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Abstracts of

HEALTH PLANNING

Problems of Concept and Method

PAN AMERICAN HEALTH ORGANIZATION

1965

SANTIAGO METHODOLOGY

Chapter I. PLANNING AND PUBLIC HEALTH

1. The need for planning

The point is made that total resources are scanty and that therefore even the most absolute needs can only be met to a very limited extent. Two ways are open: (1) to increase resources and (2) to make the best use of resources available. These methods are not mutually exclusive.

The important question is what do we mean by "efficient use of resources". PAHO states: " ..... a resource is efficiently used if the benefit obtained from its use is greater than that which would have been obtained if the same resource had been used for something else. ....." The only way to judge the efficiency of the use to which any resource is put is to compare that use with alternative uses to which it might have been put. In theory such a comparison is a simple matter, but in practice it is very complex and therefore requires a method. This method is programming or planning.

It has been argued that application of a resource normally provides for benefits in more than one category - the whole problem of "spillovers" - external economies or diseconomies which are uncompensated effects on the costs or benefits of others caused by the action of some external unit or organization - might be raised. The assumption - the less generally accepted by economists - fully aware that in a multifactorial situation nothing can be absolute. It is "obviously" necessary within such a system to wish for maximum productivity applied to the highest priority health needs.

B. Basic principles of planning

1. Problems of vertical planning

Planning is applicable to any activity demanding decisions on problems that can be solved in various ways - or setting a choice between different objectives. The first of these is called the "problem of selecting techniques" and the second, the "problem of priorities". Both are the core of planning. Objections have been made to this rather loose definition and it has been pointed out (Litsios) that "if there is a "core of planning" it is the performance of an analysis, i.e. establishing an analytic means of relating potential services to potential benefits". Since actually the whole PAHO/CENDES methodology is an attempt at doing just that this objection would seem somewhat carping.

The problem of priorities has, besides, the choice between a number of possibilities, two other dimensions that increase its complexity. One is time, and arises from the fact that needs are recurrent, so that in satisfying current needs care must be taken not to overlook future needs (the problem of consumption versus productive investment). The second dimension arises from the impossibility of completely satisfying the needs of every one and it must therefore be decided who should receive most benefit (problem of equitable distribution).

It would seem important (see Seipp Guidelines), in considering the subject of priorities, to make a little clearer what reference is being made to. Seipp differentiates two types of priorities: (1) priority for the substantive area of work, and (2) priority for the particular approach or way of working - the method. This is indicated in the PAHO text but not made explicit.

The basic problems of planning involve decisions to choose one action rather than another. The essence of decision-making lies in determining in what proportions those different objectives should be combined (for instance restoration of health versus prevention of disease). Amount of resources available is one of the important constraints determining proportion for combining different efforts.

It is a matter of choosing that combination of efforts which provides the maximum amount of health with a given amount of resources; or, inversely, if the attainment of a given level of health is desired, the fewest possible resources to achieve that level.

2. definition and comparability of the objectives

A clear definition of objectives is one of the basic principles of planning. For example, it is not enough to state that the objective is to fight malaria. One must specify the number of cases to be prevented and the time period in which that is to be achieved. /An objective thus defined is called a target /objective + time/.

Actually there are various objectives and one must be able to compare them in order to decide to which of them the highest priority should be accorded. Economists solve this problem by expressing the value of the most heterogeneous things in terms of money - thus reducing them to a common denominator. By doing this it becomes possible not only to compare two heterogeneous objectives, but also to decide how to distribute the resources among the various objectives. If one activity is directed at several objectives, then these objectives have to be reduced to a common denominator, and in the event that not all of them can be so reduced, then they must be grouped in classes so that each class constitutes a separate subactivity.

3. planning problems in the health field

What is the objective of the health activity? To solve this problem several health indicators have been proposed, some positive and some negative. Among the latter are those indicators which measure health by the conditions that affect it (disease, death, etc.). And, among positive indicators is the birth rate. Another indicator is life expectancy at birth or in the first year of life. It should be kept in mind that "life expectancy" is nothing more than the reciprocal of mortality by age groups. Consequently, to use life expectancy as a measure of health is to affirm implicitly that the purpose of health activities is to reduce the mortality rate, ignoring the harm caused by morbidity.

If it is accepted that health activities should attempt to reduce mortality and morbidity, it would be necessary to make both objectives comparable in order to be able to plan them together. In theory, this could be partly solved by introducing the concept of potential productive capacity (the Index. Y.P.C. = years of potential capacity) which would represent the number of man-years a community as a whole has at its disposal and that can be devoted to any type of activity, including leisure. The importance of each health activity would be judged by its effect on the YPC rate. Because the resources available are in short supply, the health authorities cannot escape the problem of assigning priorities or preferences to health activities according to the age of individuals. Generally, it may be said that there are two views on the social importance of the health of individuals:

(a) that one person's life is of the same importance as that of any other; or

(b) that the life of certain persons is more important to the community than the life of others.

In the first case highest priority would logically be given to the diseases whose reduction required the fewest resources. If the second view were adopted, it would be necessary to establish a yardstick for defining how much more one life was worth than another (measured in YPC). Depending on the circumstances, the individual's contribution to society increases with his age until a point is reached at which the total worth of his contribution balances the amount of resources society used to make him a productive person.

The Santiago methodology quite rightly does not propose a yardstick for measuring the social importance of health - or indicating priorities in this field - realizing that whatever point of view is adopted must reflect the scale of values of the society concerned and is more a political than a technical problem. From the planning view point it does not matter which yardstick is used. What matters

is that there should be full awareness of the one adopted. In the presentation of the methodology it is therefore stated that the yardstick used will be the number of deaths prevented through a given health activity, irrespective of the benefits arising in the form of a reduction in morbidity or disability.

The methodology does not, and makes this quite clear, deal with the "indirect" costs, the lost production (see Klarman, Rice, etc.) and the problem of "discounting" for future earnings. It therefore considers a one per cent reduction in this year to be of the same importance as a one per cent reduction in mortality in N years (however, for building of hospitals it must be considered).

4. definition and reduction of resources to a common denominator

In economics, resources are anything that can be used to produce goods and services. They are usually classified as labour, capital and natural resources, and each of these can be divided into sub-categories with greater or lesser detail. It can readily be understood that the resources to which the science of economics refers are the same as those employed in "production" of health (physicians, nurses, etc. (skilled and unskilled workers), capital in the form of hospitals, water systems, etc.).

To attain any objective - whether in economics or health, use must be made of a combination of heterogeneous resources. In economics the problem of the comparability of resources is again solved by resorting to monetary values. Cost measurements, however, meet with conceptual and practical difficulties. Most important among the former is the allocation of costs in the case of resources used to attain various objectives at the same time.

5. relationships between objectives and resources

The device of reducing heterogeneous resources to a common denominator and of assigning a monetary value to each does not entirely solve the problem of comparability. To compare the efficiency of the different combinations of resources with respect to a single use, it is not enough to reduce them to a common denominator and give them monetary expression; we must also establish the appropriate composition of each combination.

The operation of combining the resources in proportions that correspond to a given standard or technique is called the instrumentalization of resources: An instrument is a combination of certain resources in certain proportions according to certain standards, which is used to attain one or more specific objectives. This a hospital bed is an instrument for treating patients if it includes the physician-hours, auxiliary-personnel-hours, laboratories and the other installations that necessarily support that bed and enable it to fulfill its purpose.

The selection of the appropriate technique for attaining a given end is one of the planner's most important tasks. Here it is the selection of the most favourable combination of products which is important: whenever a choice must be made between two or more alternative techniques, or between different combinations of products, preference should be given to the one that shows a higher percentage relationship between the effect obtained and the cost of the instruments used - since that is the way to obtain the maximum benefit from a given amount of resource.

In practice we can often not deal with only one disease but must act on a number of diseases, partly because of considerations relating to the distribution of resources and partly owing to the fact that in some cases in order to achieve results in one disease several diseases must be controlled at the same time. Factors such as these, therefore, require a certain minimum combination that must be respected.

If more resources are available than are needed for the minimum combination, then the possibility of choosing between alternative combinations exists. Strictly speaking, the problem of priorities is the problem of establishing the optimal combination.

For short periods there are very great limiations on transferring of resources from one use to another (resources represented by a hospital cannot be used for building a water supply system).

In commenting on the above it has been pointed out by systems analysts that a certain problem arises when we try to combine specific possible output as achieved with individual people and relate them to national objectives. This is not identified as a problem in the PAHO/CENDES text which assumes that the system is logically "linear" and that benefits and costs achieved in specific priority problems are "independent" of each other.* In a system being attacked by a public health measure with preventive instruments the marginal efficiency is gradually declining so that the selection is not linear. If cost is taken into account a further element of non-linearity is introduced by economics and diseconomics of scale.

* Linearity implies: if $X gets me Y benefits, then $2X gets me 2Y benefits. No doubt the above objections - which are discussed for another purpose in an excellent paper by Hans Th. Uhaler (A note on the Formulation of Antituberculosis Programme, WHO/TB/Techn.Information/29 Rev.1. 65) are highly interesting when the methodology is used as an operational research technique. As a practical general approach it would seem unlikely that the "errors" would be of such a degree as to interfere with the usability of the approach.

Independence implies: if X_1 gets me Y$_1$ benefits of 1st kind and X_2 gets me Y$_2$ of 2nd kind (different from first), then X_1+X_2 is needed to get Y$_1$+Y$_2$ benefits i.e. there is no way to get a little more of either (or any other) benefit by a more efficient arrangement of resources.

The systems analysts therefore find it difficult to believe that specific diseases, when treated as individual objectives, have either linear or independent properties. Another problem, along the same line of thinking, is how the PAHO/CENDES approach will transform the vertical system of services into an integrated system.

6. time, subject and space in planning

The restrictions imposed by the specificity of the resources are very strict. But how strict they are will be understood if we recall that those with the most specific use are usually capital goods, which have a long lifespan, and personnel that possesses the most complex skills. If in the past serious errors were committed in their allocation, it will take a long time to correct them.

