WORLD HEALTH ORGANIZATION
Regional Office for the Eastern Mediterranean
ORGANISATION MONDIALE DE LA SANTE
Bureau régional de la Méditerranée orientale

منظمة الصحة العالمية
المكتب الإقليمي لشرق المتوسط

REGIONAL COMMITTEE FOR THE EASTERN MEDITERRANEAN

EM/RC50/7
August 2003

Fiftieth Session

Original: Arabic

Agenda item 8 (c)

TECHNICAL PAPER

MAIN CHALLENGES IN THE CONTROL OF ZOONOTIC DISEASES IN THE EASTERN MEDITERRANEAN REGION

CONTENTS

EXECUTIVE SUMMARY

Countless species of animals are sources of viral, bacterial and parasitic diseases transmitted to humans. These diseases are zoonoses. The significance of zoonotic diseases and related foodborne diseases is growing in the Eastern Mediterranean Region. In addition to causing human morbidity and mortality, such diseases hamper agricultural production, decrease availability of food and create barriers to international trade.

Brucellosis, rabies, salmonellosis and hydatidosis are among the main zoonotic diseases in the Region. In the past two decades, other emerging and re-emerging zoonotic diseases have also acquired a particular significance. These include Rift Valley fever in the Arabian peninsula and Egypt, the New World screwworm (*Cochliomyia hominivorax*) in the Libyan Arab Jamahiriya, and zoonotic cutaneous leishmaniasis in almost all countries of the Region. Common to the emergence of all these diseases are changes in animal production practices, climate patterns and demographics and globalization of the food industry.

Control of zoonoses constitutes an important health matter. However, many factors involved in prevention and control of zoonotic infections cannot be addressed by the health sector alone. Success in reducing the public health significance of zoonotic diseases greatly depends on the level of cooperation between medical and veterinary sectors in diagnosis of zoonoses, exchange of information, organization of shared surveillance systems, common training of staff and creation of community awareness. High-level commitment and the ability of national programmes to mobilize the necessary resources and to collaborate closely with other relevant sectors are needed in order to cope with the common challenges in control of zoonoses.

Strategies for strengthening zoonosis prevention and control in the Region need to focus on enhancing political commitment, identifying the most appropriate control interventions and ensuring collaboration among all relevant stakeholders. Raising awareness among decision-makers and policy-makers on the burden of zoonoses in humans and animals will assist in securing political commitment and financial support for zoonosis control programmes. Cost-effective control tools appropriate for use in countries of the Region, such as animal rabies vaccines suitable for arid climates, need to be developed or adapted. Effective intersectoral collaboration must be underpinned by the development, in each country, of a common multisectoral national plan for prevention of zoonosis in humans and animals. To implement such strategies, multisectoral coordination structures with responsibility for zoonosis control should be established at national level. In addition, information on the financial burden of zoonoses should be collected, analysed and used to enhance political support, and partnerships with relevant organizations should be strengthened at regional level.

1. INTRODUCTION

Countless species of animals are sources of viral, bacterial and parasitic diseases transmitted to humans. These diseases are zoonoses. The public health significance of zoonotic diseases and related foodborne diseases is growing in the Eastern Mediterranean Region. In addition to causing human morbidity and mortality, such diseases hamper agricultural production, decrease availability of food and create barriers to international trade.

The importance of zoonotic diseases has increased at global and regional levels in recent years in connection with human population growth, intensive human and wildlife migration, urbanization, increased international travel and trade of animals and products of animal origin, and intensification of animal production. Many of the human diseases that are new, emerging and re-emerging are caused by pathogens which originate in animals or products of animal origin. The development of antimicrobial resistance poses an increasing burden on health care systems in treatment of some zoonotic diseases.

Control of zoonoses constitutes an important health matter. However, many factors involved in prevention and control of zoonotic infections cannot be addressed by the health sector alone. Success in reducing the public health significance of zoonotic diseases greatly depends on the level of cooperation between medical and veterinary sectors in diagnosis of zoonoses, exchange of information, organization of shared surveillance systems, common training of staff and creation of community awareness. High-level commitment and the ability of national programmes to mobilize the necessary resources and to collaborate closely with other relevant sectors are needed in order to cope with the common challenges in control of zoonoses.

The objective of this paper is to review the current situation and challenges in the prevention and control of zoonotic diseases and to advise Member States on adequate measures to improve surveillance, prevention and control of zoonoses.

