



**EpiSouth Project  
WP8 Strategic Document**

**Epidemiology and Preparedness to  
Cross-Border Emerging Zoonoses  
in the Mediterranean Countries and Balkans**

**APRIL 2010**



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## WP8 Epidemiology and Preparedness to Cross-Border Emerging Zoonoses in the Mediterranean Countries and Balkans

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### *Abbreviations and key definitions*

**Directory:** catalogue of experts' names and contact details prepared through an on-line questionnaire filled in by the Focal Points of EpiSouth Countries.

**Emerging infections (EIs) or Emerging Infectious Diseases (EID):** infections that have newly appeared in a population or have existed previously but are rapidly increasing in incidence or geographic range (1).

**Epidemic Intelligence (EI).**

**European Food Safety Authority (EFSA).**

**Food and Agriculture Organization of the United Nations (FAO).**

**Horizontal programs:** Programs operating under the auspices, the planning and monitoring of distinct disciplines, which act in a balanced mode, with mutual respect.

**Human Public Health (HPH).**

**Mediterranean Area and Balkans:** the geographical area interested by EpiSouth (it includes South Europe, North Africa, Balkans and some countries of Middle East).

**Med-Vet-Net :** Network for prevention and control of zoonoses and food borne diseases.

**OIE :** World organisation for animal health.

**One Health:** the collaborative efforts of multiple disciplines, working locally, nationally and globally, to reach optimal health for people, animals and the environment (2).

**Platform:** web location where the directory's experts can share information, can post alerts etc.

**Standard Operation Procedures (SOPs).**

**Steering Team (ST).**

**Veterinary Public Health (VPH).**

**World Health Organization – Mediterranean Zoonoses Control Program (WHO–MZCP).**

**Work Package 8 - Epidemiology and preparedness to cross-border emerging zoonosis (WP8).**

**Zoonosis:** a zoonosis is any infectious disease caused by virus, bacterium, fungus, parasite, prion, which can cross the species barrier and be transmitted from domestic or wild animals to humans and vice versa (zoonosis and/or anthroozoonosis) (9).

## 1. Evidence of the problem to be addressed

The Work Package 8 (WP8) - Epidemiology and preparedness to cross-border emerging zoonosis - has, in the framework of EpiSouth Project, the main objective of providing *a platform for the communication of human (HPH) and veterinary public health (VPH) officials, describing risk assessment methods and providing a mechanism for exchanging information between human (HPH) and veterinary public health (VPH) officials.*

The objective for the WP8 was set in the 2004 and, although many progresses have been made since then by the Institutions and Organisations working in this field, EpiSouth has highlighted many areas for improvements especially referring to the Mediterranean area.

Therefore, on the basis of the experience gained by implementing EpiSouth, this document tries to give recommendations for improving the surveillance and control of zoonoses in the Mediterranean Area and Balkans both by considering the Resources already operating in the area and by outlining the possible contribution of EpiSouth to be developed with future lines of activities.

## 2. Scientific Rationale for Action

The first and main aim of the document is to call the attention of decision makers as well as of technical operators on the critical aspects which are presently affecting the efficient managing of surveillance, early warning and response for zoonoses with potential cross-border impact among the Mediterranean Countries and Balkans.

Although these issues are being discussed in several contexts, it should be recognized that many aspects are still debated and the high variability (in terms of approaches, legislations, definitions, SOPs etc), existing among the considered countries, often affect the possibility to act in the coordinated and synergic manner that is needed to ensure the proper response in case of potential cross-border threats (8-19).

Therefore, in accordance with the objective set for the WP8, the present document outlines the main constraints to be overcome as well as the opportunities which may be exploited to facilitate the process.

Finally it should be noted that, although EpiSouth has not the resources and the mandate to lead and guide this process, it can contribute to it by facilitating the discussion among the 27 Countries of the Network, by increasing awareness at national level, by setting tools aimed at sharing information and data, and by drawing context specific guidelines.

## 3. Objectives

Many factors lead to the emergence of zoonotic diseases. Environmental changes, human and animal demography, pathogen changes and changes in farming practice are a few of them. Social and cultural factors such as food habits and religious beliefs play a role too (4,5,20).