In order to prevent a continuation of such errors, or at least reduce them as much as possible, the planning technique works essentially for the future and attempts to foresee and prevent any problems that might arise (planning therefore prevention rather than cure).

In practice, almost all countries prepare long-range plans for 12-20 years, medium-term plans for 5-7 years, and one-year plans (the actual annual budget). Long-term plans are of a general nature and only outline the general direction of an activity; medium-range plans contain more detail; and annual plans contain all the details required for action. PAHO/CENDES recommends that health plans be drawn up for 10, 5, and one-year periods, although the length of time will in each particular case depend on the national plans that include every sector of the country.

In PAHO/CENDES methodological approach "health activity" is understood to mean those actions performed by the government, which are aimed directly at maintaining and improving health and include, in addition to the traditional activities those which are classified as environmental sanitation, nutrition, research, and personnel training. All these activities will be included in the programme, whether or not they are the executive responsibility of the ministry in charge of public health. It is not essential to make a comprehensive plan (see Waterston on the subject of comprehensive versus partial planning) but planning must extend to all components of an activity being planned.

The PAHO/CENDES methodology states somewhat optimistically (and Waterston could no doubt say unrealistically) that the present impossibility of reducing the objectives of various activities to a common denominator, or of establishing comparative values for education, health, employment, etc., is not sufficient reason for not applying planning to the greatest possible number of activities, since the very fact that the resources in each area will be utilized with maximum efficiency will lead to far less dramatic errors in arbitrarily allocating the available resources among the various health activities.

It is pointed out that "Planning is in itself an activity which requires resources". This is something that in the field work has often been honoured mostly in the breach by enthusiastic pioneer planners.

Mention must also be made of the spatial problem. Any activity may be defined in terms of its components and in terms of the area in which it will be carried out. In all countries, economically advanced and economically retarded areas co-exist. This is also true for health activities. There may be areas in which every 100 monetary unit used to decrease mortality will make it possible to prevent a certain number of deaths and that number will be higher there than if those units had been applied in another region. From the national viewpoint it would be more advantageous to use the resources in the first region, to the detriment of the second, but that would leave the population of the second region unprotected.

There is no "planning" solution for this difficulty, because an ethical judgement is involved in making the decision, namely the equitable distribution of the benefits of the progress, which was maintained above. It is possible, however, to determine what it will cost the nation to provide this equitable distribution.

As will have been seen from the above certain very important problems of a basically strategical nature have been dealt with:

- long-term correction of existing resources, "structuring" problems, e.g. types of personnel trained, distribution of facilities, etc.
- interrelationship of health activities with other national development desires
- how to rationalize and carry out the stated belief that all people are equal and therefore deserve equal treatment (access, quality of service, etc.)

While we most certainly must agree with critics that "identification of strategical problems is one thing; developing concepts and methodologies to solve these another", it is none the less a fact that a definite approach has been suggested, a "method" worked out. While agreeing that "future research is needed" a basis for such work has been provided.

C. The planning process

The planning process comprises the following stages: (1) diagnosis; (2) planning as such; (3) discussion and decision; (4) execution; and (5) evaluation and revision.

1. diagnosis

One of the basic principles of planning is that the aims of a programme must meet the following three basic conditions: feasibility, internal compatibility and efficiency.

The possibility of drawing up feasible recommendations will largely depend on a knowledge of the present situation of the subject being planned, which calls for the following:

(a) a description, preferably quantitative, of the status of the subject in relation to the field being planned;

(b) a knowledge of those factors which determine it;

(c) an analysis of their perspective; and

(d) an evaluation, i.e. whether or not it is satisfactory.

The description will involve the expression in quantitative terms of the pattern or patterns for measuring the situation. In the case of health, these patterns are mortality and morbidity for lack of other positive indicators.

The most complicated part of the diagnosis is the ascertainment of the factors that produce the situation, and at the same time it is the part that produces the most useful guides for planning.

In health programming, as in economics, it is necessary to identify the factors that determine the health level, as expressed by mortality and morbidity, and the interrelationship of these factors. We need to know the extent of the influence of factors like the level of economic development, the age structure, level of education, etc., and how they interrelate. Since we do not know these relationships at the moment it is not yet possible to prepare "models" which will verify the dynamics of a situation in given circumstances and facilitate decision-making. Attempts at model-making as for instance the Correa model are rather naive and not very helpful.

The totality of actions aimed at reducing mortality and morbidity is called the health policy. This policy is carried out within certain constraints, represented chiefly by the physical environment, the quantity and quality of the existing resources, and the social, economic, political and cultural context within which the operations take place.

The second task of diagnosis is to make an inventory of such aspects of each of these factors as are considered most relevant to the activity in question.

If health is to be planned it will be necessary to ascertain how much of the population is served by water supply, how many hospitals there are and their capacity, the degree to which the hospitals use their resources, what personnel they have available, which are the most frequent diseases and what is the population and its age structure, etc.

The period which a "diagnosis" should cover will vary according to the activity being planned.

The third task of the diagnosis is to estimate to what degree the situation will tend to continue in the foreseeable future as it has in the past, assuming that the present policy is not changed. Attempts at making a prognosis always meet with scepticism. This stems from a lack of understanding of the basic fact that any decision about actions with long-term effects involves a prognosis implicitly or explicitly. The prognosis should be made explicit, as in that way it has the advantage of showing the assumptions on which it is based.

The fourth task of diagnosis is to evaluate the situation, to determine whether it is satisfactory or not. For this a suitable standard of comparison is needed. In economics the standards are determined by the maximum productive value obtainable with given resources. The criterion is also used that the rate of increase in production is low if the entire voluntary savings potential is not being used to increase productive capacity.

The first criterion may readily be applied to health without change. It will be necessary to investigate how the resources are distributed among the various subactivities that make up health - what techniques are applied in each case, and to what extent each instrument available is being used to best advantage. Then a comparison will have to be made between the result that would be obtained, in terms of morbidity and mortality, if the resources were allocated in a different manner, if they were employed at full capacity and if inefficient techniques were replaced.

The second criterion applicable to the rate of improvement is not at present adaptable to the field of health.

2. planning as such

The purpose of diagnosis is to (1) ascertain the current status of the activity being planned; (2) to determine which factors condition it; and (3) to evaluate the situation.

[illegible] plan [illegible] the following three basic [illegible] (a) estimation of the physical and money resources that will be available from year to year for the entire duration of the plan; (b) establishment of the targets for the attainment of which those resources will be used; and (c) selection of the instruments that will be employed.

At the time the plan is initiated, there will be already available a certain amount of physical resources such as hospitals, care centres, drugs, equipment, etc., the details of which are known thanks to the diagnosis. In addition the plan will provide a certain amount of funds each year under the national budget and other sources, and these will be used partly for general operating expenses, such as salaries and wages, purchase of food and drugs, payment of services, etc., and partly for investments, i.e. the construction of buildings, sewerage systems, etc. and the purchase of equipment. In addition, the plan will have such resources as may be acquired with the funds obtained for operating expenses.

The second task is to decide to what use the resources will be put. It will be recalled that the general rule for allocating resources is that they should be allocated in such a way as to obtain a maximum product per resource unit used. The principal difficulty encountered in being obtained is in the impossibility of further increasing production by transforming a resource from one use to another.

The application of this same procedure to health will require a definition of the possible uses to which resources can be put. PAHO/CENDES identifies the use with the diseases or risks generally operating, with a given hazard (danger) to health. The problem then consists in how to allocate the resources available from year to year to control the various diseases.

In principle all diseases are arranged according to the cost of preventing a death, and the resources available are allocated to combat the disease that appears in the first position until it is reduced to a level that the most efficient technology can offer. Any resources left over are then allocated to the disease in second place, and so on down the line.

Among the implied conditions, one which is implicit is that the cost of preventing one death is the same regardless of the frequency of the disease or of the intensity with which it is being attacked. In fact, as the prevalence of a disease diminishes it becomes more expensive to control it, so that the order of diseases on the priority scale may change in the course of time. Another implicit assumption, which is not true, is that it is possible to reduce any disease.

Since all diseases are not reducible PAHO/CENDES methodology groups all diseases into two groups: those which can be reduced and those which cannot be [illegible] the criterion of reducibility.

Health authorities will increasingly have to care for cases of non-reducible diseases. PAHO/CENDES proposes to consider the diseases that can and cannot be reduced as subjects that cannot be reduced to a common denominator, and allocate the resources to them according to arbitrary criteria.

In the planning practice, the following procedure is suggested: the care of diseases that cannot be reduced will be regarded as a community demand that must be met; the remaining resources will be allocated to the diseases that can be reduced, in accordance with the previously indicated criterion, i.e., cost per death prevented.

It may be seen from these statements that it is essential to estimate the cost of each death prevented in the case of reducible diseases and of each case treated in the case of diseases that cannot be reduced. Unit cost will vary with improved efficiency in the use of resources. To achieve this increased efficiency is one of the principal tasks of planning.

The reduction in unit cost for the attack on each disease may have various origins. To examine them with greater clarity it will be necessary to point out the links between the real physical resources used for each disease and the effect they produce on it. As indicated, in order to use the resources they must, in the first place, be grouped into instruments, such as the vaccination instrument, for instance. Each instrument can perform one or more tasks (vaccination of a given number of persons per year) and a combination of tasks, in certain specific proportions, may be used for the control of a disease. In the PAHO/CENDES methodology such a combination is called a technique.

When the diagnosis is being made care will be taken to verify whether or not the resources are well instrumentalized (do vaccinators lack transportation? - does each instrument produce expected output?).

Normal standards (of instruments producing tasks, concentration and coverage, proportion of tasks in technique, etc.) cannot be attained from one year to the next. Consequently a planner will have to establish targets of performance and efficiency for the use of resources in each disease. Once these goals are established, he will be able to calculate the costs, using the price of each resource for the year.

For each disease two types of costs must be recognized: the current or operating costs, which include the payment of salaries and wages, acquisition of services, food and drugs; and the investment costs. Naturally one cannot charge the cost of investment in an instrument to one year, but only that proportion of its total lifespan which corresponds to the year.

