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ADVISORY GROUP ON VETERINARY PUBLIC HEALTH

Report

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Members :

- Dr I. Altara, Director-General of Veterinary Services, Office of the High Commissioner for Hygiene and Public Health, Rome, Italy ; Member of the Executive Committee, International Office of Epizootics, Paris, France (*Vice-Chairman*)
- Dr C. Banning, Chief Medical Officer of Public Health, National Public Health Inspectorate, The Hague, Netherlands
- Sir Thomas Dalling, Chief Veterinary Consultant, Animal Production Branch, Agriculture Division, Food and Agriculture Organization of the United Nations, Rome, Italy
- Sir Weldon Dalrymple-Champneys, Bt., Deputy Chief Medical Officer, Ministry of Health, London, England
- Dr Filip Wøldike Nielsen, Chief Veterinary Officer, Ministry of Agriculture, Copenhagen, Denmark
- Dr A. Stampar, Professor of Hygiene and Social Medicine ; Director, School of Public Health, Zagreb, Yugoslavia (*Chairman*)
- Dr James H. Steele, Chief, Veterinary Public Health, Communicable Disease Center (Public Health Service), Atlanta, Ga., USA (*Rapporteur*)
- Professor R. Vuillaume, Inspecteur général, Chef des Services vétérinaires, Ministère de l'Agriculture, Paris, France
- Dr Kurt Wagener, Professor of Hygiene ; Director, Institute of Hygiene Veterinary College, Hanover, Germany
- Dr W. R. Wooldridge, formerly President, Royal College of Veterinary Surgeons ; Chairman of Council and Scientific Director, The Animal Health Trust, London, England

Secretariat :

- Dr Robert I. Hood, Regional Health Officer for Public Health Administration, Regional Office for Europe, WHO
- Dr Martin M. Kaplan, Chief, Veterinary Public Health Section, WHO
- Dr James Lieberman, Veterinary Public Health Consultant, Regional Office for Europe, WHO (*Secretary*)

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ADVISORY GROUP ON VETERINARY PUBLIC HEALTH

Report

The Regional Office for Europe convened an Advisory Group on Veterinary Public Health in Geneva from 6 to 10 June 1955. Dr G. Montus, Deputy Regional Director, opened the meeting by presenting the background of activities in veterinary public health of the European Regional Office during the past several years and requested the Advisory Group to consider current problems and to make recommendations to the Regional Office for future activities in this field. Professor A. Stampar was elected Chairman, Dr I. Altara, Vice-Chairman, and Dr J. H. Steele, Rapporteur, of the meeting.

1. BACKGROUND AND PURPOSE

Since 1950, several expert groups on veterinary public health have met and reported on problems involving the zoonoses and related matters. The Joint WHO/FAO Expert Group on Zoonoses, which met in December 1950,¹ did so at the request of Member States for assistance in the field of zoonoses. The Seminar on Zoonoses held in Vienna, in November 1952,² was sponsored jointly by the Regional Office for Europe of the World Health Organization and the Food and Agriculture Organization of the United Nations. Its purpose was to bring together medical and veterinary officials of European countries to discuss several diseases of public-health and economic importance in this region—namely, rabies, brucellosis, bovine tuberculosis, Q fever and leptospirosis. Expert committee meetings and reports, sponsored jointly by FAO and WHO, have assisted materially in helping to appraise both the incidence of the diseases mentioned and measures for their control. Other joint FAO/WHO expert committee meetings are scheduled for 1955, 1956 and 1957, and there are plans for a number of other specialized meetings and teaching seminars.

¹ See *Wld Hlth Org. techn. Rep. Ser.*, 1951, 40.

² See: *Advances in the control of zoonoses (Bovine tuberculosis — Brucellosis — Leptospirosis — Q fever — Rabies)*, Geneva, 1953 (*World Health Organization: Monograph Series*, No. 19).

2. MAJOR PROBLEMS

The major emphasis in food hygiene, a traditional veterinary activity, has been limited to milk and meat hygiene, and in this area WHO has worked closely with FAO. Some of the papers submitted to the WHO/FAO Seminar on Meat Hygiene for European countries, held in Copenhagen in 1954, will soon be published,¹ as will the report of the Joint FAO/WHO Expert Committee on Meat Hygiene.²

European and other countries face several major technical and administrative problems in veterinary public health which require attention to assure progress in public health. These problems are :

- (1) the need for clearly defining the field of veterinary public health and its function in health services ;
- (2) the determination of methods for promoting advances in connexion with zoonoses, food hygiene, laboratory services and related public-health practices by national and local agencies ;
- (3) the need for adequate morbidity and mortality reporting of zoonoses ;
- (4) the present status and need for effective control of the major zoonoses in Europe ;
- (5) the establishment of effective liaison between health and agricultural agencies and other groups ;
- (6) the participation of public health veterinarians in the team of health workers ;
- (7) the extension of joint participation in undergraduate (professional) and post-graduate training by medical, veterinary and other health workers with respect to health problems of mutual interest ;
- (8) the determination of the best methods of achieving the co-operation of those groups.

The Group has considered the above problems, and submits the following report with the hope that the recommendations it contains will be incorporated as far as possible, where applicable, into the activities of the countries of the European Region and other Member States of WHO. It is realized that certain changes in governmental organization and health activities recommended in this report cannot be implemented at once, but it is hoped that they will be given careful consideration for eventual incorporation in the long-term health programmes of various countries.

¹ In the *World Health Organization : Monograph Series*, No. 23.

² Now published as *Wld Hlth Org. techn. Rep. Ser.*, 1955, 99.

3. DEFINITION AND SCOPE OF VETERINARY PUBLIC HEALTH

Veterinary public health is the field of activity which protects and advances human well-being by utilizing the combined knowledge and resources of all those concerned with human and animal health and their inter-relationships.¹

Veterinary public health is therefore concerned with such activities as the control and eradication of zoonoses; the development and supervision of food hygiene practices; laboratory and research activities in such fields as diagnosis, production of biological products, zootechnics, microbiology, epidemiology, and all aspects of comparative pathology and medicine (oncology, therapeutics, surgery, nutrition, etc.); and the education and training of professional and auxiliary workers in veterinary aspects of public health.

