3. PLANNING AND MANAGEMENT OF CONTROL PROGRAMMES

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3.1 Purpose and scope

This section describes planning methods and gives guidance for their application and the formulation of national programmes. Although used in this section for complex programming, the managerial tools for designing framework, functions, schedules and evaluation procedures can be applied in the same way for small programme components such as the establishment and operation of a diagnostic laboratory or of vaccine production.

Subsequent sections describe the detailed field and laboratory techniques and legislative requirements. This section relates these aspects to management specifications, resource allocation and allocation of responsibility.

This should guide the planners in programme development. Many planning tools have been developed for industry, commerce and administration. The complexity of rabies control does not, however, leave many options. Acceptability, applicability and success of zoonoses control programmes with large numbers of interacting factors depend largely on the art of developing and presenting plans which are simple and which can easily be read and understood not only by politicians but also by all those responsible for programme execution.

Step 1: Governments should identify and officially appoint, with the agreement of the ministers concerned, a national programme director who could also serve as secretary of an interministerial executive committee. In many countries the director of national veterinary services (Chief Veterinary Officer) has been entrusted with these functions, since most of the activities of the programme fall under the responsibility of his office.

Step 2: The national programme director should prepare a comprehensive national plan (formulated as a project document) aiming at the elimination of human and canine rabies. Already at this stage of planning, close cooperation is essential between various sectors (e.g., agriculture, health, education, interior and natural resources) and different administrative and political levels (e.g., provinces, districts and in particular the communities). The plan can describe a programme phased over a number of years. It should preferably include an initial phase of self-reliance, whereas subsequent phases of wider geographical and technological coverage may partly depend on international technical cooperation. The plan should also ensure the maintenance of the rabies-free status as the ultimate phase.

Step 3: If required, legal provisions should be modified to permit smooth and effective programme implementation.

Step 4: Once the programme is formulated and legally acceptable, it should be endorsed at the cabinet level by all ministers involved so that funds, staff, facilities and materials are properly allocated. It is often advisable or even essential for a national rabies control programme to become part of a larger national plan, e.g., economic, health, rural, environmental or industrial development plans. This may have to be considered under step 3.

Step 5: An institutional framework should be established which involves important components for information and education.

* Readers are recommended to read this section in conjunction with WHO Technical Report Series No. 709, 1984 (Rabies: Seventh Report of a WHO Expert Committee).
Step 6: In addition to funds, staff, facilities and equipment of the specialized services, resources should be mobilized as foreseen in the programme (e.g., community participation).

Step 7: Programme execution and evaluation according to a plan of work and set targets.

General remarks on steps 1-7: The responsibilities and resources available to the field coordinators as well as the communities are crucial components of national rabies control programmes. The national programmes must identify and mobilize by all means (legislation, education and information) the participation of communities with their local administrations, schools, religious and civic groups and events.

3.2 Principles of programme planning

Three components of the planning process have to be distinguished:

- the theoretical application of systems tools
- the adaptation of the tools to prevailing conditions so that agreements can be reached on cooperation by all administrative and technical levels and with the community at large
- the description of a programme or project in the form of a document giving details of inputs, outputs and responsibilities by time and place within the defined institutional framework.

Planning of zoonoses control programmes is too often considered to be a rather theoretical or abstract exercise. Experience in the planning of comprehensive national programmes shows, however, that all phases of the managerial process require very close cooperation of the community and of the authorities and institutions at all administrative levels. Facing most complex conditions and approaches, the planner must seek the collaboration of physicians, veterinarians, ecologists, sanitary engineers, specialists in education, etc. Intersectoral cooperation can, in modern systems of administration, only be ensured by clear definition and allocation of responsibilities.

The management tools and principles presented in this section have been selected because they have proved most valuable in a number of national and international projects:

a. Consider and formulate the programme as an integral part of a national development plan, national health plan, plan of primary health care or rural development, whichever appears to be appropriate and feasible.

b. Plan the programme in collaboration with persons of the community, technical services and government.

c. Motivate the intersectoral group of coordination through socio-economic analyses.

d. Obtain agreement for a simple and effective structure (institutional framework) ensuring the strict implementation of the programme from the level of the government, over the day to day functions of the field coordinator(s) to the level of community and special population groups.
3.3

e. Make sure that national regulations provide clear responsibilities for items a. - c.

At an international level, it is obvious that countries can help each other by exchanging experience on legislation, structure and management of comprehensive zoonoses control programmes. Historically, this has in fact always been the case, although legislation and structures have often been transposed from one country to another in an ill-conceived manner so that services have become inefficient in precisely such complex fields as zoonoses control.

f. Make sure that the plan is adapted by the ministers concerned thus committing staff, funds, equipment and facilities of the sectors concerned.

g. Make sure that relevant regulations are accepted by the people and observed at all implementation levels. Ensure community participation.

h. Make sure that the programme includes the maintenance of rabies-free status, following the elimination of the disease.

3.3 Prerequisites for programme planning

(a) Target species

First of all the planner must know and consider the characteristics of canine rabies epidemics and the target species of control measures (see Section 1.3.1).

(b) Field methods

Secondly one should consider in the planning process the whole range of field methods applied in human and canine rabies control (see Section 1.3.2).

(c) National structures and resources

It is important to prepare an inventory of all resources available in the country for programme implementation. Major components of the resources and related structural elements are specified in the following section.

3.4 Development of national structures and resources

The WHO Expert Committee on Bacterial and Viral Zoonoses* made detailed suggestions for the development of national zoonoses control programmes, which are fully applicable to rabies control.

The major recommendations in the following paragraphs are adapted to the specific needs of a national programme of human and canine rabies elimination.

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3.4.1 Effective structures for intersectoral cooperation and coordination

In spite of progress in technology, human and canine rabies have not yet been brought under control in many countries. The measures taken have remained inadequate because existing resources were not fully utilized or included in the institutional framework for rabies control, or had not even been identified.

Many programmes and good intentions in rabies control have failed because it was felt that an intersectoral zoonoses committee, a liaison office or a veterinary public health scheme at the national level alone would solve the problem. In the absence of a national programme (i.e., commitment to a complete plan), such committees and liaison offices often had difficulty in functioning usefully. Although veterinary public health services, committees or intersectoral zoonoses committees may be able to prepare the technical background and plans for a national rabies control programme, it should be very clear that such a programme must be approved by the ministries concerned, which should also bear jointly the full responsibility for executing the programme. This means that decisions are to be made at ministerial level not only on the operational aspects but also on the allocation and commitment of funds, staff and equipment.

At the intermediate administrative level, all officials responsible for detailed programme planning and day-to-day executive functions must be clearly identified, and resources allocated from the comprehensive national programme.

At the community level, resources are to be mobilized. Details of the approaches and targets must be outlined (see Sections 5.2.8 and 5.2.11) for the information and guidance of the public, in order to obtain their cooperation.

3.4.2 Legislation

In planning a national rabies control programme, the legislative requirements should be clearly defined so as to permit effective programme implementation. It is the task of the planners to ensure that all aspects and components of the complex intersectoral programme are covered by existing legislation. This may require a review of existing legislation. See Section 4 (Legislation).

3.4.3 Inventory and development of resources

One of the weaknesses of many national programmes of rabies control is the inadequate use made of all relevant resources in the different administrative sectors. While enlisting the cooperation of professional disciplines with their specialized institutions, the decision-makers are often not aware of the support that can be mobilized and successfully organized at the community level (Section 5.2). Thus most important part of the planning phase is the identification of all possible resources that might contribute to meeting objectives involved in a human and canine rabies control programme (Section 5.2). This is a prerequisite for the formulation of programme components requiring external assistance, in order to strengthen existing resources or supplement them.

The key to a successful programme often lies in training personnel at governmental and intermediate executive level, including managerial as well as technical field staff, in planning, implementation and evaluation.
Requirements and resources for national training programmes in managerial skills are a most important prerequisite for the rational allocation and use of resources.

The following example indicates how resources may be mobilized in a national rabies control plan.

(a) **Internal resources usually not requiring external input:**

- training courses for technical staff, including adequate briefing of field advisers on the scientific basis of the national programme
- seminars for local and central government administrators
- meetings of coordinating committees
- materials for dog registration
- national staff (salaries and career prospects of professionals, technical assistants and supporting personnel)
- community support for campaigns (information, dog registration, mass vaccination and stray dog control).

