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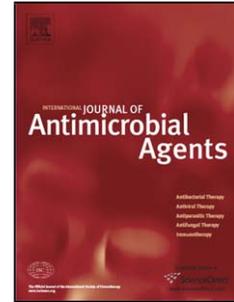
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**Capacity building for zoonotic and foodborne diseases in the  
Mediterranean and Middle East regions (an intersectoral  
WHO/MZCP proposed strategy)**

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**Abstract**

Epidemics and threats of epidemics are events of national and international public health importance. Zoonotic and foodborne disease management in the Mediterranean and the Middle East regions suffers from the inconsistent availability of accurate data at national and regional levels as well as difficulties in the timely recognition and containment of disease events. This situation mostly results from weak intersectoral national policies, strategies and programmes, together with a lack of education for professionals in crucial technical posts to help them provide effective management. There is urgent need for the development of capacity-building strategy among human resources through specialized training in fields of major importance. The World Health Organization/Mediterranean Zoonoses Control Programme is proposing the adoption of an expanded training strategy at national and inter-country level targeted at increasing the capability of professionals in sectors involved in zoonoses, foodborne diseases, food safety, the environment, emergencies, public health education and promoting intersectoral collaboration and coordination. Such capacity-building strategy will need sustained political commitment for support and reform, together with sustained technical contributions and funds mobilization by international organizations.

*Keywords:*

Education

Foodborne diseases

Public health training

Zoonoses

## 1. Introduction

Important parts of the South Mediterranean and the Middle East Regions (MMER) share similar epidemiological and other conditions that support a high prevalence of zoonotic and foodborne diseases (FBDs).

The great changes of the last decades include increasing and inadequately planned urbanization, movement of populations and immigration, intensification of food-animal production, close coexistence of humans and animals, large numbers of stray animals, illegal slaughtering and inappropriate waste disposal. Moreover, intensification of the international trade in food animals and animal products, the unsafe production, processing and use of food of animal origin associated with traditional habits and unawareness of the community, and the lack of provision of a hygienic water supply and the appropriate management of waste water are jointly contributing to the emergence and endemicity of zoonoses and FBDs [1,2,3].

Current prevention and control programmes for zoonoses and FBDs face difficulties in becoming effective and sustainable. This is the result of a combination of complex factors, including difficulties in infrastructures, a lack of trained personnel in posts of crucial importance, and weak preparedness at country level for the timely recognition and containment of disease events. Badly informed decision-makers, insufficient funds and poor intersectoral coordination complete the picture.

In complex and critical epidemiological conditions, effective prevention and control depend fundamentally on the level of collaboration among public health, animal health and related sectors in all countries. For example, endemic zoonoses such as brucellosis, echinococcosis, leishmaniasis, rabies, haemorrhagic fevers and newly

emerging diseases such as highly pathogenic avian influenza (HPAI) and the recent new H1N1 influenza can only be confronted if, both within and between countries, collaborative efforts are made towards upgrading administrative operations [16,18].

## **2. Importance of zoonoses and foodborne diseases in the MMER**

### *2.1. General considerations*

#### *2.1.1. Zoonotic and vector-borne diseases*

In developing Mediterranean countries efforts have been made to reduce the prevalence of some major zoonoses. Control programmes have been implemented in several areas, either by the appropriate government agencies or by non-governmental organizations. The programmes have shown that control is possible, but have been mainly short-term operations because of the lack of sustainability and resources [1,2,3].

Zoonoses and FBDs continue to have considerable social and economic impact among humans and livestock. Rabies, bovine tuberculosis, brucellosis, hydatid disease, leishmaniasis, etc. are still highly prevalent in the south MMER [1,3,4,5,6].

The high prevalence of these diseases is maintained mostly by traditional behaviours, such as animal-rearing practices that support the spread of infections with organisms such as *Brucella* and *Echinococcus*. Considering vector-borne diseases, leishmaniasis constitutes a major public health problem for the Southern and Eastern Mediterranean regions as well as for the whole Middle East [1,2,5,6,7].

Rabies continues to kill people, particularly children and elders. In this area rabies has specific characteristics that make it more difficult to control than in Europe, including a high turnover of the canine reservoir, whose habitat is near and within urban settlements [1,3,4].

