History of veterinary public health in the Eastern Mediterranean and Africa

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Summary: Brucellosis, rabies, salmonellosis, anthrax and hydatidosis are among the main zoonotic diseases which constitute a threat to human health and welfare. Surveillance, prevention and control of such zoonoses and related food-borne diseases are problems of considerable magnitude. Despite their obvious importance, relatively few systematic control efforts have been made by national authorities.

Major constraints include the scarcity of public health veterinarians and related sub-professional staff to plan and implement adequate surveillance and control of zoonoses, and the lack of appropriate legislation and adequate laboratory services. Veterinarians have been contributing to public health for many years, but despite considerable efforts by the World Health Organisation (WHO), the Food and Agriculture Organisation of the United Nations (FAO) and other organisations in establishing veterinary public health (VPH) programmes over several decades, the veterinarian as a career specialist in public health is a relatively new phenomenon. In the last decade, emphasis has been placed on:

- supporting the training and development of human resources to promote VPH services and cover all its components
- promoting and upgrading national epidemiological surveillance and control programmes for the major zoonotic and food-borne diseases
- cooperating and assisting in local production of safe and effective vaccines, primarily for the control of rabies and brucellosis.

The most encouraging aspect of the present situation is the growing awareness among governments of the need to develop programmes for the control of zoonoses and related food-borne diseases.

KEYWORDS: Human resources - International collaboration - Situation analysis - Veterinary public health programmes.

INTRODUCTION

Veterinary public health (VPH) programmes were thought of as the best means of employing veterinary skills, knowledge and resources in the protection and improvement of human health and welfare. From ancient literature, it appears that the veterinary profession existed as early as 2000 BC throughout Africa and Asia, over an area extending from Egypt in the west, to India in the east.

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The founding of the World Health Organisation (WHO) programme in VPH dates back to the 1st World Health Assembly in 1948, at which rabies and brucellosis were discussed and relevant action was proposed. In 1950, the 3rd World Health Assembly proposed to expand the programme to include such diseases as hydatidosis, animal tuberculosis and Q fever. The following year, the WHO was asked to assist governments in combating zoonoses of major public health and economic importance, in improving food hygiene practice, and in training personnel for VPH work.

During these years the participation of veterinarians in public health practice (food hygiene and zoonoses control) was not organised in the Eastern Mediterranean Region, and the veterinary profession laid its main emphasis on economic activities, e.g. meat and milk hygiene.

In 1954, the visit to Egypt and other countries of Dr M.M. Kaplan, VPH chief of the WHO Division of Communicable Diseases Services, was the first step in initiating VPH programmes in the area (15). In his report, he recommended the development of VPH work and rabies control in Egypt as well as the formation of a VPH unit within the Ministry of Health.

In 1957, both Dr Kaplan and Dr J.H. Steele, WHO/VPH consultant, paid a visit to the WHO Eastern Mediterranean Regional Office (EMRO) during which time they visited the High Institute of Public Health (HIPH) in Alexandria, where they discussed details of a possible VPH programme with Dr A.H. Abdou (from a veterinary background, and then assistant Professor of Public Health at the Institute). Subsequently, EMRO sent Dr Abdou for one year of postgraduate studies in public health, majoring in VPH, at the School of Hygiene and Tropical Medicine in Toronto, Canada. This was followed by three months of training at the Communicable Diseases Centre, Atlanta, Georgia, USA, and in the food hygiene department of the Faculty of Veterinary Medicine in Copenhagen, Denmark. After his return to Alexandria in 1958, Dr Abdou served as EMRO consultant on VPH matters and, in collaboration with the WHO, a VPH section was established in the HIPH, whose tremendous contribution to the VPH programme in the area will be considered later. From 1972 to 1985 Dr Abdou served as a WHO staff member and a regional advisor in the WHO African Regional Office (AFRO). He rejoined EMRO as a regional advisor from 1986 to 1989.

In September 1970, the Regional Sub-Committee A passed a resolution (EM/RC 20A/R14) which, referring to the document entitled The Problem of Main Zoonotic Diseases in the Eastern Mediterranean Region presented by the Regional Director (Document EM/RC20/Tech. Disc./2), considered that some zoonoses (such as bovine tuberculosis, brucellosis, rabies and echinococcosis) still constitute a constant threat to human health and welfare, as well as being a limiting factor in the economic development of the countries in the region. The sub-committee recommended that governments draw up a long-term programme for the prevention and eventual elimination of zoonoses in man and animals based on sound epidemiological surveillance, and requested the Regional Director to assist in providing technical advice to governments in the region.

Both the statement of the 59th session of the Executive Board, in January 1977 (Report PB 1978-1979), and the resolution WHA 31.48 of the 31st World Health Assembly, in May 1978, provided solid support to the 1970 resolution.
EASTERN MEDITERRANEAN

Since its inception in 1954, EMRO has developed a VPH programme, the main elements of which are the control of zoonoses and food-borne diseases of animal origin. Strengthening zoonoses control in the Eastern Mediterranean Region is based on technical co-operation between the Food and Agriculture Organisation of the United Nations (FAO) and WHO and their respective member states; EMRO has been acting as the executive agency for the international coordination component. VPH activities in the region are usually initiated and technical support to national projects provided by consultants made available through EMRO.

The first constructive step was taken when EMRO, in collaboration with FAO, organised a seminar in November 1964 on Food Hygiene, Zoonoses Control and VPH Practice, in Pakistan (36), followed by a field visit to Iran. The purpose of the seminar was to bring together medical officers, veterinary officers and officers in charge of training as well as others from the field of sanitation, to discuss between themselves and with WHO and FAO consultants the various diseases of public health and economic importance in the region, as well as the major technical and administrative problems in VPH which require attention to assure progress in public health. At the outset, the VPH programme concerned itself primarily with the control and possible elimination of zoonoses, as well as dealing with food hygiene. The programme has evolved continuously over the years to include, most recently, consultation on health systems research and intersectoral collaboration in VPH (35). The programme has strengthened the links between administrative and functional bodies, connecting health and veterinary services in many of their field and laboratory activities.

It was soon recognised that VPH problems do not stop at national boundaries but need to be handled on an international basis. Therefore, liaison with several international organisations interested in VPH proved to be very beneficial (e.g. WHO, FAO, Office International des Épizooties [OIE]). In this connection, EMRO sponsored many seminars and consultations related to the various components of the regional VPH programme. Moreover, it arranged for the exchange of consultants and research workers, granted fellowships, promoted and supported research and disseminated valuable information and relevant data. Governments were encouraged to set up VPH units with WHO assistance in either their Ministry of Health or Ministry of Agriculture.

In the field of VPH until now, it has been largely impossible to eliminate zoonotic and animal diseases regardless of the measures implemented. Appropriate and simple technology for the prevention and control of such diseases is therefore a high priority, and is likely to remain so in the majority of developing countries. This includes technology for diagnosis, treatment, etc., as well as for the prevention and control of a specific group of zoonotic and related food-borne diseases. Thus, several laboratory training courses were conducted to familiarise the participants with some simple and effective diagnostic methods, concentrating on the need to apply simple technology to combat major zoonoses and focusing on the intersectoral components of these diseases (23). Guidelines were prepared and distributed for extended VPH programmes.