(b) **Internal resources often requiring supplementary external input:**

- programme management (e.g., training, programme planning, evaluation)
- surveillance (materials for shipment, means of transportation, fluorescence microscopes, mouse colonies, training of laboratory personnel)
- control (vaccine application, dog control, equipment and other critical inputs)
- vaccine production (equipment, materials and training for production of vaccine for man and animals) and application (training, logistics)
- research (operational research, as well as basic research on dog ecology)
- pamphlets and film showings for public information.

There are a number of specific areas in which resources can often be mobilized by a joint effort of various sectors. In particular these are the development of disease-reporting systems for rabies in man and animals (see Section 5.4) and of laboratory services. In many countries diagnostic laboratories operated by health services are equipped and prepared to carry out rabies diagnosis in animals (e.g., the Pasteur Institute in different parts of the world). In other countries the whole diagnostic work for rabies in man and animals is performed in veterinary laboratories. Similarly, vaccine production and vaccine testing are often entrusted to one laboratory for both veterinary and medical purposes. The efficiency in the use of personnel and facilities that could be achieved in such joint laboratories is obvious. They could make it possible to offer more sophisticated and more extensive services by spreading equipment costs over two sectors. In addition, the immediate availability to both human and animal health services of information on rabies in human beings or animals could greatly expedite the coordination of control measures by the two sectors. The laboratory should be so organized that tests are performed integrally within the chains of operation of each sector concerned.

The cold chains for both human and animal rabies vaccines may already exist in rural areas of a number of countries as part of previously established veterinary programmes for livestock-disease control. On the other hand, cold chains established in a number of countries for expanded programmes on immunization in the medical field could be of great use for storage and shipment of both vaccine types.
The participation of the public is essential for all rabies control programmes. At community level there must be an educational and informative programme to teach the public about the hazards of rabies and its prevention, the value of rabies surveillance and how persons exposed to rabies can get treatment. This requires the cooperation of various sectors: health, agriculture, education, home affairs, national resources, tourism, etc.

3.5 Management tools

Decision-makers are often surprised by the complexity of rabies control programmes. This sometimes causes a certain reluctance to approve programme proposals in their entirety. Fragmentation or mutilation of a comprehensive plan often leads, however, to ineffective measures and to the discredit of the responsible services.

It is therefore useful to describe first the rabies problem in its complexity, then to define all possible objectives of a control programme, and eventually to formulate the plan. This requires a gradual development from the complexity of the problem to the simplicity of a plan which can easily be understood and which would ensure the desired results.

3.5.1 Determination of factors influencing the occurrence and spread of rabies

The determination of the prevalence of the infection in the human and animal population and the factors influencing its spread within the dog population, and from this reservoir to man, are vital preliminary steps in the development of a national programme. The factors responsible for the spread of canine rabies may include geophysical situation, social, economic, cultural and behavioural patterns, which influence the density, dynamics and mobility of the dog population and thus the circulation of the virus in its reservoir.

3.5.2 Setting the objectives of national programmes of human and canine rabies elimination

Reference was made in the preceding paragraph to the importance of determining factors influencing the occurrence and spread of rabies. It is the task of the planner to analyze each factor from the standpoint of its vulnerability to possible interventions. This makes it possible to determine the objectives and approaches of a control programme.

It should be realized that the ultimate goal of a national programme is to eliminate canine rabies. The optimum objectives are ramified, but they broadly consist of:

(a) the coordination of existing control activities in order to upgrade their functions and achievements,
(b) the establishment of surveillance programmes,
(c) the control of spread by animals,
(d) the detection, prevention and treatment of disease in man.

There are numerous cases of inefficient and economically wasteful projects in developing countries, simply because in the early phase of planning objectives and sub-objectives were incompletely defined. For example, rabies
surveillance remains inadequate if only the laboratory services are improved and the plan does not properly deal with case notification and the collection and shipment of specimens. There are many other aspects which must be considered in an efficient programme of rabies surveillance (see Annex 3.4).

National control programmes may vary from one country to another. The methodologies and strategies required to reach the above goals are summarized in Section 3.5.4 and in the "tree" diagram of the control of human and canine rabies (see Annex 3.4). This diagram should be adapted to the needs of a specific control programme and used in particular to identify critical pathways.

The ultimate objective of a human and canine rabies control programme must be one of the national development objectives. The objectives of better health for the people, and health for all by the year 2000 should be paramount. Next in the hierarchy of objectives should be those of improved health economics, rural development, occupational health, protection of national resources, tourism and recreational activities, etc. The intersectoral character of a canine rabies control programme is reflected by these objectives. Overall objectives and programme components should also define the contribution of zoonoses control to primary health care, and thus link it with national programmes in that field. In setting objectives, and attaching levels of importance (priority) to these objectives, one should be most careful, since some of the objectives, which may seem rather costly and take many years until they are met, may nevertheless be of the utmost importance and should be included in the list of immediate activities. This often concerns components requiring research and professional education, which may precede by 5-15 years the effective project implementation in a country. For example, some developing countries may not have enough resources to achieve effective rabies surveillance within the next 5 years, since the activation of public cooperation and the establishment of appropriate services for field investigations require an enormous input. In this situation it may not seem very useful to train staff in rabies diagnosis and to buy expensive equipment for fluorescent antibody techniques or mouse tests, but it would perhaps be more effective to begin with mass vaccination of dogs and classical veterinary measures.

However, what are the consequences and the drawbacks of such decisions for the long-term development of a country? Obviously there are always conflicts between medium and long-term plans. The present problems of limited funds and staff should nevertheless be overcome partially by appropriate training schemes and limited rural aid programmes, which would at least prepare the country for an objective presumably to be set for a later stage in the national development. Therefore the setting of priorities should not lead to negligence of future needs, particularly if their satisfaction requires many years of foresight and preparation.

Moreover, the planners should not overlook the interest and initiatives of politicians, technical experts, scientists and persons in a community, which should not be suppressed by the mechanism of a national plan, but carefully preserved and mobilized. Programme objectives may have to be adapted to such conditions, e.g., an eminent expert may in his country by his authority

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promote human vaccine production. On the other hand, there is a recent spread of canine rabies into a new area and the local political bodies exert great pressure on the government to establish a national programme of canine rabies elimination based on the import of animal vaccines and the immediate increase in animal rabies vaccine production. The planners may find programme objectives which combine partially both programme orientations: improvement of post-exposure treatment in man, and control of the disease in animals. Setting of objectives is thus a complicated process and not only based on "mechanical" calculations but also on foresight and the "feeling" for interactions between needs, interests and resources.

3.5.3 Application of indicator values in a logical framework of programme planning

For the detailed definition of project outputs and the corresponding inputs in terms of manpower, funds and information, the "logical framework for programme planning" offers a simple tool. This tool should not only be used for the accurate costing of the total project but also as a guide for project implementation and continuing evaluation.

The logical framework is a very simple planning aid. It defines the objectives of an activity, the expected outcome which should be measurable by figures (ratios, rates or indices) and defines the input in terms of manpower (m/m = man months) and monetary units. Moreover, it gives the source of information on whether and how the output has been achieved.

For example, it specifies as output that until May 1983, 200,000 dogs should be vaccinated and that the information on the doses administered will be available from the district veterinary office of the city concerned. The input of this vaccination programme must be specified in m/m and funds, where the latter are detailed for costs of vaccine and its storage, transportation of vaccination teams, vehicles, etc.

This planning aid therefore represents the rational modules of planning as they are generally developed by human intellect. However, the need to specify targets, to make results measurable and to describe input in terms of m/m and funds permit the combination of small modules such as that above in a very complex programme. To the example of vaccination of 200,000 dogs we would add modules on training of personnel, on public information, specifically on community participation, and perhaps on vaccine production. Thus, individual activities can be combined in a complex project or programme with broad objectives or additional specific objectives.

An excerpt from the presentation of a rabies control programme is given as an example in Annex 3-2. The logical framework is most useful for the quantification of the input required, i.e., the costing of a project, and the comparison of time and resources required for alternatives. For this purpose it should be used in combination with the objective tree diagram (see Section 3.5.2).

Once the control methods are chosen and the programme is being implemented, the logical framework facilitates evaluation at any time. It is thus most useful in programme management.