As a result of all these operations the planner will have the following information available for each year the plan is operative:

(a) total amount of financial resources expected from budget and other sources;

(b) the way these funds plus funds already available will be distributed between reducible and non-reducible diseases;

(c) division of financial resources between operation and investment;

(d) standardization goals for each year and unit cost for each case treated and each death prevented;

(e) anticipated reduction in mortality and cost of each case of non-reducible disease.

Since various government agencies will be involved it will be necessary to establish clearly what each agency must do, what amount of the financial resources it will manage, and how the administrative co-ordination of the activities of all agencies involved will be accomplished.

The resources spent on non-reducible diseases, will also have an effect on the reduction in mortality which must be calculated and added to the results obtained from the attack on diseases that can be reduced.

It will in most cases be necessary to adopt legal and regulatory measures regarding the use and administration of resources, administrative hierarchy, accounting systems, etc.

With regard to funds that may be devoted to health improvement this is, according to PAHO/CENDES, established in an arbitrary manner by decisions taken at the highest political levels.

PAHO/CENDES does not offer any procedure that will justify a large proportion of the nation's financial resources to the health sector, which is a matter of constant concern to the authorities. At this time no methodology is available for treating health on the same basis as economic production or education, or any other activity that competes for a nation's resources.

In a critical review of this section Litsios has quite rightly pointed out that "the cost of 'preventing a death' is not only related to how well resources are 'instrumentalized' but also to a whole series of administrative problems". Waterston (sic) has stated that 85% of plan failures are due to administrative failures. Litsios' point is well-taken but does not in any way invalidate the PAHO/CENDES approach.

3. discussion and decision

In countries that have a central planning unit a health plan will first be discussed with the planning authority that has the responsibility for co-ordinating the plans of the various activities and of verifying whether or not the total result is feasible, internally consistent and efficient.

The proposal that is finally submitted to the central planning unit should have the approval of the highest political authorities of the health sector. Once the plan has been incorporated with the plans of the other sectors(in the central planning unit) the final result will be discussed at the level of the President and the Council of Ministers.

The PAHO/CENDES at this stage makes a plea for the adoption of the PPBS, which has been discussed in an earlier chapter. Somewhat naively it is suggested that the PPBS may assist to get the "plan" intact through Congress, since the use of the PPBS technique forces the acceptance or rejection of a complete programme or at least project. It is of course exactly this that even in the USA - the birthplace of PPBS - has made it necessary to prepare two budgets - a PPBS for administrative use and the old-fashioned line-budget for Congress, which wants to preserve its privilege of attaining to the pork barrel.

4. execution, supervision and revision

Execution is of course at least as important as preparation and is essentially a problem of good administration. The role of administration cannot be exaggerated and one of the most important tasks in the "diagnosis" is exactly to estimate the strength of the administrative services - and plan accordingly. This is maybe not emphasized sufficiently in the PAHO/CENDES approach - but is certainly constantly implied. PAHO/CENDES does call for improvement in administrative activity and states that the degree of execution of the plan is closely linked with the degree of direct participation in the plan's preparation by its executors. This is of such importance that it may be placed on the level of a planning principle

A planner has to use the information on the fulfilment of objectives because he will have to base the preparation of new programmes partly on that information. Ideally, where a five-year plan exists, a new one should be drawn up each year (see Waterston on "rolling plans" and how - though "ideal" - they are not being used in practice), taking away the first year and adding another at the end. Planning must be a continuous process!

Chapter 2. DIAGNOSIS

A. Introduction

The diagnostic process must be based on objective criteria and must be complete It is necessary to adopt criteria that will permit the relative importance of each health problem and its conditioning factors to be weighed objectively. The diagnosis must cover the entire population and take account of all relevant factors affecting the situation.

Plan diagnosis is not an academic exercise and it is essential to fix its functions very precisely. These are:

(a) defining the subject to be diagnosed;

(b) collecting the data required to provide a description of the prevailing situation;

(c) supplying an explanatory commentary;

(d) prognosis;

(e) evaluation.

B. Defining the Subject

Each nation is a mosaic of communities at different levels of development. The level of health in a community is the product of the reciprocal influence of environmental, demographic, social, and cultural factors and will therefore vary from one region to another. It is essential for national health plans to be based on the smallest geographic units that will clearly indicate rather than conceal the fundamental differences between them. Since it is essential that the local authorities participate actively in the planning functions the local area should form the basic planning unit.

The most suitable units for programming health plans should be relatively small areas that can be grouped into larger programming regions. The combined local plans would provide the basis for regional plans and these in turn would constitute part of the national plan.

Criteria for delineating local programming areas:

1. A local programming area, as a centre for community services, should contain permanent resources that will enable it to promote and protect the health of the physically fit and secure the recovery and rehabilitation of the sick.

II. Such an area must possess, within the limits of its local area, complete political and administrative services. It can not therefore be smaller than the geographic unit for the registration of births and deaths.

III. The range of effectiveness of health service centres is limited to the population group residing within an area that is, broadly speaking, not more than two hours away from the nearest centre by the usual means of transport of the community.

IV. On the basis of experience it is estimated that the total population that will be included within the local programme area should not exceed 100,000 to 150,000 inhabitants.

V. A grouping of two or more local programming areas constitutes a programme region or planning region (groups of local planning areas that are linked to a region by economic, cultural, or political ties or by communications, so that it acts both as a focal point and as a centre of influence. A planning region should have a population of not more than 600,000 and not less than 250,000, i.e. it should include between two and six local planning areas.

C. The information required for diagnosis

The description of the health situation in the local unit of programming should be presented systematically within the following general frameworks:

(1) diseases;

(2) inventory of the resources available and the activities carried out;

(3) allocation of resources to various uses;

(4) unit cost of different activities undertaken;

(5) population;

(6) environment.

1. diseases

The most important principle governing the study of diseases arises from the fact that it is essential to establish the total cost of combating each disease and the cost of each death prevented in the category of reducible diseases, as well as the cost of each case treated.

Since the study for practical purposes has to be limited to the major diseases it is recommended that the criteria of the incidence, importance and vulnerability of diseases should be applied to death rates.

Incidence of a disease is measured by its contribution to total deaths from all causes (for age-groups it may be weighted in terms of deaths from all causes within the same group). Importance of a disease is the effect produced on the community by deaths attributable to it. This importance can be expressed in terms of the relative significance attached to death at different ages.

A measure of the importance can be obtained by making use of any of the following criteria, which represent different methods of evaluating deaths in terms of age groups:

(1) If adult lives are regarded as more important than those of children and still more so than those of old people, a weight of 1 can be assigned to deaths in the adult group, less than 1 to the children's deaths, and a still lower weight to deaths among old people.

(2) If the value of life is regarded as being in inverse ratio to the age of the individual, the weight for deaths in each age group should be reduced as the age at death rises.

(3) The construction of an index of vulnerability of each disease. By this is meant the prospect of preventing it in terms of present methods and knowledge (the methodology deals only with the vulnerability of the morbidity rate). So far the assigning of vulnerability is unsatisfactory quantitatively and entirely arbitrary. The vulnerability of any disease will vary with the time factor.

The ranking of diseases to select them for study can best be effected by combining the indices of incidence, importance, and vulnerability. The procedure is quite a simple one, involving the multiplication of the index of importance for each disease, in each age group, by the incidence factor (simple or weighted) and the addition of the results. This total is multiplied by the index of vulnerability for the disease in question. Lastly the diseases are arranged in decreasing order of magnitude according to their final coefficient. It will be clear that in terms of its incidence, a disease may appear near the top of the list but, because it principally affects persons of a very advanced age, it may have a low importance factor, which will reduce its position on the priority scale. On the other hand, it would again tend to ascend the scale if its coefficient of vulnerability were high.

TABLE 1. *Causes of death by age groups, by order of incidence. State of Aragua, Venezuela, 1960.*

Causes of death(*)	Total		Age groups					
	No.	%	Less than 1 year old	1-4 years	5-14 years	15-49 years	50-69 years	70 years and over
All causes	434	100.0	136	28	12	76	101	81
Cardiovascular diseases (B22-25-26-27-28-29)	88	20.3	—	—	1	13	41	33
Dysentery, gastritis, duodenitis, etc. (B6, B36)	42	9.7	33	7	—	—	1	1
Premature births	37	8.5	37	—	—	—	—	—
Tumors (B18, B19)	29	6.7	—	1	1	4	13	10
Accidents (excluding transportation)	24	5.5	2	2	1	13	1	5
Influenza, the pneumonias, and bronchitis (B30, B31, B32)	19	4.4	15	2	1	—	—	1
Transportation accidents (E802-E861)	17	3.9	—	—	6	11	—	—
Pulmonary tuberculosis (B1)	12	2.8	—	—	—	4	5	3
Other diseases of early childhood (B44)	11	2.5	11	—	—	—	—	—
Other causes	155	35.7	38	16	2	31	40	28

(*) Categories according to the *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death, 1955 Revision*. World Health Organization, Geneva, Switzerland, 1957.

TABLE 2. *Causes of death by age groups, by order of index of importance. State of Aragua, Venezuela, 1960.*(*)

Causes of death	Total deaths	Total importance	Average importance	Age groups					
				Less than 1 year	1-4 years	5-14 years	15-49 years	50-69 years	70 years and over
Premature births	37	37.0	1.00	37.00	—	—	—	—	—
Other diseases of early childhood (B44)	11	11.0	1.00	11.00	—	—	—	—	—
Dysentery, gastritis, duodenitis, etc. (B6, B36)	42	41.2	0.98	33.00	7.00	—	—	0.75	0.50
Influenza, the pneumonias, and bronchitis (B30, B31, B32)	19	18.5	0.97	15.00	2.00	1.00	—	—	0.50
Transportation accidents (E802-E861)	17	14.2	0.83	—	—	6.00	8.25	—	—
Accidents (excluding transportation)	24	18.0	0.75	2.00	2.00	1.00	9.75	0.75	2.50
Tumors (B18, B19)	29	19.7	0.68	—	1.00	1.00	3.00	9.75	5.00
Pulmonary tuberculosis (B1)	12	8.2	0.68	—	—	—	3.00	3.75	1.50
Cardiovascular diseases (B22-25-26-27-28-29)	88	58.0	0.65	—	—	1.00	9.75	30.75	16.50

(*) Deaths according to Table 1. Coefficient of importance of one death below 15 years of age: 1; between 15 and 69 years: 0.75; other ages: 0.50. Results standardized by age.

