3) The number of health service facilities (and beds) by province and type for 1970-1975.
FIGURE 3. Abbreviated Organization Chart

Prime Minister
- National Operating Council

- Minister of the Interior
- Office of the Prime Minister
- Ministry of Finance
- Minister of Health

- Bureau of Public Works
- Bureau of Community Development
- Economic Planning Board
- Director Gen'l for Health Services
- Permanent Secretary

- Dir. Plan. Research
- Director Health
- Director Hospitals
- Finance
- Personnel
- Stores

- Dep.-Dir. Planning
- Dep.-Dir. Hospitals

- Dep.-Dir. Training
- Dep.-Dir. Fam.Health

- Dep.-Dir. Research
- Dep.-Dir. Far.Dis.
- Chief Pharm.

- Prov. Governor

District Medical Officers
and
Health Centre Staff

*Only those offices relevant to the potential project are shown.
Figure 4. The Growth and Flow of Decisions in Health

<table>
<thead>
<tr>
<th>Decision-makers</th>
<th>Preparation of Five-Year Development Plan</th>
<th>Preparation, Implementation of Annual Operating Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parliament</strong></td>
<td></td>
<td>Review, approve</td>
</tr>
<tr>
<td><strong>Ministry of Finance (Budget Bureau)</strong></td>
<td></td>
<td>October</td>
</tr>
<tr>
<td><strong>Economic Planning Board</strong></td>
<td>Guidelines for 5-year plan</td>
<td>Coordinating Committee review</td>
</tr>
<tr>
<td><strong>Minister of Health (Director-General of Health Services)</strong></td>
<td>Receives passes down</td>
<td>Country Health Programming</td>
</tr>
<tr>
<td><strong>M of H, Division Directors</strong></td>
<td>Receive, pass down</td>
<td>Review, revise, consolidate</td>
</tr>
<tr>
<td><strong>M of H, Deputy Directors (Department Heads)</strong></td>
<td>Receive</td>
<td>Draft proposals for 5-year Plan</td>
</tr>
<tr>
<td><strong>Provincial Health Officers</strong></td>
<td></td>
<td>Draft Annual Operating Plan</td>
</tr>
</tbody>
</table>

Set provincial targets

Conduct mid-year, mid-period reviews

Report activity & resource consump.
OVERALL DEVELOPMENT POLICIES (FIVE-YEAR PLAN)

1. To increase the national output while redistributing income and improving the welfare of the population.
2. To concentrate on labour-intensive production.
3. To reduce regional economic and social imbalances.
4. To encourage active participation of the population in the development process.
5. To strengthen governmental structure.

DEVELOPMENT PROGRAMME (FIVE-YEAR PLAN)

1. Agricultural Development Programme.
2. Land reform.
3. Organized migration and resettlement.
5. Cooperative credit and agricultural extension service (training, improved seed and fertilizer).
7. Regional planning system.
8. Development of the educational system.
9. Water supply development, urban and rural.

HEALTH POLICIES (FIVE-YEAR PLAN)

1. To consolidate the existing health service with major emphasis on rural health and extension into remote areas.
2. To expand the manpower development programme in order to provide the service staff required.
3. To increase the number of hospital beds and improve medical facilities and services.
4. To improve environmental sanitation and nutritional status.
5. To integrate the family planning programme into the basic health service.
6. To strengthen the planning and implementation ability of the Ministry of Health.

HEALTH DEVELOPMENT PROGRAMMES AND THE STRATEGIES THEY CONTAIN AS RANKED IN THE COUNTRY HEALTH PROGRAMME

<table>
<thead>
<tr>
<th>Programme</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provision of Health Services</td>
<td>(a) District-level administration</td>
</tr>
<tr>
<td></td>
<td>(b) Support by community participation</td>
</tr>
<tr>
<td></td>
<td>(c) Provide in-patient, out-patient, and mobile service</td>
</tr>
<tr>
<td></td>
<td>(d) Utilize a community health auxiliary</td>
</tr>
<tr>
<td></td>
<td>(e) Provide &quot;prevention&quot; emphasis through immunization, nutrition (vitamins and food supplements), health education, family planning</td>
</tr>
<tr>
<td></td>
<td>(f) Facilities for emergency service, e.g. accidents, dehydration</td>
</tr>
<tr>
<td>Programme</td>
<td>Strategies</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>(2) Expansion of Health Manpower Development</td>
<td>(a) Manpower planning and development system including rotation and promo-</td>
</tr>
<tr>
<td></td>
<td>tion scheme</td>
</tr>
<tr>
<td></td>
<td>(b) Concentrate on district health service staff:</td>
</tr>
<tr>
<td></td>
<td>- medical assistant</td>
</tr>
<tr>
<td></td>
<td>- nurse-midwife</td>
</tr>
<tr>
<td></td>
<td>- community health auxiliary</td>
</tr>
<tr>
<td></td>
<td>- district medical officer</td>
</tr>
<tr>
<td></td>
<td>(c) Design new curriculum in support of new district health service operat-</td>
</tr>
<tr>
<td></td>
<td>ing procedures and administration</td>
</tr>
<tr>
<td></td>
<td>(d) Use team training approach in post-basic training</td>
</tr>
<tr>
<td>(3) Expansion of Rural Water Supply and Sanitation Programme</td>
<td>(a) Large-scale tube well installation with foreign assistance</td>
</tr>
<tr>
<td></td>
<td>(b) Latrine construction through community participation</td>
</tr>
<tr>
<td></td>
<td>(c) Training and supervision of community workers in well and latrine main-</td>
</tr>
<tr>
<td></td>
<td>tenance</td>
</tr>
<tr>
<td>(4) Development of a Provincial Health Management System</td>
<td>(a) Shift from central to provincial health planning</td>
</tr>
<tr>
<td></td>
<td>(b) Provide an implementation management ability at the provincial level</td>
</tr>
<tr>
<td></td>
<td>(c) Create a health information system capable of monitoring and evaluation</td>
</tr>
<tr>
<td></td>
<td>at provincial level</td>
</tr>
<tr>
<td></td>
<td>(d) Support services including supply system, laboratory, emergency trans-</td>
</tr>
<tr>
<td></td>
<td>port, and vehicle/equipment main-</td>
</tr>
<tr>
<td></td>
<td>tenance</td>
</tr>
<tr>
<td>(5) Integration of Communicable Disease Control Programmes</td>
<td>(a) Orderly phasing out of the existing control/eradication programmes in</td>
</tr>
<tr>
<td></td>
<td>malaria, goitre, TB, leprosy, and smallpox</td>
</tr>
<tr>
<td></td>
<td>(b) Inclusion of these activities in the basic health services and the com-</td>
</tr>
<tr>
<td></td>
<td>munity development programme</td>
</tr>
</tbody>
</table>
(5) Health manpower data for 1974 (posts, posts filled, expected training outputs, annual training capacity for ten staff categories).
(6) Characteristics of health manpower and facilities - time required to train each manpower type, training cost per staff by type, annual loss rate by staff type, average annual salaries and allowance by staff types, annual construction rate by facility type, construction time requirements by facility type, construction cost by facility type, annual operating cost by facility type (other than salaries).
(7) Facility descriptions (for each type of district-level facility) - general description of function, staffing pattern, and interlinkage as recommended in CHP.
(8) Construction targets - number of new and upgraded facilities by type, province, and time period as recommended in CHP.
(9) Overall financial implications for district health service development (by expenditure object and time period) plus total capital and operating costs.
(10) Resource implications of special programmes - resources and services of the following programmes to be integrated within the basic health services:

(a) family planning;
(b) nutrition;
(c) some aspects of health education;
(d) malaria passive case-detection and maintenance phase;
(e) BCG vaccination;
(f) leprosy case follow-up; and
(g) smallpox vaccination.

At this point the working group concludes that certain additional types of resource information are needed in order to produce a realistic resource projection for the national district health services and the services within Province Eaks. The group therefore proceeds to collect and analyse data of the following types:

(1) The history of fund allocation to hospital and basic health services by province over the past 10 years, as compared with budgeted amounts.
(2) The details of running costs for each facility type within the district health services.
(3) Inflation over past 5 years and projected rate of inflation over next 5 years with particular emphasis on construction costs, running costs, and salaries.
(4) Detailed staff posting history within the facilities of Province Eaks over the past 5 years.
(5) Breakdown of health service funding sources and other support for Province Eaks (including national, provincial, and municipal allocation, and support from voluntary agencies, both domestic and foreign), and revenue from public payment.
(6) Potential sources of funds and other support (including implementation resources) for possible resource shortages (development funds, recurrent funds, certain supplies, vehicles, and types of staff, including project staff).
After completing these analyses, working group 1 prepares a consolidated resource projection for:

1. the overall district health services
2. the district health services of Province Eaks

that indicates the likely availability of funds for operating costs (including salaries, staff, and facilities, adjusted for the effects of inflation). Fig. 6 and 7 are tables from the resource projection.

Lastly, the formulation team undertakes health work description (step 2.4) in the areas for which the terms of reference requested a functional description of the health service, namely immunization, nutrition, and family planning. To these the team adds the health service activity of general sick clinic, since so much of the district-level health work is currently performed within such clinics. The team as a whole discusses these four categories of health work in order to agree on the manner in which the descriptions will be generated, the form in which they will be presented, and the primary sources of information. It is agreed that working group 1 will handle immunization and main health centre clinics, group 2 will cover family planning activities and health subcentre clinics, while group 3 takes nutrition work and the curative work performed in a midwife clinic. All three groups will interview relevant programme staff and visit nearby facilities. An outline of the general format for such descriptions is drawn up. In addition, the team reviews the health work categories in relation to the disease statement produced by group 3 in activity 5 in order to identify the outputs that are currently being produced for each (step 2.41). Such outputs become the core around which the health work description will be built. The group identifies the following outputs for each category:

1. Immunization - smallpox vaccinations, DPT immunizations, poliomyelitis immunizations, measles vaccinations, and BCG vaccinations.
3. Family planning - family planning education contacts, family planning consultations (including postnatal consultations), and contraceptives dispensed.
4. Sick clinics - main health centre, subcentre, and midwife clinic consultations.

The 3 working groups conduct their reviews and prepare their descriptions. Fig. 8 illustrates the health work description produced by group 2 for family planning activities.
### Figure 6. Province EAVS: Expenditures by Institution (in T) Public Facilities Only

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Hospitals</td>
<td>Development</td>
<td>8 381.8</td>
<td>4 304.6</td>
<td>4 484.5</td>
<td>5.3</td>
<td>2.3</td>
<td>7 099</td>
<td>7 775</td>
</tr>
<tr>
<td></td>
<td>Recurring</td>
<td>5 837.0</td>
<td>6 082.9</td>
<td>6 481.7</td>
<td>9.3</td>
<td>6.3</td>
<td>6 892</td>
<td>8 800</td>
</tr>
<tr>
<td>Hospital II</td>
<td>Development</td>
<td>303.9</td>
<td>955.7</td>
<td>439.1</td>
<td>9.3</td>
<td>6.3</td>
<td>6 892</td>
<td>8 800</td>
</tr>
<tr>
<td></td>
<td>Recurring</td>
<td>4 641.7</td>
<td>5 899.4</td>
<td>5 397.7</td>
<td>5.0</td>
<td>2.0</td>
<td>5 463</td>
<td>5 913</td>
</tr>
<tr>
<td>Hospital III</td>
<td>Development</td>
<td>1 327.3</td>
<td>663.5</td>
<td>663.5</td>
<td>5.0</td>
<td>2.0</td>
<td>5 463</td>
<td>5 913</td>
</tr>
<tr>
<td></td>
<td>Recurring</td>
<td>4 517.5</td>
<td>4 806.0</td>
<td>5 047.0</td>
<td>5.0</td>
<td>2.0</td>
<td>5 463</td>
<td>5 913</td>
</tr>
<tr>
<td>B. Health Centres</td>
<td>Development</td>
<td>4 358.8</td>
<td>2 395.6</td>
<td>1 744.6</td>
<td>5.1</td>
<td>2.1</td>
<td>4 183</td>
<td>4 545</td>
</tr>
<tr>
<td></td>
<td>Recurring</td>
<td>3 486.2</td>
<td>3 768.1</td>
<td>3 849.0</td>
<td>5.1</td>
<td>2.1</td>
<td>4 183</td>
<td>4 545</td>
</tr>
<tr>
<td>C. Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Malaria</td>
<td>Development</td>
<td>1 230.8</td>
<td>1 365.2</td>
<td>1 309.0</td>
<td>3.4</td>
<td>0.4</td>
<td>1 330</td>
<td>1 352</td>
</tr>
<tr>
<td></td>
<td>Recurring</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. TB</td>
<td>Development</td>
<td>15.4</td>
<td>-</td>
<td>294.0</td>
<td>13.0</td>
<td>9.5</td>
<td>847</td>
<td>1 217</td>
</tr>
<tr>
<td></td>
<td>Recurring</td>
<td>461.3</td>
<td>469.4</td>
<td>589.4</td>
<td>13.0</td>
<td>9.5</td>
<td>847</td>
<td>1 217</td>
</tr>
<tr>
<td>3. Health Laboratories</td>
<td>Development</td>
<td>-</td>
<td>-</td>
<td>1.5</td>
<td>25.0</td>
<td>2.3</td>
<td>134</td>
<td>147</td>
</tr>
<tr>
<td></td>
<td>Recurring</td>
<td>77.3</td>
<td>58.5</td>
<td>122.8</td>
<td>25.0</td>
<td>2.3</td>
<td>134</td>
<td>147</td>
</tr>
<tr>
<td>4. Municipality</td>
<td>Development</td>
<td>-</td>
<td>56.6</td>
<td>40.2</td>
<td>42.0</td>
<td>3.3</td>
<td>1 078</td>
<td>1 228</td>
</tr>
<tr>
<td></td>
<td>Recurring</td>
<td>-</td>
<td>664.8</td>
<td>947.4</td>
<td>42.0</td>
<td>3.3</td>
<td>1 078</td>
<td>1 228</td>
</tr>
</tbody>
</table>

### Figure 7. Sources of Financing for Provincial Health Services (in Thousands of T)

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount FY 1972</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ministry of Health</td>
<td>14 389</td>
<td>41.9</td>
</tr>
<tr>
<td>2. Provincial Administ.</td>
<td>165</td>
<td>.5</td>
</tr>
<tr>
<td>3. Municipalities and Sanitary Dist.</td>
<td>1 050</td>
<td>3.1</td>
</tr>
<tr>
<td>4. Donations</td>
<td>352</td>
<td>1.0</td>
</tr>
<tr>
<td>5. Charges</td>
<td>6 858</td>
<td>19.9</td>
</tr>
<tr>
<td>6. Red Cross</td>
<td>5 992</td>
<td>17.4</td>
</tr>
<tr>
<td>7. Ministry of Defense</td>
<td>5 593</td>
<td>16.2</td>
</tr>
<tr>
<td>Total</td>
<td>34 399</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Figure 8. Health Work Description for Family Planning Activities

Health Problems Addressed - Infant mortality (200/1,000 live births) - Birth rate (34/1,000 population)

Current Operating Policies

(1) No national family planning policy is currently in effect. However, the recently completed Country Health Programme contains recommended policies that stand a good chance of being included in the Five-Year Development Plan. These policies will provide for:

(a) leaving the choice of family planning practice and technique to the client;
(b) extending the awareness of the family planning programme to the total population, with equal emphasis on urban and rural areas;
(c) a considerable expansion of family planning service activity utilizing the existing National Family Planning Board, the expanding basic health services, and private practitioners;
(d) an attempt to stabilize the rate of population growth at 2.36% per year by the end of the plan period.

(2) Service policies are as follows:

(a) Family planning services are available in hospital outpatient departments, main health centres, and health subcentres. Midwives refer initial requests for service to MHCs and then dispense contraceptives.
(b) Main health centres are to conduct half-day family planning clinics each week.
(c) The postpartum approach is just beginning in urban hospitals.
Figure 8 (continued)

TECHNIQUES APPLIED

<table>
<thead>
<tr>
<th>Type</th>
<th>Estimated Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>oral contraception</td>
<td>1 birth prevented for 5 women-years of practice</td>
</tr>
<tr>
<td>IUD</td>
<td></td>
</tr>
<tr>
<td>vasectomy</td>
<td>3 births prevented per operation</td>
</tr>
<tr>
<td>tubal ligation</td>
<td></td>
</tr>
<tr>
<td>public promotion through mass media</td>
<td>effectiveness unknown</td>
</tr>
<tr>
<td>(radio, newspapers)</td>
<td></td>
</tr>
<tr>
<td>community development lectures</td>
<td>1 accepter/20 contacts</td>
</tr>
<tr>
<td>FP clinic sessions</td>
<td>1 accepter/5 contacts</td>
</tr>
</tbody>
</table>

OUTPUTS PROVIDED (SAKS PROVINCE)

<table>
<thead>
<tr>
<th>Type</th>
<th>Amount 1974</th>
<th>Five-Year Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>oral contraceptive users</td>
<td>5 000</td>
<td>30% annual increase</td>
</tr>
<tr>
<td>IUD users</td>
<td>2 000</td>
<td>10% annual increase</td>
</tr>
<tr>
<td>vasectomies and tubal ligations</td>
<td>300</td>
<td>no trend</td>
</tr>
<tr>
<td>radio and newspaper promotion</td>
<td>once a month</td>
<td>no trend</td>
</tr>
<tr>
<td>community development lectures</td>
<td>1 per district per month (20 attendees)</td>
<td>newly instituted</td>
</tr>
<tr>
<td>FP clinic sessions</td>
<td>20 per MHC per month (5 attendees)</td>
<td>constant</td>
</tr>
</tbody>
</table>

RESOURCES USED

(1) Manpower requirements

<table>
<thead>
<tr>
<th>Type</th>
<th>Tasks</th>
<th>Time/Task/No. Clients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse-Midwife</td>
<td>dispenses cycles</td>
<td>10 min/1 client</td>
</tr>
<tr>
<td></td>
<td>FP lectures</td>
<td>60 min/10-20 clients</td>
</tr>
<tr>
<td></td>
<td>clinic consultation/exam.</td>
<td>15 min/1 client</td>
</tr>
</tbody>
</table>
Figure 8 (continued)

<table>
<thead>
<tr>
<th>Type</th>
<th>Tasks</th>
<th>Time/Task/No. Clients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Officer</td>
<td>clinic consult./ exam.</td>
<td>15 min/1 client</td>
</tr>
<tr>
<td></td>
<td>vasectomy</td>
<td>10 min/1 client</td>
</tr>
<tr>
<td></td>
<td>tubal ligation</td>
<td>45 min/1 client</td>
</tr>
<tr>
<td>Midwife</td>
<td>dispenses cycles</td>
<td>10 min/1 client</td>
</tr>
<tr>
<td>Commun. Devel. Worker</td>
<td>FP lecture</td>
<td>60 min/20-30 clients</td>
</tr>
</tbody>
</table>

(2) Manpower availability and use (Province Eaks)

<table>
<thead>
<tr>
<th>Type</th>
<th>Man-Years Avail./Year</th>
<th>FP use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse-Midwife</td>
<td>15</td>
<td>10%</td>
</tr>
<tr>
<td>Medical Officer</td>
<td>4</td>
<td>5%</td>
</tr>
<tr>
<td>Midwife</td>
<td>50</td>
<td>10%</td>
</tr>
<tr>
<td>Commun. Devel. Officer</td>
<td>10</td>
<td>5%</td>
</tr>
</tbody>
</table>

(3) Facility availability and use (Province Eaks)

<table>
<thead>
<tr>
<th>Type</th>
<th>No.</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Health Centre (MHC)</td>
<td>5</td>
<td>26 x 5 half-days = 520 hours of FP Clinic/yr</td>
</tr>
<tr>
<td>Health Subcentre (HSC)</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Midwife Clinic (MWC)</td>
<td>15</td>
<td>10% of consultation time</td>
</tr>
<tr>
<td>Community Centres</td>
<td>200</td>
<td></td>
</tr>
</tbody>
</table>

(4) Drugs and supplies used

- 60 000 cycles of pills per year 0.80T/cycle
- 400 IUDs per year 1.50T/IUD
- 2 040 family planning pamphlets 0.050T/pamphlet

(5) Transport cost for Commun. Health Devel. lectures

50 T per trip x 120 trips = 6 000 T

Organization and Procedures

(1) Agencies involved and their interrelationships:

- Basic health service staff in MHC, HSC, and MWC expanding their activities.
- Provincial Hospital through OPD consultations and contact during delivery and postpartum care.
- National Family Planning Board, which:
  (a) prepares and distributes educational and promotional material;
  (b) provides staff and material support to the Community Development Agency;
(c) is establishing and coordinating a reporting system on contraceptive use linking governmental health services, private institutions and practitioners, and suppliers of contraceptives;

(d) monitors and coordinates the FP activities of all the above agencies;

(e) solicits and allocates foreign assistance for family planning;

(f) conducts special staff training in fertility regulating techniques.

