Organisation of veterinary public health activities in countries of the Eastern Mediterranean region

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Summary: This review covers the organisation of veterinary public health (VPH) activities in countries of the Eastern Mediterranean region, with reference to zoonoses and hazards to man from foods of animal origin. A study of the region shows that no separate VPH units exist within the national Veterinary Services. Although these Services are gradually being upgraded and strengthened, most of their resources are spent in controlling serious contagious animal diseases such as foot and mouth disease, rinderpest and Newcastle disease. Rabies, present in almost every country of the region, is a zoonosis which no Veterinary Service can ignore. Other serious zoonoses affecting the region include echinococcosis, brucellosis, leishmaniosis, anthrax, toxoplasmosis and tuberculosis. Salmonellosis is one of the most serious food-borne zoonoses, while hazards from the increased presence of additives, pesticides, antibiotics and hormones in foods of animal origin are other emerging VPH problems. Many obstacles hamper efficient reorganisation of VPH activities. These include the inherited colonial system of assigning VPH activities to other authorities (health inspectors) rather than to Veterinary Services; the confusion as to which authority should actually be responsible in a given field; the lack of epidemiological studies and knowledge of the real extent of VPH problems; lack of training; inadequately staffed and poorly equipped Veterinary Services; and lack of public awareness. Nonetheless, a few countries have made excellent progress in reorganising VPH activities and in eradicating serious zoonoses. International organisations like the OIE, FAO and WHO can help greatly in establishing efficient VPH programmes.

KEYWORDS: Food safety - Veterinary public health - Veterinary services - Zoonoses control.

INTRODUCTION

This review covers the organisation of veterinary public health (VPH) activities in the countries of the Eastern Mediterranean region as well as several North African countries: Bahrain, Cyprus, Egypt, Greece, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Saudi Arabia, Somalia, Syria, Tunisia, Turkey and Yemen.
Some of these countries were formerly British colonies and under the system then prevailing, any existing VPH activities were carried out by so-called "health inspectors". Such responsibilities were rarely assigned to veterinarians or medical doctors, who at the time were very few in number. The "health inspectors" belonged to the Ministry of Health and the municipalities. This situation has continued in so far as the Ministries of Health have insisted on maintaining these prerogatives. Another recent tendency is decentralisation and the strengthening of municipalities and other local authorities. Consequently, the Veterinary Services have remained inadequately organised despite the increasing numbers of local veterinarians.

As regards VPH problems in the region, these are many and complex, and their control is not only a matter of adequate VPH organisation but also of setting priorities. The presence in the region of extremely serious contagious animal diseases such as foot and mouth disease, rinderpest and Newcastle disease, explains why VPH activities have not been a priority.

For VPH activities to succeed, many prerequisites must be satisfied, e.g. cooperation between different governmental public health services, availability of laboratories, and training and specialisation of doctors and veterinarians. It is to be regretted that such serious difficulties are encountered in the region. These difficulties lead to confusion in many countries. Different authorities are simultaneously interested in the same VPH problem or take uncoordinated action. In the end no-one can identify the organisational scheme or the competent authorities.

This paper describes the most serious VPH problems and methods of control, as well as results achieved where information is available. Also, problems encountered in the organisation of VPH services in the region are discussed and some proposals are made. Echinococcosis, anthrax, brucellosis and rabies are the most common and best-known diseases in the region, causing the heaviest losses in animals and also serious public health problems. Most of these diseases also occur in Asia and Africa, and also in more developed regions where similar conditions exist for their creation and perpetuation.

In late 1988, New World screwworm (Cochliomyia hominivorax) appeared in North Africa. Following coordinated national and international efforts (FAO, EEC, UNDP), infestation is still confined in an area around Tripoli in Libya. Urgent eradication measures in that area are imperative, along with preventive measures so that it does not spread to other countries.

Rift Valley fever (RVF) was reported in Egypt in 1977. This is a very serious zoonosis which produces explosive epidemics. Proper measures for the protection of humans (e.g. vaccination) and prevention in animals (vaccination, spraying of aircraft coming from countries where RVF is enzootic, quarantine of animals, control of animal movements, etc.) are necessary to prevent its spread to other countries.

In all countries, the Veterinary Services are controlled by the Ministry of Agriculture and funded by the government. The Service is deemed a welfare rather than a commercial activity. As such, consultations at veterinary outdoor clinics, indoor services, laboratory diagnosis, vaccination cover, health certification, etc., are supplied free of charge. Veterinary medicines are also supplied free of charge. In some countries, however, livestock owners are required to purchase costly medicines from chemists on prescription.
Veterinary aid is provided through veterinary hospitals or centres located at State or district headquarters, and under the supervision of a veterinarian. Large hospitals have indoor units and, in many countries, separate units for clinical medicine, surgery and small ruminants and poultry. These units are generally well-equipped. The next lower grade of veterinary unit is located at sub-district headquarters and referred to as veterinary sub-centres or dispensaries.

Animal quarantine is deemed the most important activity of Veterinary Services in the region, as most countries import considerable stocks of livestock for slaughter and meat.

Import quarantine facilities are in various stages of development and all countries impose animal health regulations on imports, which are almost always implemented.

**FOOD SAFETY**

Contaminated food is thought to be a leading cause of sickness in the region and it is estimated that only 1% of cases are notified. Diseases due to consumption of food of animal origin have become increasingly prevalent in many countries, partly due to greatly expanded international and national trade in live animals, animal products and animal feedstuffs, facilitating the spread of infection. Many other factors have contributed to the increasing outbreaks of food-borne diseases. These include rapid population growth, with greater demands for food, and the increase in urban populations (with a corresponding decrease in rural areas), which stimulates increased production of processed or semi-processed foods.