### 2.1.2. Foodborne and waterborne zoonoses

Foodborne and waterborne zoonoses constitute a permanent problem for the whole area. The prevention and control of these conditions through the provision of hygienic food and water supply and the appropriate management of waste water represent a major challenge that must be faced. Epidemics of typhoidal, paratyphoidal and non-typhoidal salmonellosis are still appearing. *Escherichia coli* O157:H7, campylobacteriosis, cryptosporidiosis, foodborne trematode infections and others are present in most countries [3,8,9,10].

FBDs have a significant impact on health and development in this region. Moreover, globalization of the food trade and food standards has raised awareness of the importance of food safety for the export potential of developing countries. It is also well known that the availability of safe food improves public health, is a basic human right and a platform for development and poverty alleviation. Building capacity in this domain is therefore of pressing urgency.

### 2.1.3. Emerging and re-emerging zoonoses

Viral haemorrhagic fevers, West Nile fever and Rift Valley fever are permanent risks in this area. The sudden expansion of the latter in the Arab Peninsula during 2000 is a characteristic example. Reappearance of the phenomenon cannot be excluded [8,10,20,21].

H5N1 (A/H5N1) seems to have become endemic in Egypt. The spectre of a pandemic remains and there is a continuing threat from the new A/H1N1 influenza. With the support of international organizations countries are working towards preparedness; however, there is still much to do towards integrating activities and knowledge, acquiring experience and establishing coordination [11,16,18].

#### *2.1.4. Country management of zoonotic and foodborne diseases*

In many countries zoonotic and FBD prevention and control activities are managed through vertical programmes using dedicated staff to provide specific services. Managers and senior personnel of these programmes in the ministries of health and agriculture and/or in the municipalities often resist any movement towards coordination and integration, fearing 'erosion' of their authority and resources. Such attitudes have a negative impact on the effectiveness of their programmes and activities. Deficiency of cooperation, coordination and understanding among competent services can be responsible for the failure of prevention and control programmes in any country [12,13,14].

Another aspect is that global vision and strategy for the prevention and control of even the most important zoonoses and FBDs does not seem clear at the national level. Inadequate information for decision-makers, limited financial support, community unawareness and the traditional mindset are additional limiting factors [12,13,14].

#### *2.2. Specific considerations for capacity building*

##### *2.2.1. Tackling the problems – WHO/MZCP proposals for action*

The globalization of infectious diseases, particularly zoonotic diseases, is a phenomenon of increased international attention. Communicable disease events in one country are potentially a concern for a region or even the entire world. All factors contributing to the threat or emergence of an epidemic should be considered in detail towards appropriate preparedness measures and response planning [6,15].

In addressing such situations there is a need for a multidisciplinary approach. Integrated intervention tools should be used for a more effective response that

makes the best use of available resources in order to improve the outcome of programmes and activities. In this context the 'One World, One Health' concept of working at the interface between human and animal health and their ecosystems is the best approach to merging resources, services and interventions within and between sectors, while assuring maximum effectiveness [6,12,13,14,16,17,18].

Solid intersectoral collaboration and coordination among sectors is of paramount importance, together with the establishment of timely information exchange on disease occurrence, early effective epidemiological surveillance and early-warning systems operation. Finally, sustainable technical assistance by international organizations should be made available associated with mobilization of funds [12,13,14].

At the technical implementation level a radical change of concept is necessary. There is a need to move out of individual areas of expertise towards establishing strong cross-sectoral partnerships to deliver integrated capacity-building approaches. Such global concepts should be guided by key principles on the adoption of multidisciplinary, multisectoral and multinational policies and activities.

The Mediterranean Zoonoses Control Programme (MZCP; see Appendix1) of the World Health Organization (WHO) is proposing a global strategic approach as a core tool for preparedness to address the global impact of endemic zoonotic and related FBDs, with particular emphasis on those emerging and re-emerging. Such an approach should be based on expanded programmes of capacity building and development of human resources and be aimed at enhancing disease intelligence and strengthening surveillance and response systems at national and regional levels. In this context, sharing knowledge and experience, promoting new

technologies, establishing horizontal communication, adopting public health education programmes and motivating community participation are essential.

Among the most important targets to meet is building robust and well-governed public health and animal health systems compliant with the WHO International Health Regulations (IHR) and the World Organization for Animal Health (OIE) International Standards. Such a strategy should provide integrated specialized training at national and regional level to sectors recognized for their importance and weakness. Additional targets consist of emphasizing the importance of cross-sectoral collaboration and coordination, together with motivating trainees to abandon traditional 'isolation' behaviours and better inform decision-makers in order to obtain the necessary political, legal and financial support [13,19,20].