TABLE 3. *Order of the priorities for the study of causes of death according to the indices of incidence, importance, and vulnerability. State of Aragua, Venezuela, 1960.*

Causes of death	Coefficient of incidence (*)	Coefficient of importance (†)	Coefficient of vulnerability	Product (2×3×4)	Order of priority
(1)	(2)	(3)	(4)	(5)	(6)
Dysentery, gastritis, duodenitis, etc. (B6, B36)	9.7	0.98	0.66	6.27	1
Premature births	8.5	1.00	0.33	2.80	2
Influenza, the pneumonias, and bronchitis (B30, B31, B32)	4.4	0.97	0.33	1.40	3
Cardiovascular diseases (B22-25-26-27-28)	20.3	0.65	0.10	1.32	4
Pulmonary tuberculosis (B1)	2.8	0.68	0.66	1.25	5
Transportation accidents (E802-E861)	3.9	0.83	0.33	1.07	6
Other diseases of early childhood (B44)	2.5	1.00	0.33	0.82	7
Tumors (B18, B19)	6.7	0.68	0.10	0.45	8
Accidents (excluding transportation)	5.5	0.75	0.10	0.41	9

(*) From Table 1.
(†) From Table 2.

Note: Arranged in accordance with the weighted coefficient of incidence on pp. 24-25, the causes of death would appear in the following order: dysentery; premature births; other diseases of early childhood; cardiovascular diseases; transportation accidents; accidents (excluding transportation); influenza, etc.; tumors; and pulmonary tuberculosis.

Tables 1 to 3 illustrate the preparation of such a scale of study priorities for diseases based on data obtained in 1960 in the districts of the State of Lara, Venezuela.

2. Inventory of resources available and activities carried out

The capital resources of the health sector consists of all the durable assets in existence, including such physical assets as buildings, water supply systems, laboratory and transportation equipment, and supplies of medicine and other material. Annual depreciation has to be calculated of all durable goods.

The total annual operating costs, plus depreciation charges in durable goods and inventory changes, together constitute the total funds expended in one year by the health sector. To prepare a diagnosis detailed information regarding the total value of the capital and operating resources that were at the disposal of the health sector in each year of the period under examination is needed.

The information must be obtained in both real and money terms, i.e. the physical amounts of the resources must be known, as, for example, the square feet of hospital construction; the physician-hours contracted for; the number of hospital beds available; the vehicles owned, etc., together with the corresponding figures of costs. (Basic data required for the diagnosis are proposed in an annex to the PAHO/CENDES "Health Planning".)

3. Allocation of resources to various uses

The collection of information on the amounts of resources utilized is the first step in reaching a decision on the sum to be allocated to the attack on each disease during the year under review.

For the purpose of planning it is not, however, enough to provide a simple list of the resources used to attack the disease. The basic data must be so organized that it will be possible to obtain some idea, for instance, as to the efficiency with which the resources have been used and the reason why, in some cases, they have not been employed more effectively. With these aims in mind, it is suggested that the resources should be broken down into three categories: instruments, tasks and techniques.

(a) Instruments, tasks and techniques

By instruments (definition) we understand the entire range of diverse resources which, in order to carry out a particular health function, must be combined in proportions that will vary within limits determined by technical and economic factors.

The function of restoration to health of a patient in a hospital presupposes a complete series of resources combined in proportions that can be defined. Vaccination, health examinations, consultations, and home visits are other examples of health functions.

On the other hand by tasks or activities (definition) we mean all those actions or series of actions that are performed in a time sequence in order to achieve a specific and measurable health objective. For instance hospitalization is a task the purpose of which is to restore the health of a patient, and the result of which can be expressed in terms of the number of discharges from the hospital. Each task is carried out by a specific instrument. As values can be assigned to both instruments and tasks, it is possible to establish thenumber of tasks or steps, i.e. discharges, that have been performed by a particular instrument (the hospital bed) within a specified time, and consequently calculate the unit cost of each.

In treating a disease, it generally happens that more than one step is needed, especially when groups of persons rather than isolated individuals are involved. For instance, in the case of diptheria the tasks required include vaccination, hospitalisation, consultation, and epidemiological investigation. The combination of tasks (definition) that have to be performed to combat a disease will be called a technique (or procedure). Its cost can be calculated.

On the foregoing basis we can establish a causal relationship between, on the one hand, the resources and, on the other, a particular disease.

Table 4 summarizes the definition of the various concepts discussed above and contains a specific illustration based on diptheria.

TABLE 4. *The relationship between resources and disease.*

Disease	Method	Tasks	Instruments	Resources
Expressed in terms of the mortality and morbidity rates of the community	Series of tasks employed to combat a disease	Action designed to remove or modify the factors that give rise to the disease	All the resources required to take the necessary measures combined according to their respective functions	Capital and labor allocated to health
Diphtheria	Prevention	Vaccination (dose)	Vaccinator-hour	Vaccinator, equipment, materials, etc.
		Epidemiological survey (surveys undertaken)	Epidemiologist-hour	Epidemiologist, assistants, laboratory, buildings, equipment, etc.
	Cure	Hospitalization (patients discharged and recovered)	Active hospital bed	Doctors, nurses, laboratories, buildings, beds, etc.
		Consultation (patients recovered)	Consultant doctor-hour	Similar to those specified for hospitalization (except for beds)

The identification and evaluation of the tasks or actions undertaken and of the instruments employed permits the calculation of, what we shall call here, the efficiency or product of instruments (definition), i.e. the number of tasks accomplished in a given period, normally one year.

(b) problems of instrumentation

For the purpose of identifying the instrument and facilitating evaluation, it is suggested that it should be given the name of the least divisible of the various resources of which it is composed.

After defining the names of the various instruments, the next step is to proceed to count these.

The third stage is to determine the composition of each instrument, as observed. To do so it will be sufficient to divide the quantity of each component factor or resource by instruments expressed in units. By way of illustration, let us suppose that the general medical section of a hospital has 120 beds with a staff of 10 physicians working a total of 12,000 hours a year, and a central laboratory preparing for it some 73,000 tests a year. Expressed in terms of days, the hospital bed, envisaged as the instrument, would represent one bed, 0.32 hours of medical attention, and 2 laboratory tests. (It seems that in this calculation PAHO/CENDES has used a working week of 6 days ?).

Table 5 gives an example based on data obtained in San Antonio, Chile, of how the composition of three instruments of treatment, i.e. hospitalization, outpatient consultation and home visits, can be expressed.

TABLE 5. *Resources available, by type of activity or task. San Antonio Program Area, Chile, 1961.*

List of resources available	All tasks			Task: Hospitalization			
	Annual amount		Cost per real unit (escudos/ hours)	Unit: 1 bed-year			
				Annual amount		Unit correction	
	In real units (hours)	In monetary units (escudos)		In real units (hours)	In monetary units (escudos)	In real units (hours)	In monetary units (escudos)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Medical director	1,500	7,023	4.68	960	4,493	7	31
Doctors	33,250	72,298	2.17	22,111	47,981	154	333
Dentists	4,750	30,269	6.37	—	—	—	—
Nurses	7,000	10,485	1.49	29	4,380	0.2	30
Midwives	8,500	10,705	1.26	5,100	6,426	35	45
Pharmacy	3,000	6,258	2.09	1,500	3,129	10	22
Welfare workers	3,500	4,941	1.41	1,050	1,480	7	10
Sanitary inspector	5,250	3,427	0.65	—	—	—	—
Statistical personnel	10,500	5,711	0.54	2,205	1,191	15	8
Administrative personnel	13,000	17,013	0.94	10,080	9,475	70	66
Chauffeurs	8,000	6,248	0.78	2,560	1,997	18	14
Personal services (cleaners)	40,000	21,670	0.54	1,600	8,640	11	60
Cooking staff	16,000	7,857	0.49	14,720	7,213	102	50
Laundry staff	4,000	1,512	0.38	3,040	1,155	21	8
Other personnel	54,000	8,603	0.16	21,600	3,456	150	24
Nursing auxiliaries	92,750	50,232	0.54	33,390	18,031	232	125
Food	—	22,533	—	—	22,534	—	156
Laundry	—	903	—	—	795	—	6
Transportation	—	11,076	—	—	4,431	—	31
Drugs	—	32,673	—	—	16,664	—	116
Purchase of linen	—	3,455	—	—	2,799	—	19
Purchases, maintenance, construction	—	55,988	—	—	30,774	—	214
Subsidies	—	68,676	—	—	—	—	—
Breast feeding, children's diet	—	43,682	—	—	—	—	—
Other expenses	—	20,755	—		9,963	—	69
Number of instruments		—		144 beds			
Total cost of specific tasks		—		Escudos 207,007			
Number of tasks		—		6,685 discharged patients			
Unit cost of instrument		—		Escudos 1,437			
Degree of utilization of instrument		—		72.57%			
Output of the instrument unit		—		46.4 discharged patients per bed-year			
Average unit cost per task		—		Escudos 31.00 per discharged patient			

TABLE 5. *Resources available, by type of activity or task. San Antonio Program Area, Chile, 1961 (continuation).*