About two-thirds (60.3 %) of emerging infectious diseases (EID) result from zoonoses; the majority of these have their origin in wildlife (71.8%) and have been increasing in recent years (20). There is evidence that over 50% (54.3%) of EID events are due to bacteria, and that a large number of those is drug resistant (4,5). Moreover EID emergence has been found to strongly correlate with a combination of socio-economic, environmental and ecological factors, that define areas (called "emerging disease hotspots") where EID are most likely to originate (3-5).

While extended "hot spots" jump out in areas spanning sub-Saharan Africa, India and China; smaller spots appear in Europe, and North and South America (21-27).

Social factors involved with EID emergence include human mobility especially air travel, tourism and outdoor activities, permanent residence in rural areas, food habits, international commerce, war and political conflicts (20-23). From an ecological standpoint it is probable that a growingly milder climate (due to global climatic change) may lead to a northern shift in the distribution of vectors and vector-borne diseases (20).

Challenged by this complex scenario in the fight against EID, the concept of "*One Health*", defined as the collaborative efforts of multiple disciplines, working locally, nationally and globally, to reach optimal health for people, animals and the environment, has emerged and is currently deemed by many as the appropriate strategy to adopt (6-7).

In that respect, we need to highlight the necessity of intersectoral collaboration between Human Public Health and Veterinary Public Health, including a spectrum of distinct disciplines such as internal and infectious diseases medicine,

human public health, microbiology, environmental epidemiology, epidemiology, veterinary medicine, veterinary public health, entomology and wildlife biology (10,11,13,14,28-33).

#### 4. Framework

Human health is inextricably linked to animal health and production (26,40). The provision of health care has gradually diverted from individual patients to the community, large-scale planning techniques were devised and evaluation techniques focused on zoonoses and surveillance over foods of animal origin (31-35).

Regions with close co-dependence of animals and humans are found around the Mediterranean and coordinated efforts are needed to monitor emerging zoonoses and assess appropriate control measures. Discussions and initiatives on collaboration of human and veterinary public health have been ongoing and both bioterrorist agents and emerging zoonoses are once again bringing the subject to the limelight (36,39).

The dramatic possible economic impact on countries ineffective in these fields, can be easily imagined.

Mediterranean countries significantly lag in this area, and veterinary public health and human public health services are mostly segregated and tend to work separately (see also *EpiSouth Network experience and lessons learned* for further details). At local level the organisation of intersectoral links and functions in the operational structure of HPH and VPH activities require political and legislative consensus, if this were achieved however identification of problems, policies, strategies, programs with explicit contents and joint distribution of responsibilities would be envisionable. It would also be the basis to establish solid communication channels between the two sectors, establishment of information systems and mechanisms of operational coordination and evaluation of results at the different levels.

These problems have been identified by WHO who created the WHO/Mediterranean Zoonoses Control Centre (WHO/MZCC) an inter-professional organisation 26 years ago (37). This is located in Athens and tackled the problem with a comprehensive approach, trying to identify the problems of, and the suitable solutions for the countries of the three continents facing the Mediterranean sea. Huge quantity of actions have been performed against single zoonoses (e.g. brucellosis, echinococcosis, rabies etc) and problems (e.g. food safety, canine populations control) privileging both inter-professional and inter-country collaboration. For example WHO/MZCC has fostered an inter-disciplinary culture, focusing on brucellosis in Jordan and Syria. Although Brucellosis control programs have been established in these countries, economical, political and other problems have created difficulties to the project. The present situation may provide new hopes, even if difficulties are still relevant.

The MED-VET-NET network of excellence, is an inter-professional collaboration in zoonoses research from a medical and veterinary perspective (38).

The European Union (EU) has supported member states promote the inter-professional approach in the field of zoonoses through a series of legislative and professional initiatives relevant to the improvement and standardization of diagnostic procedures, surveillance and exchange of information at the national regional and international levels.

EpiSouth has inserted its strategy and its activities in the above mentioned framework, with the intention of valorizing the resources and the activities already in place through a complementary approach oriented at filling the gaps, enhancing synergies and promoting the sharing of experience among the countries involved in the Network (39,41,42).

#### 5. EpiSouth Network Experience and Lessons Learned

As already reported the ultimate objective of WP8 is to promote the intersectoral collaboration (both at national and cross-border levels) between HPH and VPH as a critical aspect of surveillance and response to zoonoses.