The aim of establishing veterinary public-health units in health administrations is to obtain the maximum contribution of veterinarians to human health. In many countries this involves a new step in public-health organization, without appreciably affecting veterinary administrations in agricultural or other departments concerned principally with livestock-disease control. This distinction should be kept clearly in mind, as the Group does not recommend incorporation into health departments of veterinary services dealing with purely veterinary problems where these services have been long established and doing effective work in other governmental administrations.

The major activities in veterinary public health will be considered individually.

3.1 Zoonoses

The term "zoonoses" as used in this report denotes those diseases naturally transmissible between animals and man. Of the large number of zoonoses listed by the Joint WHO/FAO Expert Group on Zoonoses,² not all are of importance to European countries. A few of the more important are considered later in this report (see section 5, page 17).

¹ At its first session in December 1950, the Joint WHO/FAO Expert Group on Zoonoses defined veterinary public health as comprising "all the community efforts influencing and influenced by the veterinary medical arts and sciences applied to the prevention of disease, protection of life, and promotion of the well-being and efficiency of man" (*Wld Hlth Org. techn. Rep. Ser.*, 1951, 40, 3).

² *Wld Hlth Org. techn. Rep. Ser.*, 1951, 40, 28

The Group noted that this list is being revised in consultation with the WHO Expert Advisory Panel on Zoonoses to take into consideration advances in knowledge made since it was prepared in 1950. It is recognized that many zoonoses are not clearly defined with respect to their group relationships (for example, the virus encephalitides, other virus and rickettsial diseases, and certain helminthiases) and that some of the groupings will undoubtedly have to be changed in the relatively near future as more information is obtained. A useful procedure would be to simplify the list by separating rare and obscure zoonoses from the more common and important ones. Clarification may also be achieved by rearranging the categories of the list to include those diseases which are common to animals and man, but regarding which evidence is still insufficient to implicate an animal link in their transmission. The usefulness of the zoonoses list has been great, and the revised list, when completed, should be circulated as widely as possible.

Control of zoonoses is a major activity in veterinary public health because these diseases are a source of much ill health and poverty, brought about by the acute or chronic infections they cause in human beings, and of large economic losses to agriculture and trade. In addition to the immediate problems posed by certain zoonoses, one should not overlook the dynamic and changing pattern of micro-organisms, their adaptation to new animal hosts and their potential and actual transfer to human beings as pathogenic organisms. The emergence of new zoonoses, or the uncovering of unsuspected human-animal relationships in communicable diseases, are therefore to be expected. Examples of the latter during the past few years are bird reservoirs of the arthropod-borne virus encephalitides, the wide prevalence of bovine and other animal leptospiroses in many countries, the appearance of bat rabies in the eastern hemisphere, and the determination of widespread mammalian reservoirs of the psittacosis/lymphogranuloma-venereum group of viruses. Thus vigorous action is recommended to reduce, and if possible eradicate, the specific major zoonoses, while maintaining continued vigilance for the appearance of new zoonoses in an area.

The prevention and elimination of zoonoses in man depend in large part on the control of these diseases in animals. Experience has shown that these diseases, by their very nature, cannot be fought adequately by the separate endeavours of health and agricultural authorities. The best approach to achieve an effective attack on a specific zoonosis is by co-ordinating the efforts of public-health, agricultural and other groups. Veterinary public-health units in governmental services can assist greatly in this respect, and are particularly useful in campaigns directed against such diseases as rabies, brucellosis, bovine tuberculosis and hydatidosis (see section 5, pages 18-21).

3.2 Food hygiene

The most important and perishable foods for man are the proteins of animal origin (meat, milk and milk products, fish, poultry, eggs), and it is with respect to these foods that the greatest emphasis on food hygiene must be placed. The Group noted that considerable technical attention has already been given, and is planned for the near future, by various United Nations agencies (UNICEF, FAO, WHO) to meat and milk hygiene, and to environmental sanitation problems connected with food. The Group, therefore, limited its consideration to certain administrative problems which are encountered by governmental authorities in effectively carrying out their food-hygiene responsibilities.

In governmental administrations, responsibility for food control varies widely in different countries, and within specific countries at national, provincial, municipal and rural levels. Thus departments of health, agriculture, food, the interior, welfare, sanitation, etc. are found to be solely or partially responsible for food hygiene.

It should be emphasized that the primary purpose of food hygiene is to prevent transmission of disease to man through food products, and to ensure that the consumer receives a wholesome, nutritious and acceptable product; thus, supervision of food hygiene is essentially a public-health function. In addition, food hygiene decreases food losses and achieves other important benefits such as disease control in livestock, in which food and agricultural authorities are concerned.

It is clear that the efficient discharge of food-hygiene obligations requires the closest co-operation between health and agricultural departments. The triad of medical officer, veterinarian and sanitary engineer provides the cornerstone of professional service upon which a food-hygiene organization should be built. It is equally clear that the veterinarian, because of his special training, is pre-eminently qualified to supervise the major aspects of food hygiene.

The Group therefore recommends that, wherever possible, food-hygiene responsibilities should be unified under one supervisory unit of the governmental services. An appropriate unit to exercise such supervision would be a veterinary public-health service. The Group realizes that, in countries where there is long-established division of administrative responsibilities, the unification suggested would not be easily accomplished. However, the desirability of such a step should be recognized and plans made for its ultimate implementation.

3.3 Laboratory disciplines and experimental biology and medicine

Veterinary and human medicine have many essentials in common: their objectives are similar, and basic subjects of study are alike—namely,

histology, pathology, bacteriology, immunology, pharmacology, and related sciences, which together comprise the curriculum of veterinary and medical schools. Included in their activities are similar laboratory disciplines ; therefore, collaboration is to be fully encouraged.

3.3.1 *Government laboratories*

Health laboratories at all levels of government can utilize veterinarians as staff members for the many activities of laboratories dealing with, but not limited to, the zoonoses, although the veterinarian is particularly well qualified in the latter sphere. The performance and interpretation of existing diagnostic tests, the development of new procedures and their evaluation, the production of biological products, all fall within his scope of operation. In research activities he is a valued member of the laboratory team.

Veterinarians are likewise being used effectively in laboratories administered by agricultural departments devoted solely to the animal diseases. In view of the fact that research findings continue to reveal conditions in animals which are of direct concern to health authorities, it is of the utmost importance that maximum collaboration should exist between health and veterinary laboratories. There are many obvious advantages in uniting medical and veterinary laboratories and personnel, particularly where there is a shortage of technical personnel.