List of resources available	Task: medical consultation Unit: 1 physician-hour				Task: house visit by nurse Unit: 1 visiting nurse-hour			
	Annual amount		Unit composition		Annual amount		Unit composition	
	In real units (hours)	In monetary units (escudos)	In real units (hours)	In monetary units (escudos)	In real units (hours)	In monetary units (escudos)	In real units (hours)	In monetary units (escudos)
(1)	(5)	(6)	(7)	(8)	(5)	(6)	(7)	(8)
Medical director	240	1,123	0.03	0.12	45	211	0.03	0.14
Doctors	9,476	20,563	1	2.17	—	—	—	—
Dentists	4,750	30,270	0.50	3.19	—	—	—	—
Nurses	1,960	2,920	0.21	0.31	1,470	2,190	1	1.49
Midwives	3,400	4,284	0.36	0.45	—	—	—	—
Pharmacy	1,500	3,129	0.16	0.33	—	—	—	—
Welfare workers	2,100	2,961	0.22	0.31	—	—	—	—
Sanitary inspector	—	—	—	—	—	—	—	—
Statistical personnel	5,145	2,778	0.54	0.29	787	425	0.54	0.29
Administrative personnel	2,520	2,369	0.26	0.25	540	508	0.37	0.35
Chauffeurs	640	499	0.07	0.05	1,200	936	0.82	0.64
Personal services (cleaners)	16,000	8,640	1.69	0.91	1,600	864	1.09	0.58
Cooking staff	1,280	627	0.13	0.07	—	—	—	—
Laundry staff	760	289	0.08	0.03	100	38	0.07	0.03
Other personnel	21,600	3,456	2.28	0.36	2,160	346	1.47	0.24
Nursing auxiliaries	22,260	12,020	2.35	1.27	—	—	—	—
Food	—	—	—	—	—	—	—	—
Laundry	—	72	—	0.0	—	18	—	0.01
Transportation	—	2,658	—	0.28	—	1,551	—	1.05
Drugs	—	14,703	—	1.55	—	—	—	—
Purchase of linen	—	346	—	0.04	—	138	—	0.09
Purchases, maintenance, construction	—	15,387	—	1.62	—	2,849	—	1.94
Subsidies	—	—	—	—	—	—	—	—
Breast feeding, children's diet	—	43,683	—	4.61	—	—	—	—
Other expenses	—	4,981	—	0.53	—	1,660	—	1.13
Number of instruments	9,476 hours of medical consultation				1,470 visiting nurse-hours			
Total cost of specific tasks	Escudos 177,758				Escudos 11,734			
Number of tasks	35,063 consultations				580 visits			
Unit cost of instrument	Escudos 18.74				Escudos 7.98			
Degree of utilization of instrument	(*)				(*)			
Output of the instrument unit	3.7 consultations per physician-hour				0.4 visits per visiting nurse-hour			
Average unit cost per task	Escudos 5.07 per consultation				Escudos 20.23 per visit			

(*) Not recorded.

The extent to which each instrument is being utilized is also needed as a percentage of its capacity (100 beds gives 36,500 bed-days. If only 18,250 bed-days are used the hospital is working at 50 per cent of its capacity).

(c) problems related to the tasks

After defining the various tasks and naming them (e.g. hospitalization, vaccination) it is necessary to decide on a unit of measurement for them as well as on their composition, concentration and the degree of coverage achieved within the community.

The choice of a unit of measurement presents no problems as in each case we are dealing with a measure that is complete in itself, such as one visit by a nurse, one vaccination, etc. The composition of each task, as, for example, the sequence of activities followed in a pregnancy consultation, cannot be determined at this stage since complete statistics of such activities are not usually maintained.

By concentration we mean (definition) the number of times a particular task is fulfilled in the case of a particular patient.

The coverage is (definition) the relationship between the number of subjects treated and the total number of such subjects in the community, and is dependent on the disease it is sought to control.

(d) calculation of costs of combating individual diseases

If we proceed along the lines suggested it will be possible to estimate the cost during the year under review of combating each individual disease. In the case of the example given in Table 4, if we can ascertain the number of vaccinations given, i.e. the number of tasks, the composition of the instruments in terms of resources, and the price paid per unit of each of the various classes of resources, it will be possible to determine the full cost of vaccination against diphtheria. Moreover, if we can calculate the total number of diphtheria patients discharged from the hospital each year, the number of bed-days devoted to the treatment of these cases, the composition or breakdown of the hospital bed as the means of cure, and the unit price of the corresponding component resources, we shall be able to determine the annual cost of cures of this disease by this means attributable to hospitalization.

Finally, if we work out the cost of an epidemiological survey and of consultations with physicians, by a similar procedure, we shall be able to demonstrate the total cost of combating the disease in a given year, i.e. the total value of the resources assigned to its prevention and cure.

Similar calculations can be made for each disease, using the criteria of the incidence, importance and vulnerability, until all the diseases covered by the study have been included.

In calculating total annual expenditure on health it should be remembered that investments during the year should not be charged in full to the cost for the year in which they are made but only to an extent proportionate to the total number of years that the assets represented by the investment will last.

4. unit costs of the different activities undertaken

It is generally realized that the treatment of many forms of disease involves the combination in differing proportions of curative and preventive techniques.

(a) curative techniques

The planner should ascertain the cost per cure and endeavour to reduce it to a minimum.

The total hospitalization and outpatient costs are added together and the result divided by the sum of the number of patients discharged cured and the number of outpatient cases treated.

The application of curative procedures to non-reducible diseases leads to the recovery and discharge of patients and reduces the number of deaths. It is, however, very difficult to estimate, with the data at present available, the actual number of deaths prevented. For this reason the economic analysis of non-reducible diseases should be confined to the calculation of the cost per cure. It is exactly the fact that it is not possible to calculate the number of deaths prevented in non-reducible diseases that makes the distinction between the group of reducible and non-reducible diseases essential.

(b) preventive measures

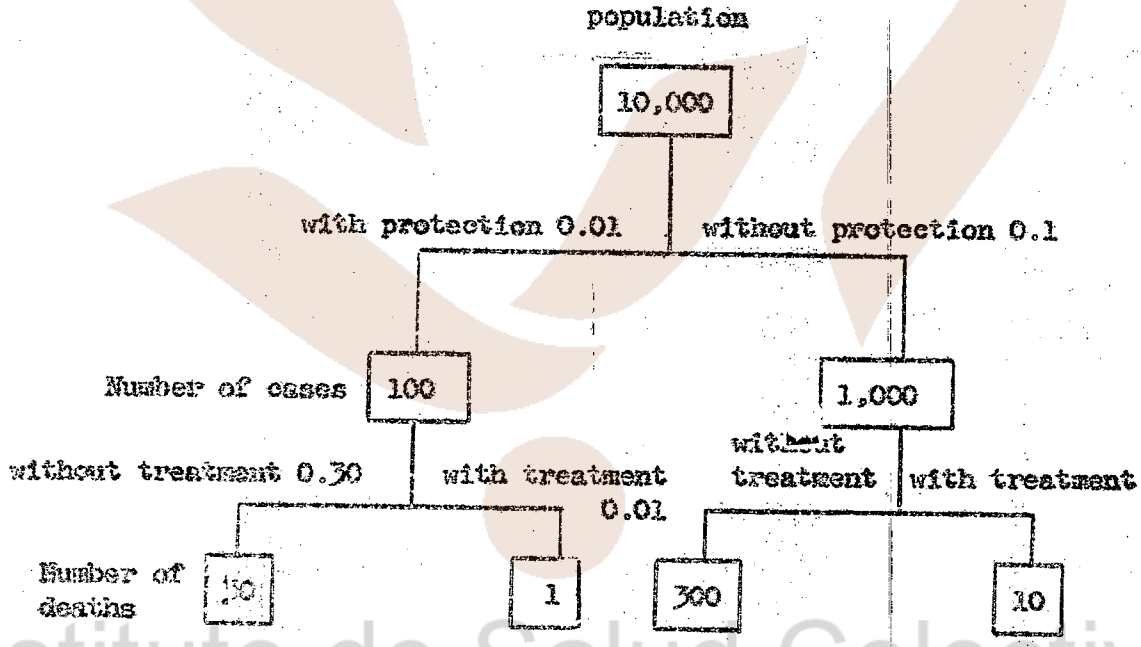
In the case of reducible disease it is possible to calculate the unit cost per person protected, the cost of preventing each potential case of the disease, and the cost per death prevented as a result of the measures of prevention taken.

(1) The cost per person protected is obtained by dividing the total cost of the preventive measures taken against a particular disease by the number of persons protected, due allowance being made for the duration of the protection provided.

(2) The cost of preventing each potential case of a disease is the total cost of the preventive measures taken divided by the number of cases prevented, obtained by multiplying the number of persons protected by the difference between contracting the disease with protection and without it. (If the protected population is 1,000 and the probability of contracting the disease without protection is 0.10 and with protection 0.01 the number of potential cases prevented is 0.09 x 1,000). The number of deaths prevented by measures of protection taken is obtained by subtracting the number of deaths that would occur with protection from the number that occur without it

An example may be given from the Trinidad course:

- Population: 10,000
- Health hazard: "D"
- Probability of contracting disease - without protection: 0.1
  - with protection: 0.01
- Death by disease - in treated: 0.01
  - in non-treated: 0.30



(a)	only curative services	1,000 cases	10 deaths
(b)	only preventive services	100 cases	30 deaths
(c)	preventive and curative services	100 cases	1 death
(d)	no health services	1,000 cases	300 deaths

(3) The cost per death prevented will be the total cost of prevention divided by the number of deaths prevented.

Table 6 gives an example of cost of health policy by disease and by activity-

TABLE 6 *Unit cost of the actual health policy.*

Disease: Whooping cough Area: Northern Santiago, Chile Year: 1963

A: Curative Techniques

Per recovery								Per death prevented				
Tasks or actions	Specific annual cost per disease (escudos)	Patients recovered: Cases treated (*)	Coefficient of probable recovery: Without treatment (†)	With treatment (†)	Difference 5-4	Number T3 × 6	Cost per patient recovered T2/7 (escudos)	Deaths prevented: Coefficient of probable fatality: Without treatment (†)	With treatment (†)	Difference 9-10	Number T3 × 11	Cost per death prevented T2/12 (escudos)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Hospitalization	15,801	48	0.97	0.99	0.02	17	1,421	0.03	0.01	0.02	17	1,421
Consultation	8,358	789										
Totals (T)	24,159	837										

B: Preventive Techniques

Tasks or actions	Specific annual cost per disease (escudos)	Estimate of persons protected: Concentration of tasks: Actual	According to norm	Degree norm was attained 3/4	Persons protected: Cases treated (*)	Number 5 × 6	Deaths prevented: Coefficient of probable infection: Without protection (†)	With protection (†)	Difference 8-9	Coefficient of probable natural fatality (†)	Number T7 × 10 × 11	Cost per death prevented T2/12 (escudos)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Immunization	5,755	2	2	1	23,672	23,672	0.60	0.45	0.15	0.03	107	67
Visits	1,403	1	1	1	47	47						
Total (T)	7,158			Total number of persons protected (†) (T)		23,672						

(*) First treatment.
(†) Norm.