To accomplish this, some methodological approaches have been taken:

- i) Definition of a set of priority zoonoses on which to experiment ways of enhancing intersectoral collaboration

The final process brought to the selection of five zoonoses: Brucellosis, Leishmaniasis, Rabies, Campylobacteriosis and West Nile Virus (see the related technical report for details at [http://www.episouth.org/outputs/wp8/WP8Report\\_Public\\_area\\_FINALE\\_REV\\_9-4-08.pdf](http://www.episouth.org/outputs/wp8/WP8Report_Public_area_FINALE_REV_9-4-08.pdf)) (41).

It should be stressed that this was not a prioritization exercise as it is meant for early warning measures, risk assessment or preparedness measures, but it was rather a way of reaching consensus on some zoonoses which, on the basis of some variables, were considered appropriate to strengthen the collaboration between the two sectors.

It is clear that if a prioritization will be carried out for zoonoses in the Mediterranean area, other relevant variables should be considered such as impact on human and animal health; impact on economy (cost of the disease in humans and animals; influence on production, commerce, tourism, intercountry relationship; etc); factors connected with the way

of life, with social evolution; with climate; with environment; public and mass media perception; technical and economic possibilities of control; political weight (consideration by public administrators) etc etc.

ii) **Description of the national situation of the selected priority zoonoses in the EpiSouth Countries**

Scientists representing 13 EpiSouth countries participated in the Meeting on Zoonoses in the context of the 2<sup>nd</sup> EpiSouth Project Meeting which took place in Athens, in December 2007. They provided experience in the field of zoonoses during the discussions and their national situation regarding the five priority zoonoses (see Annex 1 for details).

iii) **Collection of experts' names and contact details (epidemiologists and microbiologists, from both sectors)**

Through an on-line questionnaire, filled in by the Focal Points of EpiSouth Countries, the contact points for the five identified zoonoses were collected. This exercise has given the possibility to put in connection the two sectors in terms of people and related reference centers at the national level.

iv) **Creation of a Directory with experts' names and contact details**

With the contacts' details collected, the Directory was created with the aim of putting in contact the two sectors not only at national level but also among EpiSouth Countries (see [http://www.episouth.org/search\\_zoonosis.php](http://www.episouth.org/search_zoonosis.php)).

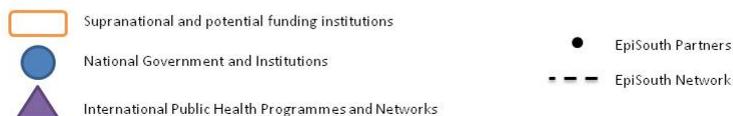
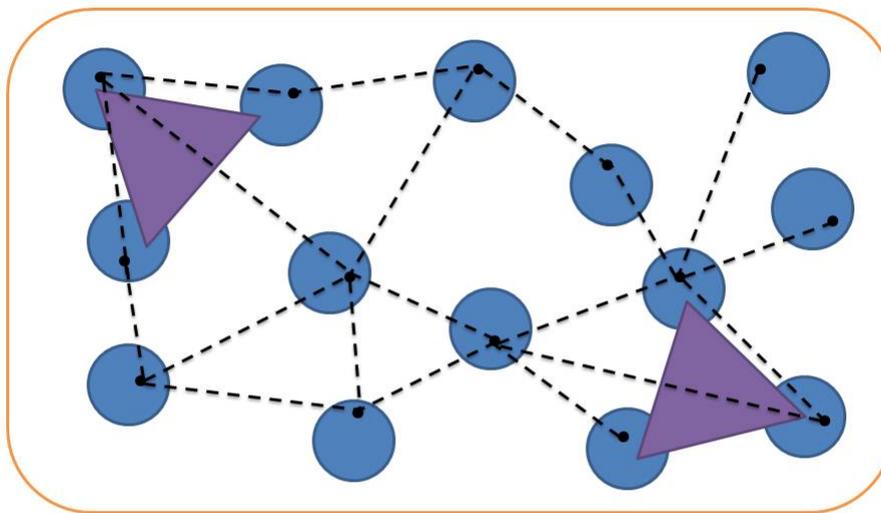
In order to facilitate the active participation of all, the EpiSouth Countries the WP8 Steering Team (ST) was established and parallel sessions were organized during the annual Project Meeting. Finally an *ad hoc* ST Meeting was organized in November 2009 in Malta (see [http://www.episouth.org/doc/Agenda\\_W8STMalta2009.pdf](http://www.episouth.org/doc/Agenda_W8STMalta2009.pdf)).