In most countries the main responsibility for hygiene of food of animal origin lies with the Veterinary Services of the agricultural ministries.

Bacterial diseases such as salmonellosis are now important zoonoses in the Eastern Mediterranean. In some countries, helminthic or protozoal parasites are also important food-borne hazards.

Added to these changing patterns of hazards associated with food of animal origin is the increased presence of additives, pesticide residues, antibiotics, artificial hormonal substances and heavy metals. These are emerging problems which constitute a major challenge in the food protection field, and their solution will depend very much on VPH activities in the region.

The status of food safety activities in the countries of the region can be summarised as follows (5), considering fourteen of the twenty-two Eastern Mediterranean region member states from which information was available and detailed enough for analysis.

**Food legislation**

Only four countries have a "basic frame law", i.e. a specific food law empowering an executive organisation to promulgate detailed regulations, food standards, etc. In three countries, there is no such law. In the remaining countries under review, the existing food laws are either obsolete or inadequate, although most have regulations of some kind.
Food safety administration

Countries of the region have difficulty in coordinating inter-sectoral activities in food safety. The enforcement of food legislation in nine countries is split among several ministries without a national coordinating body. In four countries this enforcement is in the hands of the health ministries and only one country appears to have an active coordinating committee (responsibilities in this last case are divided between the Ministry of Health and the Ministry of Trade).

Inspection

The type, quality and training of field food inspectors vary widely from country to country. Some countries have effective food laboratories with deficient inspection services, or vice-versa. In virtually no country is there a specialised corps of food inspectors.

Laboratory services

In food laboratory services — which give vital support to field inspection and import/export control, where these exist — there is often an imbalance between chemical and microbiological sections, due to difficulties in training personnel, procuring equipment, etc.

Health education

From one country to the next, there is a great diversity in health education activities, including training of food handlers, programmes for public awareness in food safety, school curricula, television programmes and publications.

Priority problems for food safety in the region

These include:

1. Lack of awareness of the relevant issues in food safety when considering consumer protection
2. Food safety is not integrated into the primary health care delivery system
3. Lack of interministerial coordination
4. Insufficient information on the magnitude of the food contamination problem
5. Inadequate food legislation
6. Inadequate implementation of existing food legislation
7. Lack of proper evaluation of specific food safety activities
8. Lack of public involvement in the promotion of food safety
9. Lack of involvement of the food industry
10. Insufficient involvement of academic institutions
11. Food safety problems related to street vending
12. Insufficient participation in the work of the Codex Alimentarius Commission and insufficient use of its recommendations
13. Inadequately equipped laboratories and inspection services
14. Lack of inter-country and regional cooperation

Observations

Food safety authorities should seek to work as partners with the food industries. Food workers should be educated in food safety measures. A well-informed public is a great asset for improvements in food safety, for instance by means of consumer groups. A food safety frame law is necessary so that standards and regulations can be formulated. Integration of environmental health with primary health care activities is effective in promoting food safety, e.g. in rural areas. A multidisciplinary team, working from an established health centre, can include environmental health, with its strong concern for food safety, in the general overall health plan. Detailed reporting by doctors is important in defining the real extent of morbidity and mortality. Also, epidemiological studies are needed in order to identify hazardous foodstuffs, bad food practices, etc.

VETERINARY PUBLIC HEALTH ACTIVITIES AND PROGRAMMES IN COUNTRIES OF THE REGION

BAHRAIN

(9)

Rabies is reported in bovines, ovines, caprines, equines, canines and felines, although no information is available on its prevalence in these animals. There is no information on human cases. Bovine tuberculosis is of low sporadic occurrence.

CYPRUS

(13)

With the advances made in VPH services, zoonoses which were major problems in the 1960s and early 1970s have either been eradicated or are now under control.

Echinococcosis

Before the 1970s, the surgical rate of echinococcosis in man per 100,000 of the population was 12.9 cases per year. There was no village without victims. Between 50-100% of sheep, goats, cattle and pigs were infected as well as 40-100% of the estimated 60,000 dogs. Between 1971 and 1985, over 85,000 stray dogs were exterminated, about 14,000 were spayed, and over 345,000 dogs were examined for _Echinococcus_; about 2,300 dogs were found infected and destroyed immediately. All owned dogs are now registered and responsibly kept. A total of 210 rural abattoirs were constructed or renovated. Examination of all species slaughtered in 1990 (over 200,000 sheep, 140,000 goats, 380,000 pigs and 4,000 bovines) failed to reveal an infected animal.
Brucellosis

*Brucella* affected 1.06% of sheep and goats in 1973. Infection in cattle was 0.47%, and by 1984 it had dropped to 0.003%. In 1988, samples from 4,608 sheep, 2,440 goats and 16,605 cattle were tested serologically and found negative. Prior to 1970, brucellosis had been a health problem among veterinary staff, but it is no longer present.

Anthrax

This was formerly one of the most serious diseases of sheep and goats in Cyprus. Due to a vaccination programme started in 1920, the disease has declined, particularly since 1950, and the last animal case was diagnosed in 1968. Vaccination ceased in 1975.

Bovine tuberculosis

Bovine tuberculosis was eradicated from Cyprus through a testing programme some forty years ago. No evidence of the disease has been found in the course of periodic testing and slaughterhouse inspections.

Other diseases

The occurrence of agents of other zoonoses such as toxoplasmosis, listeriosis, leptospirosis, Q fever (in sheep and goats, and exceptionally in cattle), salmonellosis and campylobacteriosis follow the pattern of such infections in European countries. Major parasitic zoonoses have been eliminated (e.g. infestation by *Taenia saginata* and *T. solium*) or are unknown (e.g. leishmaniosis).