The MZCP is proposing, as indicative, a series of activities at national and inter-country level targeted at increasing the capabilities of all sectors involved among the countries of the MMER. Mixed trainee groups should consist of physicians, veterinarians, biologists, health and food inspectors, laboratory staff and other personnel working in areas relevant to the prevention and control of zoonoses and FBDs, the food production chain, local administrations, contingency planning, environment, etc. Training courses should be supported and coordinated by international organizations, which should assume technical responsibility for the educational activities.

### *2.2.2. Objectives*

Based on these considerations, general and specific objectives have been identified as areas of priority emphasis for consideration in capacity building (Table 1).

[Table 1 here]

### 3. Building capacity through human resource development

The activities proposed below, in the context of global training programmes, are indicated for implementation in sectors where capacity building should urgently be started. This is not a comprehensive list and other aspects could also be suggested for a more complete programme. All integrated training activities should be based on an intersectoral collaboration and coordination approach, which remain the core targets to meet.

These activities could include, among others, the following training programmes:

#### *3.1. Inter-country and national training courses on the epidemiological surveillance of zoonoses and foodborne diseases*

Training should be on the practical aspects of epidemiological surveillance and the establishment of intercommunication networks. It should be addressed to public and animal health professionals, municipality staff and laboratory staff, etc.

The main subjects could be: 1) understanding the importance of establishing and operating intercommunicating epidemiological surveillance networks, 2) tools for the analysis and interpretation of data collected, 3) monitoring zoonotic and FBD trends and inter-country information exchange, 4) proposals for action and 5) recommendations to decision-makers.

#### *3.2. Inter-country and national training courses on food safety, HACCP systems and food security*

Training should be addressed to public and animal health professionals, municipality staff, food inspectors, food processing plant managers, laboratory staff, etc.

The main subjects could be: 1) presentation and discussion of FBDs and food safety problems, 2) FBDs epidemiological surveillance analysis and interpretation of data

collected, 3) food safety and hazard analysis and critical control-point (HACCP) systems organization, 4) understanding food safety and HACCP systems as prerequisites for social and economic development, 5) consolidation of the interrelated principles of personal hygiene, food safety and public health education of the community, 6) WHO INFOSAN programme for community awareness in food safety and 7) recommendations to decision-makers.

### *3.3. Inter-country and national training courses on environmental and public health*

Training should be addressed to professionals in the ministries of health, agriculture, education, environment and in the municipalities.

Main subjects: 1) zoonoses and FBDs related to environmental conditions, 2) understanding the direct impact of the environment on public health, 3) public health promotion with respect to the environment, 4) technical approaches towards respecting and promoting a harmless environment, 5) understanding the importance of public health education in the context of urban and peri-urban environments, 6) recommendations to decision-makers.

### *3.4. Inter-country and national training seminars on intersectoral collaboration and coordination in zoonotic and foodborne disease prevention and control*

Training should be addressed to chief public and animal health officers and heads of related sectors and agencies.

The areas covered should include: 1) understanding intersectoral collaboration and coordination as the basis for zoonotic and FBD prevention and control, 2) understanding that an isolated and territorial mentality undermines national and international efforts for public health and socioeconomic development and 3) identifying problems and recommendations for progress.

### *3.5. Inter-country training workshops and consultations on subjects of broad interest*

These could include: 1) contingency planning for emerging and re-emerging zoonosis preparedness and response, 2) occupational health promotion, 3) public health education, community awareness and participation, 4) training and inter-country harmonization of laboratory diagnosis techniques for major zoonoses and 5) other subjects to be selected.

## **4. Conclusions**

The expected key outputs in the medium to long term following the adoption of a coherent staff training strategy can be summarized as follows:

1. More and better-qualified professionals and community-based workers in public health, animal health and related sectors;
2. Upgraded public health and animal health sectors, with good governance compliant with WHO IHR and OIE Animal Health International Standards;
3. Consolidation of understanding about the importance of efficient early-warning systems operation and information exchange through intersectoral collaboration and coordination;
4. Training professionals in crucial posts will enable them to work on country- and regional-level contingency and preparedness plans, also including horizontal inter-communication systems;
5. Better information for decision-makers should promote appropriate legal and financial support of zoonotic and FBD programmes and their management;

6. Enhanced support from major international organizations to encourage and support countries in the capacity development of their public health, animal health and related sectors;
7. The beneficial effects of a coherent, expanded capacity-building strategy are expected to become a guide for country development and the justification for decades of common efforts.