3.3.2 *Other laboratories*

Other types of laboratories that effectively employ the services of qualified veterinarians are :

- (1) private research laboratories (for example, in foundations and colleges) ;
- (2) laboratories attached to medical and veterinary educational institutions ;
- (3) laboratories of commercial firms which produce pharmaceutical and biological products ;
- (4) typing centres organized by national and international bodies.

The Group recommends increased and free exchange of information between all these laboratories to ensure more complete understanding of the epidemiology of disease.

3.3.3 *Experimental biology in medicine*

An inter-professional approach in this field is essential. Considerable progress has been made over the years, involving advances in therapeutics, surgery, etc., of benefit both to human and to veterinary medicine. New

knowledge of atomic energy and its usefulness in diagnosis and therapeutics demands alertness and increased study on the part of the doctor, the veterinarian and other scientists. The value of veterinary knowledge and assistance in these fields is evident.

3.3.4 *Care and production of laboratory animals*

A matter of great importance to the execution of research is the availability to medical and veterinary research laboratories of standard, disease-free laboratory animals (mice, hamsters, rabbits, guinea-pigs, etc.). Veterinarians engaged in their production should intensify their efforts for improving this activity and for meeting laboratory needs in Europe and throughout the world.¹

4. ORGANIZATION AND ACTIVITIES OF VETERINARY PUBLIC-HEALTH SERVICES IN HEALTH ADMINISTRATIONS

4.1 *Veterinary public-health units*

The rapid advances in public health in hitherto less developed countries, and the increased demands and needs for improved public-health practices in both these and the more advanced countries, have required reorganization in public-health administrations. One of the resultant developments has been the increased attention given to veterinary public health.

Most national and large municipal health departments employ veterinarians to carry out one or more of the functions included under veterinary public health (food-control activities, control of zoonoses, various laboratory functions, stimulation and co-ordination of research in subjects of common interest to human and animal health, education and training). Traditional public-health practices in many countries have served to individualize the activities of public-health veterinarians and to keep

¹ The following publications are noteworthy :

American Public Health Association, Committee on Research and Standards, Subcommittee on Diagnostic Procedures and Reagents (1954) *Care of laboratory animals*, New York

Dumas, J. (1953) *Les animaux de laboratoire*, Paris

Farris, E. J. et al. (1945) *Ann. N.Y. Acad. Sci.*, **46**, 1

United States of America, National Academy of Sciences—National Research Council, Institute of Animal Resources (1954) *Handbook of laboratory animals*, Washington, D.C.

Universities Federation for Animal Welfare (1949) *The UFAW handbook on the care and management of laboratory animals*, London

Bulletin of the National Society for Medical Research, Chicago, Ill.

Journal of the Animal Technicians Association, London

them in separate and unrelated administrative units. This would appear to be justified in certain instances where the work in question is an integral part of a functional unit (for example, a biological production laboratory). In other countries, particularly in the western hemisphere, and in some European countries, veterinary public health has been recognized in varying degrees and established in the health services as a distinct functional unit (see section 3, page 5). Certain countries have placed the principal veterinary services in the governmental organization concerned with health services; such an arrangement should facilitate collaboration between the services.

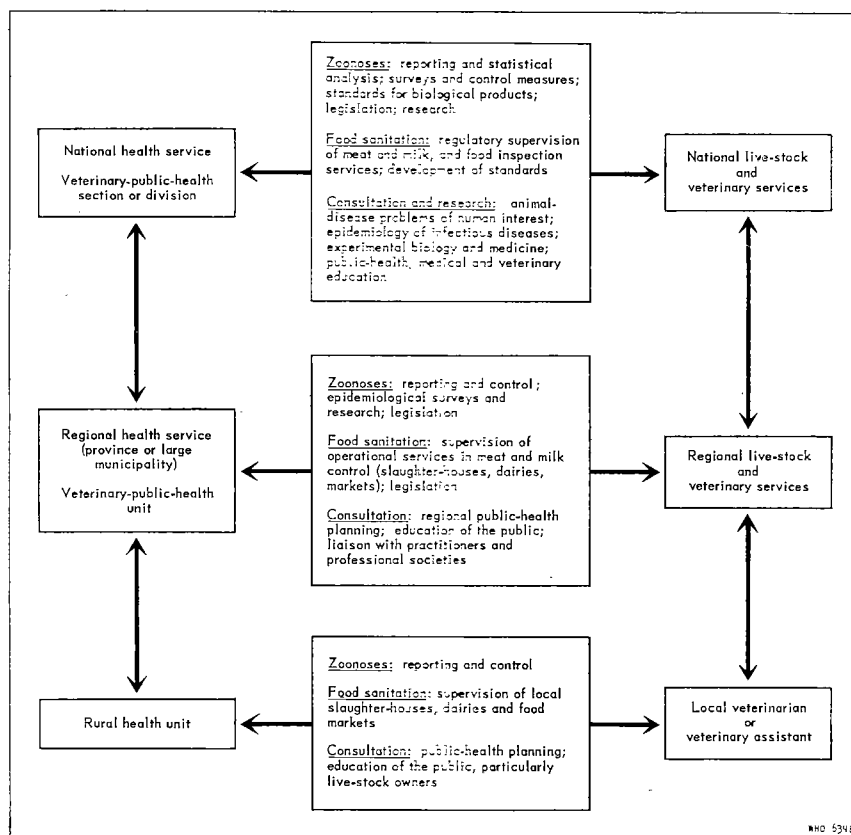
Other parts of this report deal with veterinary public-health responsibilities and needs already facing health departments (in particular, control of specific zoonoses and food hygiene). Apart from these everyday responsibilities, there should be kept in mind the continually emerging problems of new zoonoses (see section 3.1, page 6), and the hazard of radioactive contamination of foodstuffs as well as of livestock and plant life (potential foodstuffs). In this connexion, the veterinarian already occupies a key position in food-hygiene activities, and the extension of these activities to cover dangers from radio-activity is a logical development. Also worth mentioning is the problem facing scientific research to-day, namely, that increasing specialization of work is accompanied by inability to keep abreast with knowledge even in closely related fields. It is evident that the common relationships of human and animal medicine, and the benefits to be derived from their closer co-ordination, are many, but the opportunities thus presented are very frequently neglected.