EGYPT

(15)

Both the Ministry of Health and the Ministry of Agriculture (Veterinary Services) are involved in VPH activities such as zoonosis control and food inspection. Although there is no independent VPH service, mixed committees of veterinarians and doctors cooperate in these fields. Within the Ministry of Health, health inspectors carry out food control and environmental sanitation.

Brucellosis

The prevailing infection in cattle and buffaloes has been shown to be due to *B. melitensis*. Human cases increased among those in direct contact with infection in farms.

Control policy depends upon calfhood vaccination with strain 19, in order to develop an immune herd, as well as testing, with slaughter of positive cases.

Hydatidosis and rabies control

Combined efforts to control these infections were included in a pilot project. In 1987, 124,406 dogs and 15,551 cats were destroyed and 8,375 dogs were vaccinated. All vaccinated dogs were treated for echinococcosis three or four times per year. A unit for rabies diagnosis in animals was recently established at the Animal Health Institute in Dokki.
Rift Valley fever (RVF)

Since the last Egyptian case confirmed by isolating RVF virus in June 1980, there has been no clinical manifestation of the disease in Egypt.

Other zoonoses present include trichinellosis, leishmaniosis, fasciolosis, tuberculosis and salmonellosis.

GREECE

(12)

In Greece, VPH activities are the responsibility of the Veterinary Services, Ministry of Agriculture.

Tuberculosis and brucellosis

Programmes for the eradication of bovine tuberculosis and brucellosis have been implemented since 1977. Measures taken include tuberculin and serological tests, slaughter of positive animals and general disease control. A marked decrease in the prevalence of the two diseases has been reported.

Since 1975 a compulsory vaccination programme with Rev. 1 has been applied to all lambs and kids kept for restocking.

A progressive reduction in the number of abortions in animals due to brucellosis has been reported. A steady reduction in human cases has been demonstrated.

Echinococcosis/hydatidosis

This is one of the most serious zoonoses in Greece. The incidence in man is estimated at 10-17 persons per 100,000. In adult animals, the average rate is estimated at about 62% in sheep, 53% in bovines, 12% in goats, 2% in swine and up to 50% in dogs. The results of a ten-year control programme, initiated in April 1985, are expected to become manifest over the next years. Strong opposition from animal welfare societies has been raised regarding stray dog control.

Leishmaniosis

Cases in man average 65 per year. Examination of dogs for leishmaniosis is compulsory, in parallel with the echinococcosis control programme.

Rabies

Greece has been rabies-free for the last three years. Annual compulsory vaccination of dogs is carried out along terrestrial borders. About 1,000 samples from wildlife species have been examined and found negative.

Q fever

A serological survey of sheep and goats was initiated. The results reveal varying rates of infection in different areas and an increased prevalence of the infection.

Salmonellosis

Considering the socio-economic importance of salmonellosis and the fact that the population in some areas has been infected or is at permanent risk of infection,
coordinated control measures are a necessity. The Ministry of Health and the Ministry of Agriculture intend to plan and implement a pilot programme on salmonellosis control and require the services of an expert in zoonotic salmonellosis.

IRAN
(9)

The following activities and programmes are implemented for the prevention and control of zoonoses:

1. The Ministry of Health and Medical Education implements extensive programmes in cooperation with WHO and the Iranian Veterinary Organisation Centre for the control of brucellosis, tuberculosis, rabies and echinococcosis. In addition, foods of animal origin, whether produced locally or imported, are subjected to laboratory tests.

2. The Iranian Veterinary Organisation Centre implements vaccination programmes for prevention of brucellosis, tuberculosis, rabies, etc. and a programme of administration of anti-parasitic drugs. Also, the Centre supervises hygienic conditions in poultry and bovine slaughterhouses.

The following zoonoses are of low sporadic occurrence: anthrax (in ovines, caprines, bovines), echinococcosis (in bovines, ovines, caprines), leptospirosis (bovine), Q fever (bovine, ovine), rabies (bovine, ovine, caprine, equine, canine, feline, wildlife), bovine brucellosis (*B. abortus*), bovine tuberculosis, cysticercosis and salmonellosis. Caprine/ovine brucellosis (*B. melitensis*) is enzootic in Iran and is a notifiable disease. Control measures for the above diseases include testing, vaccination, slaughter of infected animals, quarantine and movement restrictions, but the programmes are hampered by the need to control other very serious diseases like FMD, sheep pox and Newcastle disease.

IRAQ
(9)

Anthrax in ovines is of low sporadic occurrence. Echinococcosis is reported in bovines, ovines and caprines (low sporadic). Rabies was last reported in 1984, in bovines only. Bovine brucellosis occurs sporadically. No information is available concerning bovine tuberculosis and cysticercosis. *Brucella ovis* infection is of low occurrence.

Other major disease problems such as FMD and rinderpest, and the recent war, overshadow VPH activities in Iraq.

JORDAN
(11, 16)

The most important public employer of veterinarians is the Ministry of Agriculture. The Veterinary Services are responsible for the control of animal diseases, development and implementation of health policies, control of import and export of animals, and
import of veterinary pharmaceuticals. The Veterinary Services work from clinics and centres throughout the country.

Meat inspection is the responsibility of the municipalities, which employ veterinarians for this purpose.

The main problems faced in Jordan for zoonoses control are:
- lack of data on human infection and infection in food animals
- inadequate slaughter inspection
- a poor reporting system
- lack of strict control on the borders
- there is no special unit in the Ministry of Health for zoonoses control.

A committee for zoonoses control has been active for about a decade with members from several related institutions, especially the Ministry of Health and the Ministry of Agriculture. The duties of the committee are to review periodically the situation regarding zoonoses in Jordan and to recommend possible solutions. However, there is no special unit to implement any such recommendations. There is a need to establish a zoonosis unit in the Primary Health Care Directorate in order to strengthen cooperation between the public health and veterinary authorities.