For the specification of measures and their expected effect it is indispensable to choose indicators which permit a quantitative assessment of the programme implementation. "Objectively verifiable indicators" are part of the "logical framework" for planning and evaluation of zoonoses control programmes and they are important as a basis for the formulation of activities and plans of work (Section 3.5.6).

Numerous indicators can be used to plan and assess rabies control programmes. Of primary significance are health indicators (e.g. incidence, prevalence rate per capita of rabies or exposure, case frequency per square kilometer of animal rabies). Of course the ultimate objective of a canine rabies control programme is the improvement of health, including the reduction of risk factors threatening it. Therefore these indicators are of greatest value. Often the outputs are defined by service indicators such as number of animals examined, vaccinated or destroyed, persons trained, information and material distributed, villages visited, vaccine doses produced, etc. In rabies control ecological indicators are also often essential for effective planning and evaluation. Such indicators may concern population densities of wildlife species (e.g., jackals) contributing to the reservoir and spread of diseases. Combined indicators are also often used such as the ratio of rabies cases in man (health indicators) over the number of persons who received post-exposure treatment (service indicators), or the number of cases recorded in animals (health indicators) over the number or percentage of animals vaccinated (service indicators).

The above-mentioned indicators can be considered as "performance indicators" once they are used to plan and measure the quantity and quality of the programme product in relation to space, time and resources.

Besides these indicators with health-related components, there are certain policy and administrative indicators which are important for the programme but do not, by themselves, indicate any improvement of health such as disease incidence or health-related factors (levels of risk or services rendered). Such administrative indicators concern the adequacy of legislation, the clear description of the institutional framework, the programme organization by clear lines of supervision and reporting, and the allocation of resources (personnel, facilities, equipment, funds and information). In intersectoral programmes such indicators of policy and administration should become an integral part of planning and continuing evaluation. Administrative conditions and national policies and resources may change during the programme implementation. It is therefore most useful to specify and continuously observe indicators concerning the compatibility of the programme with regulations, the policy of the different governmental sectors involved, the functioning of executive organs at national and lower administrative levels (e.g. zoonoses committees), the cooperation of neighbouring countries in border areas and other international aspects of technical cooperation, the voluntary participation of communities and civic groups, etc.

3.5.4 Cost effectiveness analyses and strategy selection

The effectiveness of various inputs in a complex programme may be forecast or assessed in terms of funds required and health or services obtained. The comparison of costs of different strategies, for example, is most useful for policy decision-making:

Policy A: satisfactory coverage of the whole country by human post-exposure treatment, using modern, safe and highly potent human vaccines and immunoglobulins. This would in addition require funding of most intensive rabies surveillance in animals including community education and participation.
Many developing countries are at present spending most of their resources for human post-exposure treatment only, generally without adequate epidemiological surveillance so that the number of human deaths is in fact hardly reduced. This calls for ever-increasing inputs in human vaccine provision, but the result remains rather disappointing since human cases continue to occur. This is due to the persistence of rabies in animals and partly also the lack of a well-aimed practice of post-exposure treatment. (Not all exposed persons report for treatment and many others are treated without actually having been exposed to a rabid animal.)

Policy B: total vaccine and vaccine delivery costs could be calculated for countrywide mass vaccination of dogs and for stray dog control. For this purpose a programme must be formulated and the costs be calculated, covering all components of complete elimination of canine rabies. This also includes epidemiological surveillance though not as intensively as is required for complete recording of human exposure. It should however be borne in mind that, following elimination of canine rabies, human post-exposure treatment diminishes only gradually over about 5-10 years until a minimum level is attained. According to experience, this minimum is unavoidable in view of exposures to rabid or suspectedly rabid animals outside the country or in border areas.

A subdivision of Policy B may concern mass vaccination and stray dog control with (B1) minimum surveillance and (B2) intensive surveillance combined with an improvement in human post-exposure treatment as well as an accurate assessment of the control of the epidemic in animals.

Policy B should, as a separate forecast and section, also include the costs of the maintenance phase, i.e., the continuing input ensuring the human and canine rabies-free status of the country. Canine vaccination may continue and epidemiological surveillance must continue, though at a reduced level. However, the maintenance phase requires an improved infrastructure of services which is often a most desirable general development objective of a programme of canine rabies elimination (see Section 3.5.6).

Example: at a WHO Seminar on Planning and Management of National Programmes of Canine Rabies Elimination (Athens, 1982) data have been analyzed from some Mediterranean countries (e.g. Algeria, Morocco, Tunisia, Turkey) which suggest the following generally applicable ratios:

1 human rabies case: 15 cases recorded in dogs: 600 persons treated: 24,000 dogs: 240,000 people.

Important ratios are the number of human deaths and persons to be treated per number of dogs to be vaccinated and human population (1:600:24 000:240 000)

In a country under study (Tunisia) less than 10% of the total dog population must be considered as stray dogs in the sense of a canine rabies control programme. Programme costs in this country indicate vaccination costs (vaccine plus delivery) of US$ 2 per dog. Killing of a stray dog by shooting may amount to US$ 5. One human post-exposure treatment, including the cost of loss of work and treatment of adverse reactions, amounts to at least US$ 200. The actual costs for Policy A are, however, much higher per exposed person since this would need highly intensified surveillance should human rabies actually be avoided.
Policy A would, under the given circumstances per population of 240,000 inhabitants and per year, amount to at least US$ 120,000 (600 persons × US$ 200), yet there will be one human death. Should this human case be avoided, the costs will be much higher, due to the higher number of persons to be treated and/or intensified surveillance.

Policy B can be considered fully effective in the first year if about 85% of the supervised dog population are vaccinated and about 50% of the stray dogs are removed. The costs of this canine rabies elimination under this policy and per 240,000 inhabitants would cost US$ 46,800 (i.e., 20,400 dogs × US$ 2 plus 1,200 dogs × US$ 5 = US$ 46,800). Following the elimination of rabies, these costs can further be reduced although the maintenance of this rabies-free status will continuously require input (see below).

3.5.5 Evaluation during execution and on completion of programme

Evaluation is vital to maintain impetus and progress. It should be linked to cost/benefit assessment in order to ensure continuation of funding. Projections must be made of the likely costs and benefits for the programme according to whether it proceeds at a fast or at a slow speed. Preferably, an epidemiological unit should be used to monitor disease incidence and to provide information on progress.

Evaluation on completion of the programme is especially important. First, there is a need to verify that the objectives have been completely attained. Secondly, evaluation provides an important basis for decisions on future control programmes. If the original venture is successful and clearly beneficial in relation to cost, then the experience gained may be applied elsewhere. Even costly failures can provide valuable lessons for the future.

Although evaluation should be understood as a permanent process for programme improvement and correction at any point of time, regular and formal progress and evaluation reports may be required monthly from field coordinators and diagnostic laboratories, and every 6 months from hospitals and the designated epidemiology unit, to be submitted to the national programme director and from him to all committees, officers and institutions responsible for components of programme execution. The national programme director will also prepare annually a report on progress, budget used and required, and an evaluation to be submitted to the Interministerial Committee responsible for the overall programme and the allocation of funds, staff, facilities and equipment within the sectors involved.

A programme of human and animal rabies elimination will always lead to a continuing service ensuring the rabies-free status of a country. It should, therefore, be understood that evaluation during programme execution and on programme completion concerns activities until the confirmed country-wide elimination of the disease. A final evaluation should not be undertaken earlier than 2 years after the last cases of indigenous human and canine rabies have been recorded. According to the WHO Expert Committee on Rabies a territory or country should not be designated as rabies-free at an earlier date.

Evaluation includes some key elements in accordance with the indicators used in programme planning (see Section 3.5.3).

(a) The work plan and the work actually performed are obvious sources of information on programme evaluation.
(b) Have targets specified by date and indicator values been met? In addition this needs assessment of the epidemiological data in relation to the number of vaccinations applied in man and animals, stray dogs removed and specimens recovered and examined in the diagnostic laboratories.

(c) Has the input in terms of manpower and funds been made according to the plan and does this input actually suffice to meet the set targets?

(d) Do input work plan and activity targets need to be modified in order to comply with the overall objectives and targets of the programme?

(e) The cost-effectiveness projections have to be assessed at least once annually on the basis of actual costs incurred and progress recorded.

(f) Have changes to be made in the programme because original assumptions were incorrect or because of unexpected epidemiological developments within or outside the country or in view of new technologies becoming available?

(g) The evaluation with conclusions and suggestions for programme improvement and correction must be translated into appropriate action by the Interministerial Committee, the National Executive Committee and its Programme Director.