It would appear, therefore, that only a unified view of the broad field of human-animal relationships could successfully meet both the routine needs of the present and also new demands and emerging problems.

This unified approach can well be implemented by the establishment of veterinary public-health units in health administrations, staffed by competently trained public-health veterinarians who are given sufficient technical personnel and financial support to meet the various responsibilities. The inauguration of such a programme requires a transitional period during which health-department personnel become acquainted with the newly added veterinary competencies and potentialities.

No single pattern for veterinary public-health activity at all levels of government can be given, because of the varied conditions encountered in different countries. However, the accompanying chart is a helpful guide. In general, it would appear desirable to establish veterinary public-health units first at national and provincial levels, and subsequently in local (city or district) and rural health units as soon as this is feasible economically, and when sufficient personnel are trained. Veterinary public-health work at these various levels will be considered briefly.

VETERINARY PUBLIC-HEALTH ACTIVITY AT VARIOUS LEVELS OF GOVERNMENT



4.1.1 National level

Veterinary public-health units in national health agencies are usually part of the preventive medical services, although some special activities will require assignment of public-health veterinarians to other work such as laboratory, research and special services. The director of the veterinary public-health unit is responsible for co-ordinating the veterinary public-health operations and integrating the activities into the over-all public-health programme. He also advises the director of health on all problems that involve animal diseases and human health. In most national health administrations the veterinary public-health programme has three principal areas of operation: control of zoonoses, food hygiene, and research. In addition, the veterinary service is responsible for

developing standards for certain biological products, diagnostic procedures and tests. The importance of maintaining liaison with agriculture and other interested groups (see section 4.2, page 15) is basic to the development of a veterinary public-health programme.

Research activities may encompass a broad field including microbiology, epidemiology, comparative pathology, food quality and processing, and utilization of radio-active substances. Most of these investigations are performed as a part of a team research project. Thus, useful information has been obtained in such fields as the epidemiology of Q fever, leptospirosis, virus encephalitides and psittacosis, and the development of improved diagnostic methods for their detection and the inauguration of control methods. This type of work can be the direct responsibility of the public-health veterinarian. As a programme develops, the need for special laboratory or epidemiological investigations will increase. To provide such services it is essential that public-health veterinarians should have the specialized training necessary (see section 6.1, page 23).

Control of zoonoses is the most important aspect of a veterinary public-health programme. Control activities at a national level consist of technical guidance and the assignment of specialists to the region or communities where the problems have arisen. Examples of such services are consultation on specific disease-control measures and the development of provincial or local veterinary public-health programmes. Sometimes, the national agency may assign public-health veterinarians to organize control activities on an emergency basis (e.g., for rabies), or in other instances to co-operate with other groups in developing long-range programmes for the control and eventual eradication of certain zoonoses (e.g., brucellosis or tuberculosis control in animals, directed by the regular veterinary services). An important contribution in this connexion is the establishment of morbidity and mortality reporting systems for the zoonoses (see section 4.4, page 16).

4.1.2 *Provincial, State, or county level*¹

The development of provincial (State, county) veterinary public-health functions is determined by conditions existing in the area. Provincial and national programmes are similar because usually both will include control

¹ The terms—province, State, and county—are used in this report more or less interchangeably as designating an administratively defined area, relatively autonomous but at least partially subject to the over-all direction of the national government. The difficulties in defining exactly health services at the different levels of government were considered by the WHO Expert Committee on Public-Health Administration in its second report (*Wld Hlth Org. techn. Rep. Ser.*, 1954, 83).

of zoonoses, food-hygiene operations, and research projects. The provincial officer, like his counterpart at the national level, is responsible for co-ordinating the veterinary public-health activities and for advising the health-department director on animal-disease problems of public-health significance. His principal functions will be to co-ordinate local and national efforts, to keep information flowing to the local units from the national level, and vice versa, to work with public-health officials on problems that arise, and to consult with local units and give guidance and advice to them. At times it will be necessary to participate in the promotion of specific disease-control operations in the local units, especially where professional staff may not be available locally.

One of the more important functions is to stimulate interest among veterinary practitioners in public health generally and in reporting zoonoses. Experience has shown that veterinary surgeons will support public-health measures and supply important data on the prevalence of zoonoses when they are provided with basic information on such matters as the prevalence of specific diseases in man and animals in the area concerned, and the procedures recommended to control these problems. The practising veterinarian has considerable influence with his clients and can often persuade the farmer to remove infected animals (tuberculous, brucella-diseased) or accept prophylactic measures (rabies vaccination, cooking of offal, stable hygiene) when it is pointed out to him that these diseases not only reduce his income but threaten the health of his children and family.

The provincial public-health veterinarian must also maintain liaison with agricultural, university and all other groups interested in public health and zoonoses. Within the public-health department he has an important task in acquainting other professional workers and their assistants with veterinary public health and its objectives. This is especially important among sanitarians and nurses, who in their daily activities visit many homes, businesses and farms where animal-disease problems may occur.

4.1.3 *Local (city or district) level*

The local public-health unit often has a veterinarian charged with supervision of food-hygiene control. These activities usually include meat and poultry inspection, control of milk production on the farm and of milk processing plants, guidance in handling of food by distributors and retailers, and co-ordination of inspection reports from other health jurisdictions.

The services of the veterinarian in local health units can be expanded considerably if he receives public-health training. Thus he can facilitate

the co-ordination of the veterinary public-health programme with provincial and national activities and broaden the contribution to an over-all health programme. The well trained public-health veterinarian, because of his training in biology, medicine and public health, is often the best-equipped individual to serve as an assistant or deputy health officer.

Actual operation of technical procedures and principles formulated at provincial or national levels is carried out at the local level. Thus we find that regulations concerning control of zoonoses and food hygiene are put into effect by the local public-health veterinarian. It has already been pointed out that he has the responsibility for food hygiene, and very often control of zoonoses is co-ordinated with milk or meat inspection. For example, efforts for bovine-tuberculosis and brucellosis control can be aided greatly by requiring that all milk entering an area shall be derived from brucellosis- and tuberculosis-free herds. Such a requirement should allow a reasonable length of time before its application so as not to involve undue hardship for farmers supplying the milk.