(2) Financing and other support (Health Community Development):

- Government (national and provincial) recurrent budgets.
- NFPB staff paid with foreign assistance funds (500,000 T/year).
- Educational material and training expertise provided by USAID.
- Oral contraceptives supplied partially by SIDA, partially by an international family planning foundation, and through commercial channels (health service dispensers charge 0.50T/cycle).
- Radio and newspaper promotion donated.
- 50 vehicles are being donated for support of family planning activities by NORAD.

CURRENT PROVISIONS FOR TRAINING

(1) Health staff basic training: Nurse-midwives and midwives receive only minor indoctrination in family planning techniques.

(2) Supplementary course provided by NFPB on technique and public education.
CHAPTER 3,

ANALYSING THE HEALTH, SOCIOECONOMIC, AND DEMOGRAPHIC SITUATION
3. **Analysing the Health, Socioeconomic, and Demographic Situation**

**Inputs**

- initial problem outline, 1.5
- terms of reference, 1.6

**Steps**

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**Products**

- 3.1 Select and Quantify Health Conditions

**Points of Use**

- 2.3. Estimate Future Resource Availability
- 2.4. Describe Current Health Work
- 3.3. Generate Population Projection
- 4. Analysing and Projecting the Problems
- 7. Designing the Strategies

**Existing Health Strategies**

**Inputs**

- initial problem outline, 1.5
- terms of reference, 1.6

**Steps**

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**Products**

- 3.2 Analyse Socioeconomic Trends

**Points of Use**

- 3.3 Generate Population Projection
- 5. Setting the Objectives & Targets
- 6. Identifying Potential Obstacles
- 7. Designing the Strategies

**Existing Socioeconomic Data**

**Inputs**

- initial problem outline, 1.5
- terms of reference, 1.6
- disease statement, 3.1

**Steps**

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**Products**

- 3.3 Generate Population Projection

**Points of Use**

- 4. Analysing and Projecting the Problems
- 5. Setting the Objectives & Targets
- 6. Identifying Potential Obstacles
- 7. Designing the Strategies

**Existing Demographic Data**

**Inputs**

- summary of policies & programmes, 2.2
- socioeconomic trends, 3.2
What are the purposes and products of this step?

This chapter is divided into three steps, each of which is directed to one of the following aspects of the "environment": the health situation, the socioeconomic situation, and the demographic situation. The purpose of each step is to analyse the aspects of the current situation that are most relevant to the formulation and/or the future project, to examine what the present trends are, and, on the basis of extrapolations of these trends and other predictions, forecast how relevant conditions will evolve during the plan period or periods specified in the terms of reference. The specific products that emerge from these analyses are:

(a) a "disease statement", which expresses numerically the current magnitude and probable future trend of the diseases and conditions that fall within the terms of reference;

(b) a quantified description of the current level and expected trend of selected social and economic conditions that are felt to have especially close links to the health conditions analysed in step 3.1; and

(c) a quantified description of the population that will probably be covered by the project, including the current size of relevant age groups and geographic categories and a projection of their size in the future.

Who should do these activities?

Steps 3.1, 3.2, and 3.3 should be done by small working groups. Guidance on distributing and scheduling this work can be found in the Introduction to Part I, page 8.

What difficulties are likely to be encountered?

As in step 2, care must be taken to select the most relevant data and indices from the mass of existing information. Despite the volume of existing data, accurate disease statistics may be missing, in which cases estimates will have to be made. Socioeconomic conditions analysed should be limited to those expected to change the most in coming years. Little work should be spent on producing a population projection; rather, the team should find and modify an existing projection or make its own rough estimate. The level of precision and detail aimed for should be approximately the same in all three steps.
3.1 SELECT AND QUANTIFY HEALTH CONDITIONS

The aim of step 3.1 is to define in quantitative terms the health status of the population to be addressed by the formulation.

3.11 SET CRITERIA FOR DISEASE SELECTION

The first sub-step consists in determining what criteria shall be used for selecting the relevant diseases and conditions.

The terms of reference, 1.6, and the initial problem outline, 1.5, should contain some guidance for selection criteria, for example by indicating concern over:

1. specific diseases and conditions - smallpox, pregnancy and delivery, accidents;
2. diseases and conditions having specific symptoms - fevers, diarrhoeas, upper respiratory discomfort;
3. diseases and conditions having specific effects on the individual - death, temporary disability, permanent impairment;
4. diseases and conditions having specific effects on society - work or school days lost, earnings or productivity lowered, investment or trade hindered;
5. diseases and conditions having specific environmental precursors - unsafe water, poor waste and sewage disposal, poor housing, prevalence of pests, high density of population or vehicles;
6. diseases and conditions affecting specific population groups - the newborn, school-children, women of childbearing age, workers, rural people;
7. diseases and conditions that hinder the accomplishment of specified policies or goals, such as the development of rural areas or of tourism;
8. diseases and conditions that threaten national prestige, such as internationally reportable and quarantinable diseases;
9. diseases and conditions contributing to or affected by specified health service difficulties - shortage of out-patient and clinic consultation capacity, inadequate in-patient capacity, shortage of specified types of staff, lack of coverage by specified techniques (immunization, diagnosis by blood slides).

If there is no specific guidance within the terms of reference, the team must itself establish a set of selection criteria. One approach for doing so is to define the important aspects or results of ill-health as seen from different vantage points. For example, the team would list the criteria they would expect to hear from a private individual in the population at large, an epidemiologist, a health service administrator, and a politician or national leader. (It would, of course, be best if such persons actually participated in the discussion.) The criteria to emerge from such a discussion might be as follows:

1. Private citizen - spells of ill-health; days of discomfort, disability, or impairment; income lost; money spent for service; death.
2. Epidemiologist - rates of prevalence, incidence, case fatality, and transmissibility; disease trends.
3. Administrator - service overload or underutilization; unused techniques; staff or facility shortages; great expense or inefficiency.
4. Policy-maker - public image of the service; national image of the health situation; inhibiting effects on education, productivity, and overall development.
The team as a whole would then select a few such criteria that they felt to be most in keeping with the tone of the terms of reference. These should be expressed explicitly, for example:

(1) the primary\(^1\) causes of death in infants, children, and women;
(2) the primary causes of morbidity in ages 5-44;
(3) the primary causes of hospital admission;
(4) the primary causes of office or clinic consultations.

3.12 SPECIFY DISEASE INDICES AND DATA SOURCES

As the criteria for selecting diseases to be quantified are determined, the indices for their quantification should be specified. Simultaneously, the types of data required for such quantification will become apparent. Units for measuring the extent of disease normally include the following:

(1) Cases - the number of reported cases for one year.
(2) Incidence rate - the number of new cases for one year divided by 100 000 (may be age- or sex-specific).
(3) Prevalence rate - the total number of cases at one point in time divided by 100 000.
(4) Deaths - the number of reported deaths from the disease for one year.
(5) Death rate (disease-specific mortality rate) - the number of reported deaths from the disease divided by 100 000.
(6) Case fatality rate - the number of reported deaths from the disease divided by the number of reported cases.
(7) Consultations - the number of reported contacts by the health service with the disease for one year.
(8) Admissions - the number of persons with the disease admitted as an in-patient for one year.
(9) Bed-days - the number of admissions for one year multiplied by the average length of stay in days.

Certain diseases and situations occasionally require specialized indices or rates for their quantification, for example, parasite rates, levels of immunization coverage, or duration of illness.

Normally, a number of the above indices are chosen that reflect the aspects of the health situation on which the terms of reference have placed emphasis, for example, consultations, deaths, and admissions. Since rates are convenient to work with when analysing and projecting these problems (step 4), incidence rates and case fatality rates would probably be included.

\(^1\)"Primary" should mean "among the top ten diseases" or "diseases accounting for 75% of ...".
After the disease indices are selected, the existing sources of data are reviewed to determine which should be the main ones to be used during quantification (step 3.13). It is best to rely on as few different references as possible. Thus, statistical publications containing consistent and comprehensive data extending over a number of recent years are preferred. The usual data sources include:

1. Consultation data - statistical returns from health centres, hospital out-patient departments, and travelling clinics.
4. Prevalence data - case-finding reports from disease control programmes and reports of special surveys.
5. Service population coverage data - immunization returns, special programme reports (family planning, disease control, environmental health), utilization studies, school health returns.

These types of data are not to be found in the Ministry of Health alone. Universities, research institutions, assistance agencies, and public and private professional groups often have reliable data.

3.13 SELECT RELEVANT DISEASES AND QUANTIFY THE NECESSARY INDICES FOR EACH

The selected data sources are now reviewed to identify the diseases that fit the criteria decided on in step 3.11. For example, the primary causes of consultations, deaths, and admissions would be identified by reviewing the relevant statistical returns and extracting the major contributors to each. Frequently, it is necessary to combine diseases into single ICD headings\(^1\) in order to create disease categories of consistent generality. If breakdowns into specific age or geographic population groups are desired that are not shown separately in the statistical sources, the team members will have to make estimates for these indices on the basis of their experience and using other available data thought to be epidemiologically compatible (for example, from other provinces and countries). When the criteria specify the "primary causes of mortality, morbidity, etc." it is usually sufficient to include enough diseases to account for 60-75% of the phenomena of interest. When diseases have been specified for inclusion for which no data are available, the team members, with the help of specialists in those fields, will have to estimate an "order of magnitude" for the relevant index. The final list of diseases and conditions usually includes between 25 and 50 entries. The selected diseases and their relevant statistics are tabulated in descending order of occurrence and according to categories relating to cause or body systems (see Fig. 2, page 72).

3.14 DETERMINE PAST TRENDS

During the data review an effort should be made to detect trends in disease occurrence. For diseases and conditions that have been quantified and listed, a comparison of their respective rates should be made over several successive years or time periods. If reasonably consistent increases or decreases in rate are noticed over a span of 5-10 years, the average annual percentage change in the rate should be calculated.

(Note. One method of calculating the average annual percentage rate change is as follows: For any rate that exhibits a consistent direction of change over several years, determine the amount of rate change between the first year and the last year in the time period. Divide this figure by the first year's rate to produce the percentage rate change for the total period; then divide this overall percentage change by the number of elapsed years in the total time period in order to arrive at the average annual percentage rate change. Rate changes are usually expressed as multipliers to facilitate their use in step 4. For example, a 1.1% annual rate increase would be expressed as 1.011, while a similar amount of rate decrease would be expressed as 0.989.)

Care should be taken to indicate a trend only when there is clear evidence that the disease is consistently increasing or decreasing. Apparent increases in rates of incidence are often due to the combined effects of health service expansion and improved reporting systems. Diseases for which trends cannot be confirmed are listed as having constant rates.

3.15 PREPARE THE QUANTIFIED DISEASE STATEMENT

The final list of diseases and conditions, categorized according to body system or cause, is then summarized in a table that shows for each:

(1) the name of the disease/condition;
(2) the geographic area (if the area affected varies from one disease to the next);
(3) the relevant age-sex group;
(4) the selection criteria used (optional);
(5) the indices used;
(6) the absolute amount of the disease, by index, for the baseline year (optional);
(7) the rates for those indices; and
(8) the annual trend, if any.

This disease statement should mention the sources of the data used and explain any assumptions or estimates.

3.2 ANALYSE SOCIOECONOMIC TRENDS

3.21 SELECT RELEVANT SOCIOECONOMIC CONDITIONS FOR ANALYSIS

Normally, it is necessary to research, quantify, and project only a few socioeconomic conditions. The group should examine:

(1) those conditions that are known to exert a strong influence on one or more of the relevant health problems and that are expected to change radically in future years;
(2) those conditions that are affected by one or more of the relevant health problems and that are of particular concern to development planners, for example, because of their priority (urban migration, literacy, worker absenteeism, agricultural output, tourism, status of women).

The initial problem outline, 1.5, and the disease statement, 3.1, indicate which health problems are relevant.

In some cases, the formulation team may have been instructed to conduct a more thorough analysis of the interactions between these health problems and the socioeconomic environment in order to find socioeconomic conditions with strong relationships. In such cases a broader review requiring more time and manpower would be conducted.

Fig. 1 is a checklist of socioeconomic conditions and related indices that have been quantified in past project formulations. One or more of the listed conditions will almost certainly be relevant in any given formulation, and the indices shown have the advantage of often being found in existing national data. Never should all these conditions be researched. It is likely, on the other hand, that some conditions not appearing on this list will also require analysis.

3.22 Review past trends

After the socioeconomic conditions to be quantified have been selected, government agencies (especially the Planning Ministry and Ministries of Health, Finance, etc.) and other institutions having an interest in or responsibility for the selected conditions should be approached for relevant data and advice. If possible, data should be assembled for each condition for a baseline year—if possible, the same year as that used as a baseline year for population statistics (step 3.3) and disease statistics (step 3.1). In some sectors quantified information will be difficult to obtain. In such cases descriptive (qualitative) statements should be prepared that will permit comparisons between different periods of time.

On the basis of these data one index should be chosen for each socioeconomic condition so that the levels of the condition can be compared between time periods. Such indices are usually rates or ratios of factors that represent a general degree of growth, development, or wellbeing (see indices in Fig. 3, page 74).

Next, the data from past years for each index should be examined to determine past trends of conditions and any changes in trends. In conjunction with this analysis, existing and planned development programmes (as summarized in step 2.22) should be reviewed in an attempt to estimate their expected impact on the related socioeconomic conditions. For example, major housing or education programmes are likely to have explicit targets expressed in whatever terms are used to measure the levels of these conditions; the degree to which such targets have been achieved in the past may be relevant to the projection of future trends. Discrepancies between targets and achievements in the past suggest the need for a review of programme performance, notably in terms of expenditure as compared with budget.

3.23 Predict future levels

Based on this analysis of trends and the programme review in step 2.22, index levels for future years during the plan period should be estimated for each condition. Fig. 3, page 74, illustrates one method of presenting these predictions for all conditions. In all cases, the basis for the predicted figure (whether past trends, ministry targets, etc.) should be clearly stated.
<table>
<thead>
<tr>
<th>Condition</th>
<th>Potential Indices</th>
<th>Condition</th>
<th>Potential Indices</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCTION</td>
<td>a) Gross domestic product per capita</td>
<td>NUTRITION</td>
<td>a) Per capita protein/calorie intake (daily)</td>
</tr>
<tr>
<td></td>
<td>b) Gross domestic product by sector</td>
<td></td>
<td>b) Average % of daily minimum nutrition requirements consumed</td>
</tr>
<tr>
<td></td>
<td>c) Agriculture &amp; manufacturing output by type</td>
<td></td>
<td>c) Per capita consumption by food type</td>
</tr>
<tr>
<td></td>
<td>d) Labourer productivity (by type)</td>
<td>SOCIAL UNREST</td>
<td>a) No. of sizable offences</td>
</tr>
<tr>
<td></td>
<td>e) Land use (amount or % by type)</td>
<td></td>
<td>b) No. of injurious offences</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>c) Suicides</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>d) Strikes (strike-days)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>e) Whiskey sales</td>
</tr>
<tr>
<td>EMPLOYMENT</td>
<td>a) % of labour force by sector</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Employment or unemployment rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Worker absenteeism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INCOME</td>
<td>a) Per capita income and trend</td>
<td>HOUSING</td>
<td>a) Persons per room or space per person</td>
</tr>
<tr>
<td></td>
<td>b) Wage rates by sector</td>
<td></td>
<td>b) % by type of construction or construction material</td>
</tr>
<tr>
<td></td>
<td>c) Income distribution (% of the population in various income categories)</td>
<td></td>
<td>c) % of various types of facilities</td>
</tr>
<tr>
<td></td>
<td>d) Family disposable income by population category</td>
<td></td>
<td>d) Public satisfaction (if surveys have been conducted about govt. or subsidized housing)</td>
</tr>
<tr>
<td>EXPENDITURE</td>
<td>a) Consumer price index</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>b) Consumer expenditure by type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFRASTRUCTURE</td>
<td>a) % of pop. served by source</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>b) Water systems by type</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Per capita water consumption</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) Water access (factor such as distance and private facilities)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waste Sewage</td>
<td>a) % of pop. having toilet facilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Latrine usage</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>c) % of pop. served by refuse disposal service</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) % of pop. with satisfactory drainage</td>
<td></td>
<td></td>
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<tr>
<td>Electricity</td>
<td>a) % of pop. served</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Kw/hr produced</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) consumption by type</td>
<td></td>
<td></td>
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<tr>
<td>Transportation</td>
<td>a) Km of roads by type of surface</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Vehicle density (vehicle/km)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>c) Mean travel time by area</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>d) No. of registered vehicles</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>e) Vehicles/1 000 pop. or pop/vehicle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communications</td>
<td>a) Coverage of pop. by telephone or persons by telephone</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Radios and TVs per person</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Newspaper readership</td>
<td></td>
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</tr>
</tbody>
</table>
3.3 GENERATE POPULATION PROJECTION

The purpose of this step is to enable the formulation team to learn the composition of the population to be addressed by the formulation — how it is changing, where people are living, how fast the population is growing, and how the population is likely to be distributed in future years. The product is a simple table showing the size of the population, present and future, broken down into categories felt to be relevant to the health problems being addressed and the health work to be planned, as indicated in the terms of reference, 1.6, the initial problem outline, 1.5, and the disease statement, 3.1.

The easiest way to complete step 3.3 is to find, review, and adapt a population projection that has been produced by a previous planning group or demographic study. This is feasible if the earlier projection's assumptions and techniques are known and accepted. If a usable or adaptable projection cannot be found, the working group will have to review whatever demographic data currently exist in order to produce its own rough projection. The most recent census is the usual source of such data. The types of data required include population size by relevant age-sex group and geographic area; population growth rates or crude birth and death rates and migration rates; and social, economic, and policy information relevant to population growth and migration.

It is not the intent here to produce a detailed, sophisticated population forecast. The projection should be produced quickly with simple techniques and available data. The assumptions used should be recorded.

3.3.1 SPECIFY POPULATION CATEGORIES OF INTEREST

The population should be divided into categories that are affected by the health problems being addressed by the formulation and categories that are dealt with by the service methods that are likely to be used. The terms of reference, 1.6, may have designated population groups of interest. Project formulations covering basic health services and a wide range of diseases and conditions usually require the following categories:

(1) total population
(2) age 0 (infants from birth to one year)
(3) age 1-4 (toddlers)
(4) age 5-14 (schoolchildren)
(5) females age 15-44 (childbearing population)
(6) males age 15-44
(7) age 45 and older

Specialized projects (maternal and child health, occupational health, school health) will require population categories related to the health problems and services they encompass.

In addition, geographic categories may be necessary. These must usually conform to administrative subdivisions of the overall area to be served, such as provinces, districts, and municipalities. Geographic breakdowns (such as urban-rural) may also be needed to differentiate between slow and fast growing areas, or areas with differing health problems.

If the project is to be concerned with family health, maternal and child health, family planning, or related subjects, it may be necessary to provide additional detailed data or estimations relating to the birth process. For example, data may be subsequently required
on family size, age of marriage, pregnancy rate, fetal wastage (abortions, perinatal deaths, stillbirths), unwanted pregnancies, infant mortality, and maternal mortality. Much of such data can only be estimated, but sample surveys should at least be used wherever possible.

3.32 DETERMINE POPULATION SIZE BY CATEGORY

This step results in the quantification of the desired categories of demographic data for the baseline year. The baseline year may have been designated in the terms of reference, or agreed upon by the formulation team. It is usually a recent year for which most statistics are available. If at all possible, the same baseline year should be used for disease statistics (step 3.1), socioeconomic conditions (step 3.2), and demographic statistics. If the available statistics are for a year other than the baseline year, adjustments must be made to account for the growth (or change) that is estimated to have occurred during the intervening years. Sometimes, corrections must be made for under-reporting.

Even with the most complete set of population statistics, it is necessary to abstract or extrapolate data in order to present it in the desired population categories and by the necessary geographic divisions.

