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PLANNING AND EVALUATION OF PUBLIC DENTAL HEALTH SERVICES

Report of a WHO Expert Committee

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Geneva, 10–14 November 1975

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PLANNING AND EVALUATION OF PUBLIC DENTAL HEALTH SERVICES

Report of a WHO Expert Committee

INTRODUCTION

A WHO Expert Committee on planning and evaluation of public dental health services met in Geneva from 10 to 14 November 1975. The meeting was opened by Dr D. Tejada-de-Rivero, Assistant Director-General, on behalf of the Director-General. After welcoming the members of the Committee, he stressed the need to contribute to the mobilization of the countries' own resources in all health sectors so that they could reach self-reliance in health as quickly as possible.

Dr Tejada also stated that in all areas, even the most specific and technical ones, an integrated approach is essential, considering each specific area as only a part not only of a more complex health problem but also of overall development. Thus, the objective for this Expert Committee was to consider how planning in oral health could be integrated with overall health planning and programming. Fundamental to this question were deliberations on:

— integration within the oral health sector,

— data-based evaluation of alternative approaches, and

— further testing and research to ensure maximum efficacity of the oral health input.

1. BACKGROUND

Although the planning of programmes to deal with oral health problems had been discussed by other WHO Expert Committees and Working Groups,[a, b] this was the first occasion on which a WHO Expert Committee on Dental Health had been convened to deal with this

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[a] WHO Technical Report Series, No. 298, 1965 (*Organization of dental public health services*: report of a WHO Expert Committee on Dental Health).

[b] *Planning and evaluating dental health services: report of a Working Group*. Copenhagen, WHO Regional Office for Europe, 1972 (Document No. EURO 5505).

subject exclusively. Special attention was paid during the discussions to WHO's policy concerning country health programming to help ensure that dental health planning would be considered in the context of total health planning and not to indicate that exclusive use should be made of any one health programming method. The Committee recognized that many approaches to planning are widely used and function well. The important thing is that systematic and careful planning be done to help ensure effective and efficient use of resources.

In considering the subject of planning and evaluation of public dental health services,[a] the Committee recognized that a broad interpretation of the title was indicated. Thus, the discussions that followed were directed at the planning and evaluation of all oral health services, both curative and preventive, available to the public in the context of total health services. This was deemed to be a necessary course to follow since (1) the extent to which oral health services are provided through public efforts varies so greatly from country to country, and (2) planning for any health services cannot be done properly without considering all resources and types of health services dealing with oral health as an essential part of total health services. Therefore, throughout the rest of this document, unless otherwise specified, the term oral or dental health services reflects this broad interpretation and includes public dental health services, but is not limited to them.

While emphasis was given to making this report valuable to developing countries, special efforts were made to make it useful to developed countries as well. In order to achieve this aim of usefulness in a variety of situations, while retaining enough specificity to have meaning and give guidance to planners and managers, the report is oriented largely towards principles and processes, examples being cited to assist in communication.

As populations around the world become more and more interested in health problems of all types and search for appropriate solutions, ever larger proportions of valuable national resources are being spent on health. There is a growing awareness that the ability of people to utilize health resources is almost limitless and yet there is a limit to the resources that can be devoted to health. Therefore, the need to plan and develop programmes that are directed to overcoming the most significant health problems in the most efficient and effective manner is critically important

[a] Public dental health services are educative, preventive, or therapeutic services that are organized, administered or financed by government organizations or community groups to promote, maintain, and improve the oral health status of groups of individuals or communities.

to developed as well as to developing nations. It is especially important to evaluate health programmes to determine whether they are in fact achieving their intended purposes within the allowable costs. This planning and evaluation process, to be effective, must be on a continuing basis and must feed back into and guide the decisions on management and resource allocation.

In dentistry, the need for planning to achieve wise utilization of scarce resources is particularly important. Virtually everyone needs access to dental health services, yet the amount of services that can be provided is grossly inadequate for this need. The material that follows attempts to guide the planner through an organized, systematic approach to formulating dental programmes based on carefully selected and quantified objectives whose attainment can be critically evaluated.

2. HEALTH PLANNING LEVELS

Health planning within a country occurs at three levels:

— national health policy formulation,

— national (or provincial/regional) health programme planning,

— health project formulation.

Planning at these levels takes place in all countries, sometimes explicitly by formalized planning procedures, sometimes implicitly as part of a continuous process of allocation of resources to health and related purposes by governments, organizations, or individuals. The national health programming effort should have functional connexions with the processes above and below it.

2.1 National health policy formulation

National health policies, either explicit or implicit, should provide guidance to non-health planners on the importance of health factors to national socioeconomic development, and also to national or provincial health planners (or a "country health programming" group). Such policies provide medium-term and long-term political and socioeconomic guidance and policy directives to which the national or provincial health objectives and programmes should adhere. When explicit, comprehensive, national health policies do not exist decisions are made nationally that imply the philosophies and policies of the decision-making bodies.

The need is recognized to replace disjointed national actions by explicit, national guiding policies. The planning processes outlined in this report and the reactions they evoke at the national level are aimed at fulfilling that need. Further discussion of this matter in relation to oral health is given in Section 3.

2.2 National health programme planning

National health programme planning is a process used to identify priority health problems of prime concern to countries in the context of their development plan ; to specify targets in these problem areas ; to translate targets into health development programmes to be accomplished during a plan period, through the identification of the activities, resource needs, and organization required to attain those targets ; and to implement, evaluate and reformulate such programmes on a continuing basis.

For this level of planning, pragmatic and flexible methods have been developed in WHO for adaptation by health administrations that wish to, but have not yet, developed their own procedures. Collectively these methods are called Country Health Programming (CHP) and throughout the procedures strong emphasis is placed on interaction between the health sector and other sectors in the socioeconomic field.

