

# Fifty years of veterinary public health activities in the Eastern Mediterranean Region

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**SUMMARY** This paper reviews the activities in veterinary public health in the Eastern Mediterranean Region over the past 50 years. It outlines the training and research carried out in the Region, with reference to the High Institute of Public Health in Alexandria and the Mediterranean Zoonoses Control Centre in Athens. It gives an overview of the activities carried out by the World Health Organization for the control of the different zoonoses prevalent in the Region and also looks at emerging and re-emerging zoonoses.

## Introduction

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 [1]. Veterinary public health (VPH) programmes are considered the best means of employing veterinary skills, knowledge and resources in the protection and improvement of human health and welfare.

The founding of the World Health Organization (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, WHO was asked to assist

governments in combating zoonoses of major public health and economic importance, in improving food hygiene practices and in training personnel for VPH work [2,3].

During these years, the participation of veterinarians in public health practice (food hygiene and zoonoses control) was not organized in the WHO Eastern Mediterranean Region (EMR) 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, head of VPH of the WHO Division of Communicable Diseases Services, was the first step in initiating VPH programmes in the area. 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.

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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. In 1958, in collaboration with WHO, a VPH section was established in HIPH, whose important contribution to the VPH programme in the area will be considered later.

In September 1970, the Regional Subcommittee A passed a resolution (EM/RC20A/R14) which considered that some zoonoses (bovine tuberculosis, brucellosis, rabies and echinococcosis) still constituted a constant threat to human health and welfare, as well as being a limiting factor in the economic development of the countries of the Region. The subcommittee 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 it requested the Regional Director to assist in providing technical advice to governments in the Region [2,3].

### Eastern Mediterranean Region

After its inception in 1954, EMRO developed a VPH programme, the main elements of which were the control of zoonoses and foodborne diseases of animal origin. Strengthening zoonoses control in EMR countries is based on technical cooperation between the Food and Agriculture Organization 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.

The first constructive step was taken when EMRO, in collaboration with FAO,

organized a seminar in Pakistan in November 1964 on food hygiene, zoonoses control and VPH practice. 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 among themselves and with WHO and FAO consultants the various diseases of public health and economic importance in the Region and also the major technical and administrative problems in VPH that required attention to assure progress in public health [4].

At the outset, the VPH programme concerned itself primarily with the control and possible elimination of zoonoses, as well as dealing with food hygiene. It has evolved over the years to include, most recently, consultation on health systems research and intersectoral collaboration in VPH. The programme has strengthened the links between administrative and functional bodies, connecting health and veterinary services in many of their field and laboratory activities.

In this connection, EMRO organized a workshop on regional and national programme development in VPH in Mogadishu in December 1983, in collaboration with FAO and the WHO Collaborating Centre in Berlin. It was attended by senior officials responsible for national veterinary services and for veterinary education, representing the majority of the countries of the Region. The recommendations of the workshop were closely followed by EMRO [5].

### 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 can assist veterinarians in the discharge of

their duties in the field. Postgraduate training facilities also exist in a few of the countries of the Region. However, there is a need to build bridges between training institutions in EMR countries to promote regional collaboration in VPH and health programmes.

Some of the major constraints to developing effective VPH control programmes in EMR countries are: the scarcity of veterinarians and related staff to plan and implement adequate surveillance and control of zoonoses, the lack 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 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 regard, 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 horizons.

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 the Islamic Republic of Iran. However, 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. These institutions have had 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.

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

### **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 WHO, a scheme of technical cooperation for the control of zoonoses and foodborne diseases. 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), FAO and WHO (the latter as executive agency) agreed to sponsor the programme. MZCC became a reality in February 1979 [2,3].

The main objective of MZCP is the promotion of national plans and services for the control of zoonoses and foodborne diseases. Training, information exchange and applied field research are integral parts of this programme of technical cooperation. It is pleasing to note that the activities of MZCC have increased since its founding. The large number of international meetings and training courses arranged and consultants recruited each year speaks for itself. Cooperation between EMRO and MZCP has played a vital and indispensable role in ensuring the success of the regional VPH programme.