2. OVERVIEW OF ZOONOSES IN THE REGION

2.1 Major zoonoses

A number of well-known zoonotic diseases, such as brucellosis, rabies, cystic echinococcosis, zoonotic leishmaniasis and salmonellosis, continue to affect human and animal populations in many countries of the Eastern Mediterranean Region. A wide variety of animal species, both domestic and wild, act as reservoirs of these diseases. The wide range of animal species and the unusually complex pathogens involved pose significant challenges for effective surveillance, prevention and control of zoonoses.

Brucellosis is an important source of morbidity in almost all Member States, with more than 60 000 reported cases in the Eastern Mediterranean Region in 2002. The most important practices associated with brucellosis include consumption of raw milk and dairy products, such as white cheese. Geographical distribution depends upon local food habits, milk processing methods, animal husbandry types and standards of personal and environmental

hygiene. Although human brucellosis is a notifiable disease in most countries, it is often unrecognized and unreported due to weakness of laboratory diagnostic capacity. Some countries have established reference centres for diagnosis of brucellosis and production of vaccines for immunization of livestock.

Rabies remains a public health problem in the Region. It is a disease of poverty affecting very vulnerable, often remote rural populations, mostly in the age group of 5–15 years. In 2002, 5000 deaths were recorded in the Region, mostly from Afghanistan, Islamic Republic of Iran and Pakistan. On average, fewer than 10 cases per country were reported in most other countries of the Region.

Rabies is a vaccine-preventable disease, in both humans and animals. It is responsible for significant expenditures by the public health sector on post-exposure treatments. The existence of large stray dog and cat populations in the urban environment is the primary problem. This has proved extremely difficult to control. Vaccination coverage of animals in most countries is low. Anti-rabies vaccines are produced locally in some countries; however, the majority of countries spend a considerable amount of funds for the import of high-quality rabies vaccines and rabies immunoglobulins. Lack of cooperation between the health and veterinary sectors often impedes progress in the control of rabies. Transmission of rabies from wild animals to dogs in some countries also complicates rabies control. Limited accessibility to modern rabies vaccine, lack of public awareness and insufficient political commitment are the major problems in Eastern Mediterranean Region.

Cystic echinococcosis (hydatidosis) is the cause of major public health and economic problems in many rural areas of the Region. Livestock-related economic losses are estimated to reach several million dollars annually and are the result of decreased weight gain, reduced milk and wool production and loss of infected viscera. Among the human population, 4000 to 5000 cases of hydatidosis are reported in the Region every year. The first-line treatment for such cases is surgery, and the success of surgical removal of hydatid cysts is variable; case fatality rates vary from 1% to 4% for first surgical intervention. Recurrences rates vary from 7% to 15% and result in higher mortality. Direct and indirect costs of hospitalization and residual disability or clinical sequelae, although not fully known, are estimated to reach US$ 15 million in Morocco and Tunisia. The main factors contributing to persistence of echinococcosis are large shepherd dog populations; uncontrolled disposal of offal and other slaughter wastes; and importation of live animals with echinococcosis. Prevention of hydatidosis in humans primarily involves regular de-worming of dogs, the definitive hosts. Keeping dogs away from areas with infected viscera (e.g. abattoirs) is also important.

Zoonotic cutaneous leishmaniasis is responsible for important outbreaks in several countries of the Region. Such outbreaks usually follow population explosions in rodent reservoirs. Agricultural water development projects (dams and new irrigation schemes) are important factors in population explosions. Vector control is ineffective against zoonotic cutaneous leishmaniasis. The main control strategy is rodent control and requires effective coordination between health, agriculture and environment sectors.

Salmonellosis is one of the major causes of severe diarrhoea, especially among children. Different phage types of *Salmonella enteritidis* and multidrug-resistant *S. typhimurium* are responsible for an increasing proportion of human salmonellosis cases. The factors facilitating the spread of salmonellosis are associated with the intensification of animal and poultry production, increased international trade of livestock and lack of compliance with existing regulations concerning processing and handling of food of animal origin. Surveillance for and investigation of outbreaks of salmonellosis in many countries are weak. Control of zoonotic salmonellosis requires a high degree of intersectoral and inter-institutional cooperation.

2.2 Emerging zoonoses

A significant number of outbreaks of new and resurging zoonotic diseases have occurred over the past few years, causing global concern. These zoonoses have emerged as a result of both new pathological entities and already known agents appearing in areas where they had not been previously reported. The many factors associated with emergence and resurgence of zoonoses can be categorized broadly into four groups:

- Changing livestock farming practices, international trade patterns of animals and animal products, changing consumer habits, and travel (enteric bacterial pathogens such as *Escherichia coli* O157:H7, *Salmonella enteriditis* and *Listeria monocytogenes*).