In Jordan, the main zoonotic diseases, in order of importance, are brucellosis, hydatidosis, rabies and leishmaniosis.

**Brucellosis**

An intensive survey undertaken in 1987 showed that 32% of sheep and goat flocks examined were infected, with an estimated 8% prevalence. About 2% of cattle were found positive in a survey carried out in 1988. The positive cattle were slaughtered, with payment of compensation.

Control measures for brucellosis include education of farmers and the general public along with vaccination of animals, especially sheep and goats.

**Echinococcosis/hydatidosis**

Echinococcosis continues to have high morbidity rates and to cause much suffering in the human population as well as heavy losses to animal production. Measures taken to control the disease in man and animals include disease notification, meat inspection and the destruction of infected organs from slaughtered animals, slaughterhouse hygiene, removal of dogs from the vicinity of slaughterhouses, destruction of stray dogs and public health education concerning the mode of transmission, preventive measures and the treatment of infected dogs.

**Rabies**

Among the many zoonotic diseases occurring in Jordan, rabies is considered to be of major public health importance in rural and urban areas. It is a notifiable disease in man and animals. Programmes for the extermination of stray dogs meet with great difficulties.
Cutaneous leishmaniosis (zoonotic leishmaniosis)

This disease has long been prevalent in parts of Jordan. It has declined greatly due to antimalarial insecticidal spraying in affected areas.

KUWAIT
(4, 9)

Sheep and goat brucellosis

In recent years brucellosis has spread among sheep and goats (*B. abortus* and *B. melitensis*). The disease in these animals is important from the epidemiological standpoint, because raw milk from sheep, goats and camels is frequently consumed.

Bovine brucellosis

The major area for dairy production in Kuwait is located at Al Sulibia, where about twenty-seven privately owned farms are situated with a total of approximately 12,000 cows. All cattle are imported. This area is of great epidemiological importance because it supplies all of the cattle to other parts of Kuwait.

A vaccination programme for cattle was started in December 1985. Incidence was reported as follows: 2.5% in 1984, 8% in 1985, 9.6% in 1986 and 4.6% in 1989. Strains of *B. abortus* and *B. melitensis* have been isolated.

Anthrax

Anthrax (ovine) is of low sporadic occurrence. It is a notifiable disease, and imports from infected countries are prohibited. Measures also exist for quarantine, movement control and other precautions at frontiers and inside the country, as well as vaccination.

Other diseases

Echinococcosis (ovine) is of low sporadic occurrence. Q fever has never been reported. Rabies was reported in caprines in 1988. Bovine tuberculosis is of high occurrence, with import controls, quarantine at the frontier and testing. For other diseases, there is either no information or they have not been reported.

LEBANON
(15)

Despite poor disease notification by physicians and veterinarians due to the events in the country, the situation of zoonotic diseases may be summarised as follows:

Brucellosis

Many human cases are diagnosed every year, mainly linked to ingestion of raw meat or unboiled, unpasteurised cheese.

Trichinelllosis

Small outbreaks appear from time to time. Clinical diagnosis is usually performed at once and often confirmed serologically.
Food-borne diseases

These are frequent in the country. Salmonellae are reported to be the main causative agents but in many cases laboratory investigations are not carried out.

Hydatidosis

Hydatidosis is common because slaughterhouses are not well supervised and dogs are not properly looked after.

Rabies

No human case has been reported although post-exposure treatment is given to some of the persons bitten each year.

LIBYAN ARAB JAMAHIRIYA
(1, 8, 14)

The Zoonoses Control Centre, established in 1988-1989, has collected information on cases reported, established priorities and set up research laboratories. The Centre presently outlines future plans and strategies in collaboration with the related local services as well as international organisations.

The important zoonotic diseases in the Libyan Arab Jamahiriya are hydatidosis, brucellosis, anthrax, leishmaniosis, salmonellosis, tuberculosis, rabies, cysticercosis (Taenia saginata), plague and toxoplasmosis.

Hydatidosis

Epidemiological data show infection rates of about 3-5% in goats, 3-6% in sheep, 6-9% in camels and 2-4% in cattle. Controls are exercised at abattoirs. A number of districts carry out stray dog control, and treatment of dogs with praziquantel is being planned. The disease is not recorded at high rates in humans but the economic losses to animal production are high.

Brucellosis

Among animals, brucellosis is primarily a problem in cattle (about 1% infection) although the disease is also present in sheep. Prevention and control measures include education of the public and import controls. Vaccination is not carried out. Positive reactors are slaughtered, with payment of compensation.

Tuberculosis

Tuberculosis is a serious public health risk in Libya. About 1% of cattle and 0.5% of camels are infected. Control measures include tuberculin testing and slaughter.

Cysticercosis

Cysticercosis is also present (T. saginata in cattle and T. solium in pigs). It is prevented by good hygiene, meat inspection, etc.
**MOROCCO**

(9)

**Rabies**

A national programme commenced in 1986. This includes stray dog control, dog vaccination and prophylactic vaccination of humans exposed to infection. The disease is reported in dogs, cats and all food animal species. There is no information concerning wild animals.

**Bovine brucellosis (B. abortus)**

A control programme started in 1988. Serological tests revealed infection of about 2%. Control measures include calfhood vaccination, declaration of infected zones, and test-and-slaughter (depending on the level of infection).

*B. ovis* and caprine/ovine brucellosis (*B. melitensis*) are suspected but not confirmed.

**Other diseases**

Echinococcosis is of high occurrence, affecting all species of food animals. No control measures are implemented. Leptospirosis in dogs is of low sporadic occurrence and is suspected in swine but not confirmed. Bovine tuberculosis is present, and tuberculin testing is carried out. Bovine cysticercosis is also reported. Salmonellosis in ovines is suspected.