## High Institute of Public Health

HIPH started its educational and training activities in 1956. It awards a masters degree (Masters in Public Health) in various fields of public health, including one in VPH after a two-year course of studies; it also confers a doctoral degree in public health. Since 1956, WHO has been sponsoring and aiding HIPH, supplying equipment and books as well as sponsoring the training of staff abroad. A large number of HIPH staff members have also served as staff members or consultants to WHO.

HIPH receives students from Egypt, as well as Africa and Asia, most of whom are referred via WHO. Over 3000 students from various Arab countries have been trained (Libyan Arab Jamahiriya, Iraq, Jordan, Palestine, Kuwait, Republic of Yemen, Syrian Arab Republic, Bahrain, United Arab Emirates, Sudan and Lebanon). Students from Somalia, Afghanistan, Indonesia, Liberia and the United States of America have also been trained. All these students have been trained in the various departments of HIPH including the VPH (Zoonoses and Food Hygiene) department. 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.

HIPH is still playing a major role in fulfilling the education and training needs of veterinarians in the new concept of VPH, with 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 specialized veterinarians use their knowl-

edge and available resources for the protection of human health. In EMR countries, 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 between the countries of the Region as does the extent of their practical feasibility. It is evident that VPH activities are primarily performed by veterinarians employed by ministries of agriculture and, to a lesser extent, by ministries of municipality and health [3].

For almost 5 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 that have repercussions on human health. Experience has shown that the impact of VPH activities on public health has been greatest in countries where functioning VPH units have been created within the ministries of health or agriculture. 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. The general consensus is that the principal function and field activity of public health veterinarians is food protection and zoonoses control.

## Food protection

Food protection is one of the highest priority areas for VPH services. It embraces all measures necessary for ensuring the safety, wholesomeness and soundness of food at all stages. Among the many and varied 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 [1]. In EMR countries the responsibility for

foodborne 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 foodborne 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 humans, zoonoses and related foodborne diseases are major causes of economic loss, as well as a loss of protein of animal origin.

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. Also, EMRO has prepared and widely disseminated guidelines on small slaughterhouses and meat hygiene for developing countries [4,6].

### Zoonoses

Brucellosis, rabies, salmonellosis and hydatidosis are among the main zoonotic diseases in the Region. They constitute a constant threat to human health and welfare. They are also a significant hindrance to the economic development of countries of the Region, besides being a major cause of loss of food of animal origin. For these reasons, Resolution EM/RC20A/R14 of the Regional Committee for the Eastern Mediterranean 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 [3].

The surveillance and control of zoonoses is the responsibility of both public health and veterinary services. Coopera-

tion between the veterinary and medical sectors in the surveillance and control of zoonoses is becoming an essential requirement in view of emerging zoonoses and the re-emergence of others. WHO has supported the efforts of national programmes in Member States to improve surveillance and information systems. The national programmes in Egypt and Sudan have been supported with equipment to improve the efficiency of their zoonoses information systems. In Tunisia, evaluation of the existing surveillance system and the preparation of proposals for its improvement have been carried out by national consultants with WHO support [3].

In 1996, technical assistance was provided by WHO in Lebanon to develop a study protocol for surveillance of zoonotic diseases. Manuals on diagnosis, surveillance and control of zoonotic diseases for public health personnel have been prepared with WHO support [7-9]. National training courses on surveillance of zoonoses have been organized in the Islamic Republic of Iran, Syrian Arab Republic, Sudan and Tunisia. Professionals from Egypt, Islamic Republic of Iran and Syrian Arab Republic have received WHO fellowships for overseas training in laboratory diagnosis, organization of surveillance and management of human aspects of zoonotic diseases [3].

National training courses on major zoonoses have been conducted for primary health care personnel in the Islamic Republic of Iran. The national programme in the Syrian Arab Republic has organized, with WHO collaboration, eight workshops on surveillance and control of rabies, brucellosis and salmonellosis at the provincial level. The production of health education materials on zoonoses is essential to successful programmes as the role of the community in prevention and control is significant. Production of such materials on

zoonoses has been supported in Iraq, Tunisia and Republic of Yemen [3].