- Changing environmental conditions, including climate and disasters which influence reservoirs, vectors, and/or host species and population parameters including increasing urbanization (arthropod-borne pathogens such as Rift Valley fever, Crimean–Congo and other haemorrhagic fever viruses, Japanese B encephalitis and Nipah virus infection).

- Pathogens acquiring new genetic properties through adaptation, mutation, recombination or adapting to a new species (bovine spongiform encephalitis and variant Creutzfeldt–Jakob disease).

- Human population factors (HIV/AIDS elevates the risk of secondary zoonotic disease in affected individuals).

Rift Valley fever (RVF) is one of the most important emerging diseases in the Eastern Mediterranean Region. Outbreaks of RVF have been reported in several countries, including Egypt (1977–1979 and 1993), Somalia (1997–1998), Saudi Arabia (2000) and Yemen (2000). The first outbreak of RVF outside Africa highlighted several issues, particularly the lack of intersectoral collaboration in the prevention and control of disease, the crucial need for integrated control of vector-borne diseases and the need for cross-border collaboration in disease prevention and control.

Another emerging disease in the Region is Crimean–Congo haemorrhagic fever (CCHF). Outbreaks have been reported in recent years from Afghanistan, Islamic Republic of Iran, Iraq and Pakistan.

2.3 Foodborne diseases

Foodborne diseases remain an important challenge. The steadily increasing global population and the increased demand for food of animal origin has brought changes in the technology used in animal husbandry and the food industry. However, the introduction of new technologies carries increased microbiological and toxicological risks. The consolidation of food industries has many implications for the epidemiology of foodborne diseases. Large slaughterhouses and other processing plants for foods of animal origin create hazards for the human food chain, especially where the prevalence of enteric pathogens, such as *Salmonella spp.*, *Campylobacter spp.* or *Listeria spp.*, become endemic in poultry and livestock. Poorly regulated antimicrobial use during animal production can pose human health hazards. Because of the globalization of the food supply and increasing international travel, multidrug-resistant organisms can spread to all parts of the world. Antimicrobial-resistant strains of *Salmonella*, for example, have become increasingly prominent due to consolidation of the egg production industry.

The situation with regard to zoonosis control activities varies in countries of the Region. A few countries have active surveillance systems in place, priority zoonoses identified, control programmes functioning and intersectoral collaboration mechanisms in place (Egypt, Islamic Republic of Iran, Jordan, Morocco, Oman, Saudi Arabia). However, intersectoral collaboration is generally limited to brucellosis and RVF control programmes. Moreover, even where multisectoral committees are in place, in most cases there is no joint planning or conducting coordinated action in the field. In other countries, some of these components, such as diagnosis and reporting systems, are in place or are being developed. However, several countries of the Region have no diagnosis or reporting systems, few control activities and no intersectoral collaboration.

3. STRATEGIC ISSUES

The health sector alone can only detect and treat cases of zoonotic disease among humans. The prevention or elimination of zoonotic diseases requires long-term actions from the veterinary sector to decrease incidence among disease hosts and reduce or interrupt transmission. This requires high-level commitment between the health sector and veterinary sector to implement common control programmes.

Coordinated activities among international organizations in the Region occur mainly on an ad hoc basis, usually in response to an emergency. Ongoing activities involving both WHO and the Food and Agriculture Organization of the United Nations (FAO) in zoonosis control are few and concern only brucellosis, a zoonosis where the animal reservoir has high economic importance. When the animal reservoir is of low economic importance for agriculture, as with some rodent reservoirs of *Leishmania major*, cooperation from the agriculture sector is less common. It is crucial that the agriculture and health sectors at both international and national levels develop a common agenda for zoonoses control with a clear distribution of roles and tasks for each sector.

Zoonoses control programmes should be developed with long-term objectives and should include active collaboration with international organizations concerned with animal and human health, such as FAO, International Office for Epizootics (OIE) and WHO, which are charged with providing technical advice and assistance to countries. Within countries, close collaboration is needed between veterinarians and other health professionals, including epidemiologists, occupational health workers, food technologists, specialists in environmental control and laboratory personnel.

Strategies for strengthening zoonosis prevention and control in the Region need to focus on enhancing political commitment, identifying the most appropriate control interventions and ensuring collaboration among all relevant stakeholders. Raising awareness among decision-makers and policy-makers on the burden of zoonoses in humans and animals will assist in securing political commitment and financial support for zoonosis control programmes. Cost-effective control tools appropriate for use in countries of the Region, such as animal rabies vaccines suitable for arid climates, should be adapted or developed. Effective intersectoral collaboration must be underpinned by the development, in each country, of a common multisectoral national plan for prevention of zoonosis in humans and animals.