More specifically, the purposes of CHP are to :

— clarify the nature of existing health problems, as influenced by such factors as technology, urbanization, industrialization, and within the total social, economic, and political context ;

— identify the important interrelationships between the health sector and the various social and economic sectors, and between the various components of the health sector ;

— help to elaborate alternative strategies [a] in a format that constitutes a basis for choice and that is useful to decision-makers ;

— promote and facilitate implementation of health development programmes in high priority problem areas ;

— identify programme areas requiring well-managed development projects : such areas could include existing programmes, whether

[a] A strategy is the blend of health-related technologies, combined with specified political, social, educational, administrative, logistic, financial, and evaluative procedures, methods, mechanisms, and resources that are considered necessary to ensure feasibility and adaptability in the local conditions.

or not they need revision, and areas that are not yet covered by existing or planned programmes;

- encourage improvements in health planning, project formulation, management and conduct of evaluation;
- improve national health plans, especially as regards more effective allocation of resources;
- identify programme areas and projects for which external assistance might be forthcoming from such sources as: bilateral agreements with other countries; multinational agreements; United Nations agencies and foundations.

The Committee believes that the guidelines for CHP developed by WHO are very helpful for total health problem analysis and planning but that those interested in oral health planning would find guidelines specific to dental problems of additional value. The Committee also believes it important that dental planning should be done along with total health planning and therefore that dental health planning methods should be compatible with the CHP methods. For that reason the Committee followed the train of logic and essentially the sequence of steps described in the CHP guidelines and it is believed that the planning procedures outlined in this report will be found easily adaptable for use within other formalized national health planning procedures, since all such planning systems are based upon similar logical concepts and assumptions.

2.3 Health project formulation

WHO has published a manual [a] that describes planning procedures suitable for this planning level. The procedures are very suitable for planning oral health projects. Projects in oral health development are discussed further in Section 4.

3. ORAL HEALTH POLICY FORMULATION

National governments have policies that guide their actions regarding health issues. These policies may be complementary or disjointed and conflicting. They may be clearly stated and comprehensive, or they

[a] BAINBRIDGE, J. & SAPIRIE, S. Health project management: a manual of procedures for formulating and implementing health projects, Geneva, World Health Organization, 1974 (WHO Offset Publication No. 12).

may not be stated at all. While comprehensive general health policy statements for nations are uncommon, precise statements of national policies regarding oral health are even more rare. Often national action or inaction is the only or clearest indication of an oral health policy. Nevertheless, it is essential for administrators and planners to have guiding policies for planning and implementing dental programmes.

The persons given responsibility for planning a dental programme should, at an early date, identify policies that already exist or work to formulate or modify them where needed. It may be necessary to propose policies and seek concurrence from decision-making and funding bodies before proceeding with the planning process. A national oral health policy should reflect the national:

- commitment to the improvement of oral health;
- view of oral health programmes in relation to general health;
- view of the relative roles of the private and public sectors in delivery of dental services, including roles of indigenous practitioners;
- attitudes towards development, deployment, and utilization of all types of manpower involved in the health sector;
- relative priorities for receipt of services among age groups or other special categories;
- attitudes towards the relative priorities of prevention and treatment;
- willingness to invest in research and evaluation;
- expectations in terms of results from the use of public funds for dental programmes;
- view of cultural practices that are harmful to oral health.

The more precise and understandable the policy statements, the more helpful they will be. At the same time, there are advantages in leaving room within those statements for programme flexibility in order to be able to take account of changes in policy at a later date.

In the short-term, changes in the oral health policy to meet the impact of minor events can be introduced without much dislocation of oral health programmes. However, major events may occur at some unpredictable time in the future. Data collected in the global oral epidemiology programme of WHO indicate alarming and rapid increases in dental caries prevalence in large population groups in developing

countries where the disease has previously been reported to be relatively rare. On the other hand, as a result of recent advances in health research, an increasing number of diseases and conditions can now be prevented. Technology in many disciplines continues to expand rapidly and there is no doubt that further discoveries in the prevention of disease will be made. This situation obtains in the oral health sector and encourages the assumption that eventually dental caries and periodontal disease will be controlled.

Unless these events are skilfully anticipated by the planners, the situation could arise in which the education and training of dental manpower and the prevalence of dental caries and periodontal disease have opposite trends. Oral health policies must be formulated so that allowance is made for future modification to avoid such situations. One such possible change, in line with the interrelation of oral health and general health policies, and in anticipation of oral disease control, is the integration in appropriate situations of dental and medical education, dentistry being one of the specialities of health care.

It is also vital to realize, as regards both existing situations and disease trends, not only that requirements for oral health services may differ between regions in the same country, but also that the most needy groups from a dental standpoint may be different from those groups most needy in other health sectors. The most pertinent example concerns the increase in dental caries found in urban settlers in developing countries ; these people who are so often relatively overprovided in general health services may thus be underprivileged as regards oral health. Failure to anticipate this situation, by failing to prevent urban migration or by failing to provide adequate services, will lead to problems of major proportions.

These few trends and examples serve to demonstrate the need to identify carefully the areas of similarity and difference in oral and overall health policy formulation.

4. NATIONAL ORAL HEALTH PROGRAMME PLANNING

4.1 The planning process

The planning process that is described in this report is one of many that can be used to achieve the objective of facilitating the efficient and effective use of scarce resources to achieve predetermined goals. It is

divided into six steps that should be undertaken within the context of national health policies:

— situation analysis,
— problem identification and formulation of objectives,
— formulation and analysis of alternative strategies,
— identification of special efforts,
— strategy selection, and
— programme formulation.