### *Brucellosis*

Brucellosis is a leading zoonotic disease in EMR countries due to the intensification of animal production and the increasing importation of animals from outside the Region for slaughter and breeding. The disease is an important health problem in Afghanistan, Egypt, Djibouti, Jordan, Iraq, Kuwait, Lebanon, Oman, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic and Tunisia [3]. Most Member States of the Region have adopted comprehensive approaches to control the disease through active cooperation between veterinary and public health sectors. The Regional Office is collaborating with Member States in studying the national epidemiological situation, upgrading national systems for case detection and reporting, providing laboratory equipment and diagnostic reagents, and training national personnel [9]. Plans of action for control of human and animal brucellosis have been prepared by WHO consultants in collaboration with the national authorities in various countries of the Region (Kuwait, Jordan, Saudi Arabia and Republic of Yemen).

Early in 1963, studies on the prevalence and epidemiology of brucellosis in man and animals, together with experimental work on vaccination of sheep and goats, were carried out in the Region. WHO consultants evaluated the situation of human and animal brucellosis in Egypt, Oman and the Syrian Arab Republic and advised on control strategies [3]. In 1981, WHO published a guide for the diagnosis, treatment and prevention of brucellosis [7].

The reported incidence of human brucellosis in several countries of the Region indicates that children are particularly at risk. Infection is transmitted from the in-

fecting animal by ingestion of raw milk or dairy products, especially white cheese. Epidemiology, surveillance, diagnosis, treatment and control of brucellosis in countries of the Region were reviewed during a consultation on epidemiology and surveillance of brucellosis involving human health care, organized by WHO/MZCP in Heraklion, Crete in October 1992 [10].

In 1995, WHO assistance was provided to Palestine in the preparation of a project on the prevention and control of selected zoonoses in the West Bank and Gaza Strip, with particular emphasis on brucellosis. This project received extensive support and implementation started in 1996 [11]. In the field of brucellosis control, a regional WHO/MZCP workshop on human and animal brucellosis epidemiological surveillance was held in Damascus, Syrian Arab Republic in May 1998 [12]. The participants reviewed the status of diagnosis and current procedures for reporting of brucellosis and identified measures for strengthening surveillance capabilities and intersectoral cooperation.

### *Rabies*

Of the many zoonotic diseases present in EMR countries, rabies is considered to be one of the most important as a public health problem. The majority of human deaths due to rabies during the 1990s occurred in Afghanistan, Egypt, Islamic Republic of Iran, Iraq, Morocco, Syrian Arab Republic, Tunisia and Republic of Yemen. Thus, surveillance, prevention and control of rabies is one of the components of technical cooperation between EMRO and most Member States [3]. In this connection, WHO published guidelines on rabies control in 1987 [8].

The majority of human cases reported are as a result of exposure to rabid dogs, cats and wild animals (foxes and wolves).

Although canine rabies, with dogs as the principal reservoir of infection, is prevalent in the majority of Member States, wildlife rabies, with red foxes as the transmitter of infection, has increased in some countries in and around the Arabian Peninsula. The first consultation on wildlife rabies in the Arabian Peninsula took place in October 1992 in the United Arab Emirates. Representatives from Oman, Saudi Arabia and the United Arab Emirates, with the assistance of WHO experts, reviewed the situation and outlined practical steps, particularly the possibility of organizing an oral rabies immunization campaign for foxes to stop the spread of wildlife rabies [3].

Tunisia was the first country to start implementing a rabies control programme through the Arab Gulf Fund (AGFUND)/WHO Project. Several training courses and seminars on control of rabies for public health and veterinary personnel and the production of a television film on rabies were organized under an AGFUND-supported project on control of human and animal rabies in Tunisia [3,13]. During the period 1987–1989 assistance was provided to the Republic of Yemen in the formulation of a human and canine rabies control project funded by UNDP, the training of personnel in post-exposure treatment and dog ecology studies.

Since 1993, WHO has continued to encourage and support animal rabies vaccine production in the Islamic Republic of Iran, Sudan and Syrian Arab Republic. Human diploid cell vaccine produced by the National Institute of Health, Islamabad, Pakistan has been exported to several countries of the Region. The Pasteur Institute, Teheran, Islamic Republic of Iran has continued functioning as a WHO Collaborating Centre [3].