3.5.6 Programme formulation

The presentation of the programme in a comprehensive project document (*PRODOC) which is nevertheless easy to read and to understand has become one of the crucial managerial tasks in intersectoral work. Programme formulation requires the cooperation and consent of politicians, administrators, technical experts and representatives of the community and civic groups. The different educational and social background and interests of these persons calls for a simple format of the document with easy access to all critical and important components of the programme.

The WHO Expert Committee on Bacterial and Viral Zoonoses* has devoted much of its report to the problem of proper programme formulation. It has given priority to health-programme development and implementation over mere, and often only, fictitious "improvement" by restructuring national services.

It must be emphasized that health oriented programmes in the field of zoonoses control are always intersectoral and closely linked with primary health care.

Special sections of the report of the above-mentioned Expert Committee are devoted to supporting activities in such areas as legislation, information systems, including disease reporting, joint human and veterinary laboratory services, disposal of dead animals, community participation, and other areas which could provide an inventory of resources and help to develop them. A comprehensive programme description should include these areas as contributing components. It would also require reference to operational research projects and training programmes at veterinary schools and other professional education.

A special section of the programme description should deal with the cost-effectiveness of individual control measures or the overall programme. A document describing a human and canine rabies elimination programme should in any case include an analysis of the health significance and social and economic consequences of rabies in man and animals, as well as of human post-exposure treatment. Moreover, such a document should give cost-benefit analyses of rabies and its control, taking into consideration the economic savings in dog bite surveillance and post-exposure treatment in man on the assumption of partial control and/or total elimination of the disease in dogs.

The systems tools described in Sections 3.5.2 and 3.5.3 have become most useful for the analysis and preparation of the components of a comprehensive rabies control programme. In particular, the objective tree diagram (Annex 3.4) and the "logical framework" with its specification of indicators (Section 3.5.3) are used for the assessment of time and resources required to meet sub-objectives and major objectives or goals (the latter may also be called "ultimate objectives" or "national development objectives"). Thus, the application of these tools is part of programme planning, whereas the programme with the chosen activities will eventually be described in its project document in a different and more simple way.

The following guide for programme description has been adapted from the Report of the WHO Expert Committee on Bacterial and Viral Zoonoses.* The proposed lay-out is in line with procedures developed within the UN-system and has also been used for bilateral projects. The lay-out follows the steps of a planning process. Experienced specialists can therefore use this as a guide even without the tools described in Section 3.5.3, for the planning of relatively simple national projects.

The following paragraphs describe an example of a comprehensive national rabies control programme, which may be adapted to the prevailing conditions.

Lay-out of a comprehensive national zoonosis control programme**

a. **Preamble**

This may summarize on one page the main elements of the programme for the executing agencies, the phases for its implementation, the budgetary consequences, the expected effects, the advisability of supplementary projects and the persons who contributed to preparation of the plan.

b. **Objectives of the project**

These may be sub-divided into long-term, medium-term and immediate objectives. In projects extending over a period of years, with well-defined phases of project development, the objectives of each phase should be clearly defined in this section. Objectives can be elaborated by applying the planning tools described in Section 3.5.2. Countries depending on international technical cooperation in programme implementation should aim at


** Examples of comprehensive national programmes are available from the Veterinary Public Health Unit, WHO, Geneva.
independence as far as possible. Particularly the initial phase of the programme may be planned as a phase of self-reliance. Also the ultimate phase, maintaining a rabies-free status, should be ensured by national resources.

c. Special considerations

Resolutions of the government which led to the programme and relevant initiatives at sub-governmental and at international levels can be referred to in this section, e.g., Resolution WHA 31.48 of the 31st World Health Assembly on "Prevention and control of zoonoses and foodborne diseases due to animal products".

d. Background and justification

i) Geographical and basic data of populations (of man and animals) and national services (e.g. institutions, manpower, surveillance and production capacities);

ii) epidemiological observations in man (rabies and exposure cases) and animals;

iii) socio-economic consequences;

iv) current status of rabies control (including post-exposure treatment in man);

v) other essential information (e.g., conditions in neighbouring countries and/or services of existing programmes of international technical cooperation);

vi) cost-effectiveness analysis. (See also Section 3.5.4)

e. Institutional framework

All contributing components in the national structure must be clearly identified. Comprehensive plans generally include, at governmental level, two components:

i) one inter-ministerial organ responsible for the overall programme (programme, budget, personnel, equipment);

ii) a national executive organ with its director or directorate for programme execution.

At a lower administrative level the most decisive components of the day-to-day operation must also be clearly described for field programme coordinators, vaccination teams and community institutions (see paragraph 'h' of this section and Annex 3.1). The institutional framework also includes central and peripheral laboratory services (e.g. for vaccine and reagent production or diagnosis), national institutions of education, training, research, field investigation, etc. Moreover, international and national institutions outside the country may become an integral part of a national programme for rabies control (see paragraph 'l' of this section).
3.15

f. Activities

The description of the activities in this section should offer the possibility to assign, without ambiguity, responsibilities to each of the components of the institutional framework. This section is therefore of the utmost importance since it solves otherwise often serious problems of competence and responsibility. It is essential to study most carefully at all levels every condition, and obtain suggestions of the people and their political representatives, of administrative authorities and technical services.

g. Work plan

This section should describe the major activities in the sequence of expected events (e.g. "vaccination of a defined number of dogs in the area concerned between July and October 1982", or a "seminar for 80 field assistants held in June 1982 at the central veterinary Laboratory on stray dog control") and contains all the elements to define major targets. The work plan should be given in a tabulated form (Annex 3-3 provides an example). The workplan must ensure harmony between the objectives in respect of three main areas of programme development: (i) the increasing geographical coverage of a country-wide programme, (ii) the technological coverage and advances (e.g. operational research projects, local vaccine production and diagnostic services), and (iii) manpower development (professional and auxiliary staff). These three areas are often difficult to harmonize for the control of a single zoonosis. It therefore may become a non-soluble problem for the planner if a government wishes to combine the control of canine rabies with the control of another zoonosis. The analysis of requirements, of areas and period to be covered, and of prerequisites (assumptions) are facilitated by modules of inputs and outputs as they are obtained with the tool of the "logical framework" (see Section 3.5.2).

It is most useful if the work plan identifies for each component (activity) not only the responsible institution but also the responsible officer.

h. Project organization and management

Lines of communication, supervision and reporting, as well as general coordination within the overall programme should be described in this section. It should refer explicitly to the components of the institutional framework (administrative and scientific bodies, and individual offices and officers) and their interrelationship.

A simple chart showing the institutional framework with its essential lines of programme execution is most useful to detect and deal with gaps, overlapping, ambiguities, hierarchical tangles, and other discrepancies in the overall programme. Annex 3-1 gives an example of the organization plan of a national rabies control programme.

i. Project costs and funding

This section, with its budget tables for (i) project budget covering government contributions in cash, (ii) project budget covering government counterpart contributions in kind, and (iii) project budget covering co-sponsor contributions, requires special detailed estimates of the numerous activities. The preparation of this section is often most difficult. Budget provisions should, however, be calculated with the utmost accuracy since the total will be the basis of a cost-effectiveness analysis for the
whole project and thus be crucial for the government's decision on its implementation. An annex to this section should specify all assumptions on which calculations are based (e.g. one disposable needle per 6 dogs to be vaccinated, or one information leaflet per school class per year, or one poster per 2000 inhabitants per year).

j. Evaluation

This section should consider the need of systematic evaluation throughout programme implementation (for details see Section 3.5.5). Specifically this section should determine the intervals between reports to be provided by local veterinary and medical services, field coordinators, diagnostic laboratories, hospitals, the central epidemiological unit and the national programme director.

Evaluation of each activity must be part of overall programme evaluation and adaptation to new conditions.

k. Implications for subsequent operations of national services (maintenance phase)

The programme must describe (with an annex giving details) the consequences of successful elimination of human and canine rabies for the years to come, in which the rabies-free status must be safeguarded. The essential elements will be:-

- continuing annual vaccination of dogs or bi- or tri-annual dog vaccination campaigns supplemented by special vaccination requirements concerning dogs born between such vaccination campaigns or dog populations in areas at particular risk of infection (borders, cities, tourist centres, etc.)

- enforcement of import requirements (Section 6.6). This has consequences for port and airport services, quarantine establishments, etc.