3.33 ESTIMATE FUTURE POPULATION

The most difficult aspect of this step is estimating how the population will change during the plan period or periods being addressed. If population projections covering the assigned geographic area already exist, they should be studied, adapted, and used. Care should be taken to understand what birth, death, and migration assumptions were employed since demographic projections frequently use a number of growth assumptions and oblige the planner to choose the most likely rate of growth. The acceptance or choice of an existing population projection can be made more easily after reviewing the results of the socioeconomic analysis (3.2).

If no population projection exists, the formulation team should take the shortest possible route to making its own. Perhaps the easiest projection method entails the use of crude birth and crude death rates (the number of births and deaths occurring in 1,000 people in a year). The birth and death rates for past years are observed to determine their trend, if any. Both rates are normally falling. In developing countries the death rate usually falls somewhat faster than the birth rate. An assumption must then be made about the future trends of these rates. If the decline of each rate has been reasonably consistent over the past decade, and if the plan period is relatively short (5 years), it is probably safe to project a decrease in each rate in line with the recent trend. If the group observes abnormal rate changes for which the cause is known, they may adjust the rates for future years according to whether the cause of the past changes is expected to persist. If social, economic, or political changes are expected to occur during the plan period that are likely to influence the trend of the crude birth and death rate, the group may decide to modify the past trend in one direction or another. (Note. If family planning activities are within the terms of reference of the project, the effect of such activities on the birth and death rate would not be estimated at this point. The influence of a separate ongoing or planned family planning programme would be applied at this point to future birth and death rates but only if the formulation team members feel that there is a strong likelihood of significant results from the programme.) The death rate is then subtracted from the birth rate to determine the growth rate at future points in time. For each point in time, the growth rate at that point is multiplied by the population of the previous period to determine the new population. Normally, over reasonably short plan periods (5-10 years) it is safe to hold the proportion of the population in each age group constant.
A more detailed projection method involves the use of fertility rates (the number of births occurring each year within a population of 1,000 women of childbearing age) and age-specific death rates (the number of deaths occurring each year among 1,000 people of each age group). For each year or time period the population is calculated by:

1. multiplying each age-specific death rate by the previous period's population in each age group, and subtracting the resulting deaths from the population in each age group;
2. transferring an appropriate portion of each age group to the next eldest age group (for example, from one year to the next all of the surviving infants (age 0) would move into the 1-4 age group, while approximately 25% of the 1-4 group children would move into the 5-14 group);
3. multiplying the fertility rate for that year by the female population age 15-44 and adding the resulting births to the youngest age group. The result will be the new population age group.

By far the most variable and therefore unpredictable aspect of population projection is migration. In all countries people are moving about more, and it is increasingly likely that in the future the greatest changes in population composition and distribution will be due to migration. Several types of migration are frequently encountered, with varying degrees of predictability.

1. **Seasonal migration.** This type of population movement is characteristic of agricultural regions in which migratory workers move from one area to another during planting or harvesting seasons. Internal or international flows of tourists represent another type of seasonal migration.

2. **Urban expansion.** Most countries are experiencing an increasing flow of people from rural areas to the cities. Except where policies or programmes are designed to control this flow, the trend can be expected to increase.

3. **Planned migration.** Many countries are undertaking development programmes that are partially aimed at alleviating urban congestion. Agricultural, mining, and industrial development areas are being established to attract people to less congested regions. The influence of such programmes on migration rates should be anticipated.

4. **Spontaneous and unpredictable migration.** This type of population movement has recently been seen in several countries affected by natural disasters and wars. It generally cannot be anticipated.

Whatever the projection method used, it should include adjustments for anticipated migration. All types of migration should be consolidated into a single rate for each time period, with the population for each period adjusted accordingly.

The final population projection should be prepared in enough copies for use by team members during subsequent formulation steps. The statistical methods and assumptions used should be documented. If several alternative projections are prepared, the one preferred by the team should be identified. In some cases, it may be necessary to indicate ranges of future population size.

*  

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*
ILLUSTRATION - CHAPTER 3

Working group 3 has been given a considerable head start on this activity thanks to the work done during country health programming. They review and alter slightly the CHP criteria for selecting diseases and conditions (step 3.11). Their final list of disease selection criteria is as follows:

(a) health conditions having a detrimental affect on development policies and programmes;
(b) health conditions likely to develop or become worse as a consequence of socio-economic development;
(c) health conditions that lead to or have an aggravating affect on other health conditions;
(d) health conditions for which there are effective and inexpensive preventive and curative techniques;
(e) health conditions that are rapidly growing worse;
(f) health conditions that pose a continual threat of epidemic;
(g) health conditions causing great public concern or threatening many people;
(h) health conditions that have important political implications (internal and external);
(i) health conditions consuming disproportionate amounts of public and private resources.

Much national data on disease statistics had been compiled during country health programming. The group therefore lists the following data sources for Province Eaks (step 3.12):

1. annual reports of the Provincial Health Office;
2. Provincial Hospital admission records;
3. Provincial Hospital annual reports;
4. household survey report of expenditure and utilization of health manpower;
5. annual reports of the Provincial Programmes of Malaria Eradication, Smallpox Eradication, and Family Planning;
6. accident reports from Municipal District Police.

The group then analyses these data in conjunction with the national CHP compilations and, using the selection criteria and the guidance contained in the terms of reference, selects and quantifies the diseases and conditions felt to be of greatest relevance to the future district health service of Province Eaks. Whenever past upward or downward trends in diseases are noticed, they are mentioned. The disease statement (Fig. 2) is then prepared.

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Working group 2, when preparing to analyse and project relevant socioeconomic conditions, finds a mass of data that had been calculated and analysed during country health programming. However, the CHP projections apply to the country as a whole. After a brief review of this information the working group sets out to select a short list of socioeconomic conditions that would best describe the development situation in Province Eaks. Because of the emphasis
### Figure 2. Disease Statement

<table>
<thead>
<tr>
<th>Diseases/Conditions</th>
<th>Age Group</th>
<th>Criteria</th>
<th>Index</th>
<th>1974 Rate</th>
<th>Trend</th>
<th>Remarks</th>
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<td><strong>Environmental</strong></td>
<td></td>
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<tr>
<td>Infant diarrhoea</td>
<td>0</td>
<td>cg</td>
<td>cases</td>
<td>0.3</td>
<td></td>
<td>10% severe dehydration</td>
</tr>
<tr>
<td></td>
<td>1-4</td>
<td>cg</td>
<td>deaths</td>
<td>0.25</td>
<td></td>
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<tr>
<td>Toddler diarrhoea</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0-44</td>
<td>a</td>
<td>cases</td>
<td>0.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>deaths</td>
<td>0.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hookworm</td>
<td>5+</td>
<td>e</td>
<td>preval.</td>
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<td></td>
<td></td>
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<tr>
<td>Malaria</td>
<td>0-44</td>
<td>adgh</td>
<td>cases</td>
<td>0.015</td>
<td>0.92</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>deaths</td>
<td>0.015</td>
<td></td>
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<tr>
<td>Poliomyelitis</td>
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<td>f</td>
<td>immun.</td>
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<td>adfh</td>
<td>immun.</td>
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<tr>
<td><strong>Communicable Diseases</strong></td>
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<td></td>
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<td></td>
<td></td>
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<tr>
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<td>g</td>
<td>preval.</td>
<td>0.0025</td>
<td>0.95</td>
<td>variable between districts</td>
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<td></td>
</tr>
<tr>
<td>TB</td>
<td>0-4</td>
<td>dgi</td>
<td>immun.</td>
<td>0.3</td>
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</tr>
<tr>
<td></td>
<td>15+</td>
<td></td>
<td>preval.</td>
<td>0.005</td>
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<td>adfh</td>
<td>immun.</td>
<td>0.75</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>cases</td>
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<td></td>
<td></td>
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<tr>
<td>Tetanus NN</td>
<td>0</td>
<td>d</td>
<td>deaths</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whooping Cough</td>
<td>0-4</td>
<td>d</td>
<td>immun.</td>
<td>0.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>cases</td>
<td>0.1</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>deaths</td>
<td>0.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bronchopneumonia</td>
<td>0-45+</td>
<td>g</td>
<td>cases</td>
<td>0.01-0.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>deaths</td>
<td>0.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diphtheria</td>
<td>0-14</td>
<td>d</td>
<td>deaths</td>
<td>0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>immun.</td>
<td>0.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Family Health</strong></td>
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<td>ac</td>
<td>preval.</td>
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<td>0.99</td>
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<td>F15-44</td>
<td>acd</td>
<td>cases</td>
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<td>0.99</td>
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<tr>
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<td>F15-44</td>
<td>dbe</td>
<td>cases</td>
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<td>1.205</td>
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<td>Abortion</td>
<td>F15-44</td>
<td>ei</td>
<td>cases</td>
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<td>1.02</td>
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<td>gi</td>
<td>cases</td>
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<td>0.98</td>
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<td>abce</td>
<td>cases</td>
<td>0.001</td>
<td>1.01</td>
<td>non-rural</td>
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<td>Other</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>URI</td>
<td>0+</td>
<td>cgi</td>
<td>cases</td>
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<td>M15-44</td>
<td>abcd</td>
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<td>1.01</td>
<td></td>
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<td>CVD</td>
<td>M15-44</td>
<td>abeg</td>
<td>cases</td>
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<tr>
<td>Traffic accidents</td>
<td>15+</td>
<td>abegi</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>deaths</td>
<td>0.06</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Criteria - the letters (a) through (i) correspond to the selection criteria produced in step 3.11.

2. Index and Rate - "cases" = clinical incidence, the number of cases diagnosed within the designated age group during 1974 as a proportion of the population in that age group.

"prevalence" = the proportion of the population (relevant age group) having the condition during 1974.

"deaths" = case fatality rate, the proportion of the cases dying in 1974.

"immun." = the proportion of the relevant age group protected through immunization in 1974.

3. Trend - the average annual change in the rate over the years 1966 - 1974 expressed as a multiplier, e.g., 1.01 = 1% increase, 0.99 = 1% decrease.

C = constant rate or no detectable trend. Applies to all indices and rates shown for the disease, unless otherwise noted.
placed by local policies and programmes on agricultural development, road development, education, and water supplies (as determined in activity 2), the following conditions are selected for quantification (step 3.21):

(1) employment by sector;
(2) income (per capita);
(3) water and sanitation facilities;
(4) transportation;
(5) education;
(6) participation in community development;
(7) tourism;
(8) social unrest; and
(9) diet.

The data and indices are selected from sources containing provincial and district data. The primary sources are:

(1) quarterly reports of the Agricultural Development Programme;
(2) National Census and Household Survey;
(3) Provincial Public Works Programme Review and Five-Year Plan Proposal;
(4) annual reports, Community Development Office;
(5) annual reports of the Provincial Governor;
(6) Provincial Tax Office Vehicle Registration Data;
(7) school enrolment records, Provincial Office of Education.

The group is able to make approximate predictions of how the chosen indices will move by 1980 and 1985, the two plan periods specified in the terms of reference. The data and projections are summarized in a table entitled "Socioeconomic Trends, Province Eaks" (Fig. 3).

Although a national population projection has been agreed upon during country health programming, working group 3 still has a considerable amount to do in the two days allotted for activity 07. In producing the provincial population projection, the working group takes into account the following points:

(1) The selected diseases (3.15) require the population to be broken down into six age groups (0, 1-4, 4-14, 14-44 female, 14-44 male, and 45+).
(2) The terms of reference specify that 1974 is the baseline year and that the two plan periods under consideration are 1976-1980 and 1981-1985.
(3) Because of the nature of the project it is necessary to make a separate projection for each district and the two major municipalities in the province. No urban-rural breakdown is deemed necessary.

Information sources available to the working group are:

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<th></th>
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</tr>
</thead>
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<tr>
<td>Employment</td>
<td></td>
<td></td>
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<tr>
<td>agriculture industry</td>
<td>Portion of population in each sector</td>
<td>69.3%</td>
<td>59.7%</td>
<td>60.0% 60.0%</td>
<td>Ag. development to offset urban migration</td>
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<td>16.0%</td>
<td>15.0%</td>
<td>18.0% 20.0%</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>14.7%</td>
<td>25.3%</td>
<td>22.0% 20.0%</td>
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</tr>
<tr>
<td>Income (current prices)</td>
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<tr>
<td>rural population</td>
<td>Per capita income (in T)</td>
<td>4 800T</td>
<td>8 800T</td>
<td>12 000T 17 000T</td>
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</tr>
<tr>
<td>urban population</td>
<td></td>
<td>10 000T</td>
<td>18 000T</td>
<td>25 000T 45 000T</td>
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</tr>
<tr>
<td>overall</td>
<td></td>
<td>5 000T</td>
<td>9 500T</td>
<td>14 000T 20 000T</td>
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<td>45.0% 60.0%</td>
<td>Ag. and commun. dev. targets</td>
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<td>unknown</td>
<td>52.0%</td>
<td>63.0% 73.0%</td>
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</tr>
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<td>Transportation</td>
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<td>roads</td>
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<td>500</td>
<td>650</td>
<td>860 1 100</td>
<td>Pub. Wks target</td>
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<td></td>
<td>13.0% ann.incr.</td>
<td>33</td>
<td>66 126</td>
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</tr>
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<td>Education</td>
<td></td>
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</tr>
<tr>
<td>literacy</td>
<td>% who read</td>
<td>75</td>
<td>85</td>
<td>92 98</td>
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<td>44</td>
<td>60 75</td>
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<td></td>
<td>% compl. secondary</td>
<td>2</td>
<td>6</td>
<td>15 25</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>% villages partic. pop. partic.</td>
<td>10</td>
<td>38</td>
<td>68 95</td>
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<td>0</td>
<td>0</td>
<td>50 000 150 000</td>
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<td>no. visitors</td>
<td>unknown</td>
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<td>100 000</td>
<td>250 000 400 000</td>
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<td>no. hotel rooms</td>
<td>1 000</td>
<td>1 800</td>
<td>2 600</td>
<td>3 700</td>
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</tr>
<tr>
<td>Stress</td>
<td></td>
<td></td>
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<tr>
<td>crime</td>
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<td>6.0% ann.incr.</td>
<td>170</td>
<td>240 322</td>
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<tr>
<td>alcoholism</td>
<td>litres whiskey sold</td>
<td>7.1% ann.incr.</td>
<td>5 087 mil. 7 677 mil.</td>
<td>10 818 mil.</td>
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<tr>
<td>Diet</td>
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<td>food consumption</td>
<td>ann. incr.</td>
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<tr>
<td>rice</td>
<td>0.79%</td>
<td>156.8%</td>
<td>164.4%</td>
<td>170.9%</td>
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<tr>
<td>meat</td>
<td>1.3%</td>
<td>9.3%</td>
<td>10.0%</td>
<td>10.7%</td>
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<tr>
<td>eggs</td>
<td>0.8%</td>
<td>1.0%</td>
<td>1.05%</td>
<td>1.09%</td>
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<tr>
<td>fish</td>
<td>1.1%</td>
<td>11.9%</td>
<td>12.7%</td>
<td>13.4%</td>
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<td>0.96%</td>
<td>0.9%</td>
<td>0.95%</td>
<td>1.0%</td>
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</table>


The population projections are prepared for the province and the districts on the following assumptions:

(1) Population growth is based on the medium national projection, which includes a predicted limited impact of family planning. It is assumed that the death rate will continue to drop as observed in the recent past.

(2) While out-migration slightly exceeds in-migration at the present time, it is assumed that the Agricultural Development and Land Settlement Programme will soon offset this trend. Hence, no effect is shown for the external migration.

(3) The district projections take into account the effect of rural-urban migration within the Province and the in-migration from land settlement.

The provincial projection is shown in Fig. 4.
### Figure 4.
**Population Projection** - Province Eaks

<table>
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<th>Age Group</th>
<th>%</th>
<th>Baseline Year 1974</th>
<th>1980</th>
<th>1985</th>
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<tr>
<td>0</td>
<td>3.4</td>
<td>18 467</td>
<td>22 094</td>
<td>25 776</td>
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<tr>
<td>1-4</td>
<td>12.6</td>
<td>68 562</td>
<td>81 880</td>
<td>95 521</td>
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<td>5-14</td>
<td>27.8</td>
<td>150 637</td>
<td>180 654</td>
<td>210 754</td>
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<tr>
<td>15-44 female</td>
<td>20.8</td>
<td>111 375</td>
<td>135 166</td>
<td>157 686</td>
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<tr>
<td>15-44 male</td>
<td>22.5</td>
<td>122 090</td>
<td>146 213</td>
<td>170 574</td>
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<td>45+</td>
<td>12.9</td>
<td>70 112</td>
<td>83 829</td>
<td>97 796</td>
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<tr>
<td>TOTAL</td>
<td>100.0</td>
<td>541 700</td>
<td>649 836</td>
<td>758 107</td>
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<table>
<thead>
<tr>
<th>Rate/1 000</th>
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<th>1980</th>
<th>1985</th>
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<tbody>
<tr>
<td>Birth Rate</td>
<td>34.1</td>
<td>34.0</td>
<td>34.0</td>
</tr>
<tr>
<td>Death Rate</td>
<td>10.5</td>
<td>8.7</td>
<td>7.0</td>
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<td>Growth Rate</td>
<td>2.36%</td>
<td>2.53%</td>
<td>2.70%</td>
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*1970 population figures are from the National Statistical Office 1970 census.*
Chapter 4.

ANALYSING AND PROJECTING THE PROBLEMS
4. Analysing and Projecting the Problems

**INPUTS**

- Initial problem outline, 1.5
- Terms of reference, 1.6
- Summary of policies and programmes, 2.2
- Disease statement, 3.1
- Socioeconomic trends, 3.2
- Population projection, 3.3

**STEPS**

1. Develop initial concept of problem
2. Identify problem precursors and consequences
3. Select critical problems
4. Estimate future magnitude of precursors, consequences
5. Forecast influence of precursor conditions
6. Estimate future magnitude of health problems

**PRODUCTS**

- Problem diagram
- Problem projections

**POINTS OF USE**

1. Setting the Objectives & Targets
2. Identifying Potential Obstacles
3. Designing the Strategies
What is the purpose of this step?

Step 4 provides for the joint review, by the whole formulation team, of the products of previous analyses in order to describe the relationships that exist between such factors as population growth, income, hygiene and sanitation, government expenditure, and the various manifestations of ill-health. "Problem diagrams" are constructed that depict these inter-relationships and assist the team in selecting the most critical health problems and their precursors and consequences. Once selected, these health and health-related problems are quantified (with previously abstracted data) and their future levels are predicted.

What difficulties are likely to be encountered in this step?

An attempt is being made here to force the team to define the problem situation in broad systems terms before selecting those problems felt to deserve most attention and estimating their future magnitude if left unattended. Planners in health will find it difficult to be selective. They will also find it difficult to discuss cause-effect relationships that lie for the most part outside the health services. Finally, in situations for which the current status is difficult to define, there will be great hesitancy in attempting to forecast the future. Nevertheless, it must be appreciated that sound planning needs to anticipate the environment and problems of the future.
4.1 DEVELOP THE INITIAL CONCEPTION OF THE PROBLEM

The formulation team begins problem analysis and projection by structuring the various elements of the problem situation that have been mentioned thus far into a table representing what may be called "the initial conception of the formulation problem". This table brings together the problems mentioned in the products of various preceding steps, primarily in:

(1) the terms of reference, 1.6;
(2) the initial problem outline, 1.5;
(3) problem-oriented policy statements (from step 2.2);
(4) resource problems (from step 2.32);
(5) the disease statement, 3.1;
(6) the socioeconomic trends, 3.2; and
(7) the population projection, 3.3.

Within this table (see Fig. 1, page 85) it may be useful to group the problems into the following categories:

(1) Environmental factors - lack of safe water, crowding, prevalence of mosquitoes or other pests.
(2) General or ill-defined conditions - malnutrition, accidents, upper respiratory infection, high fertility.
(3) Well-defined conditions - malaria, tetanus neonatorum, measles, gastroenteritis.
(4) General symptoms - diarrhoeas, fever, respiratory difficulties.
(5) Results of health conditions - temporary disability, permanent impairment, death.
(6) Health service difficulties - excess or under-utilization of health services, critical resource shortages, poor staff performance.
(7) Socioeconomic factors that contribute to or are influenced by health problems - low family income, illiteracy, poor hygienic practices, cultural or religious habits, development programmes in other sectors (such programmes may be hindered by health problems or, conversely, lead to them, e.g., dam construction may lead to increased schistosomiasis).