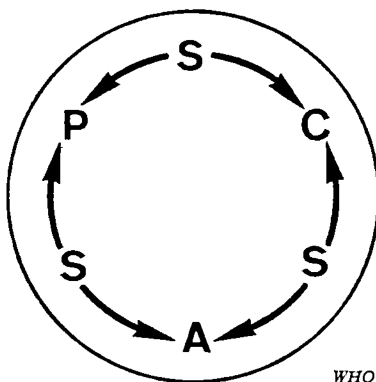
Within programme formulation there are provisions for evaluation which is, however, dealt with specifically in Section 5 of this report. These steps of the planning process are described in the following sections in the order in which they are listed above. In order to maintain a logical flow of thinking in the planning process, it is advisable to keep as closely as possible to this order, each step building on the information provided by the previous step. It is at times necessary to return to earlier steps to make modifications following detailed analyses of possibilities or redefined policy decisions based on further discussions at appropriate stages with decision-making bodies.

4.2 Situation analysis

An analysis of the situation in which programme planning and subsequent implementation will take place is essential to obtain an idea of the current health situation, the performance of the health service delivery system, and to document the development of and possible future changes in these features. Without a rather thorough understanding of the dynamics of the milieu in which people obtain oral health care, attempts to improve oral health may be misdirected and wasteful.

Given the objectives of identifying and resolving or decreasing the oral health problems of prime concern, it may be useful to think of any given planning area in terms of its dental service delivery systems. Any area may contain one or more subsystems and, in any developing economy, a single subsystem may contain components that are less clearly or formally defined than others. For example, dental manpower components may not be easily labelled according to formalized professional titles, because, in such situations, some dental functions that are usually performed by formally trained dental personnel may be per-

formed by indigenous health or non-health workers. An example of a dental services delivery system is given in the following diagram :



P = providers of direct oral health services (dentists, stomatologists, dental nurses, other dental and non-dental auxiliaries, etc.)

C = potential consumers of care, either entire populations or target populations

A = administrators, decision-makers, politicians, insurance representatives or others whose function it is to facilitate the provision and the receipt of dental services

S = oral health goods and services ; payments ; and information (goods would include items such as dentures, crowns, toothbrushes, floss, etc.)

The arrows indicate the paths through which services, goods, payments, and information might flow.

The enclosing circle represents the social, economic, and political context in which all the exchanges occur. Together these components can be conceived as structuring a system for delivering care and as such can facilitate analysis of that system and the situation in which that system operates.

The basic principles for assembling data for the situation analysis are that each item must be relevant for planning purposes ; that items for which data are gathered have mutable or changeable characteristics ; and that data can be collected from available sources at low cost, not requiring new and special surveys. Such data are best gathered by a small team of planners (including where possible a health statistician) familiar with existing data sources.

4.2.1 *Administrative considerations*

Health and oral health policy data, both quantitative and qualitative, should be collected from such sources as :

— central and regional governments, especially those ministries responsible for health policies,
— non-governmental administrators of services,
— dental care funding agencies,
— consumer organizations,
— providers of services.

Statements of relevant policies containing priorities and goals may be found in national development plans, the provisions of constitutions and by-laws, descriptions of organizational functions, in national health plans, the results of previous surveys, in resolutions passed by professional associations, etc. Such information should guide the planner in identifying incentives and constraints inherent in the current situation related to the optimum delivery of oral health services.

Health legislation that exists or is being proposed that is enabling or constraining as regards any aspect of the oral care delivery system (relating to the administrative aspects, the production, distribution and licensing of manpower, consumer eligibility, etc.) should be identified.

A flow diagram and description of the major legislative processes in the planning area is required before the relevant and appropriate entry points into this process can be determined. The roles and functions of any relevant groups that might intervene in the legislative decision-making process should be noted.

Commentary should be appended to the description of the legislation in terms of the most recent history of implementation or non-implementation and to indicate to what extent administrative decisions have affected the interpretation and thus the implementation of these laws.

Existing third-party and/or government programmes of oral health care should be examined and described as to type, scope of services, coverage of population (water fluoridation, school examinations, school treatment programmes, insurance for populations, etc.). Service records may be a valuable source of some of these data.

Care should be taken to enumerate the following budgetary information :

(1) total expenditure for health over a given period in the planning area by government and non-government sources ;

(2) total government and non-government expenditure for oral health over the same period for the same area.

These expenditures should be accompanied by indications of the number of people treated or other unit cost data where available. Where possible these data should be subdivided by category of expenditure (manpower training, delivery of direct care, personnel distribution, incentives, facilities, research and development, etc.). Since some of the available methods for recording oral diseases and treatment have a high degree of precision, the calculation of unit costs, even for rather specific services is sometimes possible and very useful.

The categories, numbers, and functions of personnel involved in administering oral health matters at each governmental or administrative level should be described. The information, evaluation, and management system at each level should be described, and the connexions between the levels should be outlined.

The number and size of the facilities used for the provision of care should be determined and grouped by type (e.g., mobile units, private dispensaries, dental laboratories, simple and multiple clinics, etc.), and their planned and actual distribution by geographic and administrative area, and the number of patients seen per facility for a specified period should be given.

4.2.2 *Consumers*

Demographic data about the current and potential consumers should be collated. Even though these represent features of the system that can rarely be altered by administrators, such information makes clear the existing incentives and constraints for the delivery of oral care services. These data should include items such as :

- — age and sex pyramids,
- — urban/rural distribution,
- — size of households by area of residence,
- — population density/distribution,
- — length of residence of identifiable subgroups of the population (by area of residence, by ethnic characteristics, etc.), and
- — population projections (based on crude birth rate, crude death rate, and both immigration and emigration rates).

Selected socioeconomic indicators such as the following should provide a fuller description of the consumer sector :

- educational attainment levels by appropriate school classifications (for example, no school attendance, primary school completion, secondary school completion, etc.) ;
- percentage of population that is economically active (in labour force) by geographic or administrative planning area ;
- distribution by occupation for each area, if possible ;
- individual and family income levels for each area ; and
- membership of special oral health care eligibility groups.