The local public-health veterinarian, as well as being responsible to his colleagues in the national and provincial health departments, must also assume responsibility for maintaining liaison with groups interested in animal-disease problems and public health. The importance of co-operation from veterinary practitioners is worth stressing again. As in the case of provincial operations, it is essential that these practitioners should be kept informed on public-health objectives and activities, and that they should receive regular reports on the prevalence of zoonoses in their area.

4.1.4 *Rural level*

Of all population groups, rural people are the most exposed to, and affected by, the zoonoses. Unfortunately, it is seldom feasible to have a full-time veterinary public-health officer permanently stationed in a rural district, but local veterinarians, or their assistants, on a part-time basis can serve as important components in health efforts. This fact was recognized by the WHO Expert Committee on Public-Health Administration in its second report, which stated :

“ One of the important responsibilities of local health officers in the control of communicable diseases, particularly in rural areas, concerns the zoonoses. . . . The adequate control of these diseases requires co-operative effort on the part of health and agricultural officials, and the local health officer can obtain invaluable aid in meeting zoonoses problems by establishing close working relationships with veterinarians and their assistants. The veterinarian can also be assigned responsibility for the control of food hygiene, particularly with respect to meat and milk, and thereby relieve the local health officer of tasks which are either unnecessarily time-consuming or else neglected altogether. Apart from the scientific training of the veterinarian and his concern with

diseases common to man and animals, his direct contacts and importance in rural community life make him a very useful member of the local team.”¹

Where there is a lack of veterinarians, it is often possible to utilize the services of an assistant trained in specific veterinary techniques (stock inspector, vaccinator) to serve for reporting suspected outbreaks of zoonoses to the health or agricultural services (where exchange of information should be arranged). Often, no personnel of any kind with veterinary training is available, but the village chief, religious leader, or other person trusted by the rural community as regards their livestock needs can be used. Short-term training can be given to these individuals to enable them to recognize the rudimentary signs of epizootic diseases so that they may be immediately reported to the responsible veterinary and/or health authorities.

Such individuals, whether they be veterinarians, veterinary assistants, or very rudimentarily trained personnel, occupy key positions of influence in rural communities because of their importance in the control of livestock diseases, often the most important factor in a rural economy. Veterinarians or their substitutes can contribute greatly towards improving a village's health and economic status, which are each dependent on the other. One way they can do so is by assuming the role of educators for improving animal husbandry and hygiene to increase economic benefits. It is then a short step for a health team to introduce improvements in human hygiene and to promote preventive inoculations. Any team approach (health officer, nurse, sanitarian, midwife) to rural health problems should include veterinary personnel. As stated in the quotation given previously, the veterinarian can assume the responsibility for food hygiene and for reporting and control of zoonoses.

4.2 Liaison with agriculture and other groups

The co-ordinating function of veterinary public-health services is of the utmost importance. This is particularly true with respect to health and agriculture officials and their resources, as has been stressed in connexion with the control of zoonoses and food hygiene. This co-ordination and utilization of combined resources not only applies to official agencies at different levels of government but also, and with equal importance, to farmers' organizations and other organized rural groups, including religious bodies, women's societies, boys' and girls' clubs, and schools and other educational endeavours.

Many other groups can be utilized by the public-health veterinarian. These include dairy associations; parent-teacher associations; medical, veterinary, and allied professional groups; private and official research

¹ *Wld Hlth Org. techn. Rep. Ser.*, 1954, **83**, 15

laboratories; commercial enterprises such as food, pharmaceutical, and insurance companies; and animal-protection societies. Public-communication facilities (radio, newspapers, periodicals) can be used to great advantage and are usually very co-operative in assisting the promotion of veterinary public-health work.

A matter of particular importance in the control of zoonoses is education of teachers, and through them of children. Rudimentary principles of hygiene and animal-disease control imparted to children through the schools, and the enlistment of their co-operation, are of great importance in controlling major zoonoses such as hydatidosis, brucellosis, rabies, bovine tuberculosis and certain parasitic diseases.

4.3 Public-health team

The team concept of dealing with public-health problems has developed rapidly in recent years. The integration of various professional groups and their assistants into a co-ordinated effort has resulted in greater efficiency and advances in public health. The public-health veterinarian can ably contribute in two specific areas: (1) the work of the research team, including epidemiology and laboratory investigations, and (2) the public-health unit, where he participates in communicable-disease control, food hygiene, and public-health administration.

Research work includes the study of such diverse questions as arctic and tropical public-health problems, spontaneous diseases of experimental animals, occupational and industrial hygiene, and oncology, as well as specific zoonoses. In the public-health unit the veterinarian works with many kinds of public-health specialists who assist one another in resolving various problems concerning communicable and chronic diseases, food hygiene, and public-health administration.

4.4 Morbidity and mortality reporting

Systems of animal-disease reporting are weak in many countries. The first principle in effectively combating diseases is to establish effective methods for ascertaining their incidence and progress.

Organized reporting of animal morbidity and mortality from zoonoses is essential to the development of veterinary public-health operations, and steps should be taken in this direction. Frequently, the establishment of effective zoonosis-reporting systems by health departments encourages analogous efforts with respect to purely animal disease by veterinary departments, and a combination of the two often results in greatly benefiting health and veterinary activities.

The organization of a reporting programme requires co-operation among all interested agencies and groups (agriculture, health, veterinarians

and statisticians). In most instances the programme with respect to zoonoses has been inaugurated at the provincial (State) level of health administration, eventually growing into a national system. The development of the programme logically falls under the guidance of the public-health veterinarian, working in close co-operation with interested groups.

The first step in organizing an animal-disease reporting programme is to secure the assistance of statistical experts to advise and guide in the technical aspects of collecting and analysing data. In most situations the best method is to use a code number for each disease on which information is requested, so that it may be readily transferred to cards that can be tabulated and sorted by machine. Such procedures are very efficient and permit reports to be compiled and distributed within a few days of receipt of the field data. Cards for reporting can be provided by the national health service to the provincial authorities, although occasionally a provincial government may purchase cards for reporting. These cards are usually mailed twice a month. The list of diseases on which information is requested is agreed on by the various groups collaborating.

Co-operation of veterinary practitioners is essential to the success of a reporting system. This co-operation can usually be achieved by keeping practitioners informed regularly of the incidence of various diseases in their area. The value of these notices is increased if they include brief summaries of diseases of current interest.