The second constructive step was an advanced Workshop on Regional and National Programme Development in VPH, in Mogadishu in December 1983, in collaboration with the FAO/WHO Collaborating Centre in Berlin (37). It was attended by senior
officials responsible for national Veterinary Services and for veterinary education, representing the majority of the countries in the region. The recommendations of the workshop are being closely followed by EMRO.

TRAINING AND RESEARCH

Almost all veterinary faculties in the region teach VPH courses related mainly to food hygiene and zoonoses control. In addition there are institutions for training paraveterinary and paramedical staff who are meant to assist veterinarians in the discharge of their duties in the field.

Postgraduate training facilities also exist in relatively few of the countries in the region. However, there is a need to build bridges between training institutions in the Eastern Mediterranean Region to promote regional collaboration in VPH programmes and health systems research (35).

Some of the major constraints in developing effective VPH control programmes in countries in the Eastern Mediterranean Region are the scarcity of veterinarians and related sub-professional staff to plan and implement adequate surveillance and control of zoonoses, the lack of adequate legislation or implementation of such legislation, the lack of epidemiological information, the absence of efficient control measures on imported food and the lack of adequate laboratory services.

The growing awareness among governments, at present, of the need to develop programmes for the control of zoonoses and food-borne diseases, and the increasing interest of countries in the development of epidemiological services are particularly encouraging.

The education and training component of the VPH programme has received high priority in EMRO, with the main aim of providing training in VPH at the postgraduate level. In this connection, EMRO regularly grants fellowships in VPH on receiving requests from governments. Seminars and training courses on laboratory methods have been held frequently in collaboration with other institutions. These training activities have done much to promote the VPH standard and expand its horizon (24).

Several teaching and research institutes in the region have contributed to fulfilling the education and training needs of veterinarians in the new concept of VPH, e.g. the Razi Institute and the Institute of Public Health in Iran. However, the HIPH in Alexandria and the Mediterranean Zoonoses Control Centre (MZCC) in Athens could be considered the two main pillars on which EMRO has built its VPH programme. Both of these institutions have played an indispensable role in this domain, and it is hoped that they will continue to do so in the future, particularly in management and epidemiology.

INTERNATIONAL COLLABORATION

Activities in the Eastern Mediterranean Region have been largely supported by the Mediterranean Zoonoses Control Programme (MZCP) and its Centre in Athens. The FAO/WHO Collaborating Centre in Berlin, the OIE in Paris and the
WHO/FAO Collaborating Centre for Research and Training in VPH at the *Istituto Superiore di Sanità* in Rome are also collaborating actively with EMRO in the regional programme, especially with respect to training and scientific meetings between various countries.

The Mediterranean Zoonoses Control Centre

In 1976, a few countries in the eastern part of the Mediterranean coastal belt took the initiative to develop, together with the WHO, a scheme of technical cooperation for the control of zoonoses and food-borne diseases. A first technical meeting was held in Athens, in 1977, with participants from Bulgaria, Egypt, Greece and the Libyan Arab Jamahiriya. A series of consultations and visits followed in Geneva, Athens, Tripoli and Ankara, to formulate the national components of the MZCP and their contribution to an international programme. Soon the idea of an international system of technical cooperation was born, and Greece offered to host and support a coordinating centre. The United Nations Development Programme (UNDP), the FAO and WHO (the latter as executive agency) agreed to sponsor the programme.

In 1978, the draft of the Document for the Comprehensive Project 1978-1983 was agreed upon, and the Joint Coordinating Committee felt that the epidemiological patterns and many related social and ecological questions called for an expansion of the programme to all Mediterranean countries. The MZCC became a reality in February 1979.

The main objective of the programme is the promotion of national plans and services for the control of zoonoses and food-borne diseases. Training, information exchange and applied field research are integral parts of this programme of technical cooperation. In this connection, the MZCC invited WHO member states to formulate and implement appropriate country-wide programmes for the control of zoonoses as an integral part of national health programmes, and to strengthen cooperation between national veterinary and public health services in improving the surveillance, prevention and control of these diseases. The technical work of the centre concentrated on the development of planning modules for zoonoses control and the development of information exchange to make use of the large number of international meetings held to discuss the major VPH problems.

It is pleasing to note that the activities of the MZCC have increased since its founding. The large number of international meetings, consultancies and training courses arranged each year speaks for itself. During the period when the author was working in EMRO, cooperation with MZCP played a vital and indispensable role in ensuring the success of the regional VPH programme.

The High Institute of Public Health

The HIPH started its educational and training activities in 1956. It awards a Masters degree (MPH) in various fields of public health, including one in VPH after a two-year course of studies (Appendix I), and also confers the degree of Doctor of Public Health. The Institute was administered as part of the Ministry of Health, with an independent budget, until it was affiliated to the University of Alexandria in 1963.

Studies were first directed to MPH levels in quarterly units ending with an examination. Later, studies were divided into two diplomas: one aimed at an overall
comprehension of public health, and the other providing a more specialised training in any of the fields of public health which interest the student. This is followed by a period of practical training.

Since 1956, the WHO has been sponsoring and aiding the HIPH, supplying equipment, books, etc. as well as sponsoring the training of staff abroad. A large number of staff have also served as staff members or consultants to the WHO. The HIPH receives students from all over Egypt, as well as Africa and Asia, most of whom are referred via the WHO.

Over 1,000 students have been trained from various Arab countries (Libya, Iraq, Jordan, Palestine, Kuwait, Yemen, Syria, Bahrain, the United Arab Emirates, Sudan and Lebanon). Students from Somalia, Afghanistan, Indonesia, Liberia and the United States of America have been also trained. All these students have been trained in the various departments of the Institute including the VPH (Zoonoses and Food Hygiene) department.

Throughout this period, the staff of the VPH section have played an indispensable and vital role in educating and training much-needed personnel in the various aspects of VPH (Appendix II). Valuable practical research has also been carried out to clarify the major problems of zoonoses and food-borne diseases, and to propose practical solutions adapted to local conditions (Appendix III).

On several occasions, the staff in charge have been called upon to give expert advice on local VPH problems, particularly in Saudi Arabia and the other Gulf states. Moreover, they have represented the WHO and FAO at the relevant regional meetings, either as temporary advisors or as consultants in developing regional and national VPH programmes. In conclusion, the HIPH is still playing a major role in fulfilling the education and training needs of veterinarians in the new concept of VPH, with an emphasis on good administrative arrangements, the development of appropriate infrastructures, community-based approaches and health education, as well as the development and application of appropriate health systems research.

SITUATION ANALYSIS

VPH services are those activities in which specialised veterinarians use their knowledge and available resources for the protection of human health. In the Eastern Mediterranean Region, such services mainly include the diagnosis, surveillance and control of zoonoses, food safety, laboratory animal medicine and comparative medicine. The importance of the various VPH activities varies greatly between the countries of the region as does the extent of their practical feasibility. Appropriate organisation and management of such services are lacking in almost all WHO member states. It is evident that VPH activities are primarily performed by veterinarians employed by the Ministry of Agriculture and, to a lesser extent, by the Ministries of Municipality and Health.

For almost three decades, EMRO and several national governments have been recommending the establishment of VPH units within government health services in order to further promote veterinary services which have repercussions on human health (25). Experience has shown that the impact of VPH activities on public health has been greatest in countries where functioning VPH units were created within the
Ministries of Health or Agriculture, e.g. improving the quantity and quality of available foods, controlling infections (especially zoonoses), protecting the environment, etc.