Throughout the working session from which this table emerges, the participants should attempt to interpret and apply the terms of reference. Each suggested problem should be reviewed by the team until there is a consensus that it is relevant. The listing and categorizing of problems continues until participants are satisfied that the spirit of the terms of reference is adequately fulfilled. Problems included in the table should be limited to those considered most essential.

4.2 IDENTIFY PROBLEM PRECURSORS AND CONSEQUENCES

The team pursues its analysis of the problem situation by attempting to identify all cause-effect relationships that exist between the various problems listed in step 4.1. Thus, each problem would be discussed in an effort to identify:

(1) any relationships that it has with other listed problems;
(2) additional problems (as yet unlisted) that appear to be caused or aggravated by the problem under discussion; and

(3) additional unlisted problems that appear to contribute to the problem under discussion.

A question and answer process - "Why is this a concern? Because ...." - should generate successive chains of problems stemming from, leading to, and linking all of the initial problems. Each of the working groups responsible for the analytical products of steps 2 and 3 should contribute information from their analysis to this discussion.

The results of the discussion can be depicted graphically as shown in Fig. 2, page 86. Since the relationships between problems vary in strength, it may be necessary to differentiate between strong and weak linkages (this is not shown in the figure).

4.3 SELECT CRITICAL PROBLEMS

The purpose of this step of the problem analysis is to select the most critical, important problems from the overall list. This focusing of concern is necessary to orient the formulation team toward the more important, rectifiable problems that fall within the terms of reference. It also reduces the amount of work that will need to be done during problem quantification and projection (steps 4.4 and 4.6). While the choice of the more important problems will depend upon the judgement and values of the group, the following selection process does contain certain reasonable criteria and may be used by the group:

(1) Identify the primary "problem consequences". These are problems that lie at the end of one or more chains of problem linkages and that represent stumbling blocks to overall socioeconomic development. They may be political in nature and lie outside the health sector. Examples of problem consequences are low agricultural or industrial productivity; low educational attainment; inhibited investment or tourism; and high infant mortality.

(2) Identify problems that exert a strong negative influence on one or more of the above problem consequences. In most health project formulations these will consist of diseases and health conditions or their immediate causes and results. Examples of such "health problems" include the prevalence of malaria; disability, death, and expense resulting from traffic accidents; and common debilitating conditions such as upper respiratory infection, diarrhoeas, and childhood diseases.

(3) Identify the major "precursor problems" that appear to be at the root of the health problems listed under (2). Examples include environmental conditions (poor hygiene and sanitation); poor dietary habits; vehicle density; poor housing; and low public awareness of health problems and services.

When choosing problems within the above three categories, attention should be paid to those which have many relationships with other problems. In other words, select

(1) precursor conditions that influence several health problems;
(2) health problems that result from several precursor conditions;
(3) health problems that contribute strongly to several consequent problems;
(4) problem consequences that are strongly influenced by several health problems.

Once the most important precursors, health problems, and their consequences have been selected, the team should return to the problem diagram produced in step 4.2 and indicate
graphically on the diagram which problems it has selected as being critical. In Fig. 2, page 84, this has been indicated by drawing a rectangular box around the critical problems. In addition, if desired, a table listing all the critical precursors, health problems, and consequences may be prepared (see Fig. 3, page 88).

4.4 ESTIMATE FUTURE MAGNITUDE OF PROBLEM PRECURSORS AND CONSEQUENCES

Most of the problem precursors and consequences selected in the preceding step will probably be socioeconomic conditions, demographic factors, or health resource inadequacies that have already been quantified and projected in steps 3.2, 3.3, and 2.3 respectively by extrapolating past trends or by using the targets or predictions of the responsible agencies. The relevant data, indices, trends, and future estimates should therefore already be at hand. For each problem for which this is the case, the team need only select the most relevant index or indices. In the case of new problems or conditions for which projections have not previously been made, the likely future level of each index should now be estimated in the same manner.

The product of this step is a table such as that illustrated in Fig. 4, page 89. Estimates of the future extent of precursor conditions will be used in step 4.5 to make the forecasting of health problems more realistic. The estimates of how problem consequences will develop in the future will not be utilized until step 5, Setting the Objectives and Targets.

4.5 FORECAST INFLUENCE OF PRECURSOR CONDITIONS ON FUTURE HEALTH PROBLEMS

In most cases, the health problems selected as being critical (step 4.3) will have been included in the earlier disease statement, 3.1. Indices will thus already have been established for them, and in some cases trends as well. In the present step, the task is to review each critical health problem in the light of the projections that have just been made for its precursors to see whether the future rate or trend of the problem needs to be adjusted to account for precursor influence. Consideration should be given to adjusting a health problem trend or future rate only in cases where there is strong interaction with a socioeconomic precursor condition. The following two principles should be followed in deciding whether an adjustment will be necessary:

1. Even when a strong relationship is detected between a precursor condition and a health problem, there is no justification for altering the trend and future rate of the problem unless the projection for the precursor condition indicates that it will undergo a considerable change in the future (that is, a deviation from its past trend). If the precursor condition is merely expected to continue changing in the future at the same rate as in the past, then the current trend in the health problem already accounts for the future influence of the precursor.

2. In general, no allowance should be made for the expected effect of health service changes resulting from the project presently being formulated or for the predicted impact of other development programmes currently in the planning or early implementation stage. If an existing programme has already proved its effect by reducing problem levels, the current problem trend will automatically account for it.

Thus, when data and expert opinion convince the team that one or more precursor conditions are likely to change to such a degree as to exert unusual influence on a particular health problem, they should adjust the expected future rate of the problem accordingly. The adjustment is done as follows. If, for example, a strong correlation is perceived between vehicle density and the incidence of injurious traffic accidents, and if vehicle density is expected to increase by a factor of 4 over the plan period (instead of continuing to
increase by 10% as it has over the past 5 years), then the team may estimate that the rate of traffic accidents will probably increase by a factor of 2 or 3 over the same period. Graphical correlations between the two variables for past years are helpful for making these estimates about likely future health problem rates.

The above example applies to health conditions for which no current trend is detectable (this is usually the case for half the critical health problems). There are, however, other possibilities, which the team should handle as follows:

1. There is no current trend detectable in the health problem and no impact from changing precursor conditions is anticipated: the baseline rate of the health problem is therefore assumed to be its future rate.

2. A recent trend is detectable, but there is no anticipated influence on this trend from a change in precursors: the current trend is applied to the baseline rate to produce the future rate.

3. There is a current trend detectable and a strong precursor influence is expected: that influence is expressed as a trend factor and is applied to the current trend to produce an adjusted trend. The adjusted trend is then applied to the baseline rate to produce the future rate. In the event that several precursor conditions are predicted to influence the problem, these factors would be combined to produce a proportionally larger adjustment — or possibly a negligible adjustment (if they offset each other) — to the current trend.

4. There is no current trend detectable, but a strong influence is expected from a changing precursor condition: that influence is expressed as a trend factor and applied to the baseline rate to produce the future rate. (This was the possibility envisaged in the example given above.)

One way of presenting these adjustments is illustrated in Fig. 5, page 90.

4.6 ESTIMATE FUTURE MAGNITUDE OF HEALTH PROBLEMS

Once the adjusted rates for each problem are determined, they are applied to the relevant population category (taken from the population projection, 3.3) to calculate how much of each problem can be expected to occur at future points in time. These amounts (expressed as numbers of cases or deaths, or as prevalence rates) represent the health problems to be addressed by the formulation team during steps 5 to 8.
ILLUSTRATION - CHAPTER 4

Once activities 1 to 7 are completed by the three working groups, the formulation team meets as a whole to consider again the basic elements of the problem situation and to project the likely extent in 1985 of the problems they consider most critical.

The initial conception of the problem [step 4.1] is developed by:

(1) grouping the problems in the initial problem outline into the seven categories shown in Fig. 1, and

(2) listing under the relevant category additional problems that are considered by each of the working groups, on the basis of their recent analyses, to help define the problem situation.

The coordinator allows the group discussion to continue until the team members are satisfied that all important aspects of the problem situation have been mentioned. The results of this discussion are shown in Fig. 1.

Because of the variety of types of problems mentioned thus far, the coordinator suggests that the discussion of problem precursors and consequences [step 4.2] should begin with the problems listed under columns 2 and 3 in Fig. 1. The team concurs, realizing that many of the other problems listed are in fact service deficiencies and other related factors that do not represent basic health problems.

Step 4.2 is undertaken by having the participants divide into three temporary discussion teams, each to deal with one group of health conditions and related factors: (a) conditions related to the environment, (b) family health conditions, and (c) communicable and non-communicable diseases not included in the other two groups. Each discussion team attempts to identify the factors that influence and are influenced by the health conditions assigned to it.

Fig. 2 illustrates how the discussion proceeded within the team that dealt with environmental conditions (a). Stage 1 depicts the health conditions (three diseases and one class of symptoms) assigned to this group. Stage 2 shows the primary factors considered by the team to contribute to the assigned conditions, as well as some conditions and symptoms felt to be closely linked to the assigned conditions. Stage 3 indicates the consequences that the assigned conditions have on the individual, and the socioeconomic factors felt to have strong relationships with them. In Stage 4 the team adds the health service problems believed to relate to these conditions. Note that the team does not hesitate to add problems that had not previously been listed (during step 4.1).

In reviewing the diagram, discussion team (a) draws the following conclusions:

(1) The roots of these problems lie in the environment (shortage of safe water, excrement disposal facilities, and drainage) and in personal hygiene and public sanitation (deficiencies in personal cleanliness, shoe wearing, defecation habits, refuse disposal, market cleanliness, and food-handling).

(2) The symptoms and consequences of the assigned health conditions have a number of direct negative effects upon several important socioeconomic factors (educational attainment, productivity, and tourism).

(3) Indirect effects are exerted on still other socioeconomic factors (family income and rate of investment), which, together with the socioeconomic factors mentioned in (2), have a negative influence on the causal environmental problems (water, drainage, and sanitation), thereby completing the vicious circle and reinforcing...
**Figure 1. Initial Conception of the Formulation Problem**

<table>
<thead>
<tr>
<th>ENVIRONMENT</th>
<th>GENERAL OR ILL-DEFINED CONDITIONS</th>
<th>WELL-DEFINED CONDITIONS</th>
<th>SYMPTOMS</th>
<th>RESULTS</th>
<th>SERVICE ASPECTS</th>
<th>SOCIOECONOMIC FACTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tentative Problem List (from step 1,5)</td>
<td>poor general environmental conditions</td>
<td>high fertility rate</td>
<td>risk of childhood</td>
<td>infant mortality</td>
<td>lack of health information</td>
<td>lack of public awareness</td>
</tr>
<tr>
<td></td>
<td>malnutrition</td>
<td></td>
<td>immunisable diseases: smallpox</td>
<td>overall mortality</td>
<td>health service insufficiency</td>
<td>inadequate public and political support for health improvement</td>
</tr>
<tr>
<td></td>
<td>accidents</td>
<td></td>
<td>poliomyelitis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>whooping cough</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>diphtheria</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>tetanus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>tuberculosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>malaria</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>leprosy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional Problems</td>
<td>shortage of clean water</td>
<td>risk of</td>
<td>diarrhoea in children</td>
<td>school days lost</td>
<td>lack of coordination</td>
<td>rural-urban migration</td>
</tr>
<tr>
<td></td>
<td>poor hygiene and sanitation</td>
<td>cholera</td>
<td>fever</td>
<td>work days lost</td>
<td>diffused decision-making</td>
<td>vehicle density</td>
</tr>
<tr>
<td></td>
<td>poor drainage</td>
<td>gonorrhoea</td>
<td>fatigue</td>
<td>self-medication</td>
<td>under-utilization of rural services</td>
<td>increasing inflation</td>
</tr>
<tr>
<td></td>
<td>malaria vector</td>
<td>bronchopneumonia</td>
<td></td>
<td>permanent</td>
<td>over-utilization of hospitals</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>maternal conditions: pregnancy</td>
<td>respiratory difficulty</td>
<td>impairment</td>
<td>lack of management control system</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>abortion</td>
<td></td>
<td></td>
<td>inadequate operating funds</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>normal delivery</td>
<td></td>
<td></td>
<td>budget rigidity</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>complicated delivery</td>
<td></td>
<td></td>
<td>shortage of rural staff</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ulcers (duodenal)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
the problem situation.

(4) The related health service difficulties are not health problems per se but instead reflect the inability of the service to respond adequately to the assigned health conditions. The factors limiting the effectiveness of the service in regard to these health conditions are felt to be far more extensive than what was brought out during this brief discussion, and the team therefore concludes that they deserve considerably more review during step 6, Identifying Potential Obstacles.

The three discussion teams select from their problem diagrams the problems that in their view best circumscribe the problem situation. These are categorized as the critical (a) problem precursors, (b) health problems, and (c) consequences. Fig. 3 summarizes the problem analysis of all three teams.

The teams then choose indices for expressing each problem quantitatively and extract the relevant data from the results of their previous analyses. Fig. 4 presents the data and trends for the problem precursors and consequences.

The pure health problems are then reviewed in relation to the precursors that affect them most in order to estimate their likely future trends (step 4.5). Twelve of the 21 health conditions are considered likely to show upward or downward trends in the future. The size of the trend is estimated by establishing a rough relationship with the health problem's primary precursor condition. For example, because vehicle density is expected to double in 5 years and quadruple in 10, it is estimated that traffic accidents will increase by 95% in each of the two 5-year periods. Similarly, infant and toddlers' diarrhoeas are expected to decrease by 10% and 15% respectively as the result of the doubling of safe water coverage and the 50% increase in latrine coverage.

The summary of the problem projection is completed by applying the adjusted problem rates to the size of the future population by group. This yields the expected magnitude of each critical problem in 1980 and 1985 (Fig. 5).
### Figure 3. Summary of Critical Problems

<table>
<thead>
<tr>
<th>Problem Group</th>
<th>Problem Precursors</th>
<th>Health Problems</th>
<th>Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment</td>
<td>malaria vector/parasite rate</td>
<td>malaria prevalence</td>
<td>low productivity</td>
</tr>
<tr>
<td></td>
<td>poor hygiene, sanitation</td>
<td>diarrhoeas in children</td>
<td>low investment rate</td>
</tr>
<tr>
<td></td>
<td>inadequate safe water</td>
<td>hookworm</td>
<td>low educational attainment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>risk of cholera</td>
<td>inhibited tourism</td>
</tr>
<tr>
<td>Family Health</td>
<td>insufficient public awareness of health problems and</td>
<td>low immunization coverage (smallpox, polio, DPT, BCG)</td>
<td>infant mortality</td>
</tr>
<tr>
<td></td>
<td>services</td>
<td></td>
<td>maternal mortality</td>
</tr>
<tr>
<td></td>
<td>inadequate public access to health services</td>
<td>Under-utilization of maternal health services (re.</td>
<td>population growth</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pregnancy, abortion, normal and complicated delivery)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>poor dietary habits</td>
<td>protein-calorie malnutrition - cases</td>
<td></td>
</tr>
<tr>
<td></td>
<td>low family income</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>low educational attainment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communicable and Non-</td>
<td>vehicle density</td>
<td>traffic accidents</td>
<td>mortality</td>
</tr>
<tr>
<td>Communicable Diseases,</td>
<td>poor dietary habits</td>
<td>- cases, deaths</td>
<td>disability</td>
</tr>
<tr>
<td>Conditions</td>
<td>changes in society, culture</td>
<td>URI</td>
<td>working days lost</td>
</tr>
<tr>
<td></td>
<td>stress of modernization</td>
<td>bronchopneumonia</td>
<td>rate of public and private expenditure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CVD</td>
<td>on health</td>
</tr>
<tr>
<td></td>
<td></td>
<td>gonorrhoea</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ulcers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>TB</td>
<td></td>
</tr>
<tr>
<td>PROBLEM PRECURSORS</td>
<td>INDEX</td>
<td>1974</td>
<td>TRENDS (annual change)</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------</td>
<td>------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Malaria</td>
<td>vector density, parasite rate</td>
<td>unknown</td>
<td>unknown</td>
</tr>
<tr>
<td></td>
<td>latrine coverage</td>
<td>52%</td>
<td>+ 2%</td>
</tr>
<tr>
<td></td>
<td>supply coverage</td>
<td>30%</td>
<td>+ 2.5 to 3%</td>
</tr>
<tr>
<td>Hygiene, Sanitation Water</td>
<td>govt svc. cont./cap/yr a)</td>
<td>1.1</td>
<td>- 0.06</td>
</tr>
<tr>
<td>Public awareness and access</td>
<td>priv. svc. cont./cap/yr b)</td>
<td>7.6</td>
<td>0</td>
</tr>
<tr>
<td>Diet</td>
<td>caloric consump./cap.</td>
<td>2 000</td>
<td>+ 1.6%</td>
</tr>
<tr>
<td>Income</td>
<td>income per capita c)</td>
<td>9 500 T</td>
<td>+ 7%</td>
</tr>
<tr>
<td>Education</td>
<td>% compl. primary</td>
<td>32%</td>
<td>+ 2 to 3%</td>
</tr>
<tr>
<td>Vehicle density</td>
<td>vehicles/km</td>
<td>33</td>
<td>+ 13 to 15%</td>
</tr>
<tr>
<td>Cultural changes</td>
<td>Stress</td>
<td>none</td>
<td>170</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>CONSEQUENCES</th>
<th>INDEX</th>
<th>1974</th>
<th>TRENDS (annual change)</th>
<th>1980</th>
<th>1985</th>
<th>WITHIN TOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivity</td>
<td>per capita GNP</td>
<td>7 207</td>
<td>+ 5.4%</td>
<td>9 374</td>
<td>12 193</td>
<td>no</td>
</tr>
<tr>
<td>Investment rate</td>
<td>see above</td>
<td>80 000</td>
<td>+ 4 to 6%</td>
<td>100 000</td>
<td>140 000</td>
<td>no</td>
</tr>
<tr>
<td>Educational attainment</td>
<td>no. int'l visitors d)</td>
<td>80 000</td>
<td>+ 4 to 6%</td>
<td>100 000</td>
<td>140 000</td>
<td>no</td>
</tr>
<tr>
<td>Tourism</td>
<td>Overall rate per 1 000</td>
<td>10.5</td>
<td>- .03 to .006/1 000</td>
<td>8.7</td>
<td>7.0</td>
<td>yes</td>
</tr>
<tr>
<td>Mortality: Infant</td>
<td>per 1 000 births</td>
<td>125</td>
<td>- 1/1 000</td>
<td>120</td>
<td>115</td>
<td>yes</td>
</tr>
<tr>
<td></td>
<td>maternal</td>
<td>25</td>
<td>- .35 to .6/1 000</td>
<td>23</td>
<td>20</td>
<td>yes</td>
</tr>
<tr>
<td>Population growth</td>
<td>annual % increase</td>
<td>3.02%</td>
<td>+ .01 to .011%</td>
<td>3.08%</td>
<td>3.15%</td>
<td>yes</td>
</tr>
<tr>
<td></td>
<td>no data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working days lost</td>
<td>no data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health expenditure: Public</td>
<td>T/cap. e)</td>
<td>4.70T</td>
<td>+ 4%</td>
<td>5.95</td>
<td>7.24</td>
<td>yes</td>
</tr>
<tr>
<td>Private</td>
<td>T/cap.</td>
<td>11.84T</td>
<td>+ 2.6%</td>
<td>13.81</td>
<td>15.70</td>
<td>yes</td>
</tr>
</tbody>
</table>

a) government service contacts per capita per year
b) private service contacts per capita per year
c) % completed primary school
d) number of international visitors
e) T unit of currency
<table>
<thead>
<tr>
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Immun. ch. dis. = Immunizable childhood diseases
FOH = Protein-calorie malnutrition
URI = Upper respiratory infections
CVD = Cardiovascular diseases
DPT = Diphtheria-pertussis-tetanus
% -imm. = Percentage not immunized

Figure 5. Health Problem Projection
CHAPTER 5.