- continuing public awareness programmes and appropriate professional education in a number of sectors

- advisory services for treatment of travellers exposed outside the country and for persons bitten within the declared rabies-free country or territory

- establishment of contingency plans and emergency services to contain and eliminate an outbreak due to an imported case of animal rabies.

The maintenance phase requires:

- a rapid communication system (radio or telephone) between veterinary officers, field coordinators and the national programme director;

- materials at the periphery (local veterinary station or livestock development officer) for specimen collection and shipment;

- vehicles (cars or bicycles) to serve rapid transport of diagnostic materials from the periphery to the laboratory;

- reserve of vaccine, cold chain and equipment for vaccine storage and application as well as storage of diagnostic specimens (at least one permanently operating fuel refrigerator in each peripheral veterinary station);
- facilities and equipment for rapid diagnosis;
- vaccine for animals and for humans according to the projected needs (see also Section 5.5);
- education material (films, pamphlets for schools, etc.);
- quarantine facilities according to import requirements;
- International Certificate for the Vaccination of dogs and cats leaving the country.

Costing: many of the major requirements for the maintenance phase have already to be met during the time of canine rabies elimination. Quarantine facilities and the maintenance of the communication system and cold chain as well as cost of continuing vaccination and surveillance, including details of laboratory equipment, training, travelling and meetings of responsible officers, must not be neglected. There are many examples of initially successful programmes which eventually failed because of neglect of the continuing efforts needed to assure the success of rabies elimination for future generations. It should be understood that the material and intellectual resources of the maintenance phase of the programme merge into the infrastructure of a country and thus improve the socio-economic situation as a whole, particularly in rural and under-developed areas.

1. International services to programme development

This section should describe the technical cooperation with neighbouring countries and international services (e.g. WHO Collaborating Centres for Rabies or Zoonoses Centres) in programme planning and implementation. Cooperation in training, provision of diagnostic reagents and special investigations could be specified in this section.

The WHO Expert Committee on Rabies described the principles, requirements and management of rabies control programmes.* The WHO Expert Committee on VPH**, on Parasitic Zoonoses***, and on Bacterial and Viral Zoonoses**** gave recommendations for the establishment and strengthening of veterinary public health services. The latter report specifically deals with the planning and management of comprehensive national zoonoses control programmes. Moreover, two of the reports (**, ***)) give lists of review books and articles, as well as addresses of international organizations and zoonoses centres, and of relevant specialized collaborating centres of WHO and FAO.

The Report on Bacterial and Viral Zoonoses**** provides in addition examples of health information concerning zoonoses control. These examples are particularly useful in the fields of occupational health and of primary health care. (For further details on international services, see Section 7).


PROJECT ORGANIZATION AND MANAGEMENT

(Example of a national programme of dog rabies elimination)

Inter-Ministerial Committee

National Executive Committee and Programme Director

RCC MWANZA
RCC MARA
RCC KAGERA
RCC SHINYANGA

Inter-Regional Coordinating Committee

Field Coordinator

District Coord. Committee

Local Authorities

District and its local services

Public education
Community participation

Dog registration and vaccination, destruction of unvaccinated dogs

Lines of Coordination

Lines of Programme Execution including Coordination
**Example of the Logical Framework for the Planning of Stray Dog Control in a Specific Country**

<table>
<thead>
<tr>
<th>Narrative Summary</th>
<th>Objectively Verifiable Indicator</th>
<th>Means of Verification</th>
<th>Important Assumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joint output</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control of</td>
<td>Reduction of stray dogs to less</td>
<td>Annual census by the</td>
<td>Cooperation of the</td>
</tr>
<tr>
<td>stray dogs</td>
<td>than 10% of the total dog</td>
<td>epidemiological services</td>
<td>public in stray dog</td>
</tr>
<tr>
<td></td>
<td>population by 1985</td>
<td>and reports of national</td>
<td>control as well as</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and district rabies</td>
<td>in licensing of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>control committees</td>
<td>owned dogs</td>
</tr>
<tr>
<td>1 Output</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legislative basis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and incentives</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1 Ordinance for</td>
<td>In force as from 1.1.1983</td>
<td>Legislative and</td>
<td>Availability of law</td>
</tr>
<tr>
<td>capture and</td>
<td></td>
<td>administrative documents</td>
<td>supporting the</td>
</tr>
<tr>
<td>destruction of</td>
<td></td>
<td></td>
<td>ordinance</td>
</tr>
<tr>
<td>unclaimed dogs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>not wearing a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>vaccination tag</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2 Supplementary</td>
<td>In force as from 1.1.1983</td>
<td>Report of Ministry of</td>
<td>Ability of community</td>
</tr>
<tr>
<td>tax for fertile</td>
<td></td>
<td>Agriculture and of</td>
<td>administrations to</td>
</tr>
<tr>
<td>owned female</td>
<td></td>
<td>municipalities, or the</td>
<td>organize this in</td>
</tr>
<tr>
<td>dogs</td>
<td></td>
<td>the Ministry of Finance.</td>
<td>cooperation with</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Report of the Ministry</td>
<td>the society for the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>of Agriculture</td>
<td>protection of animals</td>
</tr>
<tr>
<td>1.3 Purchase by</td>
<td>In force as from 1.1.1983</td>
<td></td>
<td></td>
</tr>
<tr>
<td>the Government of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>puppies of owned</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dogs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Input</td>
<td>Consultations with civic groups</td>
<td>Files of the Ministry</td>
<td>Capability to develop</td>
</tr>
<tr>
<td></td>
<td>and experts 1982/83</td>
<td>of Agriculture</td>
<td>a programme of public</td>
</tr>
<tr>
<td></td>
<td>10,000 S</td>
<td></td>
<td>awareness as specified</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>under project “improved</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>rabies surveillance”</td>
</tr>
<tr>
<td>2 Output</td>
<td>4 (areas) x 5 (team members) x $\frac{1}{3}$ m/m (1 week) = 1 m/m</td>
<td>Animal census, reports of the rabies surveillance centre or the Ministry of Agriculture</td>
<td>Ability to vaccinate between 90 and 100% of owned dogs in the census areas</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Proportion of marked (owned) dogs which were tagged when vaccinated over total number of animals counted in the selected areas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Input</td>
<td>4 x 1000 = 4000$</td>
<td>Reports of the Ministry of Agriculture</td>
<td>Availability of vaccination teams to vaccinate almost all owned dogs in the areas</td>
</tr>
<tr>
<td>Census teams annually</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information and cooperation of the public in the 4 areas annually</td>
<td>4 x 2000 = 8000$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costs of transportation and equipment annually</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3 Output

Removal of dogs, proceeding simultaneously with vaccination programmes

Dogs removed:
- 1982: 10,000
- 1983: 40,000
- 1984: 60,000
- 1985: 60,000
- 1986: 40,000
- 1987: 30,000
- 1988: 30,000

3 Input

Manpower
- Teams of 3 persons
  - 2 teams in 1979: 2 x 3 x 12 m/m per year
  - 5 teams subsequently: 5 x 3 x 12 m/m per year

Equipment
- Anaesthesia guns 50: 50 x 300 = 15,000$
- Cars, cages: 50,000$

Kennels (2 per province): 12 x 10,000 = 120,000$

Poison: 5,000$

Reports of stray dog control teams

Ability to ensure acceptance of control measures by the public

Records of district and provincial administrations and of the Ministry of Agriculture

Possibility of using kennels in the communities and of applying poison safely under certain circumstances in suburban areas, whereas anaesthesia procedures and capture is required in rural areas and highly populated city areas.
Output

Hygienic disposal of animal carcasses in relation to disease, diagnosis and control

Incineration: diagnostic specimens of 1500 animals

Rendering: in 2 existing plants: 50% of destroyed dogs

Burying: 50% of destroyed dogs

Reports of district veterinary offices, diagnostic laboratories and stray dog control teams

Availability of services to collect dead animal bodies for recycling in rendering plants

4 Output

Incineration: diagnostic specimens of 1500 animals

Rendering: in 2 existing plants: 50% of destroyed dogs

Burying: 50% of destroyed dogs

Reports of district veterinary offices, diagnostic laboratories and stray dog control teams

Availability of services to collect dead animal bodies for recycling in rendering plants