Despite the obvious importance of zoonoses and related food-borne diseases, relatively few systematic control efforts have been made by national authorities in the region. This has been due, in part, to other more pressing health programmes with prior claims on limited resources, but also to organisational weakness resulting from insufficient cooperation between the services dealing respectively with human and animal health, which often place a different level of priority on a given disease. The general consensus is that the principal function and field activity of public health veterinarians has been in food protection and zoonoses control.

FOOD PROTECTION

Food protection is one of the highest priority areas for VPH services (25). Food protection embraces all measures necessary for ensuring the safety, wholesomeness and soundness of food at all stages from its production to its final consumption.

This is a field of growing importance in the Eastern Mediterranean Region as a result of:

a) the rapidly increasing population of the world with its ever greater demand for food;

b) the increase in urban population with a corresponding decrease in rural population;

c) advances in food technology, which have been responsible for new and more sophisticated presentations of food, the handling of which may not be properly understood by the consumer;

d) the increase in environmental pollution which acts unfavourably on food quality generally;

e) increased national and international commerce within the food industry.

Among the great variety of disciplines tackling the problems in this field, the veterinary profession has been striving for a general awareness in the meat and dairy industries of the importance of preventive measures to protect consumers.

In most WHO member states in the region, the responsibility for food-borne disease control activities is dispersed among various authorities (agriculture, health, municipality). There is a need for coordination and clear allocation of responsibilities between these authorities.

Zoonoses and related food-borne diseases of animal origin have become increasingly prevalent in the region in recent years, especially with the increase in imports of food and food products of animal origin. In addition to their role as a cause of morbidity and mortality among human beings, they are major causes of economic loss, as well as a loss of protein of animal origin.
In view of the epidemiological situation, and as most WHO member states have overcome the acute shortage of veterinarians and auxiliary veterinary personnel, the functions of national Veterinary Services have shifted from mere production concerns to a more consumer-oriented approach, with an emphasis on the contributions made to food safety by improvements in animal production strategies and management.

In the field of food protection, reliable estimates should be made of future requirements for trained personnel to meet increasingly critical shortages. Where possible, the use of VPH assistants under professional supervision should be encouraged. Additionally, EMRO has prepared and widely disseminated guidelines on small slaughterhouses and meat hygiene for developing countries (20).

**Zoonoses**

Surveillance, prevention, control and possible eradication of zoonoses and related food-borne diseases are matters of great importance in the Eastern Mediterranean Region. They involve a complex interaction between human and animal populations in both epidemiological and socio-economic terms.

In spite of the obvious importance of zoonoses and related food-borne diseases, only relatively few systematic efforts have been made to control them in the region. In more fortunate regions, some of these diseases have been greatly reduced by effective preventive efforts (e.g. canine rabies, bovine tuberculosis, brucellosis and salmonellosis), but these and other diseases remain a significant health and economic problem in most WHO member states. This negative development has been partly due to other more pressing health problems, which had prior claim on limited resources but also due to the organisational weakness resulting from insufficient cooperation between services dealing with human and animal health, which may place different priorities on the same disease.

Brucellosis, rabies, salmonellosis and hydatidosis are among the main zoonotic diseases in the region. Other diseases, such as Rift Valley fever, are important in only a few countries. They constitute a constant threat to human health and welfare. They are also a significant hindrance to the economic development of the countries of the region, besides being a major cause of loss of food of animal origin. For these reasons, Resolution EM/RC 20A/R14 of the WHO Regional Committee for the Eastern Mediterranean Region recommended that member states draw up long-term programmes for the prevention and eventual elimination of zoonoses in humans and animals, based on sound epidemiological surveillance.

Surveillance, prevention and control of these diseases constitute, therefore, an important component of VPH activities through intensified technical cooperation between EMRO and WHO member states in the region (24, 31).

**Brucellosis**

Brucellosis remains an important human disease which persists in the region wherever the infection in animals has not been brought under control and where, consequently, transmission of the infection to humans occurs all too frequently (18). The prevalence of brucellosis is increasing in many WHO member states owing to the intensification of animal production, the importation of infected animals for
subsequent slaughter, and breeding from infected herds. In 1985, the Joint FAO/WHO Expert Committee on Brucellosis provided guidance on simple and direct action to be taken in countries with different economic conditions and levels of development, placing particular emphasis on management procedures for community-based programmes and the role of intersectoral cooperation.

Recent information clearly shows that brucellosis is the leading zoonotic disease in the region and is of major concern in view of its impact on both public health and animal production development schemes (32). Several member states (Egypt, Jordan, Kuwait, Oman, Saudi Arabia and the Syrian Arab Republic) have expressed their concern about brucellosis. EMRO responded by sending WHO consultants to assist in studying the national epidemiological situation and the needs for control (7, 8, 9). A training course on zoonoses was held in Tunis late in 1985 in collaboration with the MZCP, and a workshop on brucellosis control was held in Jordan, in June 1986 (18). Collaboration with Saudi Arabia in the production of brucellosis vaccine is progressing satisfactorily. EMRO has also collaborated with Syria in upgrading national laboratory facilities for brucellosis diagnosis. Representatives from fourteen of the countries of the region where brucellosis is a leading zoonotic disease participated in a Regional Consultation on Brucellosis Prevention and Control in EMRO, in December 1989 (39). They reviewed the epidemiological situation, discussed modern methods of diagnosis, treatment and health education, exchanged their experiences in organising and managing control programmes and adopted a regional plan for the prevention and control of the disease.

Rabies

Of the many zoonotic diseases in the Eastern Mediterranean Region, rabies is considered to be the predominant zoonotic public health problem. In several WHO member states, dog rabies is still prevalent and is spreading into new areas, mainly due to increasing population density and morbidity among humans and dogs. Rabies in the dog population still accounts for over 99% of all human deaths from rabies and about 90% of all human post-exposure treatment. With WHO support, specific activities for the control of human and canine rabies are being implemented in an increasing number of countries in the region (34). Surveillance, prevention and control of rabies form, therefore, one of the components of technical cooperation between EMRO and a number of member states (17, 19). Consultants have advised a large number of countries in planning for rabies control. Tunisia was the first country to start implementing its rabies control programme through the Arab Gulf Fund (AGFUND)/WHO Project. The Institute for Medical Virology and Immunology in Tunis organised a meeting on “Rabies in the Tropics” in Tunisia in October 1983 (29), which was attended by a large number of participants from the region, as well as international and local experts. In November 1986, nationals from the region also participated in the International Symposium on Research towards Rabies Prevention, in Washington.

The major field of collaboration between the WHO and national rabies programmes has been in the form of technical assistance in upgrading the quality of vaccine production at national laboratories, the training of personnel, the supply of vaccine and laboratory diagnostic equipment and the provision of health education material. WHO consultants have advised national staff on local production of rabies vaccines in Morocco, Sudan and Syria. The Rabies Department of the Pasteur Institute in Teheran was re-designated for a further period of four years as a WHO Collaborating Centre for Rabies.
Assistance was provided to Yemen in the setting-up of the human and canine Rabies Control Project funded by the UNDP, training personnel on the proper administering of vaccines and serum to persons exposed to rabies. Dog ecology studies and dog population management aimed at reducing the level of transmission of rabies among dogs and consequently reducing risk exposure among humans were initiated in Yemen with WHO assistance (10). As a trial, proposals were made to perform mass oral vaccination of dogs against rabies, to establish a clear and concise monitoring system for dog populations, and to reduce the dog population by eliminating favourable environmental conditions for reproduction.