SETTING THE OBJECTIVES AND TARGETS
5. Setting the Objectives and Targets

**Inputs**
- terms of reference, 1.6
- summary of policies and programmes, 2.2

**Steps**
1. Review
   - Guidance for setting objectives
2. Confirm
   - Period for achieving objectives
3. Choose
   - Problems for objective setting
4. Identify
   - Necessary operational outputs
5. Establish
   - Problem reduction & output ranges
6. Set objectives & targets
7. Submit to steering committee (optional)

**Products**
- Objectives
- Operational targets

**Points of Use**
- 6. Identifying Potential Obstacles
- 7. Designing the Strategies
- 8. Planning the Project
- 9. Writing the Project Proposal
What are the products of this step?

(a) A statement of the problem-reduction objectives to be achieved through the project, expressed in the same terms as the problem projections, 4.6.

(b) A statement of the corresponding operational output targets that the team considers must be reached if the problems are to be reduced as planned.

Why are objectives and targets set at this point?

One of the features of this planning method is that it is objective oriented. The design phase thus begins by orienting the formulators toward the problems that the project is to address and rectify. By setting objectives at this point there is greater assurance that the reduction of critical problems will remain the focus of the formulation and that strategy design will not become a mechanical activity of trying to improve the service for its own sake.

What difficulties are likely to be encountered?

(a) The relationships between operational outputs (services) and the reduction of health problems are often difficult to assess.

(b) Few people feel comfortable with quantified objectives. They resist setting them and hesitate to make them known, once they are set.

How final and binding are the objectives and targets set in this step?

If the comments of the steering committee or subsequent steps, such as the analysis of obstacles, strategy design and costing, and project planning, show that the objectives and targets are lacking in realism—whether overly ambitious or not ambitious enough—they can be adjusted later in the formulation or even during implementation.
Where and how are these objectives and targets used?

They form the basis for step 7, Designing the Strategies, because they constitute the results which the strategies are vehicles for achieving. They also become the basis of subsequent monitoring and evaluation of the implemented strategies.

Are there any special measures needed to ensure the success of this step?

The importance of setting explicit objectives in terms of health problem reduction must be transmitted to all participants in this step (these may include representatives of the Chartering Agency and steering committee in addition to the formulation team). A reasonable amount of time, perhaps several half-days, should be allotted for the group sessions and assurance should be given that participants will not be interrupted by outside duties.
5.1 REVIEW GUIDANCE FOR SETTING OBJECTIVES

Most of the policies that will serve as guidance for objective setting should already have been collected during the review of relevant policies (step 2.2). The purpose of the present step is to review, supplement, and translate these policies and statements into explicit criteria for problem-reduction objectives, henceforth called simply objectives. The primary sources of policies relevant to objective setting are:

1. the specific goals and policies contained in the National Development Plan;
2. the specific goals and policies contained in the National Health Plan;
3. publicly stated (preferably written) policies of national leaders (the administration);
4. the objectives set during country health programming;
5. the criteria established by the Chartering Agency, as expressed in the formulation's terms of reference;
6. the internal policies of the Ministry of Health;
7. internationally established standards and targets.

A given policy should be considered relevant to objective setting if it helps to specify:

1. the population categories having priority (for example, agricultural workers, mothers, and preschool children);
2. the geographical areas having priority;
3. the relative significance of each problem in the problem projection;
4. the desired or necessary extent of problem reduction; or
5. the time period during which the problem is to be reduced.

Many of the policies that the team members judge relevant will be found to be vaguely stated, with no indication as to the relative importance of one policy as compared with another. The task now is to decide which policies override others in their importance for objective setting, since the success of the formulation proposal may depend on which higher-level policies the proposal supports, and to what extent. If at all possible, therefore, a representative of the Chartering Agency should participate in the selection and "translation" of the relevant policies into usable and specific criteria for objective setting.

The selected policies should, lastly, be summarized in a few succinct statements, such as:

- For the diseases of concern, pursue the operational targets specified in the National Health Plan (or Country Health Programme).
- Concentrate on death reduction in all mortality-causing diseases.
- Concentrate on problems for which there is an effective technical solution.
- Give infants and pregnant women priority over all other population groups.
- Concentrate on maximizing the effective utilization of existing resources; give less emphasis to problems requiring major new investment.
5.2 CONFIRM PERIOD FOR ACHIEVING OBJECTIVES

The date by which the problem-reduction objectives are expected to be achieved should be stated in the terms of reference, 1.6. (It was mentioned earlier that this date usually coincides with the end of a plan period.) It should be noted that not all objectives will necessarily have to be achieved precisely by that date; some objectives may be so important that they will need to have intermediate targets and target dates set for them, while others may take longer to attain. In general, however, the team should now confirm that the end-point of the plan period(s) specified in the terms of reference represents the limit of the period during which attainable objectives are to be set, and they should keep it in mind when deciding what can realistically be achieved by then.

5.3 CHOOSE PROBLEMS AND INDICES FOR OBJECTIVE SETTING

All the critical problems quantified in the problem projections, 4.6, including the precursors and consequences of the pure health problems, are normally candidates for objective setting. Not all, however, will be appropriate for this purpose. To be appropriate, a problem should represent a degree of human wellbeing, should be measurable without undue difficulty, and should clearly reflect the point at which some impact is desired in each "chain" of problems illustrated in the problem diagram, 4.3.

It will be obvious that this step involves deciding on not only the problems for which some reduction is desired but also what aspect or index of each problem should be selected for objective setting. To take poliomyelitis as an example, the team might decide that the aspect of the disease for which an objective should be set is residual disability, rather than the incidence or case fatality of the disease, even though the latter may have been the indices used in steps 3.1 and 4.6 because those data happened to be available. Obviously, the "aspect" of the disease selected must be measurable. However, important aspects of problems should not be avoided simply because they are not easily quantified. They may possess a "shadow" index that can be monitored. In all cases, both the disease and the "shadow" or direct indices chosen for objective setting should be listed. (For some problems two indices may be necessary, for example, cases of gastroenteritis plus infant deaths from diarrhoea.)

5.4 IDENTIFY NECESSARY OPERATIONAL OUTPUTS

The next step is to determine the types of operational outputs (such as smallpox immunizations, cycles of contraceptive pills consumed, and attended deliveries) that are thought to be required to reduce the problems selected for objective setting. (Operational outputs were defined earlier in connexion with the description of health work, step 2.4.)

The team will find the following sources most helpful for determining what types of outputs are appropriate:

(1) The problem diagram, 4.3. It may be possible to discern effective points of intervention and types of output by reviewing this diagram. Some of the problems in the diagram may already be phrased in terms of deficiencies in output (for example, inadequate immunizations against smallpox).

(2) The health work description, 2.4. This description should include the most important elements of the technical procedures currently being used, and should indicate their observed effectiveness to date in reducing the problems to which they are applied.
(3) **Strategies that may have been outlined prior to the formulation.** Such strategies may already specify the operational outputs necessary for problem reduction. They may even indicate the amount of problem reduction desired and the amount of output considered necessary to achieve this reduction.

The assumption until now has been that for each problem to be reduced, it will be possible to identify operational outputs capable of achieving that reduction. For some problems, however, no effective output may be known. In such cases, where prevention or reduction is not feasible, the team would list the service outputs needed to respond to the problem’s effects; some diagnostic, curative, and rehabilitative services fall into this category.

Another possibility is that effective outputs may exist for a problem but lie outside the terms of reference and/or outside the health sector. Such outputs should at least be listed.

5.5 **ESTABLISH PROBLEM-REDUCTION AND OUTPUT RANGES**

Each problem selected for reduction is now viewed in relation to the policies that apply to it, the general technical ability that exists for reducing it (in particular, the types of operational outputs that have been identified as necessary and their effectiveness), and any other problems that have been shown to have a strong relationship with it. The formulation team then decides on the range of problem reduction that is felt to:

1. adhere to higher level goals and policies;
2. be technically feasible; and
3. support the reduction of related problems to a sufficient degree, or be achievable in spite of the effect of related problems.

The range of required operational output levels corresponding to the range of problem reduction is then established.

In some cases amounts of required problem reduction are prescribed, or for some other reason there is no leeway and therefore no range of problem reduction possible (for example, because of a policy that demands the complete eradication of smallpox). There may, however, still be a range of output (such as immunization coverage) capable of accomplishing the assigned problem-reduction objective. For other problems, as mentioned in step 5.4, where no operational output is known to be effective as a preventive measure, one specifies the outputs foreseen as a necessary service response to the predicted problem. In a sense this amounts to predicting the amount of service demand that an unpreventable health problem is expected to generate, and establishing a range of outputs to accommodate that demand.

In cases where the effective operational output lies outside of the formulation’s terms of reference or outside the health sector altogether, the team may wish to define a range of potential problem-reduction objectives that reflect the predicted impact of a relevant programme in the other sector, while noting the impossibility of achieving problem reduction within the terms of reference. They would at the same time estimate the required outputs if the current trend continues in the other sector. (For example, the inability of the health service to reduce the incidence of gastroenteritis would be pointed out, and the curative outputs likely to be required if water supply and sanitation programmes are not pursued would be estimated.)

To summarize, any one of the following possibilities might emerge for each critical problem:
(1) A given amount of problem reduction has been specified in advance, and the team estimates a range of necessary operational output levels.

(2) The team states a feasible range of problem reduction and a corresponding range of required levels of operational outputs.

(3) The team states a feasible range of problem reduction together with:

(a) a range of necessary operational outputs that fall outside the terms of reference, and

(b) a range of other operational output levels, which, although not effective for problem reduction, will be necessary to satisfy the service demand generated if the effective outputs under (a) are not produced.

(4) The team states a range of likely problem levels for which there is no effective operational output, together with a range of the outputs required to satisfy the demand for services generated by the problem.

Note: In the above list "feasible problem reduction" implies only technical feasibility, without regard to resource and organizational aspects.

The product of this step is a list of the critical problems that shows for each:

(1) the amount or range of problem reduction that is both required or desired and technically feasible;

(2) the type(s) and range of amounts of operational outputs that are considered effective and necessary for achieving the indicated amounts of problem reduction;

(3) the types and amounts of operational outputs that will be required to satisfy public demand for services when there are no effective problem interventions.

5.6 SET OBJECTIVES AND TARGETS

The formulation team now reviews the set of problem-reduction and output ranges as a whole in order to set specific, realistic objectives and output targets for each critical problem. There are a number of points to consider in this step. The team must:

(1) set narrower, more specific objectives and output targets where a wide range of possibilities exists;

(2) select objectives and targets that are both realistic (technically feasible) and supportive of policy requirements;

(3) take into account the relationships that exist between critical problems;

(4) where conflicts exist, identify alternative mixtures of objectives and targets;

(5) decide which objectives and targets are relatively fixed and which can be more easily adjusted when unresolvable difficulties or obstacles are identified (in step 6);

Although the ranges set in the preceding step were all defined as being technically feasible, the feasibility was judged separately for each problem. Now the task is to assess whether reaching all objectives and targets together would be feasible, and to adjust the precise levels for each. Both the objectives and the output targets are being treated here as variables, whereas in the preceding step only the latter were variables -- the problem-reduction objectives were first "fixed".
(6) state the date by which each objective should be achieved.

When the list contains only a few (3-5) critical problems, when the problem-reduction levels are relatively fixed, and when there are no apparent conflicts between the various objectives, this step is simply a ratification of the preceding step. When, however, there are more problems (5-15) that are to be reduced, and when there are wide ranges of possible objectives and conflicts between them (or between operational output categories), this step involves making some difficult choices.

One approach to making these choices is the Delphi technique. The team first identifies those problems on the list for which there are fixed reduction objectives; these need no longer be discussed. After the group as a whole reviews the remaining problems, each participant individually decides on the level of problem reduction he thinks most appropriate for each problem and then devises the corresponding output target. All the individually prepared sets of objectives and targets are then distributed to all the participants and, after brief group discussion, each participant again sets objectives and output targets for each problem. This process continues until variance of opinion is reduced and the individual sets of objectives and targets become consistent with one another. Problems about which differences of opinion persist are discussed by the group, and a group decision is made on initial objectives. It is possible that alternative sets of objectives will remain after several attempts to consolidate them into a single set. The group may in such a case decide to move into the design phase with both sets of objectives.

After the set or sets of objectives are finalized, the team should calculate the impact of achieving the problem-reduction objectives so that the predicted health situation is clear. A table should then be prepared showing for each problem:

1. its current magnitude;
2. its projected magnitude (in the absence of intervention);
3. the amount or range of problem reduction that has been set as an objective;
4. the type and amount or range of operational output judged necessary to achieve each problem-reduction objective;
5. the predicted magnitude of the problem if the objective and output target are achieved; and
6. the target dates set for their achievement.

5.7 STEERING COMMITTEE REVIEW (OPTIONAL)

The product of step 5.6 may, if desired, be submitted to the steering committee for review, discussion, and their comments.

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ILLUSTRATION - CHAPTER 5

The formulation team prepares for objective setting by performing steps 5.1 through 5.5 in the two days preceding the joint session with the steering committee at which the objectives are actually to be set. The primary guidance for objective setting is confirmed to be contained in:

(1) the guidelines for the forthcoming Five-Year Development Plan, and  
(2) the policies and targets stated in the Country Health Programme.

The following general criteria are stated by the steering committee:

(1) Concentrate on reducing the health problems of the rural population.
(2) Concentrate on reducing the health problems of women aged 15-44 and children aged 0-15.
(3) Emphasize disease prevention, particularly through good nutrition and immunization.

The endpoint of the plan periods under consideration is confirmed to be 1985. Problem-reduction objectives are to be set for two target dates - 1980 and 1985.

As preparation for objective setting, working groups extract the relevant operational outputs and the estimates of their effectiveness from the health work description. These are presented in summary form along with the health problem projections to which they relate. For the following conditions the team finds it possible to state a range of conceivable problem reduction and the corresponding output requirements:

(1) malaria - spraying, blood slides, and chemotherapy.
(2) immunizable childhood diseases (smallpox, poliomyelitis, whooping cough, diphtheria, tetanus, TB) - the relevant immunizations.
(3) maternal conditions - family planning and MCH consultations.

For the other conditions, the effectiveness of known operational outputs is either unknown or very poor.

The joint session at which objectives are set proceeds as follows:

(1) The objectives and targets relating to population growth and maternal conditions are set first. While no specific population control policy exists, the economic planners confirm that there is an unwritten goal to reduce the population growth rate to 2% by 1985. The current rate of 2.36% is expected to increase to 2.7% by 1985 if nothing is done. Therefore, the objective is set at 2.36% for 1980 (maintaining the current rate) and at 2.0% for 1985. It is assumed that overall death rates will remain as projected, allowing the required birth rates (32.3 and 27.0) to be extrapolated. The corresponding output targets - number of births to be averted, family planning acceptors, and the required family planning activities - are then calculated. It is agreed that the population projections used in calculating the expected magnitude of other health problems will not be adjusted for the effects of family planning.

(2) The next objectives and targets to be set are those pertaining to immunization. Between 75 and 95% coverage is targeted.

(3) The objectives pertaining to the environmental conditions of malaria, diarrhoea, hookworm, and cholera are set on the assumption that latrine and water supply
targets will be met through the Agricultural and Community Development Programmes. The question of responsibility for house spraying is raised because of the uncertain future of the Malaria Eradication Programme.

(4) The team addresses remaining problems requiring strong preventive action without quite knowing the techniques to be employed. These are protein-calorie malnutrition, traffic accidents, and gonorrhea. All will require effective public promotion and health education, and the group doubts the effectiveness of current techniques. Ambitious reduction objectives are set in order to direct attention to these problems. (The 73% reduction for traffic accidents amounts to holding the case rate to the current level.) Coordination with other agencies is obviously necessary for these problems.

(5) The problems of upper respiratory infection, bronchopneumonia, cardiovascular diseases, and ulcers all lack effective technologies, and hence no reduction objectives are set. The service outputs required to handle these problems are estimated on the basis of the projected problem magnitude.

The objectives and operational targets are summarized as shown in Fig. 1. Since the members of the steering committee are present they approve these as shown.
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<td>0.10</td>
<td>23%</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>WHO prevalent</td>
<td>1-4</td>
<td>0.048</td>
<td>6.9</td>
<td>23%</td>
<td>mothercraft classes</td>
<td>732</td>
<td>732</td>
</tr>
<tr>
<td>Services</td>
<td>cases</td>
<td>15+</td>
<td>0.114</td>
<td>12.2</td>
<td>safety campaigns</td>
<td>6546</td>
<td>14571</td>
</tr>
<tr>
<td></td>
<td>deaths</td>
<td>15+</td>
<td>0.073</td>
<td>3.9</td>
<td>first aid training</td>
<td>1234</td>
<td>15726</td>
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<tr>
<td></td>
<td>cases</td>
<td>0-4</td>
<td>0.02</td>
<td>2.0</td>
<td>consultations</td>
<td>77792</td>
<td>109758</td>
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<td></td>
<td>deaths</td>
<td>0-4</td>
<td>0.02</td>
<td>2.0</td>
<td>--</td>
<td>--</td>
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<tr>
<td>Bronchiopneumonia</td>
<td>cases</td>
<td>0</td>
<td>0.01</td>
<td>295</td>
<td>consultations</td>
<td>176</td>
<td>205</td>
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<tr>
<td></td>
<td>cases</td>
<td>15-44</td>
<td>0.05</td>
<td>4.9</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td></td>
<td>deaths</td>
<td>0-4</td>
<td>0.01</td>
<td>295</td>
<td>consultations</td>
<td>176</td>
<td>205</td>
</tr>
<tr>
<td></td>
<td>cases</td>
<td>15-44</td>
<td>0.082</td>
<td>4.9</td>
<td>stained pans</td>
<td>420</td>
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<tr>
<td></td>
<td>deaths</td>
<td>0-4</td>
<td>0.01</td>
<td>295</td>
<td>consultations</td>
<td>176</td>
<td>205</td>
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<tr>
<td>Gastroenteritis</td>
<td>cases</td>
<td>0-4</td>
<td>0.048</td>
<td>7.9</td>
<td>public health</td>
<td>155</td>
<td>375</td>
</tr>
<tr>
<td></td>
<td>cases</td>
<td>15-44</td>
<td>0.048</td>
<td>7.9</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TB</td>
<td>prevalent</td>
<td>15+</td>
<td>0.005</td>
<td>chemotherapy</td>
<td>2.191</td>
<td>2.556</td>
</tr>
</tbody>
</table>

*Note: The percentages indicate the proportion of the total problem that each objective or operational target addresses.*
Chapter 6,
IDENTIFYING POTENTIAL OBSTACLES
6. Identifying Potential Obstacles

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Steps</th>
<th>Products</th>
<th>Points of Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>problem diagram, 4.3</td>
<td>6.1</td>
<td>CONSTRUCT FRAMEWORK FOR ANALYSIS</td>
<td>6.4</td>
</tr>
<tr>
<td>problem projections, 4.6</td>
<td>6.2</td>
<td>COMPARE TARGETED &amp; ACTUAL OUTPUTS</td>
<td>6.4</td>
</tr>
<tr>
<td>health work description, 2.4</td>
<td>6.3</td>
<td>IDENTIFY DEFICIENCIES &amp; OBSTACLES</td>
<td>6.5</td>
</tr>
<tr>
<td>objectives &amp; operational targets, 5.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>discussions with service and administrative staff</td>
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</tr>
</tbody>
</table>
What is the purpose of this step?

In the preceding step the formulation team established objectives and corresponding operational output targets. In the present step the task is to try to predict what might stand in the way of reaching these targets. This is done by (a) asking the people most directly involved (see below) what obstacles they might encounter in attempting to produce the targeted outputs, and (b) identifying current operational deficiencies on the assumption that they will probably constitute obstacles later on when the health service is attempting to reach the operational targets set for it. The analyses done in this step may thus uncover a broad variety of hindering factors - deficiencies in health service operation, political problems, opposition by interest groups - all of which are likely to influence the achievement of operational targets.

What are the products of this step?

(a) A list of the operational deficiencies and their underlying causes; the latter are the true potential obstacles to target achievement. These obstacles are grouped in categories relevant to the project and are ranked according to frequency.

(b) A corresponding list of ideas and suggestions for reducing or avoiding these obstacles.

What does this step involve and what dangers are likely to be encountered?

The identification of obstacles requires interviewing a wide variety of people including Ministry officials, staff at various levels of the health service, and representatives of the public and professions outside the government service. The responses from these interviews, which are conducted like dialogues rather than interrogations, are carefully analysed in the light of the respondent's situation and in comparison with the other responses received. The difficulty here is to structure and control the analysis carefully in order to maintain consistency and objectivity. Continuous emphasis must be placed on identifying the most important deficiencies and obstacles and guarding against the recording of a long list of general complaints.