Indications of the difficulty in getting to and from the places where oral care is provided should be described, as follows :

- type and distance of transportation to care facilities both for primary and speciality care ;
- cost of transportation to care facilities in terms of out-of-pocket expenditure of consumers, and/or time spent in travelling to and from the facilities.

Additional indicators of consumer behaviour and attitudes towards the system such as the following would be helpful :

- expectations of oral health service delivery system ;
- actual reported experiences concerning the receipt of oral care services ;
- assessment of payment for services ;
- frequency and type of personal oral hygiene actions ;
- frequency of health visits in a given period ; and
- any opinions expressed concerning changes desired in the delivery system.

Selected health status measures should be presented in generally meaningful terms, such as :

- top five causes of death in the area,
- absenteeism from work due to oral disease,
- proportion of people, by age group, without any natural teeth,
- proportion of people needing prosthetic services,

— proportion of people, by age group, with caries experience,
— proportion of people, by age group, with periodontal disease,
— proportion of people, by age group, who receive regular maintenance care.

Etiological or predisposing factors in relation to oral health problems should be described, if known, such as :

— nutritional variations in fluoride intake and sugar consumption, and
— differential disease patterns by area or by population groups.

4.2.3 *Providers*

The provider sector of the dental care delivery situation should be described according to the past, present, and anticipated supply of manpower, the policies of professional organizations, and the practice patterns.

The following data should be collected regarding dental manpower supply :

— numbers by type of recognized manpower and other practitioners traditional to the country, according to age and location,
— numbers and location of training institutions for each type of manpower, and projected increases,
— numbers of graduates per year now, potential for future growth for each type of manpower and their past rate of growth,
— education and training costs for each type of manpower,
— numbers of dental health manpower leaving and entering the planning area each year, and
— projected trends in supply of manpower for primary and speciality care and by planning area.

The existing policies of organized professional associations as officially expressed in organizational documents that affect provision of oral health services should be listed.

The actual practice patterns for each major manpower group should be described :

— the numbers in the various types of practice (solo, group, institutional, etc.),
— types of specialization by type of practice (solo, group, institutional, etc.),

— membership in government or third-party service programmes,
— patient load by service programme and amount and type of service provided,
— distribution of practice locations,
— types of service provided (preventive, curative, maintenance, etc.),
— current and potential use of auxiliaries,
— income by type of service, and
— attitudes and opinions, standard working conditions, reimbursement arrangements, and other aspects of the delivery programme: these data, if available, should record the changes desired in the system characteristics by the provider group.

The availability of appropriate equipment and supplies and of maintenance services to the various categories of provider in various locations should be described.

Additionally, information should be provided about the amount, type, and cost of dental research that is currently being conducted.

4.2.4 *Presentation*

After this basic information has been collected (as completely as possible), it should be compiled into a document with appropriate narrative to describe the existing situation as clearly and completely as possible. The format must be easily comprehensible by non-dental personnel and should include tabular appendices. For each of the data items, it is essential to indicate any changes that are expected to occur during the planning period. However, facts should be clearly separated from forecasts. Also, where appropriate, any potential for development or purposeful change should be indicated.

It must be re-emphasized that material for the situation analysis should come from already existing data. Data sources should be documented and gaps in the data should be identified for later programme efforts. Occasionally, vital unavailable data might be gathered at this stage provided that it can be obtained inexpensively in less than about two weeks. For example, a pathfinder survey using the WHO oral health surveys [a] methodology might be a possibility in such circumstances provided a sample, probably of schoolchildren, is readily and

[a] *Oral health surveys: basic methods*, revised edition, Geneva, World Health Organization (in press).

inexpensively available. However, survey operations, if necessary at all, would normally be regarded as one of the special efforts needed for strategy selection and programme formulation.

The types of data listed in this section are not intended to be exhaustive, nor are all the items essential for the subsequent stages of the plan development. Judgement should be used as to what data items are essential for an adequate description of the situation in the particular planning area.

4.3 Problem identification and objective formulation

4.3.1 *Problem identification*

It is important at this stage to review the results of the situation analysis to determine the relative needs for intervention and to set priorities for action. In other words, it is important for policy makers to decide whether the forecasts of oral health status and health system performance are the highest levels attainable for the planning areas, given current knowledge and resources. If such is not the case, then they must decide whether the projected levels, though not the highest levels attainable, are acceptable. Where the forecasts of status and performance are unacceptable, a choice has to be made as to which area should receive priorities and what quantifiable objectives or goals should be set for the planning period.

To aid in this most important task, criteria need to be established for selection of problems to be addressed. The criteria should be selected and numerical weights, according to relative values, should be assigned by local officials according to the local situation. These should be established prior to problem definition.

Some examples of criteria for deciding the priority of problems that have been employed are :

General criteria

(See Annex 1 for examples of weighting)

(1) Relevance to meeting politically expressed needs,
(2) Relevance to increasing social satisfaction and social equity,
(3) Relevance to economic development,
(4) Relevance to population growth,
(5) Relevance to future quality of life,
(6) Relevance to family wellbeing,
(7) Relevance to modernization,
(8) Relevance to cultural patterns.

Oral health criteria

(1) Oral conditions of an emergency nature,
(2) Oral conditions threatening many people,
(3) Oral conditions causing great public concern,
(4) Oral conditions causing death,
(5) Oral conditions that can be prevented or controlled.

Using these criteria, problems can be listed in order of weighting and a decision made as to the level below which a problem would not be included in the current plan (see Annex 1).

4.3.2 *Formulating objectives*

Once the problems most in need of intervention have been determined and clearly stated, the planner should proceed to formulate objectives in quantifiable terms for attainment during the planning period. The objectives should be precise, responsive to the determined need, and stated in terms that are measurable and meaningful to dental and non-dental personnel. Once the final objectives have been established, then intermediate objectives should be formulated, again in measurable terms and for appropriate intervals of time. The intervals between these intermediate targets (sometimes called milestones or critical events) should be long enough to give opportunities for change to occur as a result of programmes or extrinsic forces and yet sufficiently frequent for management to react in a timely and effective manner. Where changes in disease prevalence in either direction and in demand for services are occurring rapidly, the timing of these intermediate stages is critical.