It is possible to determine the number of potential cases of a disease that have been prevented only if we know the probability of contracting that disease both with and without the appropriate preventive measures. The rate of incidence of a disease /fully broken down/, taken with a knowledge of its vulnerability, give some indication of the probability in both cases. The time factor must be taken into consideration (if, for instance, vaccination lasts more than one year this must be considered in costing).

Protective measures can be taken with varying degrees of intensity. For example, if a particular disease is eradicable, the campaign may either be continued to the point of eliminating the disease or it may be somewhat less intensive. In the latter case both curative and preventive techniques will have to be used to combat the disease. In the case of reducible but non-eradicable diseases it is always necessary to combine both techniques, even if preventive measures are being undertaken to the maximum extent possible. In both instances, however, it is possible to choose between various combinations of curative and preventive measures. To facilitate this choice, it is most important to know how much it costs to prevent a death by curative action in the case of reducible disease. With this in mind, it is proposed that the number of fatal cases prevented through the cure of reducible diseases should be calculated on the basis of the difference between the number of fatal cases arising in the case of those who have not been treated. Although, as we have already indicated, the information at present available on the number of fatal cases occurring among persons who have not been treated is scanty, it would be possible to obtain usable estimates by research methods.

5. population

Information on population is quite essential to health planning, as the number of inhabitants and their age distribution in part determine the extent and nature of the medical attention with which a community must be provided. A knowledge of the composition of the population by age-group - apart from its epidemiological necessity, is also essential for the calculation of specific morbidity and mortality rates.

It is also necessary to obtain estimates of probable rate of increase (or decrease) of the population over a period of 10 years. Vital statistical data are essential.

6. environment

The environment should be analyzed in terms of its influence on the health of the community. Such an analysis should include at least the following aspects:

(a) housing conditions (number of dwellings, etc.);

(b) water supply, quality, availability, etc.;

(c) disposal of excreta;

(d) food, sanitary conditions, etc.;

(e) refuse, number of dwellings and members of population with domestic refuse collection, etc.;

(f) vectors, existence of potential vectors - their relative indices of density;

(g) industries, nature of various industries, potential risk of occupational diseases;

(h) schools, number, type, distribution, etc.

D. Explanation of health

The diagnosis should not confine itself to a description of health conditions in the community but should seek to explain these in the light of the influence on them of the various factors involved.

Epidemiology shows that health conditions are affected by four principal factors:

(a) the characteristics of the population;

(b) the agents that cause disease;

(c) the physical environment;

(d) the socio-cultural and economic milieu.

Health planning adds a fifth factor, health policies, and concentrates a large part of its attention on these.

Epidemiology has not attempted to assess the relative importance of each of these conditioning factors nor the relative influence each exerts on health conditions, although such information would prove of great value in formulating more effective health policies.

It is argued that "health" is a cumulative phenomenon, tending to promote positive social changes that themselves give rise to better health.

There is a need for as complete an understanding of the dynamics of health conditions as possible and a table similar to that of Table 7 will be a valuable aid.

TABLE 7 *Health levels—The conditioning factors*

Name of disease: Dysentery and gastroenteritis — Hospital region: Cauquenes, Chile — Year: 1962

I Incidence and structure of disease					II Susceptibility			III Milieu							
Categories	No.	Rate per 1,000 inhab.	Age groups affected	%	Population	No.	%	Housing	No.	Rate per 1,000 inhab.	Level of education	No.	Rate per 1,000 inhab.	Others	%
(a) Deaths	21	0.4	-5	15	(a) Total	50,220	100	(a) Total	9,694	193	(a) Schools	45	1	(a) Auxiliary	—
(b) Discharged patients	184	4	—	—	(b) Susceptible	23,847	47.5	(b) Without water	5,960	119	(b) Registered	6,400	130	(b) Rural	56
(c) Consultations	1,812	36	—	—	(c) Exposed	7,395	14.7	(c) Without system for disposal of excreta	6,269	125	(c) Illiterates	17,200	344	(c) Unemployed	—

IV. Health policy

A: Tasks

Type	Number		Coverage			Specific annual cost per disease (escudos)						
				Persons protected		Annual expenditure		Annual appropriation for each disease			Unit cost	Total cost
	Total	First visits	Concentration observed	No.	%	Unit	Total	For health	For the particular condition	Years in effect		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
			2/3				7 × 2	(*)	(*)	(*)	$\frac{7 \times 9 \times 10}{11}$	12 × 2
Hospitalization	184	184	1	184	—	40	7,360	1	1	1	40	7,360
Consultations	1,812	1,296	1.40	926	—	6	10,872	1	1	1	6	10,872
Inspection of housing	642	642	1	3,403	—	3	1,928	1	1	1	3	1,928
Inspection of various establishments	1,475	472	3.12	17,075	—	3	4,425	1	1	1	3	4,425
Building (latrines)	98	98	1	519	—	238	23,324	0.8	1	6.5	30	2,940
						Total	47,909				Total	27,525

B: Instruments

Category	Number available	Degree of use as a %	Efficiency	Specific annual cost per disease (escudos)						
				Annual appropriations for each disease					Unit cost	Total cost
				Unit expenditure	Total expenditure	For health	For the particular condition	Period in years		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	(*)				5 × 2	(*)	(*)	(*)	$\frac{5 \times 7 \times 8}{9}$	10 × 2
Bed-day	1,691	0.81	52.56	4.4	7,360	1	1	1	4.4	7,360
Physician-hour	318	1	5.7	34.2	10,872	1	1	1	34.2	10,872
Inspector-hour	2,982	1	0.71	2.1	6,353	1	1	1	2.1	6,353
Worker-day	1,750	1	0.056	13.3	23,324	0.8	1	6.5	1.6	2,940
				Total	47,909				Total	27,525

(*) Based on norm.
Note: A(13) and B(11) are not necessarily equal, as the values for A(11) and B(9) may differ.

E. Prognosis of the health situation

The health situation in a community does not remain static. It is continually subject to modification by changes in the total population, in its distribution between urban and rural areas and by age as well as other factors.

Prognosis has a very clearly defined function to perform in health planning; it must answer the question: What is the likely pattern of health conditions in a community for, say, the next 10 years, if there is no change in health policies?

The prognosis serves a dual purpose. It permits an evaluation of current policies, by providing for a comparison between the projected trends that would result from the maintenance of these policies and the trends that would emerge if they were modified in accordance with the criteria of efficiency. In the second place, it acts as a point of departure in setting targets for each of the various forms of action proposed in the plan.

The primary function of the prognosis is to project the total population, its age structure and its urban and rural composition. Its secondary function is to project the death rate of each of the major diseases in terms of an extrapolation under given assumptions of the trends indicated by the corresponding rates for the preceding five or 10 years.

The projection is made on the assumption that neither the level of resources per inhabitant nor the allocation of these resources among the various diseases will be changed. It is therefore possible to make an estimate of the total resources that will be available and the sum allocated to combat each disease on the basis of a projection of the population. Further assuming that techniques and instruments will be constant, it will be possible to forecast the probable number of deaths that will be recorded each year for the entire period of the projection.

On the basis of calculations - as indicated in Table 8 - it will be possible to determine whether there is a tendency for health conditions to improve, remain static, or deteriorate, in terms of a reduction, levelling off or increase in the death rate for reducible disease and in terms of similar trends in the demand for curative measures against these diseases.

No attempt will be made here to describe the extremely complex procedures needed for these projections. It is felt that persons interested in mastering this technique will need to take the special course provided for this purpose.

It is essential to project the demand for curative services for each reducible disease. The projected demand in the case of non-reducible diseases is obtained by subtracting the demand for curative services for reducible diseases from the total demand for such services.

TABLE 8 *Prognosis by disease.*

Disease: Dysentery and gastroenteritis

Hospital region: Cauquenes, Chile

	Year of diagnosis 1962		1964	1965	1966	1967	1968	1969	1970	1971	1972	1973		
			1	2	3	4	5	6	7	8	9			
			Estimate corrected according to corrected 1973 rate										Corrected rate	First estimate
	No.	Rate	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.		Rate
1. Mortality rate	21	0.42%c	20.7	20.4	20.2	19.9	19.6	19.4	19.1	18.8	18.6	18	0.38%c	0.42%c
2. (a) Discharges	184	3.66%c	181	179	176	172	172	169	167	165	163	160	3.3%c	3.66%c
(b) Consultations	1,812	36.08%c	1,788	1,764	1,741	1,717	1,694	1,671	1,647	1,624	1,600	1,577	34.5%c	36.08%c
3. Susceptible persons exposed	7,395	14.7%	7,114(*)	6,974	6,857	6,739	6,620	6,506	6,390	6,304	6,217	6,132	12.6%	M
4. Milieu														
With system for the disposal of excreta	3,425d	68%c	3,425	3,865	3,865	3,865	6,425(*)	6,425	6,425	6,425	6,425	6,425	133%c	M
With water	19,420p	387%c	19,420	25,495(*)	25,495	25,495	25,495	25,495	25,495	25,495	25,495	25,495	525%c	M
Total dwellings	9,694d	5.2p/d	9,694	9,694	9,694	9,694	9,694	9,694	9,694	9,694	9,694	9,694	5p/d	M
5. Instruments available (at constant rate)														

M=majority.
c=constant.
d=dwellings.
p=persons.
p/d=persons per dwelling.
(*) Beginning of change in conditioning factors (in absolute terms). The relative changes are shown in year 1.