*  
1For the sake of convenience, the term "health service" is used in this and subsequent chapters to mean the operating system the formulation is concerned with, but a much broader meaning is intended than these words convey. The operating system in question may be a medical supply system, a health manpower training system, etc.
6.1 CONSTRUCT FRAMEWORK FOR ANALYSIS

The best way of identifying operational deficiencies is to compare what is desired with what is currently being done, in other words, to compare the targeted operational outputs with the outputs currently being produced. The first step is to construct a framework or model within which this comparison can be conducted. A separate model will be needed for each critical problem having a problem-reduction objective, but problems that fall into the same category can use basically the same model.

1. In the case of a health problem (or a symptom or a health consequence), a useful model is illustrated in Fig. 1. This consists of a sequence of states of health, beginning with the health problem in question and ending with recovery or protection. It depicts the succession of states that one would have to pass through in order to recover from or be protected against a disease. (In the following step, this model will be filled in with figures showing the number of people in the population who are now progressing through the successive states, and the number that would have to progress through each state if the problem is to be reduced as planned. Within this framework the formulators will attempt to detect deficiencies in numbers of contacts and other outputs (number of cases diagnosed, treated, recovered, etc.) as possible obstacles to reaching the operational targets set.)

2. If a critical problem is related to the subject of health manpower development, a framework could be constructed for analysing the obstacles to producing and using the relevant type of personnel. Such a model would trace the flow of personnel from a general manpower pool (primary and secondary school graduates) through the states of "recruited", "completed basic training", "assigned", "completed in-service or postgraduate training", "promoted", and "retired". The various points and causes of staff losses and of unsatisfactory service or career development could then be analysed.

3. If the formulation is dealing with diseases for which standardized control procedures exist, then the analytical framework for each such problem could be constructed around those procedures. For example, the sequence might be "immunization", "case-finding", "follow-up", and "chemotherapy" for tuberculosis; "vector control" (spraying and control of breeding places), "case-finding", and "chemotherapy" for malaria; and "immunization", "case-finding", and "containment" for smallpox.

4. If some of the critical problems have been expressed as deficiencies in support systems, a special analytical framework could be designed for them. For example, a "supply system model" might consist of the following states: "budgeting and funding", "requisitioning", "procurement", "delivery", "storage and inventory control", and "distribution". The flow in this case would concern items rather than people.

6.2 COMPARE TARGETED AND ACTUAL OPERATIONAL OUTPUTS

Taking each model in turn, the formulators enter the following data:

1. Estimates of the number of people or items now involved in each stage of the model and the number that the team calculates will need to be involved by the end of the plan period if the operational targets are to be met. These figures should be based on health service statistics and survey results, supplemented by the team's own estimates.
Figure 1. Health problem model for identification of deficiencies

CURATIVE STATES

Sick → Aware → Motivated → Contacted → Diagnosed → Treated → Recovered

PREVENTIVE STATES

Population at Risk

Susceptible → Aware → Motivated → Contacted → Diagnosed → Given Prophylaxis → Protected
(2) The types and numbers of operational outputs currently being produced.

(3) The types and numbers of operational outputs targeted for the end of the plan period. (It should be noted that some of the "states" of the model will be equivalent to the selected outputs; for example, an output target may have been set for "contacts".)

The team then calculates the "loss" (of people or items) occurring between successive states, and the discrepancies between the actual and targeted operational outputs. If possible, targets and their shortfalls should be expressed in the units of the appropriate service levels (district, health centre, etc.) so that they can be discussed more readily with staff at those levels.

Fig. 2, page 111, illustrates the data that might be entered for the analytical model of malaria. Note that two of the states ("diagnosed", "treated") are equivalent to operational outputs (blood smears, chemotherapy).

6.3 IDENTIFY DEFICIENCIES AND OBSTACLES TO TARGET ACHIEVEMENT

In this step, the formulators attempt to uncover the reasons for any discrepancies detected in the previous step between actual and targeted operational outputs. There are two main ways of going about this analysis:

(1) using the findings of consultants or special study groups that have recently reviewed the functioning of the health service in areas of interest to the formulation, or

(2) holding informal interviews with service and administrative staff from those areas of the health service.

If the second method is chosen, a few rules should be followed. It has proved most efficient to conduct these interviews at the site of the formulation, rather than having the formulators travel to observe and interview service staff in their facilities. It is also wise to seek out staff members who know most about the states in the analytical models where the greatest "losses" (of population or other items) are occurring.

During the interviews, the service staff are shown the recently established operational targets and are asked what difficulties they would expect to encounter in attempting to meet such targets, or, conversely, what obstacles have prevented those numbers of outputs from being produced. The first difficulties mentioned by interviewees are usually resource shortages - lack of sufficient manpower, facilities, drug supplies, etc. The formulators should, however, attempt to look beyond these complaints into procedural and attitudinal problems, which are usually more serious obstacles to target achievement. For example, unfriendly staff attitudes may be a greater cause of loss between the states of "motivation" and "contact" - and hence a greater obstacle to proper output of "contacts" - than simple shortages of staff, although the two factors may be linked.

For each shortfall in output observed, the formulators should attempt to elicit (a) the obvious reason for the shortfall, expressed as a "deficiency" in the operating service, and (b) the specific underlying causes of the deficiency, which are the true "obstacles" to proper output. Clues to the nature of the underlying obstacles will come from careful questioning of the service staff during the interviews, and analysing the nature of the preceding states of the model showing great losses. Typical causes of a deficient output of treated cases of malaria, for example, might be "lack of treatment after diagnosis" (the deficiency) and "hospital outpatient department overload", "patient disregard for health service remedy", and "inadequate drug supply in some facilities" (the underlying obstacles)
(see Fig. 2, page 111).

On the basis of notes taken during the interviews, the deficiencies and obstacles identified are summarized in the relevant boxes of the analytical model. They should also be summarized in a list, according to the problem they affect.

During the interviews the formulators should ask the service staff for their suggestions on how to avoid or remove the obstacles identified. All possible ideas for remedying the situation should be encouraged and recorded. (They will be compiled into a list in step 6.5.)

6.4 CATEGORIZE AND RANK OBSTACLES

After all problems have been reviewed to determine the obstacles to proper operational outputs and the causes of loss along the flows of the relevant models, the lists of deficiencies and obstacles produced in step 6.3 should be summarized. This summary should show, for each group of problems, the frequency of deficiencies, categorized by the state of the model they affect, and the frequency of obstacles, categorized according to the aspect of the health system to which they relate (technology, staff, facilities, etc.). If desired, there may be a further breakdown of obstacles into resource and non-resource obstacles, that is, quantitative shortages (of staff, facilities, vaccines, etc.) and qualitative defects or deficiencies (such as unfriendly staff attitudes, inappropriate facilities, and inconsistent vaccine quality).

It should then be possible to rank the obstacles (by type) in order of overall importance based on their frequency of occurrence. This ranking will give the formulators a sense of the proper priorities when they attempt in step 7 to design strategies that will circumvent or remove existing obstacles.

6.5 LIST POSSIBLE REMEDIES

In step 7 the team will also be helped in their design activities by having a summary of the changes proposed for circumventing or eliminating obstacles to target achievement. The list of remedies should be compiled at this point.
The formulation team begins the analysis of obstacles by meeting as a group to:

1. agree on the framework for conducting the analysis;
2. identify and notify people to be interviewed;
3. outline the interview procedure and list the questions to be asked;
4. design and produce the form to be used in recording responses; and
5. divide the list of problems for analysis into three groups to be assigned to the three working groups.

It is agreed that the model shown in Fig. 1 (page 107) is relevant for most of the critical problems, although for some the "states" of the model will have to be renamed. For childhood immunization the states are to be (a) target population (parents); (b) aware of need; (c) motivated; (d) contacted; (e) immunizations completed; (f) protected (children). For family planning, the states are to be (a) eligible women (15-44); (b) women at risk; (c) contacted for health education; (d) motivated; (e) contacted for dispensing; (f) continued use; (g) pregnancies prevented.

The team concludes that interviews should not be limited to health service staff but should also include private practitioners, traditional practitioners, community leaders, and representatives of the rural population. Most interviews are to be conducted in the Provincial Health Office. Some, however, will have to be held in the nearby Provincial Hospital, a private hospital, and a district health centre.

It is decided that the questioning should be done in such a manner as to avoid the impression of an examination or interrogation. The interviewees are to be made to realize that they are participating in a planning process and that their comments are expected to be honest and objective (while reflecting their own experience and point of view). In particular, as they describe existing and potential obstacles to achieving the targets, they should feel free to offer their own suggestions for avoiding or eliminating such obstacles.

A form is designed for recording responses, as shown in Fig. 2. Before beginning the interviews each working group prepares one sheet for each problem and records on each:

1. the current and projected magnitude of the problem;
2. the objective and its predicted impact;
3. the important operational outputs, the 1974 level of such outputs, and the targeted levels for 1980 and 1985;
4. the relevant states in the model (down the left-hand column);
5. the estimated flow of population from state to state in absolute numbers of people (actual numbers for 1974, targeted numbers for 1985), where known.

As the working groups conduct their interviews, they explain the problems and targets to the interviewees and ask questions designed to uncover reasons why such targets might not be achieved. The notes taken are later reviewed and summarized on the same sheet under the three columns of "deficiency", "obstacle", and "possible remedy". Fig. 2 shows the completed sheet for malaria.

After all interviews are completed the three working groups come together to review their findings and identify the deficiencies and obstacles that appear with greatest frequency
## Figure 2. Analysis of Deficiencies and Obstacles

<table>
<thead>
<tr>
<th>Problem:</th>
<th>Malariak - cases and deaths</th>
<th>1974: rate 0.015, cases 7 067, deaths 707</th>
<th>1985: rate 0.028, cases 8 452, deaths 845</th>
</tr>
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<tbody>
<tr>
<td>Objective:</td>
<td>Reduce deaths 50%</td>
<td>1974 output</td>
<td>1980 Targets</td>
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<td>Operational Outputs:</td>
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<tr>
<td>house spraying</td>
<td>60% of endemic villages</td>
<td>100% of endemic villages</td>
<td>100% of endemic villages</td>
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<tr>
<td>drainage projects</td>
<td>0</td>
<td>50 projects</td>
<td>50 projects</td>
</tr>
<tr>
<td>blood smears</td>
<td>18 385</td>
<td>12 345</td>
<td>13 865</td>
</tr>
<tr>
<td>chemotherapy</td>
<td>8 000</td>
<td>16 000</td>
<td>16 000</td>
</tr>
<tr>
<td>Pop. At Risk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age 0-44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1974 - 47 113</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1985 - 60 231</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sick (0.1 of pop. at risk)</td>
<td>Incomplete house spraying</td>
<td>Staff shortage, turnover. Insufficient transport for spraying teams. Public refusal, houses locked. Poor inter-agency communication and coordination. Transient population. Inflexible spray schedules. Confirmed cases not reported or addressed missing/inaccurate.</td>
<td>Control of breeding places and house spraying could be carried out by community. Provincial coordination between health centres, malaria control programme, and community development programmes.</td>
</tr>
<tr>
<td>1974 - 47 113</td>
<td>Insufficient control response to cases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1985 - 60 231</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aware (0.6 of sick)</td>
<td>People cannot tell the difference between malaria and other fevers.</td>
<td>Lack of public knowledge of the disease's characteristics.</td>
<td>Health education could be emphasized within community development programme.</td>
</tr>
<tr>
<td>1974 - 28 668</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivated (0.6 of sick)</td>
<td>Lack of public concern.</td>
<td>Symptoms too familiar. Conflicting advice from family, friends, and traditional practitioners. Health facilities unattractive, staff are impersonal.</td>
<td>Utilize local health auxiliaries.</td>
</tr>
<tr>
<td>1974 - 9 422</td>
<td>Lack of desire to approach govt health service.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contacted (0.3 of sick)</td>
<td>Few people establish contact with govt health service until gravely ill.</td>
<td>Most live considerable distance from nearest facility. Lack confidence in govt staff, prefer traditional practitioners. Sick cliente schedules are inconvenient for mothers and working people.</td>
<td>Use mobile health service.</td>
</tr>
<tr>
<td>1974 - 14 128</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1974 - 7 067</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1985 - 13 865</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treated (0.17 of sick)</td>
<td>Lack of treatment after diagnosis.</td>
<td>Hospital GDR overload. Patients disregard health service remedy. Inadequate drug supply in some facilities.</td>
<td>Establish a provincial medical supply system.</td>
</tr>
<tr>
<td>1974 - 8 000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1985 - 10 000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1974 - 6 360</td>
<td>Failure to follow-up.</td>
<td></td>
<td>Utilize local health auxiliaries.</td>
</tr>
<tr>
<td>1985 - 8 029</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
on the analysis sheets. The following summaries are produced:

(1) Summary of deficiencies and obstacles (Fig. 3), which identifies for each state of the model the general deficiencies and underlying obstacles that appear with greatest frequency.

(2) Distribution of deficiencies and obstacles (Fig. 4) for seven problem groups, which shows in which states the deficiencies appear to cluster and what types of obstacles appear to be causing them. The team is surprised and encouraged to learn that over 80% of the obstacles are not related to a shortage of resources, and that over 80% are in the (non-resource) categories of staff, procedures, and policies, all of which are relatively easy to change.

(3) List of possible remedies (Fig. 5), which is a summary of the ideas suggested by interviewees for circumventing obstacles.

While the team considers it impossible to rank individual obstacles, they proceed to list categories of obstacles by order of importance, based on frequency of occurrence:

(1) operating procedures [57]
(2) administrative procedures [47]
(3) staff (non-resource) [35]
(4) health policies [35]
(5) facilities (resource) [35]
(6) economic, social, and political factors [34]
(7) physical environment [33]
(8) technology (non-resource) [24]
(9) staff (resource) [24]
(10) non-health policy [22]
(11) facilities (non-resource) [7]
(12) technology (resource) [6]
<table>
<thead>
<tr>
<th>GENERAL DEFICIENCIES</th>
<th>PRIMARY OBSTACLES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SICK</strong></td>
<td></td>
</tr>
</tbody>
</table>
| (1). Insufficient coverage of population with preventive/promotive measures (immunization, safe water, spraying, antenatal contacts, attended deliveries) | (a) maldistribution of staff and facilities  
(b) shortage of some types of staff, both public and private  
(c) poor staff motivation  
(d) poor coordination between agencies  
(e) shortage of transportation |
| (2) Inadequate epidemiological information | (a) vital statistics incomplete  
(b) service statistics variable in accuracy and completeness  
(c) no provincial summaries |
| **AWARE** |                  |
| (1) Lack of public awareness about prevalent diseases, the means for their prevention, the technology for use, and the availability/capability of the government health service | (a) information not sufficiently available  
(b) available information not understandable or relevant  
(c) adults lack basic general education |
| **MOTIVATED** |                  |
| (1) When aware of disease not concerned enough to approach the health services | (a) many symptoms are frequent  
(b) lack faith in the service, its technology and staff  
(c) prefer traditional or private practitioners |
| **CONTACTED** |                  |
| (1) Rural facilities under-utilized | (a) distance  
(b) cost  
(c) preference for hospital |
| (2) Provincial hospital overloaded | (a) faith in MUs  
(b) prefer larger institution  
(c) excuse to go to town |
| **DIAGNOSED** |                  |
| (1) Diagnosis not undertaken or poorly performed, resulting in excessive presumptive treatment | (a) staff unable to diagnose because of lack of training, supervision, equipment  
(b) dispense from habit  
(c) seek revenue from drug sales  
(d) lack of patient or specimen referral system |
| **TREATED** |                  |
| (1) Incorrect prescriptions in many cases | (a) (see Diagnosed)  
(b) hospital overload  
(c) high cost of treatment  
(d) inconvenience  
(e) preference for traditional practitioners  
(f) drug shortage |
| (2) Incomplete treatment | (a) (see Diagnosed)  
(b) hospital overload  
(c) high cost of treatment  
(d) inconvenience  
(e) preference for traditional practitioners  
(f) drug shortage |
| **RECOVERED/PROTECTED** |                  |
| (1) High proportion of relapse | (a) (see Treated)  
(b) symptoms temporarily disappear, treatment terminated  
(c) self-medication |
| (2) Failure to follow up | (a) poor patient records  
(b) staff shortage  
(c) lack of transport  
(d) population movement |
| (3) Protection not achieved | (a) shortage of vaccines  
(b) spoilage of vaccines  
(c) no follow-up to complete series - see (2) above  
(d) (see Contacted) |
### Figure 4. Distribution of Deficiencies and Obstacles

<table>
<thead>
<tr>
<th>Problem Group</th>
<th>DEFFICIENCIES, BY STATE</th>
<th>OBSTACLES, BY TYPE</th>
<th>TOTAL</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aw.</td>
<td>Mot.</td>
<td>Cont.</td>
<td>D/T/R/P</td>
</tr>
<tr>
<td>Family Health</td>
<td>2</td>
<td>12</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Nutrition</td>
<td>8</td>
<td>6</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Immunization</td>
<td>0</td>
<td>6</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Communicable Diseases</td>
<td>1</td>
<td>14</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Accidents</td>
<td>4</td>
<td>4</td>
<td>19</td>
<td>7</td>
</tr>
<tr>
<td>Stress</td>
<td>5</td>
<td>9</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Environmental</td>
<td>10</td>
<td>21</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Total deficiencies</td>
<td>33</td>
<td>72</td>
<td>50</td>
<td>37</td>
</tr>
</tbody>
</table>

**Total Resource Obstacles**

<table>
<thead>
<tr>
<th></th>
<th>24</th>
<th>47</th>
<th>35</th>
<th>65</th>
<th>17.5%</th>
</tr>
</thead>
</table>

**Total Non-Resource Obstacles**

<table>
<thead>
<tr>
<th></th>
<th>104</th>
<th>57</th>
<th>67</th>
<th>371</th>
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</table>

**Total Obstacles by Type**

<table>
<thead>
<tr>
<th>% by Type</th>
<th>8.1%</th>
<th>19.1%</th>
<th>11.3%</th>
<th>28.0%</th>
<th>15.4%</th>
<th>18.1%</th>
</tr>
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**KEY**

- **Aw** - awareness
- **Mot** - motivation
- **D/T/R/P** - diagnosis, treatment, recovery, or prevention
- **Res** - resource obstacle (see text)
- **NR** - non-resource obstacle (see text)
- **Op** - operational
- **Admin** - administrative
- **Phys** - physical environmental factor
- **ESP** - economic, social, or political factor
(1) Utilize traditional practitioners and village auxiliaries for:
   (a) birth attendance;
   (b) assistance in vital event registration;
   (c) promotion of and referral to government services;
   (d) assistance in mobile clinics.

(2) Encourage health centre deliveries to lessen burden on hospitals.

(3) Greatly expand mobile health services for increased coverage with immunizations, antenatal consultation, family planning consultation, case-finding (malaria, communicable diseases, protein-calorie malnutrition, hookworm, complicated deliveries), treatment of common ailments, case follow-up, and request for environmental services.

(4) Strengthen health education programme with use of commercial sector, mass media, and schools.

(5) Establish simple epidemiological surveillance system.

(6) Launch accident prevention programme in coordination with provincial and municipal police.

(7) Institute Provincial ambulance service with "voluntary" support from bus and taxi drivers, private citizens.

(8) Make available first aid training for police, bus and taxi drivers.

(9) Enact legislation for compulsory use of seat belts and helmets.

(10) Establish a Provincial Health Advisory Committee with representatives of the communities.

(11) Strengthen health service procedures and staff supervision through the creation and use of technical, operational, and administrative procedures manuals, in-service training courses, supervisors' training, simple operational reporting system, outstanding staff award and reward, and staff evaluation procedure.

(12) Establish commercial drug control legislation and procedures.

(13) Use Community Development Programme for health education, environmental protection, and health service promotion, facility construction and maintenance.

(14) Establish provincial medical supply system.

(15) Involve private practitioners in health planning, health education, promotion, and prevention activities.