Certain indicators, both dental and non-dental, are available for these objectives. Examples of the dental health indicators are the caries experience index (DMF), periodontal and malocclusion indices or measurements, and other epidemiological methods.[a] Examples of non-dental indicators are instruments for the measurement of acceptability, accessibility, and availability of dental programmes to consumers. It is also necessary, of course, that the objectives be stated in a manner that is understandable by political leaders and the public, and for this purpose the epidemiological and sociological indicators should be translated into laymen's terms.

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[a] *Oral health surveys : basic methods*, revised edition, Geneva, World Health Organization (in press).

4.4 Formulation and analysis of alternative strategies

Having decided which objectives the programme should attempt to attain during the planning period, it is advisable to consult with some of the groups likely to affect policy determination or resource allocations. The planning document as developed so far should be reviewed with them to ascertain reactions and indications of support, rejection, or need for modification of objectives or other supporting material.

The next step is to formulate feasible alternative strategies for reaching the agreed objectives. As it is important to obtain expert, objective input into this phase of planning, it is wise to establish, wherever feasible, working groups of appropriate experts having diverse backgrounds and opinions to assist in this process. Their involvement should help to gain support for implementation of the strategies that are ultimately selected.

When formulating alternative strategies, the factors taken into account in establishing the objectives should be kept in mind. For example :

— the priority needs of the whole population ;

— the needs of specific target groups, e.g., children, the aged, families, industrial workers ;

— the type of service needed, e.g., preventive, curative, educative, selective, incremental, limited, comprehensive ;

— the kind of disease or condition which the service is intended to combat, e.g., dental caries, periodontal disease, oral cancer ;

— the integration of oral health services with general health services ;

— the cost/benefit ratio of methods of combating and reducing the problem.

It is possible, of course, for strategies based on combinations of these factors to be employed, the ultimate objective being to select the most effective combination of alternative strategies. In addition, it will frequently become apparent, as alternative strategies are considered, that constraints exist that will interfere with their implementation. It is then necessary to determine which strategy is the most feasible approach in the existing situation. For the planner and others to decide which strategies are preferable, it will be necessary to describe each and then give the strengths and weaknesses of each, as well as constraints to their successful implementation. Regrettably, desirable strategies must often

be discarded at this stage owing to insurmountable obstacles to their ultimate fulfilment.

4.4.1 *Examples of alternative strategies*

An example is useful in order to illustrate the nature of the process employed in the formulation of alternative strategies. We are considering a country or province that has a predominantly rural population, though urbanization is proceeding at a rapid rate. There is a central oral health planning group and the opportunity to coordinate all elements of the oral health services available or likely to be available. The prevalence of caries is extremely low, but increasing to moderate in urban areas. The prevalence of periodontal diseases is uniformly high, and the demand for services is low except in the urban areas and for emergencies. There is 1 dentist per 100 000 population and an equal but more rapidly increasing number of operating dental auxiliaries. There are both time and cost constraints on the more rapid production of professional manpower. Alternative strategies are available both *between* types of services, e.g., the concentration on preventive or restorative care provided in structured (systematic) or unstructured (demand) services and *within* a type of service, e.g., different preventive and health education approaches and different programmes of systematic care. Moreover, relevance of these strategies will differ between the urban and rural populations.

Objectives were defined in relation to 12-year-old children, to achieve :

(1) at least no further increase in dental caries prevalence in urban and urban-fringe schoolchildren and perhaps a reduction in the number of DMF teeth per child of 1/2 to 1 tooth,

(2) maintenance of the low prevalence of dental caries in rural children, and

(3) elimination of loss of teeth in urban and urban-fringe schoolchildren.

The possible alternative strategies were (1) the selection of professionally or self-applied topical application methods for fluorides, or systematic administration, (2) the choice of applying prevention to all children or to a group selected on the basis of an indicator such as DMF measurements of population sectors, where the disease showed signs of increasing, or (3) the selection of a systematic care procedure from several patterns of regular selective care.

For each of these strategies there were cost-effectiveness considerations and logistic constraints. With regard to prevention, the unsuitability and general lack of public water supplies virtually ruled out fluoridation of water as an option, the possibility of greater effectiveness of professionally applied topical fluoride application had to be weighed against the low cost of supervised self-applied methods, and all methods had to be considered in terms of the possible effects on the generally low caries prevalence. As regards systematic care, the dental manpower requirements for the options considered ranged from 1 : 1200 to 1 : 3300 depending on the comprehensiveness of the service provided.

It should be noted that while cost-effectiveness is a very powerful factor in making choices in such situations, there are many other factors to be considered. The important point is that for a number of situations very clearly defined alternatives can be provided as the basis for planning in the oral health sector.

Many other similar examples could be quoted of problem situations that illustrate the various considerations necessary at the time of formulation and analysis of alternative strategies. It is most important, at this stage of the planning process, that those with this responsibility demonstrate awareness of the various options available and are creative with regard to their formulation and analysis. Each alternative strategy needs to be examined carefully as regards its feasibility—technical, social, political, institutional, financial, and economic.

Given the constraints that are found in any country, an appropriate decision might be sequentially to implement increasingly comprehensive strategies. For example, it is often necessary to begin with emergency dental services for the entire population, if possible including preventive and health education components, followed by care and special preventive measures for selected target populations, and then by comprehensive programmes implemented in an incremental fashion for various groups until the entire population is covered both preventively and curatively. At each stage of this sequence, appropriate manpower production must be planned and evaluation must be envisaged for the programme as a whole. Allowance must also be made in calculations for the achievement of the objectives.