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**OMAN**

(2)

Oman is continuously affected by major epidemics like polio, cholera and malaria and epizootics like rinderpest, FMD, sheep pox and goat pox. Zoonotic diseases are consequently given insufficient attention.

In 1982, a national vaccination programme was established and some of these epizootics were contained.

Subsequently, more emphasis has been given to zoonoses, e.g. brucellosis which was found to be of alarming prevalence in some areas, and rabies which was reported for the first time in 1990.

A Zoonotic Commission was formed in 1986, with a veterinarian as chairman and members from both the Ministry of Health and the Ministry of Agriculture and Fisheries. Its objectives are:

- coordination of control activities
- review of the status of zoonoses and identification of the most important problems
- recommending strategies for disease control
- assisting in the drafting of legislation
- conducting education programmes
- reviewing progress.

The major zoonotic diseases in Oman are brucellosis, tuberculosis, salmonellosis, anthrax, psittacosis, rabies, echinococcosis, cysticercosis (T. saginata), toxoplasmosis and leishmaniosis.

SAUDI ARABIA

Brucellosis

Brucellosis is one of the significant public health problems in this country (3). Infection in animals is widespread. About 10% of small ruminants in some farms are infected.

There were 5,224 human cases in 1987 (52.6 per 100,000), which shows that the problem is serious.

Recently, improvements have been made in the surveillance of communicable diseases in general and brucellosis in particular. There has also been an increase in the number of primary health care centres and their expansion to the periphery, improvement in laboratory equipment in most health facilities, and greater public awareness of the disease and its complications.

A national campaign for the control of brucellosis in animals was officially launched by the Ministry of Agriculture in 1990 (and is presently in progress). Its primary goal is the immunisation of all sheep, goats and cattle in the country. The campaign also assists in data collection, in assessing the extent of infection by testing blood samples and in educating farmers and the general public.

Rabies

Cases of rabies involving human exposure are reported from various provinces (10). The control programme presently adopted involves the cooperation of the following ministries:

- Ministry of Agriculture (vaccination of animals especially when the herd is exposed to bites from a suspected animal; free vaccination of dogs and cats)
- Ministry of Health (post-exposure vaccination of persons and pre-exposure vaccination of high-risk groups)
- Ministry of Municipalities (control of stray dogs within towns and villages)
- Ministry of the Interior (control of wild animals such as foxes and wolves).

This plan has led to a significant decrease in the number of cases of rabies in animals and man.

Leishmaniosis

Both types of leishmaniosis (visceral and cutaneous) are present (15). The disease is widely distributed in the Eastern and South-Eastern provinces. Saudi Arabia has a programme for leishmaniosis control which will be extended to all provinces where the disease is endemic.
SYRIA
(15)

Rabies

Rabies control activities include stray dog control, immunisation of owned dogs and post-exposure treatment for human beings. In 1986-1987, 5,962 persons received post-exposure treatment, 1,361 persons received anti-rabies serum, 9 persons died from rabies and 26,436 stray dogs were killed. The national programme, initiated in 1983, is supported by three Ministries: Public Health, Local Administration and Agriculture.

Echinococcosis/hydatidosis

A pilot project was initiated in the two provinces of Damascus (city) and Damascus Rural Areas early in 1987, which included stray dog control, public education, treatment of taeniases in owned dogs, supervision of slaughter, etc. The project is being evaluated by triennial studies of school children six and twelve years old in the two provinces.

Brucellosis

In 1980, 10.6% of tested dairy cows were positive, compared to only 2.62% in 1985.

Control measures taken between 1980 and 1985 were limited to vaccination of adult cows in infected herds. Testing of goats is also carried out, with isolation of positive animals.

About 500 cases of human brucellosis are estimated to occur annually.

TUNISIA
(15)

Rabies

In 1985 no human rabies was reported while there were eight cases in 1986 and two in 1987. The strategy against this disease has been changed since 1986. It now comprises the following:

- surveillance of the disease in animals
- stray dog extermination
- education of the public
- vaccination of dogs in the region of Tunis (the most affected area)
- greater attention by the various departments (interior, defence, information, education, etc.) especially in areas which have the most human cases.

The campaign against rabies has entered its maintenance stage.

Hydatidosis

Hydatid disease causes very high economic losses. Annually there are more than 300 human cases. A special coordinating group is being formed to study planning and implementation of a control programme.
Leishmaniosis

Outbreaks of cutaneous leishmaniosis have ceased but the disease is endemic in some areas. Control measures are being implemented. Visceral leishmaniosis also appears from time to time.

TURKEY
(6, 7)

Brucellosis

Brucellosis was introduced into Turkey with the importation of new breeds of animals. By 1940 the disease was already a significant problem in sheep.

Cattle

*B. abortus* was first demonstrated in cattle in 1931. Between 1942 and 1964, 163,380 blood sera collected from cattle on State farms and examined with the tube agglutination test, revealed a 4.4% reactor rate.

As only a minimal number of animals (0.15%) could be tested, the above information did not reflect the actual incidence for the country as a whole. During this period, in fact, 31 of 61 State farms had no incidence of brucellosis. From 1957 to 1970, another serological survey of cattle on State farms gave a similar reactor rate (4.4%), while the next survey in 1975-1986 revealed a reactor rate of only 1.6%, due to the implementation of protection measures and inoculation. Some regional surveys indicated reactor rates ranging from 7 to 23%. Since official information is derived only from State farms and *Brucella*-intensive locations, it is believed that disease incidence is lower among local cattle in remote areas where improved breeds have not been introduced, than in high-settlement regions.