(16) Establish provincial health inspection unit for inspecting market, eating places, waste disposal, and for prostitute health examination. Support with legislation and publicity.
Chapter 7,
Designing the Strategies
7. Designing the Strategies

7.1 Establish Design Criteria

7.2 List Necessary Changes

7.3 Outline Potential Strategies

7.4 Select Most Feasible Strategies

7.5 Design Strategy Details

7.6 Estimate Strategy Costs

7.7 Assess Adequacy of Future Resources

7.8 Revise Strategies & Targets

7.3-7.5 Design Strategy Details

8. Planning the Project

9. Writing the Project Proposal

Terms of reference, 1.6
Summary of policies and programmes, 2.2
Objectives and operational targets, 5.5
Ranked obstacles, 6.4
Possible remedies, 6.5

Terms of reference, 1.6
Objectives and operational targets, 5.5
Ranked obstacles, 6.4

Objectives and operational targets, 5.5
Ranked obstacles, 6.4
Design criteria, 7.1

Objectives and operational targets, 5.5
Ranked obstacles, 6.4
Design criteria, 7.1
Other analytical products as necessary

Resource projections, 2.3

Objectives and operational targets, 5.5
Strategy descriptions, 7.5

(if necessary)
What is the purpose of this step?

While all previous steps are critical for sound project planning, the main goal of this formulation method - to design a feasible approach for reducing specified health problems - is realized in step 7. The health strategies that are to be the basis of the new or revised services must be designed in enough detail to permit them to be understood and reviewed by decision-makers and to enable strategy implementation to begin.

What products normally result from this step?

Every formulation team must design products specific to the situation and in accordance with the terms of reference. In general, however, the following are produced during step 7:

(a) Criteria to which the proposed strategies must confirm.
(b) The outlines of alternative strategies under consideration.
(c) The detailed design of selected strategies, including for each:
   - the technology or technical procedures to be applied;
   - the types and numbers of people to be served;
   - the staff and facility requirements;
   - support requirements (supplies, transport, etc.);
   - costs by category of resources and time period.
(d) Sources of expected funds and other resources.
(e) Resource shortfalls.
(f) Adjustments to objectives and targets, if necessary.

What should be watched for and avoided?

(a) Presenting decision-makers with a proposal filled with generalities. Strategy descriptions should be specific.
(b) Presenting decision-makers with strategy descriptions that are too detailed. At the extreme, no more detail should be included than is indispensable for decision-making and initial implementation.

(c) Being unrealistic about future resource availability, or the ability to change public attitudes.

(d) Not focusing the strategy descriptions on the most important aspects of the strategies.
7.1 ESTABLISH DESIGN CRITERIA

To guide the process of strategy design, it is important that the formulators should first reach agreement on the criteria to which any new or revised health strategies should conform.

The most obvious sources of such criteria are the terms of reference, 1.5, the summary of policies and programmes, 2.2, and the objectives and operational targets, 5.6.

Typical criteria that might be extracted from the first two documents include resource or budget limitations, required service or health strategies (calling for improved health education, patient screening, etc.), development of services in certain geographic areas, and time limitations. The objectives and targets, the third source, may imply a need for emphasizing certain aspects of design, such as prevention and early contact. All these criteria should now be expressed in succinct statements.

Another source of design criteria is the analysis of potential obstacles to target achievement. Here, the team should proceed as follows. Construct a matrix such as that illustrated in Fig. 1, page 129. The main "states" that made up the analytical models in step 6 are listed alongside one axis of the matrix, and appropriate elements of the health or service system are listed alongside the other. The obstacles identified in step 6.3 are then reviewed by the team and placed in the appropriate cells (boxes) of the matrix. (In summarizing the obstacles the team must take care to differentiate between general obstacles that affect all problems and those pertaining to specific problems.) As the matrix is filled, obstacles will be seen to cluster in certain cells or groups of cells. These clusters illustrate forcefully the areas in which potentially massive hindering effects may be expected if no action is taken. The team must now examine them to determine whether they deserve special attention during strategy design. For example, if unfriendly staff attitudes recur repeatedly as an obstacle to proper contact of the health service by the public, the team would draw up a criterion calling for at least one strategy to address and rectify this situation. Similarly, if lack of accurate information is repeatedly mentioned as an obstacle to contact and follow-up, a criterion calling for improved record systems would be in order.

At this point, the list of criteria should be reviewed in the light of the ranked obstacles, 6.4, to make sure that all high ranking obstacles have been adequately reflected in the design criteria.

As the list grows, care should be taken to avoid contradictions, arbitrariness, and overlapping. The final list of design criteria should be well understood by all team members. It usually deserves to be reviewed and ratified by the steering committee.

7.2 LIST NECESSARY CHANGES IN DETAIL

In this step the formulators decide what specific changes will have to be made in the existing operating system or systems in order to (a) ensure that the operational output targets, and hence the problem reduction objectives, are achieved, (b) satisfy the design criteria just established, and (c) circumvent or eliminate the potential obstacles to target achievement. Such changes will normally fall into the following categories:

1. Changes in the basic technology used - introduction of a new or revised technical procedure, or the elimination of one currently being applied.

2. Changes in service staff - modification of their current functions, placement, or training, or the creation of new types of staff.
(3) Changes in facilities - modification of their function, design, placement, or equipment.

(4) Procedural changes - modification of the procedures for patient referral, laboratory and supply systems, supervision, reporting, etc.

(5) Organizational changes - changes in organizational structures, responsibility, or focus of control.

(6) Changes in legislative, administrative, or operating policies.

(7) Changes in the physical or social environment, including attitudinal changes.

The exact approach used in this step will vary somewhat with the formulation subject. One approach is to take each critical problem in turn and run through the seven categories of change listed above to see what would be needed in each category to achieve the operational output targets or eliminate possible obstacles to their achievement. (Experience has shown that the order of categories shown above is the best sequence to follow because of the hierarchical relationships that exist between those categories. Following this sequence is felt to minimize the backtracking or "looping back" that occurs when a change in one category, such as technology, necessitates a corresponding change in some other category, such as staff functions or referral procedures.) It may be helpful for team members to have the current health work description, 2.4, in front of them during this step, as this is the status quo that is to be changed. One source of ideas for change is the summary of possible remedies, 6.5. If, as often happens, several alternative remedies have been suggested for avoiding or eliminating the same obstacles, they should all be listed at this point. Later on a choice will be made among them when the strategies are designed.

A frequent dilemma in this step is how to set a limit on the number and detail of potential changes. Formulation teams in the past have encountered difficulties at subsequent stages (strategy design, proposal review and approval, and project implementation) when the list of changes was too long and detailed. Obviously, some changes are more critical for the achievement of targets than others. There should be an effort to identify the changes having the most direct links to the targeted operational outputs. Subsidiary changes in support systems and other desirable changes may be added to the list if the team feels that their presence does not jeopardize or downgrade the importance of the more critical changes. Non-essential changes and ideas of dubious feasibility should be screened out.

The reasons for each proposed change should be recorded in the final list, where the changes should be grouped according to the critical problem involved.

7.3 OUTLINE POTENTIAL STRATEGIES

This step of project formulation exceeds all others by far in the need for imagination and creativity.

In this step the formulaters, working either as a team or in smaller groups, devise and outline potential strategies for delivering the targeted operational outputs. The term "strategy" as used here embraces all that must go into a managerial or operational approach for the delivery of service, including the technology to be applied, the procedures (administrative and other) to be used, the organizational aspects of service delivery, the policies or laws that may have to be changed in order to deliver the outputs in the manner desired, ways of achieving necessary changes in public or professional attitudes, and so on. Each strategy should contain features that provide for the removal or avoidance of potential obstacles to target achievement. Since the majority of such obstacles are usually non-resource (see Chapter 6, page 106), circumventing them will most often require policy and organizational change, and perhaps qualitative changes in staffing or facilities.
Primary guidance for devising strategies will come from the design criteria, 7.1. However, the list of changes (7.2), the summary of policies and programmes, 2.2, and existing strategy and health work descriptions (from step 2.4) are also useful inputs to this step.

The strategies chosen at this point may be entirely new, or they may be the same as those currently being applied. Alternatively, they may result from the revision of current strategies or the regrouping or reorganization of current health activities. Some of them may have been suggested to the formulation team in the terms of reference, for example, a strategy proposed by country health programming.

The set of potential strategies may not include all the detailed changes proposed in step 7.2 and may not cover all the critical problems. It should, however, address a good proportion of the operational output targets. Usually, several strategies are required to achieve all the targets and circumvent all the identified obstacles, but it is conceivable that the design could be concerned with a single strategy only. Alternative strategies may emerge for the same purpose. All should be listed at this point. In order to encourage innovation, it is important that the number of potential strategies should not be limited. Later on, in step 7.4, the number of strategies to be planned in detail and presented in the project proposal will be reduced by combining the best ideas into the most viable approaches and discarding the least feasible.

The outline for each strategy proposed should be a general one. It should normally include the following:

1. a description covering the general philosophy of the strategy, the population groups it is to address, and the general techniques to be employed (without going into the extreme detail of tasks);
2. the choice of facilities and types of staff to be used;
3. critical support requirements;
4. general cost estimates (as related to varying levels of coverage);
5. risky aspects of the strategy (activities that may not prove feasible, etc.);
6. a list of critical actions necessary (such as revising laws and/or policies, or generating professional interest);
7. the operational output targets to be achieved with the strategy.

7.4 SELECT MOST FEASIBLE STRATEGIES

In some project formulations all the strategies devised in step 7.3 are necessary. This step can then be skipped and the team can begin the design of each strategy in detail. If, however, alternative approaches have been outlined, or if more strategies have been proposed than can be supported by the available resources, it is now necessary to select the most viable strategies. Selection is usually done by the formulation team as a whole, often after each strategy has been presented by the working group that originated it.

Typical criteria applied during this selection process include:

1. the probability that the operational targets and objectives set will be achieved through the strategy;
2. the degree to which it satisfies the relevant design criteria;
3. the likelihood that obstacles that need to be eliminated for successful implementation will in fact be able to be removed (political support, policy or legis-
lative change);

(4) the number and effect of unavoidable obstacles;

(5) the degree to which the strategy adheres to budget limits;

(6) the predicted ease of implementation, as reflected by the amount of change required in existing services and in political, professional, or public attitudes;

(7) the presence of design features likely to be attractive to decision-makers, politicians, professional groups, or the public.

The selection problem may be solved in part by combining the best ideas from several similar strategies into a single approach.

Higher priority strategies should be so identified, and the degree of independence or interdependence between strategies should be described.

7.5 DESIGN THE DETAILS OF SELECTED STRATEGIES

This step calls for the detailed description of each strategy just selected. The potential changes previously listed (step 7.2) are now reviewed to see how they can be fitted into one or more of the selected strategies.

The amount of detail to be included in the strategy descriptions depends on several factors, not the least important of which is the time and manpower available to the formulation team for this purpose. The terms of reference may have specified certain design products that the Chartering Agency expects to find in the final proposal, such as job descriptions, plans for organizational revisions, and a method for increasing the usefulness of a specific type of facility. These products must be given the attention that they need in order to provide decision-makers with a basis for judging the viability of the proposed project.

On the other hand, the team must be careful to identify those aspects of the proposed strategies that can best be designed later on by specialists. In those areas, the team should limit itself to providing clear specifications for the final product, whether it is a building, a staff training course, or a health education programme. If, for example, a specialist will be called upon later to design the details of a training curriculum for midwife refresher training, the team need only specify clearly what tasks the trained midwife will be expected to perform for which her training must prepare her.

The coordinator, in consultation with the steering committee, should be in the best position to judge how much detail the formulation team must provide so as to describe the proposal adequately and guide the technical staff that will undertake more detailed design during the early phases of the project. Past project formulations have perhaps erred on the side of too much detail. In any event, the optimum compromise must be found.

The general sequence to be followed in detailed strategy design, which is usually undertaken by working groups, is as follows:

7.51 DESCRIBE REVISED TECHNOLOGY

The changes in technology and technical procedures proposed previously for each critical problem (step 7.2) are now reviewed and re-described in terms of the strategies through which they will be delivered or supported. (Any technical changes that cannot be fitted into a specific strategy would need to be described separately here.) These technical descriptions must include both the new procedures and those from the past that are to be retained within
the strategy proposed for implementation. For a rural mobile health service strategy, for example, the description would include the main technical activities, both new and old, to be carried out by the mobile teams. (Descriptions of any technical activities already in use may be taken from the health work description, 2.4.) The overall strategy should be described in a manner that encourages its complete and consistent delivery.

7.52 ESTABLISH STRATEGY COEFFICIENTS

For each strategy the next step is to determine the population groups to which it must be delivered in order for the operational output targets to be met. The population projection, 3.3, and the problem projections, 4.6, are the basic inputs to this step. The coefficient represents the number of people that must be covered by the various preventive and curative activities within each strategy. Coefficients are usually expressed in terms of the number of people within the areas of responsibility of operational units such as districts or health centres.

7.53 DETERMINE STAFF AND FACILITIES REQUIRED

It is now necessary to indicate where the various activities comprising each strategy are to be performed and what types of staff are to perform them. Again, this part of the strategy description should cover all work to be done, not merely the new or revised activities. For an antenatal strategy, for example, one would indicate that it is comprised of a combination of clinic and home consultations, with some of the clinic visits being individual examinations and others being group mothercraft classes. The number of auxiliary nurses, nurse-midwives, and traditional midwives assigned to those activities would be indicated. The amount of time required to be spent by a doctor would be estimated on the basis of the expected percentage of abnormal or complicated pregnancies. Lastly, one would estimate the approximate time for each type of contact, or the number of contacts by type, facility, and staff type. The total staff requirements can then be calculated and summarized by type, geographic area, and operational level.

7.54 DESCRIBE PROCEDURES AND SUPPORT REQUIRED

In completing the description of each strategy, it is essential to outline the operational procedures and special support it will require. Such procedures might include supervision, reporting, patient referral, and short-term planning and evaluation. Typical support requirements are transportation, adequate supply of appropriately packaged drugs and other expendable materials, provision and maintenance of equipment, and staff refresher training. In some cases one or more support systems are so important that special support strategies must be designed in detail to ensure that they are made operational. Examples of support systems often requiring special strategies are information systems and staff in-service training.

All types of support estimated to involve significant costs should be carefully indicated so that they are not overlooked in step 7.6.

7.55 DESCRIBE ORGANIZATIONAL REQUIREMENTS

Here, the formulators should describe necessary changes in existing organizational structure (such as the establishment of new units), in existing patterns of authority and responsibility (such as a shift from centralized to decentralized planning and control), and in communication and coordination techniques.
7.56 INDICATE NECESSARY POLICY CHANGES

These might include a revision of constraining legislation or the enactment of enabling legislation (such as legislation covering payment for service), or the revision of operating regulations (for example, to permit nurses to give injections).

7.6 ESTIMATE STRATEGY COSTS

How much detail the team needs to go into in estimating costs depends on the situation. If the strategies being proposed are reasonably new and different from current health work, the overall costs of each strategy will have to be calculated. If the strategies are simply descriptions of the current health work with few and minor additions or revisions, the costing may be limited to the changes of "new costs", plus the new total costs generated through expanded coverage. In either case it is desirable to compare the total cost of each and every strategy with the current expenditures for the same type of health work.

To calculate total strategy costs, the consultation or contact time estimates from step 7.53 are applied to the coefficients produced in step 7.52. Overhead and lost time factors are added before calculating the overall staff and facility costs by type (overheads must be clearly defined in each situation). The costs of equipment, vehicles, and critical drugs and supplies are added when necessary.

Generally, the cost estimates are presented in two categories:

(1) Capital costs: facilities and equipment; sometimes manpower development.
(2) Recurring costs: staff, expendables, and overheads.

Locally applicable budget procedures and formats should be used in this step, with the assistance of budget officers.

7.7 ASSESS ADEQUACY OF FUTURE RESOURCES

The above calculation of strategy costs should now be compared with previously set budget limits (if any were stated in the terms of reference) and with the resource projections, 2.3, by category, to determine in what categories future resources will be adequate for the estimated strategy resource needs and in what categories they will fall short of the required amount. A budget officer should assist the team in this activity. He should be able to tell the team which costs may be funded from development allocations and which should come from operating budgets.

It is essential that this evaluation should cover all resource categories, which normally include:

(1) funds;
(2) manpower, by type - numbers, training, salary, and allowances;
(3) facilities - construction and maintenance;
(4) equipment - purchase, replacement, and maintenance; and
(5) supplies - all expendables, with special emphasis on drugs.

If revenue generation is part of the strategy design (drug payment, water rates, etc.), revenue projection and utilization would be studied in this step as one source of funds.
The sources of these resources must now be closely scrutinized to identify the most realistic estimates of availability, to determine where shortfalls will certainly occur, and to identify those categories in which availability cannot be predicted with much certainty. If operating budget projections from step 2.3 were based on the average annual increases from past years, the team must assess the likelihood that this average will be maintained in the future. Staff turnover and output from training institutions must similarly be reviewed and the certainty of future availability estimated. Conservative estimates should be used in the place of optimistic projections.

A comparison would then be made between strategy resource requirements (by category and time period) and total resource availability as projected from the most reliable, certain sources. Any resource shortfalls should be indicated by category and time period.

If the shortfalls discovered would seriously threaten the proposed project, the team should make an effort at this point to locate and secure alternative sources of resources. The first step might be to look to the national financing system to see whether allocations could possibly be increased. This might require some informal promotion of the proposal by the coordinator or members of the steering committee. The other possibility would be foreign assistance, whether bilateral or from an international agency. If the team estimates that there is a good chance of obtaining funds from such sources, drafts of the necessary assistance requests should be prepared. In some cases the Chartering Agency may have been aware from the beginning that foreign assistance agencies were interested in supporting the project; this would have been indicated in the terms of reference, 1.6.

7.8 REVISE STRATEGIES AND TARGETS (IF NECESSARY)

Strategies and, if absolutely necessary, targets should be revised in the light of resource shortfalls only if and when the team is certain that additional budget allocations and external funds will not be forthcoming. This step should thus be deferred until all possibilities for obtaining the needed assistance have been exhausted.

If revisions are inevitable, the first attempt at meeting budget limitations should be to modify one or more of the strategies by (a) rephasing development activities so that they extend over a longer period, (b) cutting out all activities not deemed to be essential, and/or (c) reassigning tasks to less expensive (or more readily available) types of staff and facilities, while maintaining the targeted levels of operational outputs. If resource limits are still exceeded after this strategy revision, it may be necessary to lower the operational output targets, thereby reducing the strategy coefficients. Operational outputs of least assured technical effectiveness and highest unit costs should be the ones to be lowered first. If the problem-reduction objectives are correspondingly threatened, this should be noted.

The process of strategy adjustment for cost reduction may need to be repeated several times before a feasible level is obtained. Alternatively, the team may wish to set out various scales of operation with their corresponding costs and effects. Aspects of the strategies that may be easily adjusted in the future in the event of unforeseen resource constraints should be identified.

The final strategy designs, cost estimates, and operational targets must be clearly documented.

*  

*  *
During the initial session devoted to strategy design (step 7.1), the formulation team reviews the obstacles identified in step 6 and classifies them according to the elements of the health system involved (technology, staff, procedures, facilities, policies, organization, and physical/social environment). This matrix of obstacles (Fig. 1) is then considered along with the terms of reference and the policy summary from step 2.2. During the ensuing discussion, statements are written that incorporate the criteria the team feels should be followed when strategies are designed. After this general meeting, a working group meets to finalize the criteria statements, as shown in Fig. 2. These design criteria are passed immediately to the steering committee for review and approval.

In the meantime, the ranked obstacles and the suggested remedies from step 6 are reviewed in an effort to compile a complete list of the changes whose implementation might avert potential difficulties and facilitate the achievement of operational targets (step 7.2). This list is categorized according to the elements of the health system involved.

As the discussion on potential changes proceeds, the coordinator notices that natural groups are beginning to form within the team, each with its own school of thought and favourite ideas for improving the health system. After all suggested changes have been listed, it becomes obvious that several strategies have begun to take shape.

In regard to the provision of basic health services, three alternative strategies are suggested. In addition, a number of special strategies are proposed for resolving certain obstacles or addressing particular health problems. The team is divided into three working groups in order to produce outlines of the potential strategies (step 7.3). Each group is to address one of the three basic health service alternatives plus two of the special-purpose strategies. The strategies devised by the three groups are as follows:

Working Group 1

(1) Basic Health Services, Alternative A. This alternative (as suggested within the Country Health Programme) calls for more of the present approach to basic health services. The infrastructure of main health centres, health subcentres, and midwife clinics is to be strengthened and extended to provide more complete coverage of the population.