4.5 Identification of special efforts

Most programme strategies that are likely to be considered will need to be accompanied by certain time-limited supportive activities to help overcome constraints and to help ensure success. Such activities are

adjuncts to the major programme but may be essential to achieving the final objective. These activities are referred to here as special efforts in order to emphasize the need to plan for them and to anticipate resource and time requirements for their completion.

Some examples of special efforts that may be necessary for the success of dental programmes are :

- — data gathering of a non-recurrent nature ;
- — development of a special training programme for indigenous community workers or leaders to assist in programme implementation, especially in the areas of emergency care and health education ;
- — acquisition of expert consultants and technical assistance from other countries or from WHO ;
- — field testing of preventive-control and other programmes before they are implemented widely.

Each of the alternative strategies proposed for consideration should be reviewed to determine what special efforts or projects [a] would be needed if they were selected for implementation. The nature, extent, and cost of these special efforts should be given to help in selecting the most desirable programme strategy.

The continuous process of planning, implementation, and evaluation may disclose the need for other special efforts that were not anticipated at the time the original planning was done. The need for such efforts may also arise from new technological developments, outcomes of biomedical or clinical research, changes in public or political attitudes, or changes in attitudes or behaviour of the provider segment.

Specific, time-limited external assistance with funds or expertise may be necessary for these special efforts and should be sought and accepted as they fit into the selected strategy and the programme objectives. There is always the danger that donors will be ready to give certain types of assistance that are inappropriate to the programme for which the assistance is needed and that acceptance of such assistance would hinder rather than facilitate programme and goal achievement.

4.6 Strategy selection

Once the alternative strategies for achieving the selected objectives have been described, together with their advantages and disadvantages,

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[a] It may be helpful to refer to the WHO publication on procedures for formulating and implementing health projects mentioned earlier in the report (see footnote p. 9).

constraints, and required special supportive efforts, the critical step of selecting the most desirable strategies for each objective should be taken. To aid in this process and to gain support for the future implementation of the selected strategies, it is desirable to involve in the selection process, to the extent possible and practical, technical experts, providers, consumers, and administrators.

Prior to initiating the process of strategy selection, a set of weighted criteria should be developed and agreed upon specifically for this selection. Some criteria that might be used to identify the most desirable strategies are :

— the degree to which the strategy fits with general health policy and actions,

— the degree to which the proposed action is compatible with oral health policies and actions,

— the degree to which the strategy facilitates or establishes desirable long-term trends,

— the probability of success in achieving the quantified objectives in the desired time-frame,

— freedom from resource or attitude constraints now or in the forseeable future,

— the ratio between cost and effectiveness,

— the degree to which desirable or undesirable side benefits or effects are anticipated.

The criteria actually used should be established by the planner to fit the situation in the planning area. The same goes for the assignment of a numerical weight to each criterion. Through experience it may be found that the proposed criteria do not adequately discriminate among the proposed alternative strategies and additional criteria may be required. In some situations, the final choice may have to be made on subjective judgments. Regardless of how the decisions are made the assumptions and considerations used should be made explicit and recorded for future reference.

4.6.1 *Consultation with superiors*

When the strategies have been selected it is advisable to confer with those who will be making decisions about the acceptability of the programme and resource allocation. Care should be taken to have the documents prepared in such a way that the decision-makers can be led

through the planning and decision process and understand the rationale for recommending certain strategies. It is important to elicit questions, concerns, opinions, and guidance at this session. It may be necessary to return later with specific answers and responses to questions and more comprehensive arguments to support the recommended directions. At least a tentative concurrence should be obtained before proceeding to the next step.

4.7 Programme formulation

It should be noted that although each strategy has been selected for a good reason, trimming may be necessary because they are not feasible in combination. When the strategies have been identified, described, selected, and considered feasible as a whole with the available national resources, the resulting documents and discussions will give guidance to the formulation of the actual programme. A programme can best be defined as a schedule for the application of the physical, human, and financial resources and the introduction of the institutional changes required for the implementation of one or a combination of several strategies aimed at a specific target. It describes in more detail than the corresponding strategy(ies) the technical approach, techniques, and procedures (technology) and how they will be applied and managed (application) ; it specifies the target population (geopolitical, population groups, etc.), the coverage expected, the institutional and political changes required, if any, and who should implement the strategy (staff), with what (resources), and when (timing). In other words, the plan should indicate precisely what is to be done, by whom, using what methodologies, when, and at what cost. Generally, the formulation of programmes will represent the compilation and consolidation of the information analyses and decisions developed during the preceding steps and will include :

— a short review of the existing situation, including a statement of the problems,

— a statement of objectives and strategies,

— a list of programme activities and their expected results,

— a description of the managerial approach (authority and responsibilities) for implementation,

— a general programme activity schedule,

- a statement of resources required in terms of manpower and facilities,
- an estimation of budget requirements, including capital and recurrent cost,
- methods for evaluation.

It is advisable to incorporate into the programme formulation, a brief, self-contained summary, that will help the decision-makers to obtain a clear impression of the proposed programme. It should be stressed at this point that a logical and systematic approach in programme formulation should always be kept in mind so as to justify the programme proposal, especially in terms of allocation of resources. It is helpful to represent diagrammatically the various actions, responsibilities, and timing for discussion purposes and for management guidance. Critical steps in the implementation process should be identified and provision should be made for determining when they have been accomplished. Arrangements should be made for outcome assessment during the programme operation to be built into the system where possible but using special assessments as necessary; the chapter on evaluation elaborates this subject further.

It is advisable to subject the programme plan to review by appropriate experts and persons who will be involved in the implementation and to adjust it accordingly. The decision-makers should then be briefed and consulted on the proposed plan of action. The plan should be further modified as indicated by their reactions. A ceiling of budget allocations, for example, has in many cases led to reformulation of a programme. Modification of the plan may also be required even as implementation is underway, as a result of the evaluation process. As modifications are made at these various stages, the budgets, outcome estimates, and timing should be adjusted accordingly.