From the whole process emerged the points in the SWOT analysis (paragraph 5) and the following points indicating future strategies:

- There is high necessity for improvement of intersectoral collaboration in the majority of countries.
- There is the need to facilitate the intersectoral exchange of information, also by setting criteria for prioritization and alerts, harmonization of early warning systems, case definitions and risk assessment methods which can enhance national and cross-border response.
- There is need of field exchange of experiences among countries, experienced staff of one country has had the chance to be sent in another country to provide his/her expertise.
- In the EpiSouth countries, with a few exceptions, there are no Risk Assessment Committees convening regularly. Instead, they are urgently set up and invited to convene upon public health emergencies. Usually they follow the guidance of International Organizations, the Risk Assessment methods of which, they accept and follow precisely even if they do not always respond to internal context specific needs.

## 6. Players, Partners and Audience

In order to ensure that this strategic document might have the expected outcomes, several actors should be properly involved and many of them should act in a coordinated and interconnected manner.



**i) Supranational and potential funding Institutions:**

- European Commission
- European Centre for Disease Control (ECDC)
- World Health Organization Europe (EURO)
- World Health Organization East ----(EMRO)
- World Health Organization Africa (AFRO)
- World Health Organization, office for national epidemic preparedness and response Lyon- France
- EUROMED
- Arabic league
- Maghreb Arabic Union
- FAO
- OIE
- EFSA

**Main Role:** *“Ensuring international framework”* (Setting of policies’ common guiding criteria; collaboration in priority actions identification; resources allocation; capacity building; tools development etc.)

**ii) National Government and Institutions**

- The political authorities of countries
- Ministries of Health
- Ministries of Agricultural Development
- Human Public Health Sector
- Veterinary Public Health Sector

Media play a complementary role facilitating the comprehension of the problem as well as the implementation of activities.

**Main Role:** *“Ensuring national framework”* (identifying national policies; ensuring implementation of national policies’ related programmes; prioritizing resources allocation; identifying relevant experts for collaborating in EpiSouth activities etc.).

**iii) International Public Health Programs and Networks**

- Arabic league
- Maghreb Arabic Union
- MZCP
- MED VET NET

**Main Role:** *“Facilitators in broadening and magnifying the impact without overlapping”* (sharing lesson learned; replicating good pilot and experiences; helping in identifying needs etc.)

#### iv) EpiSouth Partners

Main Role: All the EpiSouth Focal Points will facilitate the due attention to the document's recommendations at National level and will promote the needed cross-border measures with the other EpiSouth Countries.

The EpiSouth Coordination will ensure that the WP8 Directory might be constantly updated and will facilitate the use of the cross-border early warning platform by the VPH and HPH in coordination with the WP6 leadership.

## 7. Expected Outcomes

### SWOT ANALYSIS OF PRESENT SITUATION TOWARDS THE POSSIBLE ACTIONS FOR ENHANCING COLLABORATION BETWEEN SECTORS

#### STRENGTHS AND WEAKNESSES

##### ➤ STRENGTHS

- The co-operation at national level between Ministries of Health and Agriculture exists but it is inadequate. Additionally, experts are aware of the need for further enhancement of the HPH VPH collaboration.
- WHO, FAO, OIE and other relevant agencies may assist in establishing multidisciplinary fora consisting of designated experts as official representatives of the two sectors with the aim of developing, implementing and assessing policies strategies programs.
- WHO and WHO- MZCP has established several control and eradication programmes in Mediterranean countries. This experience can be valorized for future actions in the area.