Surveillance, prevention and control of rabies in Lebanon has been reviewed and a

suitable plan of action was prepared in cooperation with health and veterinary services in 1995. The national rabies control activities in Afghanistan continued in 1996/1997 with support from WHO, FAO and other international and nongovernmental organizations [3]. A regional seminar on rabies prevention and control was organized by the Regional Office in Teheran, Islamic Republic of Iran in 1998. The participants reviewed the available methods of surveillance, prevention and control of rabies and adopted a regional strategy [14].

### *Salmonellosis*

Salmonellosis remains among the main causes of foodborne illness in many countries of the Region. The results available from some epidemiological studies indicate that it is an important cause of severe diarrhoea among children as well as other age groups of the population. Also, it is known to create economic problems in poultry production, which is considered to be the main cause of human infection.

It is well known that the most common source of infection is food of animal origin. However, the very limited scope of studies performed and the lack of surveillance networks for salmonellosis in the majority of EMR countries have made it difficult to undertake effective control measures at the national level.

The magnitude and seriousness of zoonotic and foodborne diseases, including salmonellosis, to the countries of the Region has been repeatedly underlined and reflected in several WHO, FAO and OIE reports. It has been expressed in such reports the increasing concern in relation to the spread of salmonella and recommendations have been issued in several meetings organized by the above-mentioned international organizations [15]. The WHO Expert Committee on Salmonellosis provided

guidelines on the prevention and control of salmonellosis [16].

The magnitude of salmonellosis and other foodborne diseases has been assessed in some countries of EMR, such as Iraq, Saudi Arabia and Tunisia, and advice given on the organization and management of surveillance systems [3]. An MZCP consultation on human and animal salmonellosis national control activities was held in 1995 in the Syrian Arab Republic. Multidisciplinary approaches for the prevention and control of salmonellosis and other foodborne diseases with community participation were adopted at the consultation [17].

#### *Echinococcosis/hydatidosis*

Echinococcosis/hydatidosis (E/H) is a prevalent parasitic disease in large areas of the Region. It remains a public health and economic problem in most EMR countries although it is entirely preventable. Highest infection prevalence is observed in intensive sheep-rearing areas where the dog/sheep cycle is important [18].

The incidence and prevalence of E/H in humans, herbivorous animals and dogs is not precisely known in several countries. However, although not accurately documented, the human prevalence seems to be rather high. Among the countries that regularly report human cases are Jordan, Libyan Arab Jamahiriya, Lebanon, Morocco, Sudan, Syrian Arab Republic, Tunisia and Egypt. Cyprus is the only Mediterranean country where an eradication programme has successfully been implemented for 15 years [19,20].

Despite the obvious importance of the disease, relatively few systematic control efforts have been undertaken by national authorities in the Region. This is partly due to other more pressing health programmes and limited resources, but also to organizational weaknesses resulting from insuffi-

cient cooperation between services dealing with human and animal health. The growing awareness among governments of the need to develop programmes for the control of E/H and the increasing interest of countries in the development of epidemiological services are particularly encouraging [21].

Training courses on echinococcosis control have been organized in collaboration with WHO in Jordan, Syrian Arab Republic and Tunisia. Applied research studies on the geographical distribution of echinococcosis and assessment of the cost of patient hospitalization and treatment has been supported in Tunisia [3].

#### **Emerging zoonoses**

The problem of emerging zoonoses and re-emergence of others is another potential hazard for the populations in EMR countries as well as elsewhere. The surveillance and control of zoonoses is the responsibility of both public health and veterinary services. Cooperation between the veterinary and medical sectors in the surveillance and control of zoonoses is becoming an essential requirement in view of emerging zoonoses and re-emergence of others. A WHO regional seminar on international and intersectoral collaboration in surveillance and control of major zoonoses was held in Cyprus in November 1996 with the objectives of reviewing and strengthening means of cooperation between medical and veterinary services [22].

In EMR countries, a number of zoonoses have emerged either as new pathological entities or as already known agents appearing in areas or species where they had not been previously reported. As such problems are likely to continue to appear, animal diseases and zoonoses surveillance will need to be reinforced and maintained at the country level and internationally. In this connection, a regional con-

ference on emerging infectious diseases was held in Cairo, Egypt in 1995 [23].