5. EVALUATION

Evaluation, it has been said, is the mirror image of planning, being intended to determine the value or worth of the planned programme, to see if it is in fact being carried out as prescribed, and to determine whether the required outcomes and the planned output are actually occurring. Once a plan is put into operation, it must be ascertained

whether the objectives are being achieved, what is the extent of the programme's contribution to the improvement of the oral health of the community, and whether each activity of the programme is playing its appropriate part and progressing at the planned rate.

Such an evaluation can demonstrate the worth of the service to the community and indicate needed adjustments. Obviously a good plan and a good evaluation of it at periodic intervals can be of great assistance in obtaining public and financial support.

Information regarding the situation existing before the commencement of the programme is essential to later evaluation of what the programme has achieved. This information is commonly called baseline information and should relate to planned output and to the things the programme is designed to change. Thus the kind of baseline information needed for the situational analysis should be broad enough to provide a reference point for the quantified objectives.

A health education programme may have as its objective an increase in the proportion of a population using the available services in any one year from 20% to 30%, or a preventive programme may aim to reduce DMF teeth at a specific age by 20%. In an integrated plan, manpower production is linked to these objectives and if the objectives are not being achieved as expected, only timely evaluation of those specific objectives can save the situation from serious imbalance.

The basic variables to which attention needs to be paid are resources, activities, and outcomes as predicted by the planned objectives. A determination of effectiveness requires the comparison of measures of health status at the beginning of the programme with the same measures at its completion and with the planned level of health status as contained in the objectives set for the programme, remembering that even the achievement of outcome objectives may suffer in evaluation from a demonstration of overconsumption of resources. Planned outcome compared with observed outcome must be viewed in terms of the resources and activities planned and actually consumed and conducted, being careful to take into account other forces or happenings that may have contributed positively or negatively to the outcome. The latter factor will help to separate the true effects of the programme from the effects of extraneous forces.

A plan can be considered to represent the predicted links between the expenditure of a defined set of resources in the performance of activities as described in detail by the planner and the performance of these activities to attain a state of dental health as calculated or estimated to be the potential outcome of the planned input. If the plan is considered

as a prediction, evaluation of the consequent programme could be called the test of its validity and of the assumptions on which it was built.

One very pertinent example of the importance of such testing comes from the general observation that although the results of laboratory or small clinical trials [a] of preventive agents or methods may demonstrate a certain, sometimes dramatic, level of effectiveness, the same agents or methods applied in a broad field programme may fail to show the same or even any effect. Such an example emphasizes the need to evaluate methods and whole strategies as part of the plan and programme implementation to ensure that the expected effects are being achieved. This need exists even when methods and strategies have been successful in other situations in which disease levels and management or other factors were different. It may also exist in a situation where a programme may be outliving its usefulness.

In the past there has been a tendency to forget about the implications of differences in knowledge, attitudes, and behaviour on the resource and activity variables. The social and behavioural sciences are now becoming more solidly based on facts and these will be more and more at planners' and evaluators' disposal to help them describe more accurately the resources and activities and thus to improve the usefulness of the management tools. It may be well understood for instance that the same expenditure of resources in two similar programmes may lead to the performance of activities that are very different in quality and quantity, and may eventually result in very different health situations for the " target " population, because of different levels of knowledge, attitudes, and behaviour on the part of the providers or the consumers, or both, in the two programmes. Relevant data come from the results of an International Collaborative Study of Dental Manpower Systems [b] which demonstrate large differences in disease prevalence and treatment for the five countries studied. One of the outstanding differences between the consumers in this study concerns their preventive behaviour.

Planning and evaluation must therefore take account of these attitudinal and behavioural dimensions and components in all programmes and examples of the instruments used in the Study mentioned in the previous paragraph for the collection of such material are available on

[a] Principal requirements for controlled clinical trials of caries preventive agents and procedures. London, Fédération Dentaire Internationale, 1974 (Technical Report No. 1).

[b] See BARMES, D. E. & COHEN, L. K. *Community Dent. Oral Epidemiol.*, 2: 37–39 (1974).

request.[a] Direct and indirect measures for evaluation of oral conditions are discussed below.

Direct measures

Direct measures are those that compare " before and after " data on those variables planned to be changed by the programme. This has often been done in programmes of fluoridation of public water supplies. Obviously such data are extremely valuable for programme assessment and for communicating the results to others.

Indirect measures

The results of a particular action may not be readily or immediately apparent or easily measured and thus it may be necessary to resort to using indirect indicators of programme effects. For example, it would take many years to measure directly the effects of a health education programme aimed at reducing bone loss from periodontal disease in terms of total periodontal status. Instead, it may be necessary for purposes of evaluation to look at such factors as the change in oral hygiene practices, the levels of oral hygiene status, and the prevalence of gingivitis. It is obvious that there may be dangers in indirect methods of attributing effects to particular actions.

Evaluation takes place with reference to norms, conditions, qualities, or attributes on the basis of a certain underlying set of values. The criteria that one uses in evaluation should consequently be expressed explicitly for the purposes of analysis. These criteria, naturally, vary with the cultural, political and socioeconomic characteristics and background of the evaluators. They may also vary with the evaluator's position in the system under observation, whether he is outside or inside, whether he is a professional or a non-professional, a provider or a consumer. Obviously, evaluation varies also with the nature and quality of the measurements of the selected criteria.

The main characteristics used as criteria for evaluation of health programmes are : [b]

(1) Effectiveness : has the stated objective been attained as a result of the programme ?

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[a] Requests should be addressed to : Dental Health, World Health Organization, 1211 Geneva 27, Switzerland.