5. MAJOR ZONOSIS PROBLEMS OF IMPORTANCE IN EUROPE

The general question of zoonoses has been the subject of FAO/WHO expert committee reports and monographs in which particular reference is made to methods of control and eradication.¹ In the present report, only four zoonoses are considered, namely, bovine tuberculosis, brucellosis, rabies and hydatidosis. These four diseases are of great importance in Europe at the present time, and the Group feels that methods of control and even of complete eradication are sufficiently well advanced and understood to enable countries to inaugurate satisfactory schemes where they are not already in operation. In combating such diseases, success will depend largely on a combination of effort and collaboration among all

¹ Joint FAO/WHO Expert Committee on Brucellosis, report on the first session and second report (*Wld Hlth Org. techn. Rep. Ser.*, 1951, 37; 1953, 67); WHO Expert Committee on Rabies, report on the first session and second report (*Wld Hlth Org. techn. Rep. Ser.*, 1950, 28; 1954, 82); Joint WHO/FAO Expert Group on Zoonoses, report on the first session (*Wld Hlth Org. techn. Rep. Ser.*, 1951, 40); WHO/FAO Seminar on Zoonoses, Vienna, November 1952 (*World Health Organization : Monograph Series*, No. 19, Geneva, 1953)

concerned with public-health and agricultural activities. In this respect, veterinary public-health units within the health services of a country can greatly assist (see section 4.1, page 9).

5.1 Bovine tuberculosis

The control of tuberculosis in cattle formed part of the report of the Joint WHO/FAO Expert Group on Zoonoses.¹ The Advisory Group fully endorses the views expressed therein and now emphasizes some of the important points.

In some parts of Europe, bovine tuberculosis is still a serious menace to the human and cattle populations. Following upon the adoption of well-planned control schemes, the disease has been completely or nearly eradicated from the cattle of some European countries, while in others progress is being rapidly made towards this end. It has been clearly shown that the most effective method of control and final eradication of the disease is the detection of infected cattle by means of the tuberculin test and their removal from contact with healthy animals. By a concentrated effort it is possible, in a comparatively short period of time, to eradicate the disease from the cattle population of specific areas and eventually of the entire country. For tuberculin-testing to be effective, it is essential that tuberculin of adequate potency should be used and that strict interpretation of results should be made.

The Group is of the opinion that, in general, vaccination as a method of controlling the disease should not be permitted except under special conditions where no other system of control is possible, and only as a purely temporary measure. The application of most of the vaccines at present available leads to the development of a sensitivity to tuberculin, and hence their use is not compatible with an eradication plan which depends upon tuberculin-testing.

It should therefore be stressed that the use of vaccines and therapeutic agents has to be excluded from any official systematic campaign for the eradication of bovine tuberculosis.

The Group emphasizes that in a control programme no distinction can be made between "open" and "closed" tuberculosis in cattle.

For effective control of bovine tuberculosis and its final eradication from the cattle population of a country, it is necessary to enlist the co-operation of all interested in public-health and agricultural activities. An incentive must be given to cattle breeders and livestock owners generally. This can be done, as described in the report of the Joint WHO/FAO Expert Group on Zoonoses, by the provision of special funds by governments,

¹ *Wld Hlth Org. techn. Rep. Ser.*, 1951, **40**, 5

agricultural organizations or other sources. Also, educational campaigns can play a big part both in influencing farmers to clear bovine tuberculosis from their herds and in creating a public demand for milk, milk products and meat derived from animals free from tuberculosis. Although pasteurization may be claimed to take care of tuberculous contamination of milk, the method has certain limitations, as has been shown by experience.¹

The following are specific steps which should be taken by governmental authorities in carrying out a bovine-tuberculosis eradication scheme :

(1) The provision of adequate funds to ensure the payment of indemnities to farmers for infected cattle slaughtered, and to cover the costs of technical services involved in the various aspects of the field programme. For these purposes, funds should be obtained not only from agriculture and health ministries, but also from co-operating farmer and dairy organizations.

(2) The establishment of a price differential for milk from tuberculosis-infected and tuberculosis-free herds.

(3) The promotion of close collaboration and exchange of information between official medical and veterinary tuberculosis services and other agricultural groups. This will facilitate the early tracing of sources of human infection from animals, so that appropriate action can be taken by both medical and veterinary authorities.

(4) The use of common laboratory facilities for diagnosis, research and the preparation of biological products used in the control of tuberculosis.

(5) The education of the public, in particular the rural population, on the danger of bovine tuberculosis for man, and in the public-health and economic advantages derived from its eradication. The full support of the public, both urban and rural, is absolutely essential to the success of any control programme.

(6) The organization of national advisory councils to guide and assist in the over-all control programme. Membership of this council should include representatives of the government, of medical, veterinary and other professional societies, of farmers and consumers, and of other interested groups.

5.2 Brucellosis

The Group has noted the first and second reports of the Joint FAO/WHO Expert Committee on Brucellosis² and endorses the recommendations contained therein.

¹ See for example : Wagener, K. & Reuss, U. (1954) *Lebensmitteltierarzt*, 5, 113; Oldenburg, F. (1954) *Lebensmitteltierarzt*, 5, 146.

² *Wld Hlth Org. techn. Rep. Ser.*, 1951, 37 ; 1953, 67

Br. abortus infection is still prevalent in most European countries. In some other countries, however, rapid progress is being made towards its eradication, or eradication has already been achieved. The application of adequate measures of sanitary control, together with the use of a suitable vaccine (strain 19), is leading to satisfactory results.

The control of *Br. abortus* infection in cattle naturally presents difficulties, especially where bovine tuberculosis control is given precedence. Nevertheless, the combined efforts of those concerned with public-health and agricultural activities can make appreciable advances towards the ultimate goal.

The same general measures as recommended for bovine tuberculosis control are also applicable to brucellosis.

Br. melitensis and *Br. suis* infections appear to be increasing in incidence and to be spreading into hitherto non-infected areas. These diseases in man and animals should be made notifiable. Because of the seriousness of these infections in human beings and the effect they have on the agricultural economy of a country, their control and elimination are matters of urgency. Brucellosis of sheep, goats and swine lends itself to rapid eradication if drastic means are adopted. The slaughter of the entire flock or herd in which infection is diagnosed in an animal of these species will not only ensure that the infected animals are eliminated, but also prevent the hazard of carriers and the transmission of the organisms by fomites. Attention is drawn to recent findings that brucella infection has been found in hares.