Salmonellosis

Salmonellosis is recognised as one of the most important of the zoonotic diseases in the region. It is often transmitted to humans from animal sources and products. Outbreaks, sometimes involving large numbers of people, have been recorded in recent years. The introduction of modern animal production and food technologies, as well as changes in consumer habits, are particularly affecting urban areas in the region. Managerial skill, intersectoral cooperation, education and facilities are often inadequate to cope with these trends.

Food-borne infections, particularly those in which salmonellae are incriminated, present a serious public health services and socio-economic problem in most countries of the region. In this connection, and in collaboration with the FAO/WHO Collaborating Centre for Food Hygiene and Zoonoses in Berlin, a WHO consultant visited Iraq, Saudi Arabia and Tunisia in 1986 to study the magnitude of salmonellosis and other food-borne diseases and advise on the organisation and management of surveillance systems.

The study showed that at least one third of food poisoning cases are due to salmonellae from animals and foods of animal origin. In most countries food control is divided between several ministries, and the lack of medical supervision on food handlers together with illegal slaughtering are among the causes of the relatively high occurrence of Salmonella in foods. Another reason is the lack of collaboration between public health services and Veterinary Services. Therefore, national surveillance programmes for salmonellosis should be developed with such close collaboration. An essential step is the improvement of suitable laboratories and the introduction of modern techniques for isolation and identification of causative agents of food-borne diseases (e.g. the creation of a Salmonella centre).

In September 1987, the WHO Expert Committee on Salmonellosis Control provided guidelines on salmonellosis with the aim of recognising the important role of domestic animals in the disease. The committee indicated that human and other resources are insufficient in most WHO member states. It was stressed that quite apart from the morbidity and mortality and human suffering, zoonotic and food-borne diseases are responsible for significant economic losses. In this region, where diarrhoeal diseases are of great public health significance, the role of zoonotic agents, including Salmonella, in the aetiology of these diseases should not be underestimated, and this problem should receive the attention it deserves. Therefore, the WHO has continued to strengthen national capabilities in prevention and control of salmonellosis and other food-borne infections (30, 33). A training course on food microbiology, in Berlin in November 1988, organised by the FAO/WHO Collaborating Centre for Food Hygiene and Zoonoses, was attended by participants from several countries of the region.
Echinococcosis/hydatidosis

Echinococcosis/hydatidosis continues to occasion high morbidity rates and to cause much suffering in populations of the Eastern Mediterranean Region and the Arabian peninsula. The disease gives rise to relatively high economic losses both in the public health sector and the animal production industry, despite great advances in health sciences and technology. In most countries of the region this situation calls for major efforts on the part of governments to control the disease, which is much more widespread than is generally believed (21).

This disease is of particular importance in several countries of the region (e.g. Jordan, Tunisia, Egypt and Sudan), where technical assistance has been provided. EMRO recently received a well-planned protocol drawn up for the study of echinococcosis/hydatidosis in Jordan. The protocol is expected to deal with the problem in human beings, animal intermediate hosts and reservoir hosts. The WHO consultant who visited Jordan recently also recommended a project for surveillance, prevention and control of echinococcosis/hydatidosis in the country.

All factors favouring the perpetuation of this infection were discussed at the Intercountry Consultation on Prevention and Control of Echinococcosis/Hydatidosis organised by EMRO in Jordan in 1989 (22). Participants from fifteen WHO member states reviewed the situation in the region, evaluated recent advances in prevention and control of the disease and discussed intersectoral and international cooperation on control. The consultation also recommended the development of national centres for control, training and research as well as the preparation of guidelines on echinococcosis/hydatidosis control in the countries of the Eastern Mediterranean Region. Thus, guiding procedures for the elaboration of national programmes for the prevention and control of echinococcosis/hydatidosis adapted to the socio-economic conditions and cultural background prevailing in the region have been prepared by the MZCP and give priority to two programme components: education/training of both the public and professional groups involved in the food chain of food of animal origin; and improvement of the slaughter infrastructure, especially in rural areas of these countries, along with the reduction of illegal and private slaughtering practices. Another important component of the project is dog population control.

In conclusion, echinococcosis remains a predominant parasitic disease in large areas of the region. Chemotherapy offers some hope for human patients, and the combination of serological tests and ultrasonic scanning by portable equipment permits early diagnosis and treatment. The principal measures of prevention remain, however, hygienic slaughter practices and control of the dog population.

EMERGING ZOONOSES

Rift Valley fever

Rift Valley fever was discovered for the first time in Egypt in November 1977. It began as a remarkable epizootic which represented the first recognised extension beyond the African Saharan Range and lasted for about two months. The disease was established in riverine irrigated land areas, warning of possible endemicity in such areas. The presence of the natural host, vector and possibly carrier states provides reason to fear possible future epidemics. A significant feature of the epizootic was
human involvement at a level not previously observed in African epizootics. EMRO has been active in preparing and disseminating technical information dealing with this disease. The WHO/EMRO *Technical guide for the diagnosis, prevention and control of Rift Valley fever in man and animals* (38) was widely distributed in the region.

**Screw-worm myiasis**

In 1989, concern was expressed by some WHO member states in the Eastern Mediterranean Region over the recent introduction of screw-worm myiasis into the Libyan Arab Jamahiriya. This vector-borne zoonosis could have very serious consequences for livestock and perhaps even human populations in some countries of the region. The WHO, in cooperation with the FAO, has promoted the initiation of active surveillance of myiasis in animals and man in suspected areas, in order to clarify the epidemiological situation and introduce the necessary preventive and control measures. Technical information was distributed to WHO member states in the Eastern Mediterranean Region and neighbouring countries were advised to strengthen surveillance activities.

The screw-worm fly infestation has been closely monitored, and control measures have been undertaken by national authorities in collaboration with the FAO, which has assisted in establishing essential surveillance services and control programmes.

**ROLE OF THE WORLD HEALTH ORGANISATION**

Since 1955, the WHO has recognised the important role which public health veterinarians can play in public health programmes. In this regard, the WHO has stressed the increasing importance of veterinary participation in public health practices and the consequent need to strengthen VPH services. A VPH unit was therefore established at WHO headquarters, and regional advisors were later nominated in EMRO and AFRO to advise on VPH activities in each region.

It is now more than three decades since the WHO first started encouraging national governments to more effectively harness the resources of veterinary medicine in coordinating efforts to improve human health. It is gratifying to note the development of the WHO/FAO programme in VPH, and it would be desirable for collaboration between these two organisations to be further strengthened in this field.

While concentrating intensively on a number of specific technical activities of particularly high priority, such as zoonoses control, food protection, and comparative medicine, the WHO/EMRO programme has also been of value because of its catalytic and focal roles in many other fields, e.g. laboratory services and environmental hazards.

**The Eastern Mediterranean Regional VPH Programme**

Bases for the policies governing the operation of the VPH programmes:

1. Resolutions of the World Health Assembly, the Executive Board and the Regional Committee. In this connection, the following two resolutions form the policy basis of the programme:
a) The 31st World Health Assembly adopted Resolution 31.48 on “Prevention and control of zoonoses and food-borne diseases due to animal products” in an effort to alleviate suffering due to the diseases. The resolution invited WHO member states:

- to formulate and implement appropriate countrywide programmes for the control of zoonoses as an integral part of national health programmes;
- to strengthen cooperation between veterinary and public health services;
- to collaborate further in ensuring the appropriate development of zoonoses centres.

b) The Regional Committee for the Eastern Mediterranean Region, in its resolution EM/RC 20A/R.14, recommended that member states draw up long-term programmes for the prevention and eventual elimination of zoonoses in man and animals based on sound epidemiological surveillance.