[b] For further examples of the use of these criteria in dentistry see : Planning and evaluating dental health services. Copenhagen, WHO Regional Office for Europe, 1972 (Document EURO 5505).

(2) Efficiency : how much has attainment of the stated objective cost in absolute terms and in comparison with what was anticipated ?

(3) Appropriateness : has priority been given to the most useful strategy for attainment of the stated objectives ? Is acceptability of the strategy optimal ?

(4) Adequacy : has the programme covered the total health problem it was aimed at, or just one part of it ? What are the levels of availability to the various sections of the population ?

Because careful evaluation is so important as a way of demonstrating success and because it can be so difficult to do well, it is suggested that the evaluation plan, like the programme plan, be subject to review prior to its institution, perhaps by a steering committee. Objectivity and breadth of perspective can be increased in this way.

As had been said before, evaluation is an integral part of programme management and leads to constant reappraisal of programme design and execution. This *evaluation-modification process* must always take into account the social/political/professional effects and reactions and consider whether the measures taken are in reality appropriate to and adequate for the problem. The evaluation must always be alert to changes in attitudes, knowledge, and technology, not only in dentistry, but also in the whole health field and must recommend appropriate changes as the programme progresses.

6. SUMMARY AND RECOMMENDATIONS

The Committee recognized that in different countries the economic, social, and political structures, as well as structures and mechanisms for dealing with health matters are in different stages of development. It also recognized that many countries accept the concept and value of national health planning but that few actually carry out planning effectively. While recognizing that there are many existing health planning systems, the Committee agreed that there are many common elements among these planning systems and that the important principle is that careful, systematic planning and evaluation should take place. There was agreement that there are certain specific principles and steps in planning that are applicable to almost all situations regardless of the political or social situation.

The Committee wishes to emphasize certain points and made a number of recommendations :

(1) Careful and continuous national health planning, using a logical systematic approach, is essential in order to make wise use of resources for oral health services.

(2) Health planning should take place within the context of the national, social, political, economic, and health policies and oral health planning should be an integral part of that planning.

(3) Oral health programmes, therefore, should be consistent with the existing state of development of, and make logical advances in, both preventive and curative programmes consistent with developing resources.

(4) Planning for dental health manpower should be an inseparable part of total oral health programme planning.

(5) It is important that oral health planners be aware of the potential of non-health and non-dental resources in achieving oral health objectives and use these resources imaginatively.

(6) Evaluation is an essential component of responsible programme administration; it should be planned as an integral part of all programmes and should assess health programmes in terms of appropriateness, adequacy, effectiveness, and efficiency. It should be understood that availability, accessibility, and acceptability of services to consumers and providers are also factors to be accumulated.

(7) Health planning, programme implementation, evaluation, replanning, and reprogramming should be a continuous process.

(8) Programme administrators should see their role as one of spanning the gap between the community for which the programme is designed and the politicians.

(9) The development of adequate numbers of qualified programme planners and administrators is essential to the proper conduct of oral health programmes. Educational materials for workshops having this objective are available from WHO.

(10) The International Collaborative Study of Dental Manpower Systems (WHO–US Division of Dentistry) serves as an excellent example of a system for assessing national programmes and for interrelating the many factors involved in the provision of oral health services.

(11) Further efforts are needed for the continued improvement of planning and evaluation methods appropriate to dentistry.

(12) Continued development is needed with regard to systems for gathering standard oral health data either from surveys or records and for rapid data analysis and retrieval, as an extension of the WHO global

oral epidemiology programme area. Although the methods developed for indicating oral disease levels has already achieved much, further advances in this area should be encouraged.

(13) Country health administrators should be encouraged to look outside their boundaries, when indicated, to use technical expertise and assistance available elsewhere.

(14) Further research, either combined or limited to the oral health sector, to increase the range of feasible options for improving oral health status should be encouraged both within countries and internationally, with an emphasis on finding out what can be successful for whole population groups.

(15) New knowledge and insights into problems in the areas of planning and evaluation should be shared with other countries so that positive findings can be applied with the least possible delay and so that unsuccessful programmes are not repeated without suitable modification. All aspects of programmes and methods used, including innovative manpower structures or teams, should be reported.

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Annex 1

THE USE OF CRITERIA FOR DECIDING PRIORITIES AMONG NATIONAL HEALTH AND HEALTH-RELATED PROBLEMS [a]

1. Weighting of criteria

General criteria	*Score (weight)*
The problem, or its solution, should :	
— conform to a " phased programme of action ",	21
— meet politically expressed needs,	12
— increase social satisfaction—psychological, physical, and economic—and increase social equity,	18
— be of economic benefit,	17
— conform to local cultures,	14
— emphasize the needs of younger age groups.	18
	100

Direct health criteria	
The problem should :	
— predispose members of the community to sickness,	21
— kill people in large numbers,	18
— make people sick in large numbers,	18
— cause damage to the development of young people,	16
The solution should :	
— produce immediate improvement in community health,	16
— be available to as many as possible of the population at risk.	11
	100

[a] The examples given illustrate the criteria and weighting system used in one country in the non-dental field.

Statement of health-related and health problems, with appropriate weighting

National problems	*Total criteria score*
Malaria—" nation-wide "	186
Malaria—" man-made "	186
Wider coverage by primary health care	186
Bilharzia—" man-made "	186
Public's lack of health information and lack of hygienic habits	186
Communicable diseases, especially those preventable by immunization	186
Need for safe and adequate water supplies	168
Environmental sanitation (refuse and human excreta disposal)	166
Protein-calorie malnutrition	152
Gastroenteritis (children, adults)	151
Tuberculosis	178
Premature deaths	82
Economic loss due to sickness	62
Iron deficiency and hookworm anaemia	62
Trachoma and conjunctivitis	47

It was decided not to continue to state separately the four problems with a criteria score of less than 100.

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