The possibility of brucellosis should be considered by medical practitioners in all cases of vague illness, particularly in farmers, slaughter-house workers, dairy workers and other occupational groups frequently exposed to the disease.

5.3 Rabies

Although many European countries have been free from rabies for many years, and are still free, the disease is prevalent in some parts of the continent, and countries hitherto free are threatened by invasion. A disturbing fact is the prevalence of the infection in wild life. This threat of invasion has meant that control campaigns, including vaccination of dogs and the reduction of wild life, have had to be inaugurated by some countries, especially in frontier areas. In addition, the finding of rabies in the bat in Yugoslavia is of significance.

Two reports have been made by the WHO Expert Committee on Rabies¹ and the Group endorses their recommendations. It has been

¹ *Wld Hlth Org. techn. Rep. Ser.*, 1950, 28; 1954, 82

clearly shown that rabies can be well controlled and finally eradicated from countries or parts of countries by energetic application of the recommended measures. Implementation of these recommendations could well be extended to countries and areas in which inadequate control is now being practised. In order to obtain maximum results in control efforts the following points deserve full consideration :

(1) Close liaison between health and veterinary services should be established with respect to improved reporting and diagnostic procedures, and production and potency testing of biological products.

(2) Where indicated, energetic control campaigns should be centralized under a single authority headed by a veterinarian, whether in the health or agricultural services.

(3) Agreements should be arranged between neighbouring countries for prompt and periodic exchange of reports, and for co-operative control programmes in border areas.

(4) The preparation and distribution to medical and veterinary practitioners of information brochures on rabies is advisable, so that rabies in an area will be quickly detected and dealt with.

(5) Every means of publicity should be used to inform the public on the major aspects of the disease in order to obtain the co-operation essential for successful control.

5.4 Hydatidosis

Hydatidosis is the cause of considerable suffering in human beings and of heavy economic loss in some parts of Europe, particularly in Mediterranean countries. Its incidence in other parts of Europe, although not so extensive, must also be considered of importance. Technical procedures for its control have been enumerated in the report of the Joint WHO/FAO Expert Group on Zoonoses.¹

It has been shown that the disease can be eradicated from an entire country by the adoption of vigorous measures. Strict control of slaughterhouses is essential in order to prevent the consumption of infected offal by dogs. In the transmission cycle, sheep, goats and swine probably play a more important part than do other types of livestock. Wild animals can also serve as reservoirs of the infection.

The treatment of infected dogs must form an important part of any campaign for the control and eradication of hydatidosis. The elimination of the mature parasite from the intestinal tract of infected dogs may be effected by the use of a reliable anthelmintic; arecoline hydrobromide has been found to be the most satisfactory. Regular treatment of dogs is

¹ *Wld Hlth Org. techn. Rep. Ser.*, 1951, **40**, 20

essential (see below) and can often be combined with rabies vaccination programmes. Tapeworms expelled from dogs must be destroyed, preferably by burning or burial, and the coat of the animal disinfected to destroy adhering eggs.

Concerted co-operative effort on the part of health and agricultural authorities is important in any control campaign and, to this end, the following measures are recommended :

- (1) Centralization of responsibility for co-ordinating control measures.
- (2) Education of the public, principally in the schools and in rural areas. This would include the stimulation of local rural communities to construct inexpensive slaughter-house facilities, or to improve existing ones (an accompanying benefit, of course, would be improved meat-hygiene practices).
- (3) The enactment and enforcement of adequate legislation concerning slaughter-houses in both urban and rural areas.
- (4) The organization of centrally directed mass campaigns, combined with rabies vaccination where indicated, and a dog reduction programme. The anthelmintic treatment (preferably every three months) should encompass a period of at least one year. As far as possible, such campaigns should be organized without cost to the rural population, and provision should be made to continue the campaign with local personnel over a period of years.

5.5 Other zoonoses

Several other zoonoses are of importance to European countries, and these, as well as the ones discussed in this paper, are being followed actively by WHO in collaboration with FAO and the International Office of Epizootics. For example, zoonoses transmitted through meat—such as trichinosis and taeniasis—and bacterial food poisoning have been considered by the Joint FAO/WHO Expert Committee on Meat Hygiene.¹ UNICEF, FAO and WHO are collaborating on improving milk hygiene practices which will protect human populations against milk-borne diseases. Studies on the epidemiology and diagnosis of leptospirosis are currently being co-ordinated by WHO, and it is planned to convene a study-group on this disease towards the end of this year.² Expert committees on brucellosis (FAO/WHO), milk hygiene (UNICEF/FAO/WHO), rabies (WHO) and zoonoses (WHO/FAO) are planned during the next two years.

Assistance on the technical aspect of the zoonoses is always available upon request to WHO and FAO by Member States.

¹ See *Wld Hlth Org. techn. Rep. Ser.*, 1955, 99.

² The report of this study group, entitled *Diagnosis and typing in leptospirosis*, will be published soon in *Wld Hlth Org. techn. Rep. Ser.*, 1956, 113.

6. EDUCATION FOR VETERINARY PUBLIC HEALTH

6.1 The aim of veterinary public-health education

The aim of education for veterinary public health is to impart the knowledge necessary to enable veterinarians to contribute fully along with medical and other personnel to the public-health services.

The demands of public health on the veterinary profession can be met only if the veterinarian has been suitably trained for work in this field. In his education he should be made familiar with the philosophy of a national public-health programme. Early in his student years he should be imbued with the idea of public service. Opportunities should be afforded him to learn the part a veterinarian should take in promoting community health and national welfare. Indeed, a well informed veterinary profession is an essential keystone in a sound, well balanced, effective public-health programme, and a very important pace-maker in the policies to be adopted by animal husbandry and other livestock interests. The responsibility for this enlightenment lies primarily with veterinary medical institutions, whether they be universities or autonomous colleges.

6.2 Veterinary education and community or herd health

Early in its development, veterinary practice had to take cognizance of the need to bring under control the major epizootics, thereby emphasizing the importance of herd or community health in distinction to the health of the individual. Methods of eradication soon led to the study of methods of prevention. Instruction in preventive medicine, animal nutrition, farm-herd hygiene, and building construction early took an important place in veterinary education. Economic conditions governing livestock production have led schools of veterinary medicine to devote much attention to those environmental factors influencing the optimum development of the animal and its products. This type of training for the veterinarian is in keeping with the modern public-health approach of considering all factors governing the health of the community in addition to the needs of the individual. The veterinarian fits with special facility into the family of public health, since he has been accustomed to the concept of protection of populations against crowd diseases and malnutrition, as well as the study of the individual.