2. Recommendations contained in the published reports of WHO Expert Committees and Scientific Groups on the various VPH activities.

The successful implementation of this programme is dependent to a large extent on its close reciprocal links with several EMRO programmes — particularly the Laboratory Services, Food Safety, Epidemiological Surveillance, and Vector Biology and Control programmes — besides the relevant programmes and divisions at WHO headquarters.

The VPH programme is implemented through the following channels:

- The Regional Advisor provides liaison between WHO member states, the regional office, WHO headquarters and other interested agencies, besides offering technical advice when needed.

- The Inter-country Programme (ICP) for Veterinary Public Health in EMRO (ICP/VPH/001/RB) is designed to enable EMRO to meet some of the urgent requests of WHO member states in the region, and ensure fruitful collaboration — particularly in planning and estimating the health personnel needed to reduce the incidence and prevalence of the major zoonotic diseases and related food-borne diseases in the region. In 1983, the ICP sponsored a regional workshop on VPH, and this has increased interest among member states in stimulating national zoonoses control activities. So far such programmes exist in fourteen member states. Other regional workshops on VPH are planned to be held whenever feasible.

- The Mediterranean Zoonoses Control Programme (MZCP) has a centre in Athens, the MZCC, which consolidates its inter-regional activities and coordinates its contribution to the regional programme of zoonoses control. Therefore, close collaboration is maintained with the centre, as well as with VPH headquarters, especially in the training of personnel on a national level, in organising scientific meetings and in providing the necessary technical and material support to national programmes. Several WHO member states are seeking WHO collaboration for consultant advice on joint control measures for specific diseases, provision of diagnostic materials and training of personnel, and these needs have been met largely through the MZCP. The other WHO Collaborating Centres play a vital role in the implementation of the VPH programme, particularly in training. Moreover, the exchange of scientists between national institutes and other WHO Collaborating Centres active in work on zoonoses and related food-borne diseases is facilitated through EMRO.
Joint Government/WHO Programme Review Mission of Technical Cooperation and National VPH Programmes (e.g. JOR/VPH/001/RB). Over the past few years, technical cooperation between WHO member states and the WHO itself has focused on the preparation and implementation of national, regional and global strategies designed to reach the main social target of governments and the WHO, namely "the attainment by all people of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life", also referred to as "Health for All by the Year 2000" (HFA/2000). Therefore, EMRO has been collaborating closely with WHO member states in the preparation of national HFA/2000 strategies and is supporting, through technical cooperation, the implementation of such strategies with special emphasis on primary health care development. It is in this context that the WHO proposed to member states in the Eastern Mediterranean Region that a joint national/WHO team would examine the technical cooperation programme between the respective governments and the WHO. As the WHO prepares its budget biannually, a WHO team visits each of the member states every two years to review the WHO contribution to national health development activities and make preliminary proposals for the technical cooperation programme over the next biennium. The WHO team consists of the national WHO representative, the desk officer in the country and another regional advisor or consultant. The Joint Review group lays a broad outline of the national programme statement for the biennium. It is gratifying to note that the groups have recommended VPH programmes in fourteen WHO member states so far. Each VPH programme is to provide the country with consultant services, supplies and equipment, fellowships and funds for national training courses. These programmes have contributed to a large extent in solving many of the VPH problems in the region.

AFRICA

In 1972, the first step was taken to initiate a VPH programme in Africa. At the invitation of the Ugandan Ministry of Health, a group of three VPH consultants were sent to WHO Headquarters. The three were experts respectively in zoonoses, food hygiene and laboratory animal medicine. The experts put forward their recommendations concerning the initiation of a VPH programme for Uganda, including the establishment of a VPH Unit at the Ministry of Health. From their recommendations, and at the request of the Ugandan Government, AFRO appointed the author as a WHO VPH Advisor in 1974.

Realising the importance of and need for centrally-coordinated VPH services, the Ministry of Health responded favourably to the WHO proposal. Thus, a VPH Division was established in 1975, comprising two sections: one for zoonoses and one for food hygiene. The head of the division was a local veterinarian who was sent through AFRO to be trained in VPH at the Minnesota School of Public Health (5).

The planning and development of a programme for zoonoses surveillance was given all the attention such a project deserves. In this connection, two main suggestions were implemented. The first was the establishment of a Zoonoses Centre to deal with control of the zoonotic diseases in the area. Moreover, the centre included a unit intended to focus primarily on research and training in the problems of wildlife zoonoses. Although, initially, this was a national project, it would in time develop into an International Centre for Africa. The second suggestion was the establishment
of an Epidemiological and Statistical Unit within the Veterinary Department of the Ministry of Animal Resources.

Of the three main national parks, the Rwenzori National Park was selected, due to the presence of the Uganda Institute of Ecology (UIE). This Wildlife Zoonoses Unit (6), the first of its kind in Africa, was based at Mweya, where a centre for ecological research had been officially opened in 1975. The Wildlife Zoonoses Unit was set up in 1976 as part of the WHO/Ministry of Health/VPH programme, and comprises two laboratories reasonably well-equipped for research on aspects of wildlife diseases. The staff of the unit initially consisted of a veterinarian from Uganda, a microbiologist and a veterinary laboratory technician. Technical and scientific supervision was provided by the WHO VPH Advisor, who acted as honorary senior research consultant to the UIE. The unit concentrated on the initiation of a programme for the surveillance of zoonoses in wildlife, e.g. trypanosomosis.

Preliminary studies showed that a good number of the trypanosomes species are kept alive by some of the wild game, namely bushbuck, bushpig, buffalo, elephant, hippopotamus, baboon, water buck, etc. Moreover, some of these animals acted as actual host to the vectors of the disease. Initially, particular attention was directed towards primates which, being closely related to humans, are well able to serve as sentinels for foci of infections potentially hazardous to human populations. Moreover, monkeys are among the most important experimental animals needed for laboratories and research institutions.

To fully establish the veterinary profession in Uganda as an integral part of the whole public health apparatus, all national veterinarians must have a comprehensive grasp of the VPH problems involved and a clear perspective of their value to society. Therefore, the AFRO VPH Advisor offered his services to teach and start a programme for VPH at the Faculty of Veterinary Medicine, Makerere University, Kampala. The farsighted faculty council responded positively by establishing a VPH Division, which began work in 1975.

In 1976, the author was appointed as a visiting professor to the Institute of Public Health at Makerere University, where he conducted two courses each year to the physicians registered for the Diploma in Public Health – one in zoonoses and a second in food hygiene. In Uganda, there are several schools and institutes which cater for the training of VPH auxiliaries. AFRO extended its technical help through the AFRO VPH and Public Health Education (PHE) units in the project UGA/ESD/001. The project paved the way for the implementation of control programmes for some of the major zoonotic diseases, not only in Uganda but also in other countries of East Africa as a result of extending the services of the members of the project.