Implementation of such strategies requires that certain preliminary steps are taken:

- Establishing a coordination structure at national level to spearhead control activities. Necessary actions would include the establishment of a strong multisectoral committee or similar structure for zoonosis control and the development of a intersectoral surveillance system and control and prevention programme involving both the health and veterinary sectors.

- Building an evidence base to enhance political support. Emphasis must be placed on the economic burden of zoonoses, with results of economic analyses, including cost–benefit and cost–effectiveness analysis of control strategies. This should be carried out at regional level.

- Establishing and strengthening partnerships. Partnerships need to be forged with animal and human health organizations such as OIE, FAO, relevant pharmaceutical companies and interested nongovernmental organizations such as the World Society for the Protection of Animals (WSPA). Such partnerships would be aimed at coordinating zoonosis control activities at regional level, mobilizing resources and supporting operational research in control and prevention.

4. CHALLENGES FOR EFFECTIVE ORGANIZATION AND IMPLEMENTATION OF NATIONAL ZOONOSES CONTROL PROGRAMMES

The primary challenge for effective implementation of zoonoses control is to establish an effective veterinary public health system with well trained staff in the broad areas of public health and preventive medicine. Sectors such as health, consumer protection, agriculture and

the environment must be aware of and involved in cooperative efforts in zoonoses control and food hygiene.

Intersectoral cooperation is fundamental for controlling zoonoses. However, processes involved in planning and implementation of intersectoral actions are complex. Each country must develop its own strategy and approaches for intersectoral action. The process of developing intersectoral cooperation should include the following:

- Elaboration and implementation of policies, rules and requirements aiming at effective collaboration in specific projects;
- Improvement of communication through the bureaucratic structure;
- Identification of health and related problems requiring intersectoral action;
- Identification of technical and financial resources;
- Identification and allocation of specific responsibilities and activities for each of the cooperating sectors;
- Planning and implementation of joint in-service training programmes for workers from various sectors;
- Identification of contradictory or conflicting policies between different sectors and constraints resulting in hampering effective collaboration.

Management and communication skills of zoonoses control staff need to be strengthened through educational training, and control staff must be better represented in key policy-making positions. The managerial staff need to have:

- Ability to mobilize resources, disseminate information and promote intersectoral cooperation;
- Skills to administer available technology and to integrate it within national programmes;
- Ability to articulate zoonoses issues effectively to politicians and policy-makers, to the scientific and technical community, and to the population in general;
- Knowledge and understanding of sociocultural issues, particularly those related to prevention of zoonotic diseases, including food hygiene practices.

An additional challenge is to keep the activities of the national programme in pace with new developments in society, such as the introduction of novel food products of animal origin, changes in production systems and changes in sources of animal protein.

Outbreaks of zoonotic diseases often occur in areas far from sophisticated health care services, and reliable data on their distribution, incidence, morbidity and mortality are lacking. This is partly due to the lack of appropriate diagnostic tools for diagnosis and detection of pathogenic agents, which are basic requirements for prevention and control. National programmes need to strengthen their laboratory components to serve for the routine confirmation of clinical syndromes and for rapid confirmation of the causative agent in outbreaks. Laboratory services (availability, functionality and level of sophistication) should be assessed in order to determine the role of the laboratory in surveillance. Networks of national and regional reference centres could be established to meet local needs in diagnosis of zoonotic diseases.

Surveillance of zoonoses needs to be integrated into the functional national communicable diseases surveillance system. The main function of the surveillance system is to provide the information necessary to identify appropriate interventions. Analysis of surveillance data makes it possible to determine operational alternatives, their cost and benefits. Disease reporting from clinical and veterinary diagnostic laboratories is a crucial element in public health surveillance, particularly in prevention of outbreaks of emerging and re-emerging zoonoses. Unfortunately, in many countries animal and human data relating to zoonoses are collected independently by the health and veterinary services, with no coordination of efforts. Data are aggregated and tabulated, but seldom analysed or interpreted for the specific information needed for zoonoses control activities. Information exchange on zoonotic diseases, consistent training of staff and standardization of reporting needs to be given higher priority at all levels of the administrative chain. The pressing challenge for the national programmes is to develop and enhance surveillance of outbreaks of emerging and re-emerging diseases and to monitor changes in the incidence and geographical distribution of these diseases. Mechanisms for cooperation with private medical and veterinary sectors must be developed for collection of the essential information.