Sheep and goats

Brucellosis was demonstrated in sheep and goats in 1943 and 1944. In Turkey, brucellosis in sheep not only leads to significant economic loss; it is also the main source of the disease in humans. From 1952 to 1963, an extensive survey was carried out with sheep and goat sera collected mostly from animals on State farms. The analysis indicated 2.6% positive reactors. Other serological surveys on State farms revealed 11% (1957), 9% (1965-1966) and 5% positive reactors (1960-1970).

In spite of strict control and protection measures, there was a high incidence of brucellosis in sheep on State farms, due mainly to rural breeding activities in the vicinity. Since there are no extensive studies, data on the incidence in animals kept by rural populations is not reliable.

The implementation of the “Turkish brucellosis protection project” has resulted in almost no incidence of brucellosis in sheep on the State farms, and it has also led to a significantly lower incidence in sheep owned by rural populations in the areas adjacent to State farms.

Human beings

In 1915, brucellosis was detected for the first time in Turkey in a soldier.
Information about the incidence of brucellosis in human beings is mostly acquired from the records and reports of the Refik Saydam Institute, articles printed in various health journals and papers presented at numerous seminars and symposia. Reported human incidence varies according to job activity and location, i.e. 10% (slaughterhouse workers in 1947), 9% (official records indicate that until 1968, a total of 9% of the 11,621 persons examined with the Tube Agglutination and Allergic tests, were demonstrated as reactors), 6.5% (high-risk occupations with animals), 50% (in owners of infected livestock), etc. In 1982, 820 people were treated for brucellosis, while from 1983 to 1986 this number steadily increased, reaching 1,668 in 1986.

**Bovine tuberculosis**

Bovine tuberculosis is notifiable. Its prophylaxis consists in detection by means of the tuberculin test and destruction of diseased animals. Owners are compensated.

**Rabies**

Rabies, another notifiable disease, has continued to affect animals. Rabid animals are slaughtered, as are those which may be contaminated unless the owner specially requests vaccination and quarantine for surveillance.

**Anthrax**

Anthrax is largely controlled by vaccination and measures for burial of dead animals.

**Hydatidosis**

With regard to hydatidosis, methods for destruction of diseased animals are available in well-equipped slaughterhouses, but the disease cycle is maintained through rural slaughter under poor conditions.

**Food-borne diseases**

Food-borne diseases of animal origin are a cause of concern in both the Ministry of Health and municipalities. The main food-borne diseases in Turkey are anthrax, brucellosis, tuberculosis, salmonellosis, cysticercosis, *T. saginata* and hydatidosis. Diagnosis and testing are carried out in twenty-four food control laboratories belonging to the Veterinary Services.

**YEMEN**

(9)

Echinococcosis/hydatidosis is of low sporadic occurrence in bovines and ovines while no information is available for caprines and swine.

Rabies is suspected but not confirmed in bovines, ovines and canines while there is no information regarding this disease in caprines, equines, swine and felines.

Bovine tuberculosis is also suspected but not confirmed. Bovine brucellosis is not reported while brucellosis in goats is suspected but not confirmed; no information is available for brucellosis (*B. melitensis*) in sheep.
FACTORS AFFECTING THE ORGANISATION OF VETERINARY PUBLIC HEALTH ACTIVITIES IN THE REGION

Reports from international organisations concerning the need for VPH programmes have for a long time reached the offices of those responsible for health policy in countries of the region. Yet, for a variety of reasons, no specific activities against VPH problems have been organised in many of these countries, with consequent repercussions on public health. The reasons for this situation are primarily:

a) There is a lack of public concern due to ignorance of the repercussions of zoonoses and food-borne hazards upon public health and the economy. Thus, there is no pressure upon the authorities from the people.

There are many examples of such ignorance: the role of dogs in *Echinococcus* infection, cats and toxoplasmosis, brucellosis, anthrax and tuberculosis infection, pork and cysticercosis, taeniasis and food hazards like antibiotics and hormonal contamination.

Farmers may not know the true nature of a disease. Hydatid cysts may appear as water-storage organs which actually meet the needs of animals. Unaware of their parasitic nature, farmers often feed the cysts to dogs, thus perpetuating the zoonotic cycle. Regarding brucellosis, the public may not be aware that drinking raw milk is a frequent route of infection. Also, farmers and even veterinarians often contract the disease during assisted parturition or while handling aborted foetuses. Tuberculosis too is often contracted through raw milk. The role of cats in toxoplasmosis infection of pregnant woman has become known only recently in these countries. This ignorance regarding so many dangerous zoonoses is the cause of passive acceptance of one's fate and misery. If the source (animal or food) and means of infection are unknown, how can the public voice its concern? Thus, the absence of public pressure may in fact be a reason why comprehensive programmes have not been implemented to deal with these problems.

b) Data are lacking on the prevalence or existence of such diseases and food hazards, because epidemiological studies have not been undertaken.

This is the responsibility of the competent health services; initiative and interest on their part are a prerequisite for such epidemiological surveys. Many problems may first be signalled by doctors, e.g. when operating for *Echinococcus* or during treatment for human brucellosis or tuberculosis. Food hazards like salmonellosis and intoxications, and toxoplasmosis in pregnant women, are other serious problems which doctors may encounter. Thus, preliminary data may be available at general hospitals. However, the full extent of the problem in all its facets (epidemiology and real extent) may not be clearly known. For example, comprehensive epidemiological surveys are needed in order to determine the incidence and type of *Brucella* present in food animals in a country. This also applies to echinococcosis in dogs and food animals. Base-line data are very important for planning any control programme.