**TRAINING AND RESEARCH**

Promoting and strengthening the development of a cadre of well-trained technical personnel to form an effective infrastructure is a continuous process. In this connection, the WHO has arranged several workshops, e.g. on the planning, organisation and management of VPH programmes, attended by the directors and senior staff of several national Veterinary Services (28, 31). These workshops stressed the need to strengthen coordination between national health services and Veterinary Services. They also highlighted the principal problems, obstacles and constraints
in the African countries, namely the failure to recognise the problem, the lack of technical knowledge, manpower and resources, and insufficient intersectoral cooperation.

The Commission For Technical Cooperation in Sub-Saharan Africa serves as a parent body for scientific cooperation in this region. Veterinarians are actively involved in two of its bureaus, i.e. the Tse-Tse and Trypanosomosis Bureau and the Animal Health Bureau. The latter is concerned with epizootic animal diseases and encourages the exchange of veterinary workers and consultants between countries in Africa.

AFRO and EMRO have sponsored several seminars and expert committee meetings related to the various components of the VPH programmes. They have also arranged exchanges of consultants and research workers, granted fellowships, promoted and supported research and disseminated valuable information and relevant data with particular emphasis on the rapid exchange of epidemiological information.

SITUATION ANALYSIS

Africa is rich in both domestic and wild animals. It is uniquely suited to the study of zoonotic diseases, particularly due to the presence of national parks created for the protection of the abundant wildlife present on the continent. The domestic and wild animal species cohabit with each other and with the human population in a variety of ecological niches which offer unparalleled opportunities for the transmission of zoonotic diseases.

The surveillance, prevention and control of zoonoses and related food-borne diseases are problems of considerable magnitude in Africa. They involve a complex interaction between the human and animal populations in both epidemiological and socio-economic terms. Quite apart from human suffering, sickness and death, these diseases adversely affect the social and economic development of the countries in the region, hamper agricultural productivity and the availability of food, lower the nutritional status of the people and impede rural development.

In view of the public health and economic implications of these diseases, as well as the feasibility of controlling some of them with the available means, AFRO and VPH headquarters have run a programme aimed at controlling the major zoonoses and related food-borne diseases. The principal objective of the programme is to promote better socio-economic standards by increasing food production, improving the safe protein supply, and reducing the incidence and prevalence of zoonoses and related food-borne diseases of major public health importance.

Although zoonoses and food-borne diseases are grossly under-reported in Africa, there is sufficient evidence that a great many are present in most African countries. Some of them are particularly widespread, eg. rabies, brucellosis, bovine tuberculosis, anthrax and salmonellosis. Control systems differ in WHO member states of varying economic development.

Major constraints to developing effective VPH control programmes in most of the African countries include the shortage of veterinarians and veterinary auxiliaries to adequately carry out these programmes, as well as the lack of adequate legislation and of the means to make such legislation effective.
Moreover, VPH in Africa presents problems of an organisational and technical nature. The responsibility for action in the control of zoonoses is distributed among various authorities at a national level, such as agriculture, municipality and health authorities. There is little coordination and no clear distribution of responsibilities. There is also a lack of adequate legislation, particularly with reference to food-borne infections of animal origin.

**FOOD PROTECTION**

Functions expected of public health veterinarians in Africa include diagnosis, surveillance and control of zoonoses as well as checks on the health aspects of the production, processing and marketing of foods of animal origin. The hot climate and the scarcity of refrigeration facilities in the majority of the African countries severely limit efforts to enforce meat and milk hygiene. Although several countries have some legislation relating to the sale of meat, milk and related products, the main problem is the difficulty in putting the laws into effect.

Considering the standards of personal and community food hygiene and sanitation, food-borne diseases of animal origin (particularly salmonellosis and perhaps other zoonotic diarrhoeal diseases) must be widespread. However, there is no information about the magnitude of the problem, largely because of the inadequate development of public health laboratory and VPH services for assessment of the epidemiological situation.

**ZOONOSES**

The surveillance, prevention and control of zoonoses and related food-borne diseases constitute important components of all veterinary public health activities. To provide an adequate service, intensive technical cooperation is required between AFRO and WHO member states in the African Region. Preliminary work has begun in the region on a review of existing facilities in member states, to identify those potentially interested in collaborating with AFRO and WHO headquarters. The role of domestic animals and wild fauna as reservoirs and vectors of zoonoses dangerous to human populations was taken into consideration at the time of planning, and WHO member states in the region have been invited to collaborate further in setting up control centres against zoonoses whenever necessary.

In this connection, a network of sub-regional zoonoses centres for technical cooperation has been set up in the three sub-regional divisions of the African Region in order to provide essential services to national health programmes. One centre for East and Central Africa in Nairobi, Kenya, a second centre for West and Central Africa in Ouagadougou, Burkina Faso, and a third centre for Southern Africa in Harare, Zimbabwe. The activities of these centres should assist national, regional and inter-regional (AFRO/EMRO) strategies and methods for the surveillance, prevention and control of the priority diseases.
Rabies

Rabies is still considered the number one zoonotic disease of major public health importance in Africa, and therefore receives high priority in prevention and control activities (3, 11). It is primarily a disease of the canine family, propagated in nature by dogs and such wild carnivores as the fox, jackal and wild dog. Recently, rabies has been a source of growing concern for health and veterinary officials throughout Africa. A tremendous number of individuals are bitten by dogs each year, and have to receive a course of treatment. The available data clearly shows that rabies is endemic all over Africa, being particularly prevalent in eastern and southern parts (e.g. Kenya, Tanzania, Zambia, Mozambique and Zimbabwe), leading to proposals for programmes to combat the disease (2, 12, 13, 16).

In 1976, outbreaks of rabies occurred in two areas of Tanzania, reaching epidemic proportions in 1978 (4). At the request of the Tanzanian government, the author was assigned by AFRO to collaborate in the control of the continuing epidemic. At the height of the epidemic in 1977-1978, reported human exposures totalled 5,631 and human deaths 140. During this period, over 63,000 dogs were vaccinated and some 90,000 dogs, cats, jackals and hyenas were destroyed. The seriousness of the outbreak was due to its occurrence next to the Serengeti National Park, the largest in Africa. During these outbreaks, control measures were seriously hampered by lack of adequate animal vaccine and ammunition, while human vaccine was also in very short supply.

In view of the seriousness of the situation, the WHO collaborated with responsible authorities in Tanzania on the formulation of a comprehensive Project Document outlining four phases for rabies control in the country (27). It is hoped that this document and the accompanying campaign will serve as a model for WHO member states which have not yet started a programme (26). The WHO is still providing technical advice whenever required (12, 13), and collaborating in the establishment of sub-regional centres for the production of a suitable vaccine (13, 14). In this connection, a WHO consultant visited Kenya, Tanzania, Zambia and Zimbabwe to discuss international technical cooperation on rabies control and the production and distribution of rabies vaccine within the context of Technical Cooperation among Developing Countries (TCDC) (16). In addition, FAO/WHO held a workshop on rabies vaccine production in Dakar (Senegal), in November 1983, and the WHO organised a consultation meeting on technical cooperation in zoonoses (rabies) control for East and Southern African countries in Geneva, in May 1983 (28).

In conclusion, despite the evident goodwill and the efforts made so far, rabies is far from being under control in Africa.

Brucellosis

Brucellosis has existed in Africa since time immemorial. Although the disease has continued to be a problem in both humans and livestock in almost all African countries, it still receives little attention from the veterinary and medical authorities. Serological tests carried out in several East African countries have shown that brucellosis is present in domestic livestock and some wild animals.