(2) Provincial Health Education Strategy. Health education in the Province is to be provided in an active, continuous way with some unique approaches. These include:

(a) The use of commercial drug and grocery firms for distributing health education material and showing movies in the rural villages (such firms currently cover the rural population with mobile promotion units showing popular movies).

(b) The use of mass media for delivering health education messages and warnings on a continuous basis. Such media include radio, television, newspapers, and cinemas.

(c) Increased emphasis on health education in schools through:

- inclusion of health education material in basic curricula in coordination with the Ministry of Education;
- lectures and presentations by health staff in conjunction with the school health programme.
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<tr>
<th>TECHNOLOGY</th>
<th>STAFF</th>
<th>FACILITIES</th>
<th>PROCEDURES</th>
<th>ORGANIZATION</th>
<th>POLICY</th>
<th>ENVIRONMENT</th>
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</thead>
<tbody>
<tr>
<td>MIODIAGNOSIS</td>
<td>Staff not motivated to travel. Many vacant posts. Health workers benighted. Poor time utilization. Staff refer patients to their private practitioners.</td>
<td>Laboratory facilities lacking or inadequate. Test equipment not maintained.</td>
<td>Lack of diagnostic (e.g., malaria). Inadequate transmission of reports.</td>
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<tr>
<td>TREATED</td>
<td>Staff not performing tasks for which trained. Emergency service overloaded. Inadequate staff training. Lack of rapport between different categories of staff.</td>
<td>Insufficient ambulance service. Lack of rehabilitation equipment. Inappropriate facility design.</td>
<td>Family rooms not maintained. Delay in hospitalization. No back-up referral system. Mobile services fail to refer/communicate. Poor inter-facility &amp; staff coordination.</td>
<td></td>
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<tr>
<td>NURSERYED</td>
<td>Midwives get earnings from delivery, thus dislike F.P.</td>
<td>Infant nutrition is not weighed. Mothers' classes too short. Poor immunization records.</td>
<td>Lack of coordination with police re VD. Clinic registration not enforced. No clear responsibility for smallpox immunization.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Female work discouraged; breast feeding. Sweet condensed milk available. Food handlers need hygiene education. Safety devices not used.</td>
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</table>
1. Service (curative and preventive) shall encompass the public and private as well as the traditional and modern sectors.

2. Health promotion (e.g., health education, environmental improvement) should be undertaken with active and continuous coordination and cooperation with other government agencies and elements of the private sector, (e.g., community development programme, voluntary medical services, private clinics).

3. Provincial problem-reduction objectives must as a minimum adhere to those set nationally.

4. Provincial health services should be operated under a single administration responsible for pursuing those objectives.

5. The design shall specify the mechanisms for inter- and intra-sectoral and intra- and inter-ministerial coordination for health at the district and municipal levels.

6. The provincial health administration must develop adequate leadership, supervision, and control jointly with all sectors mentioned in 1.

7. Service design should be flexible enough to accommodate public demand while taking into account government objectives.

8. The design should be applicable as a general model for other provinces of the country.

9. Emphasis should be placed on improving the degree of access and quality of health service for the rural population of the province.

10. Concentrate on improving the attractiveness of the peripheral health services (those outside of the hospitals) with regard to:
   a) appearance of facilities,
   b) behaviour of staff,
   c) expeditious handling of patients, and
   d) lower costs to patients.


12. Staff functions and placement patterns may be modified, but new types of staff should be created only if there is a need for them nationwide.

13. Before adding staff and facilities, concentrate on improving efficiency.

14. Facility functions and types may be altered and criteria for siting may be revised if justified.

15. Any service changes to be implemented for pursuing the problem-reduction objectives must be accomplished by the end of 1980.

16. The design must:
   a) address itself to new sources of financing, and
   b) rectify present obstacles related to the cost of health care for the public.

17. Government resource requirements should not exceed projections of past allocation trends.

18. Designers should explore necessary changes in laws, administrative practices, roles of government agencies, and budgetary processes.

19. The provincial and local health administration should be supported with health legislation/regulation and methods of enforcement.

TOR = Terms of reference
(d) Increased emphasis on health education within the Community Development Programme, especially mothercraft classes, community environmental health work, and first aid classes.

(3) Provincial Traffic Accident Prevention Strategy. This strategy is based on strong coordination with the Ministry of the Interior and its various police and transportation regulatory agencies. It is aimed at reducing the frequency and severity of traffic accidents through a broad-based promotion campaign, the strengthening of laws and their enforcement, the requiring of safety devices and their provision, and the provision of first aid and patient transport in the event of traffic accidents.

WORKING GROUP 2

(1) Basic Health Services, Alternative B. This approach recommends the maintenance and support of existing rural health facilities but strives for greater coverage of the population through a mobile health service that would operate within each district out of existing facilities. Such mobile teams would concentrate on preventive activities and case-finding but would also provide rudimentary curative services. They would also handle the school health programme.

(2) Rural Community Health Worker Strategy. In an effort to overcome the staff shortage problem and improve the technical capability of the popular traditional practitioners, this strategy proposes

(a) that traditional midwives and health practitioners be identified and registered on a continuing basis;

(b) that local volunteers interested in supporting community health services be utilized;

(c) that practitioners, midwives, and volunteers be given training in good practices in their own fields and in their role of supporting the Mobile Health Service programme; and

(d) that such auxiliary staff be supported with recognition, supplies, advice, and financial remuneration.

WORKING GROUP 3

(1) Basic Health Services, Alternative C. This approach would utilize expanded outpatient capacity in the three hospitals of the Provinces to accommodate all demands for ambulatory and emergency medical care. The existing health centres would be used for the management of expanded prevention and health promotion activities, much of which would be carried out in schools and villages by mobile teams. Private practitioners would be encouraged to use hospital facilities and would be counted upon to support the provincial health programme. Private practice by government staff would be legalized.

(2) Community Participation Strategy. Health would be a major component of the Community Development Programme. Through coordination with the National Community Development Agency a development committee in each community would canvass and respond to the public’s desires in regard to health services. The committee would report to higher administrative levels on problems unable to be solved locally. These committees would in addition be used to support health programmes at the village level and to improve the reporting of vital and health statistics. In addition, community, district, and provincial leaders would function within a Provincial Health Advisory Council to provide a second source of feedback of public opinion. The Council would also serve as a forum for discussing problems
In carrying out health programmes and for soliciting support for their successful completion.

(3) Provincial Emergency Communications and Transport Strategy. A system of reporting and responding to emergencies would be provided using:

(a) health service facilities and vehicles;
(b) police radio network;
(c) police vehicles;
(d) local voluntary vehicles and drivers; and
(e) military vehicles and communications.

This would ensure that each community is served with an emergency communications mechanism and an emergency vehicle whose driver is trained in first aid. The system would fill the current need for communicating requests for emergency medical assistance and for transporting emergency cases to the hospital.

Each working group produces general outlines, covering the points listed in step 7.3, describing how the proposed strategies would function. It then presents its strategies to the overall team, which discusses their feasibility and attractiveness.

All special-purpose strategies are received with enthusiasm by the team, and it is agreed that for all of them the outline just drawn up should be expanded into full protocols for inclusion in the proposal.

The basic health service alternatives are discussed at great length. Alternatives B and C differ significantly from the current approach and if implemented would represent a major change in Ministry of Health policy. Each of the alternatives is seen to have certain attractive features.

To aid the selection process, the team summarizes the advantages, disadvantages, and risks, along with the additional resource requirements, of each (see Fig. 3).

It is finally agreed that alternative B seems to offer the most advantages at least risk and cost. Certain ideas from the other alternatives are, however, considered good enough to include in the selected strategy, namely, periodic rotation of hospital staff with rural staff in order to familiarize all with rural conditions and to support technical upgrading; making a major effort to improve the attractiveness of rural centres; and establishing a referral system that would prohibit non-emergency cases from going directly to the hospital outpatient departments.

A summary of the three alternatives and the final choice, as modified, are prepared for presentation to the steering committee.

Detailed strategy design is undertaken by the working groups assigned. These activities result in the following products:

(1) Detailed description of the basic health service strategy (with mobile team), including staffing and support requirements.
(2) Details of how the mobile health service would operate at the district level, including travel schedules and visit targets (Fig. 4).
(3) Completed protocols for all special-purpose strategies.
(4) Detailed costing for all strategies for Province Eaks over a 5-year period (for the
### Figure 3. Comparison of Basic Health Service Alternatives

<table>
<thead>
<tr>
<th></th>
<th>A: Expansion of Present Health Centre System</th>
<th>B: Creation of a Mobile Health Service</th>
<th>C: Expansion of Hospital Out-Patient Capacity, Health Centres Shift to Prevention and Promotion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advantages</strong></td>
<td>Provides the theoretical coverage required. Adheres to the service model currently in vogue. Supports the policy of bringing service to the rural population.</td>
<td>Provides coverage of critical targets. More centrally managed and controlled. Supports policy of bringing service to the rural population. Familiarizes staff with the people and their environment. Can be implemented quickly. Provides continual contact, supervision, and support to village health workers. Provides opportunity for case follow-up. Provides opportunity for health information collection.</td>
<td>Capitalizes on the attraction of hospitals, and the increasing mobility of the people. Provides more desirable working environment for some staff. Easiest to manage. Easiest to implement. Will gain professional support.</td>
</tr>
<tr>
<td><strong>Disadvantages</strong></td>
<td>Existing H.O. are currently under-utilised, strategy offers no feature for increasing contact and utilisation. Unlikely to achieve critical targets. Very expensive for full national implementation. Increased dispersion of facilities and staff makes managerial control difficult. Supply problems likely to increase. Will take 5-10 years to implement fully within Province limits.</td>
<td>Will incur vehicle maintenance and operating expenses.</td>
<td>Does not support policy of bringing service to the rural people.</td>
</tr>
<tr>
<td><strong>Links</strong></td>
<td>May not be able to recruit and retain qualified staff for rural facilities. May be difficult to increase the attraction of H.O.</td>
<td>Staff may resist the frequent travel required. Poor weather conditions may hinder service. Villagers may resent intrusion.</td>
<td>May be difficult to create demand for preventive service alone through rural facilities. Rural staff may resent not having curative work (although rotation with hospital staff may be possible). May lack political support.</td>
</tr>
<tr>
<td><strong>Staff</strong></td>
<td>Staff: 3 H.O., 20 Nurses, 63 Midwives, 20 Hth Workers</td>
<td>Staff: 2 MDs, 1 Nurse, 1 Midwife, 2 Hth Workers</td>
<td>Staff: 6 MDs, 12 Nurses, 6 Midwives, 6 Technicians</td>
</tr>
<tr>
<td><strong>Facilities</strong></td>
<td>Facilities: 3 Health Centres, 10 Subcentres, 50 Midwife Clinics</td>
<td>Other: 1 Land Rover</td>
<td>Facilities: CDP expansion</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>Other: Vehicles - 3</td>
<td>Funds: Development - 5 million T/yr Operating - 1.5 million T/yr</td>
<td>Other: Vehicles - 6 ambulances</td>
</tr>
<tr>
<td><strong>Funds</strong></td>
<td>Funds: Development - from 500,000 to 2 million T/yr over 5 years</td>
<td></td>
<td>Funds: Development - 5 million T/yr Operating - 1 million T/yr</td>
</tr>
</tbody>
</table>
### Figure 4. Mobile Health Service Strategy for Province X: Summary by District

<table>
<thead>
<tr>
<th>District</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total rural population</strong></td>
<td>85,968</td>
<td>75,326</td>
<td>66,000</td>
<td>72,200</td>
<td>30,600</td>
<td>128,000</td>
<td>86,000</td>
<td>2,100</td>
<td>526,388</td>
</tr>
<tr>
<td><strong>Total villages</strong></td>
<td>124</td>
<td>36</td>
<td>66</td>
<td>17</td>
<td>72</td>
<td>174</td>
<td>49</td>
<td>6</td>
<td>544</td>
</tr>
<tr>
<td><strong>Average population village</strong></td>
<td>693</td>
<td>2,048</td>
<td>1,000</td>
<td>4,247</td>
<td>429</td>
<td>620</td>
<td>1,759</td>
<td>350</td>
<td>968</td>
</tr>
<tr>
<td><strong>Number of Health Centres</strong></td>
<td>12</td>
<td>8</td>
<td>6</td>
<td>1</td>
<td>8</td>
<td>12</td>
<td>8</td>
<td>1</td>
<td>56</td>
</tr>
<tr>
<td><strong>Number of Health Subcentres</strong></td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>-</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>-</td>
<td>12</td>
</tr>
<tr>
<td><strong>Number of Midwife Clinics</strong></td>
<td>24</td>
<td>4</td>
<td>8</td>
<td>8</td>
<td>35</td>
<td>3</td>
<td>217</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Days to visit all villages once</strong></td>
<td>42</td>
<td>10</td>
<td>20.5</td>
<td>9</td>
<td>19.5</td>
<td>63.5</td>
<td>14</td>
<td>1.5</td>
<td>120</td>
</tr>
<tr>
<td><strong>Number of schools</strong></td>
<td>86</td>
<td>69</td>
<td>50</td>
<td>36</td>
<td>86</td>
<td>65</td>
<td>4</td>
<td>421</td>
<td></td>
</tr>
<tr>
<td><strong>Schools in Mobile Service area</strong></td>
<td>42</td>
<td>5</td>
<td>30</td>
<td>4</td>
<td>20</td>
<td>63</td>
<td>7</td>
<td>4</td>
<td>169</td>
</tr>
<tr>
<td><strong>Additional schools</strong></td>
<td>44</td>
<td>64</td>
<td>30</td>
<td>21</td>
<td>16</td>
<td>23</td>
<td>58</td>
<td>-</td>
<td>226</td>
</tr>
<tr>
<td><strong>Visits/village/year</strong></td>
<td>4</td>
<td>8</td>
<td>4</td>
<td>8</td>
<td>4</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Necessary Mobile days</strong></td>
<td>168*</td>
<td>80*</td>
<td>82</td>
<td>72</td>
<td>78</td>
<td>254</td>
<td>118</td>
<td>4</td>
<td>832</td>
</tr>
<tr>
<td><strong>Village Mobile days/week</strong></td>
<td>3.4</td>
<td>1.6</td>
<td>1.7</td>
<td>1.5</td>
<td>1.6</td>
<td>5.1</td>
<td>2.3</td>
<td>1.2</td>
<td>17.3</td>
</tr>
<tr>
<td><strong>Additional school visits/days</strong></td>
<td>14/22</td>
<td>64/32</td>
<td>36/25</td>
<td>22/10.5</td>
<td>16/8</td>
<td>23/11.5</td>
<td>58/9</td>
<td>-</td>
<td>256/16</td>
</tr>
<tr>
<td><strong>Villages per week</strong></td>
<td>6.8</td>
<td>1.6</td>
<td>3.4</td>
<td>1.5</td>
<td>3</td>
<td>10</td>
<td>2.3</td>
<td>0.24</td>
<td>38.8</td>
</tr>
<tr>
<td><strong>Village Mobile consultations/week</strong></td>
<td>690</td>
<td>350</td>
<td>360</td>
<td>360</td>
<td>360</td>
<td>1,000</td>
<td>47</td>
<td>24</td>
<td>2,444</td>
</tr>
<tr>
<td><strong>School visits per week</strong></td>
<td>0.89</td>
<td>1.30</td>
<td>0.61</td>
<td>0.63</td>
<td>0.65</td>
<td>0.47</td>
<td>1.18</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total Mobile days per week</strong></td>
<td>4.3</td>
<td>2.9</td>
<td>2.3</td>
<td>1.9</td>
<td>2.2</td>
<td>5.6</td>
<td>3.5</td>
<td>0.12</td>
<td>-</td>
</tr>
</tbody>
</table>

*Served by a Health Centre, Subcentre, or Midwife Clinic.
mobile strategy this requires (a) village and school consultation profile,
(b) activity summary, (c) village and school visit work distribution, (d) drug
costs, (e) supply requirements, and (f) drug payment schedule (Fig. 5).

(5) General costing for the mobile health service throughout the country.

(6) Ideas and specifications for the forthcoming project formulation on the Provincial
Health Management System.

In comparing resource requirements and availability (step 7.7) the team concludes that
the strategies can be carried out with existing facilities and staff, provided that certain
posts currently vacant in the Provincial Health Office and in two Health Centres can be
filled. In addition, a vehicle would need to be purchased for one Health Centre; this
purchase is seen as a subject for a foreign assistance request. The provision of all the
other additional resources required (see Fig. 8) is judged to be within the capacity of the
Ministry of Health. Since the strategies are felt to permit the achievement of operational
targets, no target revision is necessary.
<table>
<thead>
<tr>
<th>1. <strong>Transport</strong></th>
<th>Amount per year (T)</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Fuel</td>
<td>852 days x 40 km x 2.0 T x 5 km</td>
<td>13,632</td>
</tr>
<tr>
<td>b) Lubricant</td>
<td>852 days x 40 km x 45 T x 2,000 km</td>
<td>767</td>
</tr>
<tr>
<td>c) Routine service</td>
<td>852 days x 40 km x 40 T x 2,000 km</td>
<td>682</td>
</tr>
<tr>
<td>d) Repair</td>
<td>- Spare parts 5,000 T/car/yr</td>
<td>30,000</td>
</tr>
<tr>
<td></td>
<td>- Service charge 2,000 T/car/yr</td>
<td>12,000</td>
</tr>
<tr>
<td>e) New car replacement</td>
<td>Total Transportation Costs</td>
<td>57,081</td>
</tr>
<tr>
<td>2. <strong>Per diem allowance</strong></td>
<td>852 days x 3 personnel x 22 T x 3</td>
<td>18,744</td>
</tr>
<tr>
<td>3. <strong>Equipment (replacement and repair)</strong></td>
<td>(1,250 T/team x 6)</td>
<td>7,500</td>
</tr>
<tr>
<td>4. <strong>Drugs</strong></td>
<td>Village mobile service</td>
<td>1,344,848</td>
</tr>
<tr>
<td></td>
<td>School health vaccinations</td>
<td>88,721</td>
</tr>
<tr>
<td></td>
<td>Total drugs</td>
<td>1,433,569</td>
</tr>
<tr>
<td>5. <strong>General supply items</strong></td>
<td>Total recurrent expenditure (if target number of villages and consultations is to be reached)</td>
<td>1,560,437</td>
</tr>
</tbody>
</table>

**Cost per consultation**

| Villages | No. of consultations | 168,640 | 8.72 |
| School | 219,566 | 4.08 | 382,206 |
### Figure 6. Additional Resources Required for Mobile Health Service Strategy (Province Eaks)

<table>
<thead>
<tr>
<th></th>
<th>Existing in 1974</th>
<th>Required in 1975</th>
<th>Additional in 1975</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Staff</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MD</td>
<td>6</td>
<td>8</td>
<td>2</td>
<td>1 MD for PHO</td>
</tr>
<tr>
<td>PHN</td>
<td>18</td>
<td>19</td>
<td>1</td>
<td>1 MD for District D</td>
</tr>
<tr>
<td>MW</td>
<td>67</td>
<td>68</td>
<td>1</td>
<td>1 PHN for PHO</td>
</tr>
<tr>
<td>HW</td>
<td>60</td>
<td>63</td>
<td>3</td>
<td>1 HW for District F</td>
</tr>
<tr>
<td>Dent. Aux.</td>
<td>5</td>
<td>5</td>
<td>-</td>
<td>2 HW for PHO</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>156</strong></td>
<td><strong>165</strong></td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 HW for District F</td>
</tr>
<tr>
<td><strong>Vehicles</strong> (car)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHO</td>
<td>6</td>
<td>PHO 6</td>
<td>-</td>
<td>1 car for District F</td>
</tr>
<tr>
<td>HC</td>
<td>5</td>
<td>HC 6</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>11</strong></td>
<td><strong>12</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Drugs (free)</strong></td>
<td></td>
<td>Mobile Service</td>
<td></td>
<td>Approx. 1 million T will come from charges.</td>
</tr>
<tr>
<td>Prov. Total</td>
<td>200 000T</td>
<td>300 000T</td>
<td>200 000T</td>
<td></td>
</tr>
<tr>
<td>Mobile Service</td>
<td>100 000</td>
<td>Total Cost</td>
<td>1 344 848T</td>
<td></td>
</tr>
</tbody>
</table>

**ABBREVIATIONS USED**

- HC = Health Centre
- HW = Health Worker
- MW = Midwife
- PHN = Public Health Nurse
- PHO = Provincial Health Officer