Input

Purchase of two incinerators

$2 \times 6000 = 12,000$

As 4 output

Availability of two incinerators at the site of diagnostic laboratories

Machinery for burying at the charge of district administration

Use of existing services, costs not quantifiable
**EXCERPT FROM A WORK PLAN FOR HUMAN AND CANINE RABIES ELIMINATION IN TANZANIA**

<table>
<thead>
<tr>
<th>Item</th>
<th>Activity</th>
<th>Location</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Establishment of the Inter-Ministerial Committee, National Executive Committee and bodies for dog rabies elimination in Mwanza and Mara regions</td>
<td>At all administrative levels</td>
<td>March 1981 May 1981</td>
</tr>
<tr>
<td>5.</td>
<td>Procurement of vaccine, vehicles and other materials, selection and training of staff (8 veterinary officers) at the interregional level (Mara and Mwanza) for the campaign of first phase</td>
<td>Dar es Salaam Mwanza, Mara</td>
<td>March 1981 15 May 1981</td>
</tr>
<tr>
<td>7.</td>
<td>Training of teams in dog vaccination and dog destruction.</td>
<td>Mwanza (Field Coordinator)</td>
<td>April 1981 15 May</td>
</tr>
<tr>
<td>Item</td>
<td>Activity</td>
<td>Location</td>
<td>Schedule</td>
</tr>
<tr>
<td>------</td>
<td>-------------------------------------------------------------------------</td>
<td>-----------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>9.</td>
<td>Seminars at district level with authority of divisions, wards and villages to discuss reasons and procedures of the campaign</td>
<td>UKEREWE</td>
<td>1 May - 15 May</td>
</tr>
<tr>
<td>10.</td>
<td>Dog vaccination and destruction of unvaccinated dogs in UKEREWE: 68 villages</td>
<td>UKEREWE; Mwanza (Field Coordinator)</td>
<td>15 May - 15 July</td>
</tr>
<tr>
<td>11.</td>
<td>Collection of specimens and shipment to Dar es Salaam for rabies diagnosis in campaign area</td>
<td>Dar es Salaam; Mwanza (Field Coordinator)</td>
<td>30/31 July - indefinitely</td>
</tr>
<tr>
<td>12.</td>
<td>Evaluation of results of UKEREWE campaign</td>
<td>Mwanza</td>
<td>June 1981</td>
</tr>
<tr>
<td>13.</td>
<td>Preparation and implementation of campaign in BUNDA District</td>
<td>Mwanza (Field Coordinator)</td>
<td>November 1981</td>
</tr>
<tr>
<td></td>
<td>(analogic to items 5 - 12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Feasibility study and preparation of plan of action for the establishment of rabies diagnosis laboratory at the Veterinary Investigation Centre in Mwanza (special PRODOC)</td>
<td>Mwanza</td>
<td>June 1981</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>December 1981</td>
</tr>
<tr>
<td>15.</td>
<td>Elaboration of a plan of work for animal rabies vaccine production at national level (special PRODOC)</td>
<td>Dar es Salaam</td>
<td>June 1981</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>December 1981</td>
</tr>
<tr>
<td>16.</td>
<td>Evaluation of all components of 1st phase of the programme</td>
<td>Dar es Salaam; Mwanza (Field Coordinator)</td>
<td>February 1982</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mwanza</td>
<td>March 1982</td>
</tr>
<tr>
<td>17.</td>
<td>Detailed planning of 2nd phase of programme covering whole regions of Mwanza and Mwanza</td>
<td>Mwanza (Field Coordinator); International Tech. Cooperation</td>
<td>February 1982</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>March 1982</td>
</tr>
<tr>
<td>18.</td>
<td>Establish rabies diagnostic laboratory of Veterinary Investigation Centre in Mwanza (special project)</td>
<td>Mwanza; Dar es Salaam Technical Cooperation</td>
<td>February 1982</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>December 1982</td>
</tr>
<tr>
<td>19.</td>
<td>Production of animal rabies vaccine at national level:</td>
<td></td>
<td>April 1982</td>
</tr>
<tr>
<td></td>
<td>Capacity 500,000 doses per year (special project)</td>
<td></td>
<td>April 1983</td>
</tr>
</tbody>
</table>
TREE DIAGRAM FOR CONTROL OF HUMAN AND CANINE RABIES

Principal Considerations

1. General objectives

2. Establishment of surveillance

Control of human and canine rabies

A. Production of vaccines and anti-agglutinins

B. Control in animals

C. Prognosis, prevention, and treatment in man
1. General objectives

Meet general objectives (apply as appropriate to categories 2, 3, 4 & 5)
2. Establishment of surveillance

Establish laboratory services

Meet requirements of field investigation

Establish surveillance

Define geographical coverage

Provide mechanisms for reporting to data centre

Define tests to be carried out

Ensure effective flow of information

Establish epidemiological evaluation system

Histological tests

Type of test

FA test

Mouse inoculation

Serological surveys

Determine ways of communication

Decide on data to be recorded and assessed

Inform local administration and service

Inform government

Cooperate internationally

Collect and prepare specimens for shipment at ambient temperature, frozen, or 4-10°C

Ship specimens to laboratory by public transportation, animal owner, or special services

Utilize local administration and professional services

Investigation of outbreaks

notification

through local professional services

by the public

around public awareness

mass media

schools

community events

civic groups

other measures (regulations, &c)

veterinary posts

local administration

police

medical practices

primary health care posts

hospitals

Define geographical coverage

Histological tests

Type of test

FA test

Mouse inoculation

Serological surveys

Determine ways of communication

Decide on data to be recorded and assessed

Inform local administration and service

Inform government

Cooperate internationally

Collect and prepare specimens for shipment at ambient temperature, frozen, or 4-10°C

Ship specimens to laboratory by public transportation, animal owner, or special services

Utilize local administration and professional services

Investigation of outbreaks

notification

through local professional services

by the public

around public awareness

mass media

schools

community events

civic groups

other measures (regulations, &c)

veterinary posts

local administration

police

medical practices

primary health care posts

ehospitals

Establish laboratory services

Meet requirements of field investigation

Establish surveillance
3. Production of vaccines and immunoglobulins

- Produce anti-rabies vaccines and immunoglobulins

  - Determine total requirements and type of products
    - Vaccine for man
    - Vaccine for dog immunization campaign
    - Vaccine for animals other than dogs
    - Antiserum or immunoglobulin for man

  - Specify available production capacities
    - Production costs versus imports
    - Benefit in respect of progress in rabies control

  - Establish potency and safety testing
    - Cost-benefit analysis
4. **Control of animals**

- **Control of stray dogs**
  - Establish dog control teams
  - Modify environmental conditions to reduce carrying capacity of habitat for dogs

- **Strengthen rabies control in animals**
  - Produce and test vaccine
    - Select and purchase vaccine
      - for dogs
      - and meet storage requirements
    - Personnel
      - Vaccination centres
      - House-to-house visits
      - Community participation
      - Licensing and identification of dogs

- **Reduce contacts between dogs**
  - Leashing
  - Muzzling
  - Increase tax (to reduce population of owned dogs)
5. Diagnosis, prevention and treatment in man

Establish diagnostic services

- to detect rabies in man
- to detect rabies in animals

Protect high-risk group

- Special education and training
- Safety in handling and shipment of animals and specimens
- Pre-exposure immunization
- Availability of emergency kits and services

Produce or import vaccine and immunoglobulin or antiserum

Meet requirements for storage and distribution

Arrange for immediate and proper post-exposure treatment

- Through advisory services to individual physicians
- Through rabies treatment clinics
- Ensure immediate reporting of cases of exposure and rabies in animals and man
## CONTENTS

4. **LEGISLATION**

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<td>4.2 The model legislation</td>
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<tr>
<td>4.3 Note on Article 8: Detention and isolation of dogs</td>
<td>4.9</td>
</tr>
<tr>
<td>4.4 Note on Article 9: Registration or licensing of dogs</td>
<td>4.9</td>
</tr>
<tr>
<td>4.5 Note on Article 10: Vaccination of dogs</td>
<td>4.9</td>
</tr>
<tr>
<td>4.6 Rabies-free territories</td>
<td>4.9</td>
</tr>
</tbody>
</table>
4. LEGISLATION

4.1 Introduction

This section sets out draft model legislation for use by countries when drawing up or updating a national law, act or ordinance for the control of rabies in dogs. It is based on the legislation used in countries that have conducted successful campaigns to control rabies in dogs and by these means have eliminated the disease in the canine and human populations. If enacted in full the model legislation would provide all the powers necessary for the operation of a complete programme for the control of rabies in dogs. This would include the reporting of cases, or suspected cases, in dogs, their slaughter for diagnosis, the declaration of rabies-infected areas, and within these areas, the registration, licensing and identification of dogs, the control of movement of dogs, both in or out of the area, and when being exercised locally, the compulsory vaccination of dogs and the rounding up and disposal of stray dogs.