In general, little is known of the prevalence and significance of the disease either in animals or humans. In preparation for the meeting of the Joint FAO/WHO Expert Committee on Brucellosis in 1985 a questionnaire was sent out to all countries. As
expected, the response was not very satisfactory and few countries were in a position
to provide any information. However, it is customary in most countries to drink milk
grown from the animal, so transmission to humans is very likely.

EMERGING ZOONOSES

The problem of emerging zoonoses is another potential hazard for the population
in Africa as well as elsewhere.

Marburg disease

Marburg disease (initially termed "Marburg virus infection") was first recognised
in 1967, when outbreaks occurred among laboratory workers in the Federal Republic
of Germany and Yugoslavia. The virus which causes the disease is known to have
been introduced into both countries in consignments of African green (vervet) monkeys
imported from the same source in Uganda. In 1976, Marburg disease appeared in
extensive and almost simultaneous epidemics in two areas of Africa (southern Sudan
and northern Zaire).

Rift Valley fever

Rift Valley fever (RVF) is another emerging human and animal problem (38). Following its dramatic appearance in Egypt in 1977, RVF has come into prominence
as a potential international virus disease problem and is an emerging zoonosis of
interest to countries in Africa and the Mediterranean area (OIE Resolution No. XIV,
May 1981). However, it was already recognised as an important epizootic disease
in livestock populations (principally cattle and sheep) in Kenya, Uganda and Tanzania
some seventy years ago. The disease has also been recognised in many African
countries including Sudan, Malawi, Zambia, Zimbabwe, Mozambique and South
Africa.

Plague

Plague is a source of concern in Africa, as there are indications that activity in
natural foci is increasing and needs continuous surveillance. Significantly, the first
consultancy mission made by the author to Africa, in 1971, was to collaborate in
bringing under control the outbreak of plague in the eastern part of Zaire (1). In
1983, there was an outbreak of human plague in Tanzania, Madagascar and
Zimbabwe. In addition, a consultant collaborated on plague control activities in
Kenya, and examined the possibility of setting up a sub-regional reference centre to
coordinate such control and to study the alarming increase in rodent populations which
constitute reservoirs of human disease, particularly plague. A wide-scale research
project on plague in East Africa was agreed upon, and there is a good chance that
it will continue to be implemented.

Monkeypox

Monkeypox is a rare zoonosis occurring in the rainforests of West and Central
Africa. In the years since smallpox was eradicated, monkeypox has been regarded
as a highly important orthopox virus infection, requiring surveillance. Since 1970,
over 50 cases of monkeypox have been found in West and Central Africa, 80% of
which were in Zaire, where the government envisaged setting up a zoonoses control centre with WHO support. In 1979, a team of specialists (one veterinarian, an ecologist and an epidemiologist) carried out a mission to the Equator region of Zaire to collect data on the natural history of monkeypox. These data were used to prepare the inter-regional surveillance and research programme. A seminar on the surveillance of monkeypox and varieties of viral haemorrhagic fever (yellow fever, Lassa fever, Marburg disease, Ebola) was organised in Brazzaville, in May 1980, with the participation of health personnel from twelve countries of West and Central Africa. AFRO has decided to set up reference laboratories in two countries of the region (Nigeria and Mozambique).

Lassa fever

Lassa fever was first discovered in Nigeria, and has continued to occur sporadically in Africa. Cameroon notified a suspected case in 1979. The existence of sporadic cases of the disease and the severity of its clinical evolution justify continual surveillance, thus AFRO has decided to continue collaborating with the Lassa fever research centre in Sierra Leone.

The other viral haemorrhagic fevers, although their occurrence is occasional, have dangerous epidemic potential and can cause great public health problems once outbreaks begin, as was the case in Sudan and Zaire. Following these epidemics, surveys were made in collaboration with EMRO and bilateral technical cooperation was organised to develop surveillance systems for these diseases.

ROLE OF THE WORLD HEALTH ORGANISATION

The operation of AFRO Regional VPH Programmes is governed by the following resolutions and recommendations relevant to the African Region: the resolutions of the World Health Assembly, the Executive Board and the Regional Committee; the recommendations contained in the published reports of the WHO Expert Committees and Scientific Groups on the various VPH components.

Over the last two decades, AFRO and WHO VPH headquarters have collaborated closely with WHO member states in the African Region, particularly in the following activities:

- appointment of a Regional Advisor in charge of the VPH programme to be responsible for coordinating VPH activities in WHO member states where a disease is endemic, recruiting relevant consultants whenever the need arises and liaising with WHO headquarters and EMRO — the necessary multi-disciplinary approach is achieved through linkages with the following programmes: Epidemiological Surveillance, Food Safety, Laboratory Services, Health Manpower Development, and Vector Biology and Control

- preparation of national VPH programmes and support for the establishment of VPH units within government health services

- provision of consultant services, supplies and equipment, fellowships, etc.

- support for training and human resources development to promote all aspects of VPH services
– promotion and upgrading of national epidemiological surveillance and control programmes for the major zoonotic and food-borne diseases, with particular emphasis on rabies control within the TCDC system

– cooperation in the transfer of technology, and assistance in local production of safe and effective vaccine for the control of rabies

– facilitating the exchange of scientists between national institutes and FAO and WHO Collaborating Centres active in work on zoonoses and food-borne diseases

– initiation and sponsoring of regional seminars and workshops on the various VPH activities, with an emphasis on training courses.

In conclusion, veterinarians have been making a contribution to public health for a very long time, but the veterinarian as a career specialist in public health is a relatively new phenomenon, despite the considerable efforts of the WHO, FAO and other organisations in initiating and promoting VPH programmes in these regions. On the other hand, a most encouraging aspect of the present VPH situation is the growing awareness among governments in the region of the need to develop programmes for the control of the present major zoonoses and related food-borne diseases.

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The author should like to acknowledge the major role of Professor A. El-Ahwal, Professor H. El-Darie and Dr M. Adel, who succeeded him in the VPH section at the High Institute of Public Health in fulfilling the education and training needs of public health personnel in the new concept of VPH. Their valuable and conscientious research has contributed to clarifying the situation regarding the major problems of zoonoses and food-borne diseases which, in turn, has helped the discovery of suitable solutions to some of these problems.
Appendix I

COURSES FOR THE DEGREE OF MASTER OF PUBLIC HEALTH 
AT THE HIGH INSTITUTE OF PUBLIC HEALTH, 
UNIVERSITY OF ALEXANDRIA, EGYPT

Majoring in Veterinary Public Health

First Quarter
- Principles of Parasitology
- Principles of Microbiology

Second Quarter
- Principles of Epidemiology
- Principles of Public Health Administration
- Principles of Nutrition
- Principles of Public Health Education
- Principles of Occupational Health

Third Quarter
- Zoonoses
- Communicable Diseases
- Veterinary Bacteriology
- Biostatistics
- Principles of Public Health Education

Fourth Quarter
- Field Work (four weeks)

Fifth Quarter
- Vital Statistics
- Zoonoses
- Virology
- Food Hygiene
- Laboratory Animals

Sixth Quarter
- Food Analysis
- Vector Control
- Rodent Control
- Seminar
- Veterinary Parasitology
Majoring in Food Hygiene

First Semester
- Principles of Public Health Administration and Public Health Education
- Principles of Family Health
- Principles of Nutrition, Food Hygiene and Control
- Principles of Epidemiology
- Principles of Environmental Health and Occupational Health
- Principles of Tropical Hygiene
- Principles of Microbiology
- Special Studies
- Interdepartmental Studies

Second Semester
- Milk, Oil, Egg Control
- Meat, Poultry, Fish Control
- Food Legislation
- Food Microbiology
- Food-Borne Diseases
- Food Standards
- Food Additives
- Special Studies
- Hygienic Inspection of Food Premises
- Workshop Studies

Third Semester
Courses are selected according to the nature of theses in the specialisation of Food Hygiene (twelve hours).