#### *Screw-worm myiasis*

In 1989, concern was expressed by some EMR Member States 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. WHO, in cooperation with FAO, has promoted the initiation of active surveillance of myiasis in animals and humans in suspected areas in order to clarify the epidemiological situation and introduce the necessary preventive and control measures. Technical information has been distributed to EMR Member States and neighbouring countries have been advised to strengthen surveillance activities [3].

#### *Rift Valley fever*

Rift Valley fever (RVF) is an emerging human and animal problem. Following its dramatic appearance in Egypt in 1977, RVF has been recognized as a potential international virus disease problem, and is an emerging zoonosis of interest to countries in Africa and the Mediterranean area. In 1993, another RVF outbreak was reported in Egypt after a 12-year absence [3,24]. The epidemiological situation of RVF in 1993 was a cause of great concern. The appearance of human cases in the Nile Delta indicated the threat of a major outbreak similar to that seen during 1977–1978 when an explosive epidemic affected thousands of humans and domestic animals. In order to prevent wider spread of the disease in the country and outside, WHO gave technical assistance to national authorities in the organization of surveillance among populations at risk of infection and in the planning and implementation of control measures.

These timely measures helped to prevent a major spread of the disease, but further vigilance is needed until infection completely disappears [3]. A WHO/EMRO technical guide for the diagnosis, prevention and control of RVF in man and animals has been widely distributed in the Region [25].

#### *Zoonotic tuberculosis*

The principal reservoir of *Mycobacterium bovis* is cattle, which can transmit the infection to many mammalian species, including humans. During an international conference on animal tuberculosis in Cairo in April 1992, it was reported that bovine tuberculosis continued to be an important source of human infection in the Region, especially in countries with a high prevalence of infection among domestic animals [26]. Joint actions between veterinary and public health services in the prevention and control of animal tuberculosis were recommended to countries in which it is endemic.

Bovine tuberculosis is important not only as a source of human infection but also as a cause of economic loss. This was clearly indicated in the report of the WHO/FAO meeting on zoonotic tuberculosis held in Geneva in 1993 and the report of the WHO/FAO working group on zoonotic tuberculosis held in Mainz, Germany in 1994 [27,28]. Strengthening zoonoses control, including bovine tuberculosis, in the EMR is based on technical cooperation between Member States, WHO and FAO.

#### *Fascioliasis*

Since 1950, clinical cases have been reported in countries of the Region with the largest numbers being reported in Egypt and the Islamic Republic of Iran. Animal fascioliasis is widespread in Algeria, Libyan Arab Jamahiriyan and Tunisia but no confirmed human infection has been reported. Fewer than 100 cases have been document-

ed in Iraq, Lebanon, Morocco, Saudi Arabia, Syrian Arab Republic, Tunisia and Republic of Yemen. Since 1978, human infection with *Fasciola hepatica* and *F. gigantica* has been increasingly reported in various parts of Egypt. Fascioliasis has now been designated as one of the emerging diseases of importance in the Region [18,23].

## Role of WHO

Since 1955, WHO has recognized the important role which public health veterinarians play in health programmes and the consequent need to strengthen VPH services. A VPH unit was therefore established at WHO headquarters and regional advisers were later nominated in the WHO Regional Offices for the Eastern Mediterranean and Africa to advise on VPH activities in each region.

Over the past decade, technical cooperation between Member States and WHO has focused on the implementation of national, regional and global strategies designed to reach the main social target of governments and WHO, namely the attain-

ment by 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 Member States in the preparation of national HFA/2000 strategies and, through technical cooperation, is supporting the implementation of such strategies with special emphasis on primary health care development.

In conclusion, surveillance, prevention, control and possible eradication of the main zoonoses in the EMR countries are matters of great importance. In this connection, it is gratifying to acknowledge that EMRO, in collaboration with MZCC and several international agencies and collaborating centres, is continuously organizing joint intercountry and national workshops, seminars and consultations in surveillance and control of the major zoonotic diseases in the Region. This has resulted in a growing awareness among Member States of the need to develop programmes for the control of zoonoses and foodborne diseases.

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