V. Evaluation of the health situation

Any judgement of whether the situation is satisfactory or not must inevitably involve a comparison between conditions as they are and some alternative that is regarded as acceptable. Strictly speaking, to evaluate the existing situation, it would be necessary to define the normal state of health of a community, but as this is not at present practical the PAHO/CENDES methodology has adopted the criterion that the situation is not normal if, with the resources available per inhabitant, it would have been possible to have achieved a higher level of health in the past or will be possible, during the period of prognosis, to reach a more satisfactory level than that indicated in the projection of the trend.

In more concrete terms, the evaluation should answer the following questions:

(1) Are the resources fairly distributed among the various reducible diseases?

(2) Are the most effective methods being employed in combating each disease?

(3) Is the general standard of the instruments in use adequate with respect to (a) their composition; (b) their effectiveness; and (c) their concentration and coverage?

(4) How and when can shortcomings indicated under the previous points be corrected?

In analysing the various functions performed by a given instrument, the important factors are: the components of each task, the degree of concentration per patient, and the coverage and proportion of persons protected. Norms have to be established for components (composition) and concentration. It is more difficult for coverage where demand of service has to be taken into consideration.

Operational norms or standards should be established in association with the local planners. The suitability of the technique, i.e. of the composition of its component factors has to be evaluated as in many cases an increase in the ratio of one of the component factors to the others can raise efficiency and reduce cost.

In the case of non-reducible diseases, where the entire demand must be met, the evaluation process is limited to making a comparison between the actual cost per case and the standard cost or norm.

Chapter 3. DETERMINATION OF FEASIBLE ALTERNATIVES IN THE LOCAL PROGRAMMING AREA

A. GENERAL PROBLEMS OF PREPARING THE PLAN AS SUCH AND ALLOCATION OF RESOURCES BY AREA

1. Introduction

Within the general planning process the phase of the actual preparation of the plan is designed to answer two main questions:

(a) what volume of resources should be allocated to the activity, in this case health, in each of the years covered by the plan?

(b) to what diseases should available resources be assigned preferentially, and what techniques are best suited to the purpose?

It is possible to determine either resources and the targets by derivation or start with "reasonable" targets and estimate required resources. Since feasibility is one of the basic criteria in establishing targets and availability one of the principal factors in determining feasibility, it is reasonable to start with some idea of resources. In practice, owing to the complex relations existing among the elements involved, successive approximations are almost inevitable, regardless of whether the determination of resources or of targets is taken as the point of departure.

A combined working procedure is generally adopted. It is proposed that the central health planning authority take responsibility for determining the volume of resources that will be available to finance health activities throughout the country during the period of the plan. At the same time, the local programming authority would be responsible for defining the minimum and maximum limits of the field within which feasible targets can be chosen for the local area without considering the exact amount of resources on hand for each particular zone.

If the planner has several alternatives available for each of the local areas, it will be possible to elaborate a great many of these for the nation as a whole, combining them in different forms.

The contents of the plan should include:

(a) the total amount of resources to be employed year by year throughout the nation and in each region and area;

(b) the proposed targets for each division of activity and each disease;

(c) the targets designed to standardize instruments and techniques to be used in each case;

(d) required annual expenditures for both current operations and investment;

(e) personnel needs and expected difficulties in procurement;

(f) investment projects to be initiated;

(g) the legal, regulatory, and administrative provisions essential for the execution, control, revision, and evaluation of the plan.

2. The need for establishing alternative maximum and minimum plans for each local area

The need for determining a minimum limit is motivated by consideration of the fair distribution of health benefits referred to in Chapter I. Actually, a national policy based exclusively on efficiency criteria, such as maximum mortality reduction with available resources, can, as noted, lead to complete neglect of the health of individuals affected by diseases that can only be combated at very high cost. To avoid such an imbalance, it is here proposed that the full demand for curative services be met without broadening such demands further.

Strict application of an assignment criterion based on efficiency can lead to situations that appear to be inacceptable, such as depriving a region of health services because of high local cost. The dilemma of equitable distribution on the regional level is as follows: either the resources are distributed among the regions in order to achieve maximum reduction in the death rate, even though some regions may not be included, or else health services are provided to all regions, even though this does not lead to maximum reduction in the national rate of mortality.

To resolve this geographic aspect of the problem it is recommended that available national resources be assigned in such a way as to ensure that current health levels will be maintained unimpaired in all areas during the plan period. This approach establishes the minimum alternative for each local programme area.

In this early edition of PAHO/CENDES it is also recommended that a maximum alternative be prepared establishing the highest possible rate of increase in the health level of a community during the plan period. This has rarely - if ever - been carried out in practice.

It should be kept in mind that the rate at which community health can be improved depends not only on the resources available, but also on other factors limiting an area's capacity for effectively utilizing a greater volume of resources. These factors include the length of the period of latency and development of the instruments and other administrative and socioeconomic considerations.

B. PREPARATION OF THE MINIMUM ALTERNATIVE

1. The Role of the Predicted Trend

Maintenance of the health level recorded at the time of diagnosis is understood to mean, specifically, maintenance of the mortality rate resulting from reducible diseases and satisfaction of the demand for curative services per inhabitant at the same levels registered for the basic period or those indicated by predicted trends.

If the predicted trend is unfavourable, the minimum alternative will indicate whether reassignment and standardization will suffice to head off such deterioration or whether the amount of resources per capita will have to be increased.

To summarize: the proper functions of planning are:

(1) standardize instruments and tasks and select most efficient techniques and establish goals of standardization to be expressed in results that will serve as basis for estimating the unit cost of each instrument (this is the standardized cost; the result of the diagnosis is the observed cost);

(2) quantify its objectives in relation to both reducible and non-reducible diseases;

(3) estimate the total expenditure required to achieve these objectives.

2. Standardization of instruments and standardization targets

There are two questions involved here:

(1) how to establish the standards;

(2) how to determine the time required for their fulfilment, i.e. how to establish the targets for standardization of instrument.

Ad (1): A standard can usually be established either by research or estimation. In many cases, experimental research will make it possible to define the standard representing maximum efficiency. In others, where research is not feasible, estimates must be made. Cost reduction must be subject to consideration of technical efficiency. Standards must be realistic and permit modification from time to time.

Ad 2: Once the standards have been established, the problem of yearly standardization of targets must be solved. In the case of some instruments, a standard can be achieved in a matter of months, but in others, the personnel must be fully re-educated to accept the standardization or change in conditions, such as certain administrative provisions; this is difficult to achieve within a brief period.

Once standardization targets have been set for each instrument, expressed in the proposed annual output, it is possible to determine the cost of each instrument unit, since each output target entails a specific composition of the instrument in terms of primary resources.

3. Quantification of targets, instruments, and resources for nonreducible diseases

As stated earlier the minimum alternative entails the maintenance of curative services already available per inhabitant. Curative services are provided for both reducible and non-reducible diseases - but it is advisable to establish separate targets for each group.

The diagnosis makes it possible to determine the volume of services provided for treatment of non-reducible diseases, expressed in terms of hospital discharges per thousand inhabitants, outpatient consultations per thousand inhabitants, etc. Since a population projection for the local programme area is available, it is a simple matter to estimate the total services that must be provided in order to maintain the hospitalization and consultation rates recorded for the period of diagnosis.

A knowledge of the number of individuals to be treated makes it possible to determine the volume of instruments required to provide this treatment.

In estimating the instruments needed to satisfy increased demand, it should be considered that some of these may have surplus installed capacity - making new instruments unnecessary until existing ones are operating at full capacity (heavier expenditure will be incurred for food, drugs, etc.). The planner should ensure that specific rates for cure do not deteriorate during the plan period.

Finally, information on the volume of instruments and their composition in terms of resources makes it possible to estimate the amount of resources that will be required annually. Since the unit price of such resources is known, both the cost and the total expenditure necessary are apparent.

Again the detailed actual computations can only be mastered by a special course in the PAHO/CENDES methodology.

4. Determination of targets and calculation of instruments for prevention and treatment of reducible diseases

This aspect is concerned with maintaining the mortality rate for reducible diseases observed during the base period, which may be the last year of the diagnosis. However, it is not the observed rate of specific mortality per disease, but the over-all average with which it deals. Certain specific rates may increase, provided the average is retained. Nevertheless, targets must be determined disease by disease, since it is almost certain that all of them must be combated to some extent.

If mortality and probabilities of acquiring a disease are constant throughout the plan period the number of lives to be saved through measures applied to reducible disease is directly proportional to the number of individuals protected against this disease. Consequently, computation of the additional number of lives that must be saved is reduced to a determination of the additional number of lives that must be protected. This computation can begin with the diseases for which cost per life saved is lowest, using fully standardized instruments.

Once the target of mortality reduction has been achieved, the diseases whose cost per life saved is highest are studied to determine the feasibility of decreasing some of the resources assigned thereto in the past and transferring them to other, lower cost diseases. If feasible, the first operation will lead to an increase and the second to a reduction that outweighs that increase.

Once the foregoing operations have been carried out, a determination will be made of the number of individuals to be protected against each disease and, consequently, the number of instruments that must be brought into play. The rest of the operations required to compute total cost and total expenditure are identical to those discussed in the preceding section.

The demand for treatment relating to reducible disease is projected on the basis of an analysis of the mortality rate caused by reducible disease, on the one hand, and the rate of hospitalization and consultation relating to the same diseases on the other. Consequently, if these rates remain constant, treatment demand will increase only as a result in increase in population.

5. Computation of total annual costs and expenditures

Once the modification in demand for treatment of reducible diseases has been quantified, the next step is to calculate the necessary instruments and total costs and expenditures by using the same procedure outlined in Section 3. The sum of these costs and expenditures, together with those resulting from the prevention of reducible diseases and treatment for non-reducible diseases, gives the total value of resources that must be utilized to implement the minimum alternative.