The group of subjects mentioned above, together with food hygiene (including food quality), have been part of the veterinary curricula of different countries under such headings as veterinary preventive medicine, veterinary hygiene, dietetics and animal husbandry, animal sanitation,

veterinary State medicine or veterinary public health. The Group recommends that the term "veterinary public health" should be more generally used in veterinary education to cover the subjects related to public health.

6.3 Liaison between the medical and veterinary professions in undergraduate and post-graduate training

It is clear that if the veterinary profession is to play its part fully in public-health services effective liaison must be established between members of the veterinary and medical professions. This can be accomplished at both the professional (undergraduate) and the post-graduate level. In some countries medical and veterinary teaching forms part of the instruction given in the same university, and sometimes the teaching in the basic sciences is given to the two groups of students together. For instance, in some universities the classes in chemistry, physics and biology are attended by both veterinary and medical students. Instruction in physiology, biochemistry, histology, parasitology, and general pathology and bacteriology is also largely the same, whilst even in anatomy and preventive medicine some parts of the courses are common. The more vocational courses (those relating solely to medical and veterinary practice) are given separately. The veterinary student receives considerable instruction, even as an undergraduate, in animal husbandry, animal management, the production of meat, milk and eggs, and the improvement and control of their quality. Preventive medicine relating to the methods of controlling animal disease by eradication, prophylaxis and hygienic management forms an important part of undergraduate (professional) veterinary instruction, as do applied pathology, veterinary medicine and veterinary surgery.¹

Although the vocational parts of medical and veterinary training are given separately, nevertheless the period of common study forms a major part of the course and the mixing of the students enables friendships and mutual understanding between individuals of these two branches of medicine to become established. Appreciation of the tasks undertaken by members of the two professions might be improved, however, if students of one profession could participate in part of the professional or vocational instruction given to students of the other. One result of such a practice would be a greater appreciation by the physician of the emphasis which is given to preventive medicine in veterinary teaching today in many countries.

Liaison between medical and veterinary graduates is facilitated by the earlier student contacts, but mutual understanding between the two

¹ In the first report of the Committee on Veterinary Education in Great Britain (1936), the veterinary surgeon is described as "the physician of the farm and the guarantor of the nation's food supply".

professions can be improved, as is happening in many countries, by joint membership of scientific and professional societies where topics of interest to both human and veterinary medicine are discussed by medical, veterinary and other scientists. A further result arising partly from these meetings is the growing co-operation between medical, veterinary and other scientists on projects of research. Nevertheless, to get the best results in veterinary public health it seems to the Group that joint participation is desirable, at least in part, in the post-graduate courses that are considered advisable for the public-health specialist, whether he be qualified as a physician or as a veterinarian. Courses exclusive to veterinary or medical graduates should be modified to meet this need.

Thus, the veterinarian could with advantage share his post-graduate training in certain fields with medical men, e.g., in biostatistics, epidemiology and control of infectious diseases, public-health administration, and sanitation. A development such as this, including the award of the same (or equivalent) degree, would be to the mutual advantage of the veterinarian and the physician, and would encourage the young veterinarian to undertake specialization in public-health work. Post-graduate training of the kind proposed would strengthen the veterinarian's position and enable him to fill supervisory and administrative posts more efficiently. Lay help would be used for routine inspection and similar duties.

The training for public-health veterinarians should include: (a) advanced instruction in specialized fields which are of particular importance to veterinary public health, namely, epidemiology, bacteriology, immunology, virology, parasitology (including some medical entomology), communicable diseases of man and of animals, tropical medicine, environmental sanitation, animal and human nutrition, and food hygiene (including the control of the quality of food, its inspection during and after its production, and its preservation); and (b) instruction in public-health administration and education, public-health law and economics, biostatistics, industrial hygiene, community health education, and the function of auxiliary personnel in the public-health service. This instruction will improve the veterinarian's understanding of, and contribution to, the development of a more comprehensive health programme. It will permit him to understand the problems of other professional groups in public health, and will enable him to define his own activities more clearly.

6.4 Auxiliary veterinary personnel

If professional services are to be efficient from the point of view of the community, they must be established on a sound economic basis. To ensure this, trained auxiliary personnel have been developed in many professions.

As with other professions, the fields of endeavour open to veterinarians continue to increase in scope and importance. Few young veterinarians are entering upon extended careers largely devoted to comparatively simple and routine duties. It is questionable whether veterinarians, with their extensive education and qualifications calling for relatively high salaries, are needed in the performance of certain routine and sub-professional duties. Auxiliary personnel already exists in other branches of the medical profession, and there is no doubt that the veterinarian could best earn the prestige and remuneration he expects and deserves by serving primarily in an administrative, advisory or technical capacity, which would make possible maximum utilization of professional personnel.

The successful use of trained ancillary personnel by the veterinary profession is not new. To accomplish their mission with a minimum of veterinarians, but with a high degree of efficiency, the veterinary military services in many countries have established technical and field training courses for selected non-commissioned personnel. After completing successfully the required courses, these men work directly under the supervision of veterinary officers. They carry out routine tasks, receiving only such professional supervision as individual circumstances may require. This procedure has also proved effective in civil food-hygiene services and ensures optimal use of professional personnel.

In the interest of the community, if veterinary auxiliaries are to be used, their capabilities and integrity must be assured. Therefore, their educational and training standards, their licensing, and their activities in relation to the profession should be under the guidance and control of schools of veterinary medicine and veterinary licensing authorities.

6.5 Refresher courses and in-service training

The Group considers it important that personnel engaged in public-health activities should have the opportunity from time to time to attend courses of instruction designed to refresh and bring up to date their knowledge. It is expected that although such courses will vary both in length and in scope, each will provide certain necessary technical information to meet important programme needs. Groups may be convened, therefore, as occasion may demand and at locations which facilitate maximum attendance. Experience shows that best results are achieved through courses which are informative and stimulating but short.

In order to integrate into the health unit personnel with diversified as well as specialized training, newly recruited professional staff and their assistants should work for short periods with sections of the service dealing with research and investigation, epidemiology, food hygiene, control of zoonoses, and public-health administration.

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