Food contamination with hormones, antibiotics or radiation has to be thoroughly surveyed and this necessitates expert personnel and specialised laboratories and equipment. The absence of such base-line data makes it difficult to plan control programmes, since the relevant parameters — personnel, funds, timing, equipment, etc. — cannot be precisely determined.
It is the responsibility of governments and their competent services to carry out epidemiological surveys in order to determine the real extent of a problem in all its aspects.

c) Other official authorities in a country often refuse as a matter of principle to recognise the responsibilities of the Veterinary Services in VPH. Long-standing authority in a given field is not easily transferred from one service to another.

For example, outdated laws may give powers for abattoir inspection to the local municipalities. Also, since zoonoses affect man, powers may be vested with the Ministry of Health. This situation creates confusion as to who will undertake to do what. Half-hearted, inadequate, spasmodic efforts by well-wishing committees will not achieve anything until the Veterinary Services assume all responsibilities and implement comprehensive programmes for the control of zoonoses. The professional and technical personnel of the Veterinary Services are in the best position, due to their training, to carry out this work. In order to acquire these powers, which rightfully belong to them, the Veterinary Services will have to exert pressure and promote their cause within the governments. And this calls for leadership which can persuade and actively promote its cause. The quality of the veterinary leadership is thus of the highest importance.

d) Funds are lacking since the competent health authorities do not themselves support such programmes.

After acquiring authority in VPH affairs, the Veterinary Services must draw up well-documented programmes and seek approval and funding from government. Again, the quality of the veterinary leadership plays an important role in securing funding for VPH programmes.

e) There may be other serious disease problems to which the Veterinary Services must give priority.

In countries with very serious contagious animal diseases like foot and mouth disease, rinderpest, anthrax, Newcastle disease and African swine fever, which can cause devastating losses, it is natural for these problems to be dealt with first. As the situation improves, however, programmes dealing with serious zoonoses like brucellosis and echinococcosis could be implemented, to be followed later by other VPH programmes.

f) In all countries of the region, government veterinarians are involved almost entirely with clinical work, disease control and VPH activities. However, there are no concrete, specific efforts made for the control, eradication, prevention or even detection of most serious VPH problems in the region, unless the disease combatted also happens to be a zoonosis (e.g. brucellosis, anthrax). Thus, it is necessary to separate clinical work carried out by the Veterinary Services from the rest of their activities and, if possible, transfer this work totally to private veterinarians. The Veterinary Services will then be able to direct their efforts in disease control towards serious epizootics and other problems which are basic for animal production and also towards specific VPH problems, some of which are very serious to man while remaining insidious or inapparent in animals. For example, the farmer may not realise that echinococcosis (and other zoonoses) can cause serious economic losses and so he may not be overly concerned about it. As a public health problem, however, this disease is a source of countless cases of human suffering, pain and death.
GENERAL CONCLUSIONS AND PROPOSALS

1. The control of zoonoses is hampered by the migratory movement of animals over long distances, while the periodic occurrence of drought leads to close contact between flocks and herds on communal grazing lands and at waterpoints in arid and semi-arid rangelands.

2. Certain animal hosts of zoonotic agents like dogs, cats, wolves, foxes and other wild animals are abundant in the region. These are sources of heavy contamination of the environment in both urban and rural areas. Furthermore, nomadic flocks are usually accompanied by dogs. A number of zoonoses, like rabies, echinococcosis and even brucellosis, are thus perpetuated in almost all countries of the region.

3. Abattoirs are of particular significance for the control of zoonoses, especially parasitoses like echinococcosis and cysticercosis. Unfortunately, slaughter practices at abattoirs in the region often perpetuate zoonoses by failing to prevent the access of dogs to offal.

4. Traditional animal houses, and the lack of adequate environmental infrastructures, may produce unsuitable conditions for the practice of hygienic measures. "Pest-house" conditions can develop where animal diseases of all types, including zoonoses, accumulate, unless planning and supervision are undertaken. It is essential that simpler but adequate measures be designed to meet the specific needs of these areas.

5. With some exceptions, there is a shortage of personnel engaged in animal health services, both professional and sub-professional.

6. Due to the inadequacy of the veterinary staff in many countries, there is a lack of knowledge regarding zoonoses, their incidence, geographical distribution, seasonal appearance and epizootiology. Such knowledge is necessary for the sound planning and execution of effective control programmes. For certain diseases (e.g. diseases derived from foods of animal origin), information is either scarce or unavailable.

7. While many zoonoses remain to be identified in the region, the recent trend towards development of facilities for diagnosis, veterinary education and research is resulting in a clearer overall picture of the disease situation. However, concerning the relative economic significance and public health hazard of various disease conditions, information is still inadequate.

8. Improvement of the animal health situation in exporting countries is in the interests of all countries of the region. It would be advantageous to harmonise import requirements on a regional basis. For the practical application of such a proposal, standing arrangements would be needed for the continuous supply of detailed information on the animal health status in exporting, importing and transit countries.

9. Quarantine of animals is important in the prevention of the spread of disease, but it must be accompanied by as many other measures as can be carried out, beginning at the place of origin of the animals concerned. Measures taken by exporting countries to control and eradicate disease benefit not only importing countries but the region as a whole.
10. The carrying out of epizootiological surveys, detailed studies of livestock movements within, into and out of countries in the region and the demarcation of infected, exposed and disease-free areas will greatly assist the countries in combating animal diseases, including zoonotic ones.

11. Only a few member states have a complex national food programme. Several services usually participate in the implementation of such programmes. They are located in sectors such as the Ministries of Health, Agriculture (Veterinary Services), Food, Foreign Trade, and Education. Close coordination and collaboration is needed to avoid duplication of effort, as well as gaps in the important field of public health, and to meet all the requirements laid down by legislation and expected by the public. Multisectoral cooperation could be greatly enhanced by the establishment of a national food control committee to supervise the overall planning, execution and evaluation of the national food control programme, including hygiene control. There is no doubt that national and international food hygiene programmes require close collaboration of experts from a number of disciplines. Doctors and veterinarians are the pillars of these programmes but other professionals also have an important role to play. This collaboration should be provided between and within different sectors and at all stages of programme planning, execution and evaluation.