6. Targets and requirements of the minimum plan when the trend indicates maintenance or improvement

Up to this point we have analyzed the case in which the predicted trend indicates a deterioration in the health level. If, on the other hand, this trend should point to maintenance or increase in that level, the task of the planner with reference to preparation of the minimum plan would be confined to reducing the cost of combating existing disease, standardizing instruments, and improving techniques.

C. PREPARATION OF THE MAXIMUM ALTERNATIVE

1. The present

The maximum alternative represents the body of activities required to increase protection against risks associated with reducible diseases and to expand treatment for all types of diseases with the maximum speed technically, administratively, and socially feasible.

2. Determination of targets, instruments, and resources for the prevention and treatment of reducible diseases

The goals for the maximum alternative plan relating to reducible diseases should be established individually for each disease.

The planner should indicate the percentage of the population to be protected in order to reduce the disease to the maximum extent possible in accordance with its established vulnerability. Most probably, it will not be necessary to protect 100 per cent. It must be noted that it will not be feasible to protect the marginal cases, since this would entail a very high cost.

The population increment that will have to be protected during the plan period must be established and the instruments to be employed to protect those individuals, calculated with the aid of standardization targets, etc.

3. Quantification of treatment service targets

Under the maximum alternative the targets for treatment services of non-reducible diseases are raised and the hospitalization and consultation rates are revised to conform to the level recommended by medical technique, simultaneously with an attempt to improve the quality of care.

In computing treatment needs for reducible diseases, the procedure in the case of the maximum alternative - based on a correlation between the mortality rate for a given disease and the hospitalization and consultation rates for the same disease - is the same. Consequently, the first step will be to compute the effect on the mortality rate of each one of the activities required to decrease it to its lowest level, [illegible] vulnerability.

The development period of an instrument (definition) is the period between application and effect of the instrument. The latency period (definition) is the time required to adapt the instrument to normal conditions.

The calculation of instruments required for treatment of reducible diseases is identical to that outlined for the minimum alternative. When the number of cases to be treated and the standardized output of instruments are known, a simple division will indicate the number of instruments necessary.

4. Total expenditures for maximum and minimum alternatives

Generally speaking, the total annual expenditures required for the maximum alternative are computed in the same way as those for the minimum alternative, so that no further explanation is necessary. However, there is one problem of some interest for both the maximum and the minimum alternatives that calls for additional comment. This is the determination of the optimum opportunity for construction of facilities requiring heavy capital outlays, such as hospitals, water systems, etc.

5. Unit costs

In examining the method of estimating costs per life saved in the diagnosis, it was stated that total current and capital costs incurred in combating a disease should be divided by the number of lives saved, and that the same method should be used to estimate costs per case treated.

This procedure is not correct for the calculation of unit costs per deaths to be prevented or cases to be treated in the future with instruments whose construction is still undecided.

Chapter 4. PREPARATION OF REGIONAL PLANS AND THE NATIONAL PLAN

A. INTRODUCTION

The proportion of extreme alternatives for each local programme area marks the close of the first stage in the process of planning.

The second stage is concerned with preparing alternative plans on all levels: (1) national, (2) regional and (3) local.

Feasible alternatives beyond the minimum level applicable to the local area are the responsibility of the regional rather than the local planner. Likewise the national planning agency should decide upon the best regional alternatives.

This chain of decision has two main reasons:

(1) the best national health strategy may not be the sum of the best regional strategies, nor the best regional plan the sum of its local parts;

(2) some essential health activities cannot be regionally or locally centered.

B. THE TASKS OF THE REGIONAL PLANNERS

1. Functions of the Regional Authority

Characteristics of a planning region were discussed in Chapter 2. Each planning region should have a health authority to see that specialized services are provided efficiently, together with various other services that can be implemented more efficiently at the regional than at the local planning level. Such activities should be expressed in the form of special regional programmes (with their own targets, instruments and schedule of expenditure).

2. Special regional plans

Problems in connection with setting up specialized treatment services - not to be made available in local areas - are similar to those discussed previously, i.e. inventory of available instruments, analysis of output and composition of instruments, establishing standards and standardization targets, projection of demand, and calculation of the instruments required to meet this demand, including costs per case treated.

Regional authority must prepare "penetration plans" designed to provide health care for those residing in isolated areas, lacking permanent health facilities. Here it is preferable to choose a limited number of diseases characterized by a simple chain of epidemiology and by high vulnerability. It is impossible to stipulate strict criteria for optimum volume of resources to be used for "penetration plans".

3. Preparation of alternatives for the region

The office of regional health planning will draw up the regional alternatives on the basis of various combinations of local plans plus special regional plans. These regional alternatives are the raw material with which the national office of health planning works.

Regional planners will have no difficulty in preparing a minimum alternative for the region, since this will be the expression of the sum of minimum plans for the local planning areas and special regional programmes. Preparation of more ambitious alternatives will require an estimate of resources available to the region in each year of the plan. This is the task, as mentioned earlier, of the national planner.

The details of these procedures will have to be learned by actual case studies.

C. THE RESPONSIBILITY OF THE NATIONAL PLANNER

1. Introduction

The chief responsibility of the national health planner is the same, on the national level as that of the regional planner. His task is to distribute the resources available for the health sector, in excess of the minimum required for implementing the minimum alternative throughout the country, among the regions in such a way that efforts designed to combat reducible diseases ensure maximum reduction in the number of deaths together with minimum costs per case treated.

(1) review regional proposals and transfer resources from high-cost to low-cost regions (allowing for minimum alternative);

(2) prepare national plans co-ordinated with regional and local plans;

(3) develop planning methods for local and regional areas.

He will also allot resources to regions and project total health resources for the entire country.

2. Projection of available health resources

General national planning mechanism, where it exists as an agency, is concerned with establishing the general economic framework of reference within which all state activities will be carried out. This entails the projection of total production of goods and services, distribution of income and volume of certain transactions, such as real estate sales, etc. The general planner proposes, on the basis of projected receipts to the political authority, a scheme for allocation of percentages among the various state activities. These proposals once approved and modified by the political authority serve as a guide for each government sector in the preparation of its programme proposals.

3. Assignment of resources among the various regions

The national planner will at a given date have all the regional proposals and their corresponding alternatives on hand. On the basis of the minimum alternative and the annual expenditure required for execution of the national plans, the central health planning agency may estimate the balance of resources that can freely be reassigned among the various regions - Table 9 shows a proposal for organizing this information:

TABLE 9 *Resources projected and available for national reassignment.*

(in thousands of monetary units)

Resources and expenditures	Years									
	1	2	3	4	5	6	7	8	9	10
a. Projected resources										
b. Expenditures under minimum alternative										
Region I										
" II										
"										
"										
"										
Region N.										
c. Expenditures under national programs										
d. Total fixed commitments (b + c)										
e. Available for reassignment (a — d)										

TABLE 10 *Programs in addition to the minimum alternative.*

Program	Cost per life saved	Annual expenditure Years									
		1	2	3	4	5	6	7	8	9	10
Region I											
i. Disease											
ii. Disease											
"											
"											
"											
"											
n. Disease											
Region II											
i. Disease											
ii. Disease											
"											
"											
"											
n. Disease											

Furthermore, the information will contain a list of the diseases that each region considers to hold highest priority once the minimum alternative has been satisfied, etc. These data may be arranged as Table 10.

The national health planning agency now proceeds along the same lines as the regional planner with respect to local areas, and as the local planner with respect to the various reducible diseases. Any remaining resources will be assigned to the expansion of treatment services, selecting first those regions where cost per case treated is lowest.

The first alternative at the national level is the minimum.

4. Other responsibilities of the national planner

The national health planning agency is also responsible for preparing the national programme such as central command, training, research and investment.

(a) central command plans

These deal with the so-called "vertical" programmes aimed at combating diseases that for epidemiological reasons, can be attacked effectively only if they cover an extensive area of the country (malaria, smallpox, etc.). Priority ratings are again based on "cost per life saved".

(b) trained personnel requirements

All local plans should specifically present their personnel requirements. The data needed are obtained from an analysis of the composition of the instruments required to execute the health activities provided for in the plans, as well as the corresponding chronological programme for gradual and progressive standardization of the same instrument.

Regional authorities should consolidate and co-ordinate local personnel needs as indicated by the respective plans, adding the personnel required for execution of activities on the regional scale and this process is finally repeated at the central level, making it possible to prepare a personnel budget detailed by region and by type of need, both immediate and future.

It will be necessary to analyze the teaching capacity of national educational institutes, etc.

(c) investment plans

The investment plan represents the aggregate of investment projects. Close collaboration with public works is needed. Economic evaluation of the project, in the case of a hospital, makes it possible to determine the cost per case treated in that hospital.

As additional experience is acquired and constructions are standardized, the national planner will be able to prepare alternative figures on unit costs in various regions of the country, which would be made available to the local planner.

(d) the national plan and the budget

The national plan contains, among other items, a proposal with reference to estimated expenditures year by year for health activities. Some of these activities are the direct responsibility of the health authorities, but others correspond to other state and municipal agencies, as for example the supply and management of water and sewerage service and refuse disposal. The plan should specify with absolute clarity the responsibilities of the different agencies, the expenditures entailed, and the receipts available to each.

The health budget, i.e. the proposed expenditures for the following year, is based on the proposals of the plan for the first year.

PAHO/CENDES makes a strong plea for adoption of a PPBS:

Budget preparation on the basis of the plan inevitably presents problems in relation to classification of expenditures and receipts, since it is customary to prepare budgets by classifying expenditures into wages and salaries, acquisition of materials, and a series of other items, arranging them by executive units, such as divisions or departments. Unfortunately, functional classifications specifying proposed expenditures in combating the various diseases or expenditures for prevention and treatment are not made. This classification is indispensable, since it is the one used in the plan. Budgets that present expenditures classified in the manner suggested here are called programme budgets or functional budgets. These terms are derived from the fact that all expenditures corresponding to a programme should be presented under this programme and every programme in relation to an objective or a target.

Therefore, adoption of a planning system in the field of health implies a need for transforming the budget system, not only in its formal aspect, but also in relation to congressional discussion and approval.