However, a full programme such as this may not be appropriate to the disease situation in any particular country, or there may be national financial limitations on what the country can afford to do.

The model legislation as set out in Section 4.2 below has been designed to enable it to be modified to meet such varying needs. For example:

(a) For a programme to include dog registration and vaccination but not stray dog destruction

omit Article 11.

(b) For a programme to include dog vaccination and stray dog elimination but not dog registration

omit Article 9.

(c) For a programme of dog vaccination only, including stray dogs

omit Articles 5, 6, 7, 8, 9 and 11.
4.2 The model legislation

DISEASES OF ANIMALS

The Rabies Control Order 19...

Made

Coming into operation

The Minister of Agriculture (or appropriate Department) in exercise of the powers conferred by sections 00 to 00 of the (overall act or ordinance governing animal disease control, if any) and now vested in him, and of all his other enabling powers (if appropriate) hereby orders as follows:-

Citation, extent and commencement

Article 1. This order, which may be cited as the Rabies Control Order, 19... shall apply throughout (name of country or part of country) and shall come into operation on (date).

Interpretation

Article 2. In this order, unless the context requires otherwise -

"Animal" means any mammal of a species naturally susceptible to rabies, except man;

"authorized officer" means an officer appointed by the Minister to issue licences under this order or to carry out any functions under this order as required;

"dog" means an animal belonging to the species Canis familiaris of the order of mammals Carnivora;

"exposed to rabies" means a person or an animal being bitten, scratched or licked by, or having other direct physical contact with, a rabid dog or a dog suspected of being affected with rabies. In an infected area, a dog of unknown status (e.g., a dog which escaped after biting) is generally considered to be suspected of being affected with rabies, particularly in a case of unprovoked attack. Every case of exposure must be defined as such and be reported by a medical or veterinary officer;

"infected area" means an area which is declared to be an infected area for purposes connected with the control and elimination of rabies by an order of the Minister to which Article 5 of this order relates;

"infected area order" means an order made by the Minister under Article 5 of this order;

"licence" means a licence granted under this order, and includes any permit, approval or other form of authorization;

"the Minister" and "the Ministry" mean respectively the Minister and Ministry of Agriculture (or appropriate Department);
"owner" means every person who is the sole or part owner of any animal and includes any person who is in charge of an animal; and the occupier of the premises on which any animal is found shall be deemed to be the owner of such animal until the contrary is proved;

"stray dog" means any dog not kept in compliance with the regulations for rabies control;

"vaccination" means the administration of an approved anti-rabies vaccine to an animal;

"veterinary officer" means the veterinary officer or authorized livestock development officer appointed by the Minister to receive information about animals and carcasses affected or suspected of being affected with specified diseases for the area in which the animal or carcass is.

Notice of rabies or suspected rabies

Article 3. (1) A person who knows or suspects that an animal (whether in captivity or not) is affected with rabies, or was at the time of its death so affected, shall, subject to practicable means, give notice of that fact to an officer of the local authority, a health care worker or to a police constable, unless he believes on reasonable grounds that another person has given notice under this paragraph in respect of that animal.

(2) Without prejudice to paragraph (1) above, a person who knows or suspects that an animal in his possession or under his charge is, or was at the time of its death, affected with rabies shall, to the best of his practicable, keep that animal separated from the rest of the animals for as long as is practicable.

(3) Where notice under paragraph (1) or (2) above is given to an officer of the local authority, a health care worker or to a police constable, he shall immediately transmit the information received by him by the most expeditious means:

(a) in the case of a police constable or a health care worker, to the veterinary officer and to an officer of the local authority;

(b) in the case of an officer of the local authority, to the veterinary officer.

Veterinary enquiry as to the existence of rabies

Article 4. (1) Where a veterinary officer has grounds for suspecting that rabies exists in a dog:

(a) by reason of information received under Article 3 above, or,

(b) by reason of clinical signs of rabies in a dog that has been detained under Article 7 below, or

(c) where a dog has bitten a person and been detained under Article 6 below,

he may cause the dog to be slaughtered and its carcass examined for the existence of rabies.

(2) No compensation shall be paid to any person in respect of the destruction of any dog under the provisions of this Article.
Declaration of an infected area

Article 5. Where the Minister believes or suspects that rabies exists in an area, he may by order declare that area, together with any adjoining area into which he considers there may be a possibility of rabies spreading, to be an infected area for purposes connected with the control and eradication of that disease, and the provisions of Articles 6 to 13 below shall apply in relation to every infected area so declared.

Control of dogs in an infected area

Article 6. (1) No person shall take any dog out of a rabies-infected area nor bring any dog into a rabies-infected area except in accordance with a written licence issued by an authorized officer.

(2) The owner or person in charge of any dog within a rabies-infected area shall cause such a dog to be kept under effective control, either

(a) by confining it within an enclosed area from which it is impossible for the dog to escape; or

(b) by tying it up securely; or

(c) by muzzling the dog and leading it by a chain or lead of strong cord or leather properly secured to a collar or harness worn by the dog.

Provided that an authorized officer, if he is satisfied that any class of dog, whether by reason or prophylactic treatment or otherwise, is not at risk of contracting rabies, may exempt such a class of dog from the requirements of this sub-section subject to such conditions as he may think fit.

(3) Any dog found within a rabies-infected area which is not under effective control in accordance with the provisions of sub-section (2) may be destroyed by an authorized officer and any person so authorized may enter any land, building or premises for the purpose of carrying out the provisions of this sub-section:

Provided that such person -

1) shall not enter into any dwelling house for such purpose except during the hours of daylight; and

2) shall, if so required, produce and show his written authority to the owner, occupier or person for the time being in charge of such land, building or premises.

(4)(a) Any person contravening the provisions of Article 6(1) shall be liable to a fine of (amount) or to imprisonment for a term of (period).

(b) Any person failing without reasonable excuse to comply with the provisions of Article 6(2) shall be liable to a fine of (amount).
Article 2. Where any dog is found or accused of being a dangerous dog by the veterinary inspection service or the police, in which case it shall be impounded or otherwise disposed of by the police, or any other competent authority, and the owner of the dog is not identified within the specified time, the dog shall be destroyed in accordance with the provisions of Article 3.

Article 3. The body of the destroyed dog shall be disposed of by the police, and the owner shall be informed of the disposal. If the owner does not claim the body within the specified time, the body shall be destroyed.

* The precise method of disposal to be specified by the government according to the level of reliability required.
(7)(a) The owner of any dog which is detained in detention premises shall pay to the local authority in advance for the period of ten days isolation a fee at the rate of (amount) per diem for the feeding, accommodation and attendance on the animal:

Provided that:-

(b) the dog dies during the period of detention the fee shall be charged only in respect of the number of days for which the dog was actually detained and the balance shall be refunded to the owner, and

(c) an owner fails to remove any dog from the detention premises in accordance with the provisions of sub-section (4) hereof he shall pay to the local authority a fee at the rate of (amount) per diem in respect of the additional period during which the dog remains in the detention premises.

(8) No compensation shall be paid for any dog which contracts any injury or sickness or which dies while under detention in accordance with the provisions of this section.

Registration (or licensing) of dogs in an infected area

Article 9. (1) All dogs over the age of three months shall be registered (or licensed) within one month of reaching this age, or of possession, and thereafter annually, and the owner of any dog shall:-

(a) present the dog on its attaining the age of three months at such time and place as determined by the local authority, for registration (licensing) and

(b) shall produce a certificate that the dog had been vaccinated against rabies when over three months old and had been re-vaccinated at periods of not more than two years (where vaccine is used which is recognized by the Minister as conferring two years' immunity after one injection);

(c) shall pay such registration (licensing) fee as may be determined by the local authority.

(2) The registering (licensing) officer shall -

(a) provide the owner with a certificate of registration (a licence) for the dog, and

(b) tattoo the dog or affix to it a distinguishing collar tag as proof of registration (licensing).