Appendix II

THESES FOR MASTERS AND DOCTORATE DEGREES IN PUBLIC HEALTH AT THE HIGH INSTITUTE OF PUBLIC HEALTH, UNIVERSITY OF ALEXANDRIA, EGYPT

During the period 1958 to 1990, sixty-nine theses were accepted for Masters and Doctorate degrees. The most significant from the public health point of view are the following:
The problem of brucellosis in Egypt.
- Animal salmonellosis in relation to public health.
- Situation of bovine tuberculosis in Egypt and its public health importance.
- Epidemiology of Q fever.
- Epidemiology and control of foot and mouth disease.
- Animal milk-borne diseases in Egypt.
- Epidemiology and control of mastitis in Egyptian dairy cattle.
- Pasteurisation of milk and its public health importance.
- Studies on Salmonella infection in apparently healthy slaughtered animals.
- A study of fascioliasis in farm animals and man.
- Echinococcosis in some animals and their human contacts in Alexandria.
- Isolation of Salmonella from market and farm milk.
- Estimation of the prevalence of ringworm infection in cattle and pets and their chance of infecting livestock and humans.

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Appendix III

SCIENTIFIC PUBLICATIONS OF THE HIGH INSTITUTE OF PUBLIC HEALTH, UNIVERSITY OF ALEXANDRIA, EGYPT

During the period 1965 to 1990, fifty-eight scientific papers were published. The most significant from the public health point of view are:

- Brucellosis in raw market milk in Alexandria.
- Mycobacteria in milk products in Alexandria.
- Studies on the use of microbiological and chemical tests for the detection of antibiotics residues in milk curd and whey.
- The carrier rate of Salmonella in apparently healthy slaughtered animals.
- The effect of marine pollution on the hygienic quality of shellfish caught on Alexandria beaches.
- Studies on the detection of antibiotic residues in different organs of injected guinea-pigs.
- Evaluation of management training in food service establishments in Bahrain.
- Mastitis in dairy buffalo due to Klebsiella pneumoniae and in association with other common causative organisms.
- A study on the chemical composition and protein pattern of local processed meat products.
- Evaluation of food hygiene knowledge among post-graduate students at the High Institute of Public Health.
- Evaluation of some of the commonly-used serological methods for diagnosis of brucellosis.
- Isolation of Shigella from milk and milk products.
- Detection of complement fixing and haemagglutinating antibodies against Rift Valley fever virus in sera of domestic animals in Qalubia governorate.
- Mastitis in buffaloes and cows with special reference to tuberculous mastitis.
- Epidemiological and biological studies on fascioliasis in Abis I village, Behera province.
- A study on the prevalence of brucellosis among dairy farm animals in Alexandria.
- Epidemiology and control of anthrax.
- Rabies, a major public health problem in Egypt.
- Care and breeding of laboratory animals.

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Résumé: Parmi les zoonoses majeures, la brucellose, la rage, la salmonellose, la fièvre charbonneuse et l’hydatidose constituent une menace pour la santé et le bien-être de l’Homme. La surveillance, la prévention et le contrôle de ces zoonoses et des intoxications alimentaires qui en résultent posent des problèmes d’une ampleur considérable. En dépit de l’évidente nécessité d’un contrôle systématique de ces maladies, peu d’efforts ont été entrepris dans ce sens par les autorités nationales.

Les principales difficultés résultent du nombre insuffisant des vétérinaires spécialistes de santé publique et de leur personnel affectés à l’organisation et à la mise en œuvre de la surveillance et du contrôle des zoonoses, ainsi que l’absence d’une législation appropriée et de services de laboratoire adéquats. Si la contribution des vétérinaires à la santé publique est effective depuis de nombreuses années, la spécialisation des vétérinaires en santé publique est un phénomène récent, malgré les tentatives d’organisations telles que l’Organisation Mondiale de la Santé (OMS) et l’ Organisation des Nations Unies pour l’Alimentation et l’Agriculture (FAO), de mettre en place des programmes de santé publique vétérinaire (SPV) sur plusieurs décennies. Les tâches prioritaires durant les dix dernières années ont été les suivantes:

- aide à la formation et au développement des ressources humaines en vue de promouvoir la SPV et d’en couvrir tous les aspects ;
- promotion et revalorisation au niveau national de la surveillance épidémiologique et des programmes de contrôle des zoonoses majeures et des intoxications alimentaires ;
— coopération et assistance aux productions locales de vaccins efficaces et sans danger, en particulier pour le contrôle de la rage et de la brucellose.

L’aspect le plus encourageant de la situation actuelle est le fait que les gouvernements ont mieux pris conscience de la nécessité de mettre en œuvre des programmes de contrôle des zoonoses et des intoxications alimentaires.

MOTS-CLÉS : Analyse de la situation - Collaboration internationale - Personnel vétérinaire - Programmes de santé publique vétérinaire.

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HISTORIA DE LA SALUD PÚBLICA VETERINARIA EN EL MEDITERRÁNEO ORIENTAL Y EN ÁFRICA. — A.H. Abdou.

Resumen: La brucelosis, la rabia, la salmonelosis, el carbunco y la hidatidosis hacen parte de las zoonosis que ponen en peligro la salud y el bienestar del hombre. La vigilancia, la prevención y el control de estas zoonosis y de las toxoinfecciones alimentarias emparentadas, plantean un problema de considerable magnitud. Los esfuerzos que las autoridades nacionales consagraron al control sistemático de tales enfermedades han sido relativamente escasos a pesar de la importancia evidente de las mismas.

Las principales dificultades son la falta de veterinarios especialistas de salud pública y de su personal dedicados a organizar y a ejecutar las medidas adecuadas de vigilancia y control de las zoonosis y la ausencia de legislación y servicios de laboratorio adecuados. Los veterinarios vienen contribuyendo a la salud pública desde hace varios años, pero la especialización de la carrera veterinaria en salud pública es un hecho reciente, a pesar de los esfuerzos considerables dedicados a la instauración de programas de salud pública veterinaria (SPV) a largo plazo por organismos como la Organización Mundial de la Salud (OMS) o la Organización de las Naciones Unidas para la Agricultura y la Alimentación (FAO). En los últimos diez años, las prioridades han sido:

— contribuir al adiestramiento y al desarrollo de recursos humanos de manera a promover la SPV y de abarcar todos sus aspectos;

— promover y revalorizar a nivel nacional la vigilancia epidemiológica y los programas de control de las mayores zoonosis y toxoinfecciones alimentarias;

— brindar ayuda y cooperar en las producciones locales de vacunas eficaces y sin riesgo, en particular para el control de la rabia y de la brucelosis.

El aspecto más alentador de la situación actual es el hecho que los gobiernos están tomando mayor conciencia de la necesidad de instaurar programas para el control de las zoonosis y de las toxoinfecciones alimentarias.

PALABRAS CLAVE: Análisis de la situación - Colaboración internacional - Personal veterinario - Programas de salud pública veterinaria.

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REFERENCES