Adoption of the proposed extended capacity-building strategy would need funds mobilization for the support of short-, medium- and long-term activities. In this context, international organizations could play an essential supportive role for attracting the interest of international donors.

## **5. Concluding remarks**

The MZCP vision in proposing these global intersectoral training programmes at national and regional levels is to focus the attention of countries and specialized international organizations operating in the MMER on the necessity of adopting a well-planned and systematic capacity-building strategy. Respecting the conditions and needs of each country it should become an integrated supportive instrument in the context of the specialized frameworks and platforms of major international organizations such as the FAO–OIE Global Framework for Progressive Control of Transboundary Animal Diseases (GF-TADs), the FAO–OIE–WHO Global Early Warning System (GLEWS) and the WHO Food Safety and Zoonoses Strategies.

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*Ethical approval:* Not required.

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## Appendix 1

### *Briefing on the WHO/MZCP*

The Mediterranean Zoonoses Control Programme (MZCP) is an intersectoral/interdisciplinary specialized programme established by the World Health Organization (WHO) following the adoption of a resolution passed by the 31st World Health Assembly in 1978 on the Prevention and Control of Zoonoses and Foodborne Diseases due to Animal Products.

Greece has been hosting and supporting its coordinating unit, the *Mediterranean Zoonoses Control Centre*, since 1979. The MZCP is a WHO-directed and supervised interregional (Europe and Eastern Mediterranean) programme that works in close cooperation with specialized collaborating centres of WHO, the Food and Agriculture Organization (FAO) of the United Nations and the World Organization for Animal Health (OIE), and with the MZCP network of national participating institutions.

The overall objectives of the MZCP are to foster integrated programmes and activities for the surveillance, prevention and control of zoonoses and related foodborne diseases through strengthening collaboration between national, inter-country and inter-agency public health and animal health sectors and related institutions.

The governing body is the Joint Coordinating Committee, which meets every 2 years.

The goals of the MZCP are to: 1) develop capacity building in surveillance and response to emerging zoonotic and related foodborne diseases, 2) strengthen national capacities for risk communication to the community, 3) promote cross-

border inter-agency collaboration for zoonoses prevention and control, and 4) foster applied research on zoonoses and foodborne diseases.

Based on the rules provided by its statute, the MZCP's services depend on annual financial contributions from its member countries and contributions in kind from its collaborating institutions.

The participating countries are: Cyprus, Egypt, Greece, Iraq, Italy, Kuwait (State of), Lebanon, Oman (Sultanate of), Saudi Arabia (Kingdom of), Spain, Syrian Arab Republic and Turkey.

Associated countries include: Algeria, Bulgaria, Jordan, Morocco, Tunisia and United Arab Emirates.

Adherence to the programme is voluntary.

**Table 1**

General and specific objectives identified as areas of priority emphasis for consideration in capacity building

General objectives	Specific objectives
Provide and share knowledge, skills and experience on:	<p data-bbox="684 548 1793 581">Epidemiological surveillance of endemic and emerging/re-emerging major zoonoses</p> <p data-bbox="684 716 1171 748">Early warning and response systems</p> <p data-bbox="684 816 1772 914">Developing capacity to detect, assess, notify and report zoonotic disease events in humans and animals in accordance with IHR and OIE international standards</p> <p data-bbox="684 982 1241 1015">Foodborne disease prevention and control</p> <p data-bbox="684 1083 1751 1115">Food safety, hazard analysis and critical control-point systems, food security, etc.</p> <p data-bbox="684 1183 1377 1216">Environmental and occupational health development</p> <p data-bbox="684 1284 1371 1317">Public health education and community participation</p>

Establish and promote horizontal intercommunication and cross-sectoral partnership by:

Sharing knowledge and experience

Identifying priority prevention and control-oriented joint activities

Placing inter-agency and cross-sectoral collaboration and partnership among the highest priorities

Promote new technologies and concepts by:

Using informatics tools for cross-sectoral information exchange, analysis and interpretation for action

Encourage public health education by:

Promoting educational programmes adapted to specific community participation groups, e.g. school children, occupational groups and housewives

Motivation of local community leaders, etc.

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IHR, WHO International Health Regulations; OIE, World Organization for Animal Health.