(3) Every adult dog shall be so registered (licensed) every twelve months.

4. Any owner not presenting their dog or dogs for annual registration (licensing) shall be guilty of an offence under this order and shall be liable to a fine of (amount).
Vaccination of dogs in an infected area

Article 10. (1) The Minister may require that all dogs over the age of three months shall be vaccinated against rabies and that the vaccination shall be repeated every two years. Wherever it is necessary, the Minister may cause a single injection.

(2) The vaccinations shall be carried out at such intervals as the Minister may require.

(3) The veterinary or first-aid officer, in collaboration with the local authority, shall report to the Minister as necessary to inform the Minister of the location of the vaccination center.

(4) All owners shall present their dogs for vaccination at such times and places as required by the veterinary officer.

(5) At the time of each event of gathering the owner of any dog shall provide the owner with a statement of the information in the form and set out in the Schedule. The Schedule shall be clearly written and collected, and the collected statement kept in the register of the vaccination.

(6) Any person who breaches the provisions of this Article shall be guilty of an offence punishable under the amended dog and animal control Act.

Precaution, detection and disposal of infected dogs

Article 11. (1) Where the local authority shall take all the necessary precautions to ensure that any dog or a person exposed to the dog shall be isolated in the premises of the local authority where he is thought to be infected.

(2) The local authority shall take all the necessary precautions to ensure that no dog exposed to the disease shall be allowed to leave the premises of the local authority except under orders of the local authority.

(3) Where a dog exposed to the disease is identified, the local authority shall have the dog subjected to the provisions of paragraph (1) and (2) above and shall be subject to appropriate penalties of any kind if it is established that the dog causes damage to any person.

(4) Where a dog exposed to the disease is identified, the local authority may destroy the dog and dispose of its carcass.

(5) Where circumstances prevent the dog from being destroyed, the local authority may have the dog destroyed under Article 10. The officer or a police constable to destroy the dog (other article 10).
A functioning fluorescent microscope should be adequately maintained. An emergency power supply should be present where there is danger of the electrical supply being interrupted during working hours. In tropical areas every attempt should be made to keep microscopes dry by using dessicant chambers or light bulbs held close to the microscope at night. Special care must be taken to clean carefully object lenses after use with oil, and to replace broken or cracked filters.

Examination of skin biopsies or corneal epithelium by immunofluorescent microscopy When skin sections are to be processed, the laboratory must be equipped with a cryostat, knife sharpener, stereoscopic microscope, humidity control in the laboratory and a good ultraviolet microscope equipped with epi-illumination. Other requirements are the same as above.

Virus isolation Equipment for mouse inoculation and mouse colonies must include adequate metal or plastic cages, wood shavings, a continuous and clean water supply, and mouse food, either pellets or a suitable alternative.

Detection of antibody Antibody detection utilizes either mouse inoculation or cell culture systems; the equipment needs are comparable to virus isolation.

Many laboratories in developing countries find maintenance, repair service and parts difficult to acquire. It is recommended during the initial plans for development of a rabies laboratory, that funds and other considerations for maintaining equipment be included.

5.3.9 Supplies for laboratories*

The ready availability of high quality supplies for a rabies laboratory is essential. This includes buffers, tissue culture media, glassware, and plastic disposable ware. Reagents, utilities such as gas, electricity, compressed air, and so forth must be routinely available and not suffer from significant delays in delivery. The FITC conjugated antibody must be of high quality and well controlled whether produced in the laboratory itself, purchased from commercial sources or furnished from reference laboratories. Mice used for virus isolation or neutralization studies must be healthy, of the proper age and genetically stable in origin. Three week old Swiss Webster white mice are considered a standard.

A functioning laboratory must receive high priority for supplies or its function will falter or fail completely. This refers to the availability of funds, reliability and communication with sources of supplies, and satisfactory storage arrangements so that advantage can be taken of quantity purchases.

A formidable problem of developing countries always seems to be delays in gaining official entry into the country of shipments of supplies, which are often diverted for months pending government clearance or with the imposition of extremely high import tax.

* A list of basic equipment and supplies is given in Annex 5.17
4.8

(6) The Minister will give guidance on the methods to be used (shooting, poisoning, or capture and destruction by other methods) in different environments (area of habitation, market place, rubbish dump, open countryside, etc.).

(7) A veterinary officer, an officer of the local authority or a police constable may enter any land for the purpose of seizing or destroying a dog which is liable to be seized under this Article.

(8) The local authority will be responsible for the collection and safe disposal of the carcasses of any dogs destroyed under this Order.

Offences

Article 12. Any person who contravenes any provision of this order, or any provision of this order as applied in an infected area order, or any provision of a licence granted or notice served under any such provision, or who fails to comply with any such provision, or who causes or permits any such contravention or non-compliance commits an offence against the order.

Local authority to enforce order

Article 13. The provisions of this order, except where otherwise expressly provided, shall be executed and enforced by the local authority.

SCHEDULE

Rabies vaccination certificate

<table>
<thead>
<tr>
<th>Ministry of Agriculture</th>
<th>Description of Dog</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certificate of Anti-rabies Vaccination</td>
<td>Male</td>
</tr>
<tr>
<td></td>
<td>Female</td>
</tr>
</tbody>
</table>

I, the undersigned, Veterinary Surgeon, certify that the dog described opposite, the property of:

Name: .........................................
Address: ......................................

Other relevant details ......................................

Date of injection: ......................................

Official stamp

has received an anti-rabies vaccination

Signature: .................................

Certificate No.
4.3 Note on Article 8: Detention and isolation of dogs

This Article gives the necessary powers for the detention and isolation of any dog that has bitten a person in an infected area. It contains two additional clauses - 8(7)(a) and 8(7)(c). These should be included if it is decided to charge for detention for the duration of the provision of Article 8(1). They should be omitted if it is decided not to charge for this compulsory detention.

In either case, clause 8(7)(a) allows a power to be made for every dog after the compulsory ten days that the dog remains in the detention premises because of the owner's failure to collect it.

4.4 Note on Article 9: Registration and licensing of dogs

This Article gives the necessary powers for registration or licensing of dogs and leaves the option present to authorities to charge or not to charge for registration.

Relevant rules under which registration can be used to finance other aspects of dog control activities, e.g., the vaccination programme, but a risk of anti-social behaviour in many areas. To make a compulsory charge for dog registration and/or licensing to finance these programmes, because dog owners (particularly the licence payment will be higher and a payment mechanism is likely to be the least - see Section 5.2.1) will not be willing paying the fee and may not present their dogs for registration, not for vaccination.

In a rabies control programme, it is therefore probably better not to make a charge for registration of dogs.

4.5 Note on Article 10: Vaccination of dogs

This Article gives the necessary powers for conducting a compulsory dog vaccination programme but the wording is so general, so that the authorities can conduct the programme by whichever of the standard methods is appropriate to the area. The three methods are vaccination at veterinary clinics, at vaccination centres, or by house-to-house campaigns, are described in Section 5.2.1.

4.6 Other points to consider

The model legislation can be adapted to the needs of countries or areas that have eliminated rabies. After two years with no cases of rabies, one approach might be to consider the legislation so as to leave in force only those Articles which provide for border controls to prevent the entry of dogs from neighbouring infected areas (Article 6(1)), the control of dog movements within areas of particular risk (Articles 6(2) to (3)) and for a continuing programme of vaccination of dogs (Article 10) and destruction of stray dogs (Article 11).

Another approach, but this would avoid the much variation of control legislation, might be to leave all the provisions in force so that an area at special risk would remain as an infected area. This would provide protection against neighbouring infected areas or areas of unknown rabies status. Control would be effected at airports, sea ports and other points of entry for business, trade and tourism.

4.9
Thus all essential control measures (mass vaccination and stray dog control) would continue, whereas the application of Articles 7 (destruction or detention of dogs exposed to rabies) and 8 (detention and isolation of biting dogs) would become less frequent as a result of the absence of rabies and the decreasing number of suspected cases of disease in all susceptible animals.

Note

The vaccination certificate in the Schedule to the Order (at the end of Section 4.2) has been used in a national campaign of mass vaccination of dogs. Vaccination centres may issue certificates giving additional information on the vaccine used (type of vaccine, lot number, name of producer) and the identification of the animal (Section 5.2.2) in line with the requirements of the International Certificate of Vaccination against Rabies (Section 6.3).