12. The proper organisation of comprehensive VPH activities remains a distant goal. With the increasing involvement of international organisations in the region, there is a great need to harmonise activities, since often these overlap. A variety of expert consultations, organised seminars, meetings, etc. are often held for the same VPH problems (e.g. brucellosis, echinococcosis) and similar programmes may be implemented by different international organisations, leading to confusion instead of progress. Many uncoordinated, overlapping activities are thus conducted in the region. Organisations must study ways to harmonise their initiatives so as not to waste resources, time and money. Guidelines should be prepared for use by the countries of the region and these should focus specifically on the region and, if possible, each country, considering the local conditions there. These guidelines can best be prepared by experts or consultants of the region itself, who are best placed to know about prevailing conditions, from veterinary affairs to local, social and religious customs, and who can thus effectively study, analyse and recommend solutions to problems. In this way, the efforts of the international organisations will have the most effective, beneficial results.

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ORGANISATION DES ACTIVITÉS DE SANTÉ PUBLIQUE VÉTÉRINAIRE DANS QUELQUES PAYS DE LA MÉDITERRANÉE ORIENTALE. – K. Polydorou.

Résumé : L'auteur traite de l'organisation des activités de santé publique vétérinaire (SPV) dans plusieurs pays de la Méditerranée orientale concernant les zoonoses et les risques d'intoxications alimentaires par les produits animaux. L'étude de cette région démontre qu'il n'existe pas d'unités de SPV au sein des Services vétérinaires. Ces derniers ont été progressivement revalorisés et renforcés, mais leurs principales ressources vont au contrôle des maladies contagieuses les plus graves des animaux, telles que la fièvre aphteuse, la peste bovine et la maladie de Newcastle. Présente dans presque tous les pays de la région, la rage est une zoonose que nul Service vétérinaire ne peut ignorer.
D'autres zoonoses sont présentes dans la région, dont l'échinococcose, la brucellose, la fièvre charbonnouse, la toxoplasmose et la tuberculose. La salmonellose est l'une de ces graves maladies transmises par les aliments ; la SPV est également confrontée à un autre problème : celui des risques qui résultent de la présence de plus en plus fréquente d'additifs, pesticides, antibiotiques et hormones dans les denrées d'origine animale. Plusieurs obstacles s'opposent à une réorganisation efficace des activités de SPV : le maintien d'un système hérité de l'époque coloniale qui confie les activités de SPV à d'autres services que les Services vétérinaires (par exemple, aux inspecteurs de santé) ; la confusion portant sur l'attribution des responsabilités pour chaque secteur ; l'absence de recherche en épidémiologie ainsi que de connaissances sur l'ampleur réelle des problèmes de SPV ; l'insuffisance du personnel et des équipements dans les Services vétérinaires ; l'ignorance des populations concernant ces problèmes, etc. Cependant, quelques pays ont fait de grands progrès dans la réorganisation des activités de SPV et dans l'éradication des zoonoses majeures. Des organisations telles que l'Office International des Épizooties (OIE), l'Organisation des Nations Unies pour l'Alimentation et l'Agriculture (FAO) et l'Organisation Mondiale de la Santé (OMS) peuvent être d'un grand secours lors de l'établissement de programmes efficaces de SPV.

MOTS-CLÉS : Contrôle des zoonoses - Santé publique vétérinaire - Sécurité alimentaire - Services vétérinaires.

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Resumen: El autor describe la organización de las actividades de salud pública veterinaria (SPV) en varios países del Mediterráneo oriental, relativas a las zoonosis y a los riesgos de toxoinfecciones debidas a los productos de origen animal. El estudio de esta región demuestra que no existen unidades de SPV dentro de los Servicios veterinarios. Estos últimos, a pesar de su progresiva revalorización y fortalecimiento, consagran sus principales recursos al control de las más graves enfermedades contagiosas de los animales, tales como la fiebre aftosa, la peste bovina y la enfermedad de Newcastle. La rabia, presente en casi todos los países de la región, preocupa a todos los Servicios veterinarios. Otras zoonosis graves afectan esta región: la equinococosis, la brucelosis, la leishmaniasi, el carbunco bacteridiano, la toxoplasmosis y la tuberculosis. La salmonelosis es una de las mayores zoonosis transmitidas por los alimentos. La SPV debe igualmente confrontarse con el nuevo problema planteado por la presencia cada vez más importante de aditivos, plaguicidas, antibióticos y hormonas en los productos de origen animal. Varios obstáculos impiden que se reorganicen de manera eficaz las actividades de SPV: entre ellos, el hecho que no son los Servicios veterinarios los que se ocupan de la SPV, sino otros servicios (por ejemplo los inspectores de salud), debido a la conservación de los sistemas de la época colonial; la confusión sobre las responsabilidades que cada autoridad debe asumir en cada sector; la ausencia de investigación epidemiológica y el desconocimiento de la real importancia de los problemas de SPV; la escasez de personal y equipos en los Servicios veterinarios; enfin, la poca conciencia del público en relación al tema. A pesar de ello, algunos países han avanzado considerablemente en la reorganización de sus actividades de SPV y en la erradicación de las mayores zoonosis. Organizaciones internacionales como la Oficina Internacional de Épizootias (OIE), la
Organización de las Naciones Unidas para la Agricultura y la Alimentación (FAO) y la Organización Mundial de la Salud (OMS) pueden brindar un apoyo importante durante el establecimiento de programas eficaces de SPV.

PALABRAS CLAVE: Control de zoonosis - Salud pública veterinaria - Seguridad alimentaria - Servicios veterinarios.

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