Communities need to be actively involved in the decision-making process and in implementing strategies to control or eliminate diseases of animal origin. Health education programmes should be developed for individual target groups (children, women, consumers, opinion leaders, schoolteachers). Appropriately prepared materials such as pamphlets and posters can be used to communicate information on diseases to local communities, and to encourage them to adopt healthy lifestyles. Dissemination of public information through the mass media is also essential in preventing and controlling zoonotic diseases and promoting zoonotic control interventions. It is particularly important to reach livestock producers, as they are key players in efforts to control zoonoses.

For sustainable implementation of zoonoses control programmes, both medical and veterinary students must be educated on zoonoses, intersectoral cooperation, exchange of information, epidemiology and control of foodborne diseases, emerging diseases, food quality, animal welfare, human health and the environment. It is important that the educational curricula for veterinary and health professions be reviewed and developed on a regional basis, with emphasis on specific problems of a geographical region. In addition, the national programmes need to encourage interdisciplinary, cost-effective, problem-oriented research relevant to their needs.

The challenge for the national programmes and international organizations such as FAO, OIE and WHO is to promote strong coordination of activities by different stakeholders in the fields of animal management, prevention of animal diseases, zoonoses control, food safety, training and dissemination of information at local, regional and global levels.

5. CONCLUSIONS

A number of endemic and epidemic zoonotic diseases, particularly rabies, brucellosis, cystic hydatidosis, leishmaniasis and foodborne zoonotic infections occur in the Eastern Mediterranean Region. New and emerging zoonoses and related foodborne diseases represent

a threat to human and animal populations of the Region but also lead to significant economic losses by reducing the availability of animal products and create barriers to international trade of live animals and animal products. There is a great need in the Region for high-level recognition that animal and human health are inextricably linked and that the veterinary and public health sectors share the common goal of protecting, promoting and improving the health and well being of human populations.

Efficient surveillance and control of zoonoses require that human and animal health issues be merged into a new public health agenda. Creating and responding to such an agenda depends on effective interactions between human and veterinary clinical, laboratory and public health professional organizations. These interactions are essential for implementing effective zoonosis control programmes. Although the benefits of intersectoral collaboration are recognized by all sectors involved in zoonoses surveillance and control, collaborative efforts to date have been weak due to technical and administrative obstacles. Intersectoral collaboration can be strengthened by establishing coordination structures that include technical and administrative support.

6. RECOMMENDATIONS

To Member States

1. Assess the national burden of zoonotic and related foodborne diseases and prioritize the diseases according to their impact on morbidity and the national economy.

2. Create multisectoral committees responsible for surveillance and control of zoonoses. These committees should be empowered to coordinate zoonosis control activities at national level and be provided with adequate budget. The committees should comprise members from all sectors involved in zoonoses surveillance and control, particularly public health and veterinary services. To ensure effective collaboration, the following strategies should be applied.

    2.1 Develop a common multisectoral national plan for zoonoses prevention and control in humans and animals.

    2.2 Strengthen surveillance of zoonotic diseases and integrate it with other infectious disease surveillance systems, particularly at peripheral level. Reporting should include both human and animal data.

    2.3 Strengthen veterinary and public health diagnostic laboratories in order to standardize and improve diagnostic methods.

    2.4 Enhance communication between veterinary and health services to secure exchange of relevant epidemiological information and reports on prevention and control activities for zoonotic and foodborne diseases.

2.5 Initiate or intensify joint public health and veterinary services staff training on zoonoses and foodborne diseases. This is essential to facilitate joint planning, implementation and evaluation of preventive and control actions with regard to zoonoses, food hygiene and related health promotion.

2.6 Identify indicators to monitor and evaluate prevention, surveillance and control activities.

3. Encourage active community involvement in the implementation of zoonosis prevention and control activities through disseminating targeted public information materials, providing health education and establishing community partnerships.

4. Update veterinary and health professions educational curricula according to current knowledge and practical needs for control of zoonotic diseases, with emphasis on multisectoral approaches.

To WHO

5. Strengthen partnerships with other international organizations such as FAO and OIE to coordinate control activities at regional and national level.

6. Build an evidence base on the economic burden of zoonoses, including cost–benefit and cost–effectiveness analysis of zoonosis control interventions, to enhance political support for zoonoses control and to assist countries in identifying appropriate control strategies.

To Member States and WHO

7. Promote and support multidisciplinary research on new approaches to control zoonotic and foodborne diseases and health system research to strengthen intersectoral collaboration and coordination.