##### ➤ WEAKNESSES

- There is a need for international collaboration and coordination of actions taken.
- Different perception of the problems and different expectations between the two sectors hinder coordinated activities within and between member countries.
- Variability and timeliness among the systems could delay the information exchange in case of outbreaks with a negative impact on prompt response. Risk assessment capacities at national level do not operate extensively and efficiently.
- Policies are often written but in practice strategy and programme implementation is not adequately effective as there are no explicit guidelines within the related project descriptions. The lack of written and practically applied programmes in the majority of the EpiSouth countries being evident in the "Outline of the 13 countries involved in the vertical session of the 2nd Project Meeting in Athens, regarding the 5 selected zoonoses", poses the need for solid programs well organized and efficient.
- Eradication and control programmes have different principles, targets, as well as financial impact and this should be taken into consideration when setting strategies.
- Illegal animal transportation hampers all efforts for cross-border control of zoonoses.

#### OPPORTUNITIES AND THREATS

##### ➤ OPPORTUNITIES

- EpiSouth can provide evidence of gaps and needs within each country and highlight the preferable solutions.
- The threat of cross border emergence is an opportunity for collaboration.
- A basic element of zoonoses control strategies should be education of the public, especially education of people at high risk working in the agricultural sector. Education of children using audiovisual material and leaflets should be introduced. Media can offer a major contribution in the enhancement of safe practices' adoption by the public.
- A HPH VPH directory will bring scientists together as a first step in the visibility of the EpiSouth network. Mechanisms of control with agreed criteria are indicated as necessary to be established at an international level.
- Joint training courses for HPH and VPH officials would enhance understanding of the aims and purposes of data collection and of intersectoral and international transparent dissemination. Workshops would facilitate cooperation between the two sectors, information exchange, integration of the HPH VPH officials and would provide the grounds for investigation of zoonotic issues with a potentially cross border expansion.
- Joint HPH VPH public health investigations will also minimize the gap.

- More integrated health strategies, after the model of those undertaken by WHO, with intersectoral action for health could ensure the endurance of policies, strategies and programmes. A diversion from the vertical approach to the horizontal one includes common planning and implementation of programmes and activities.
- A multidisciplinary forum consisting of designated experts as official representatives of the two sectors, can supervise the above mentioned opportunities.
- A suggestion is that control programs should be continuous and not intermitted when epizootologic results depict decreasing trends in animals and should involve both HPH and VPH sector so as to evaluate constantly the progress.

➤ **THREATS**

- Developed countries with highly functioning health infrastructures stand to gain much from global surveillance efforts that may help them to protect themselves from the spread of infectious and communicable diseases. But if national health systems of developing countries are seen to be irrelevant to this global project, there is a risk that funding and commitment to those systems will decline as the chart of global health surveillance gets put before the horse of robust national health infrastructures (14).
- The entity of the problem of EID is expected to increase due to several reasons (the rapid growing of the world human population, the increasing of urbanisation, pollution and environmental problems, the global temperature etc etc).
- As already discussed, zoonoses exhibit a potential for cross-border transmission and in certain countries they are probably imported from neighbours. This poses an important barrier to their effective control.
- Institutions of Public Health cope with the emergence of 30 pathogens per year worldwide.
- Vertical programs for disease prevention and control encounter constraints during their implementation as a result of financial limitations and changes in the policies.

## 8. Proposed Strategy

The analysis above and the lessons learned by EpiSouth suggest the following aspects to be considered in for an EI zoonoses cross-border surveillance strategy in the EpiSouth Area:

### Actions to be taken at country level

- Encourage integrated surveillance with the close collaboration of Human Public Health and Veterinary Public Health officials at central and peripheral levels.
- Propose and promote national control programs with horizontal implementation, or encourage the horizontal/multidisciplinary evaluation and supervision of already existing ones.
- Avoid interrupting Programs as soon as epidemiologic indices start improving.
- Set guidelines or elaborate the existing ones within the context of operation of the programs of VPH and HPH.
- Define and educate target groups (officials from both sectors, the public, the high risk groups, students, specify the geographic area indicated for each disease).

### Actions to be taken horizontally (across countries)

- Mapping of experts HPH-VPH;
- Bring HPH and VPH into collaboration;
- Support the use of the EpiSouth cross-border early warning alert platform;
- Define and educate target populations;
- Set guidelines or harmonise the countries with existing ones;
- Identify common criteria for ensuring cross-border alerts, risk assessment procedures and concerted response;

## 9. Final Recommendations and Conclusions

A *national multidisciplinary forum on zoonoses and risk assessment* of designated scientists with clearly explicit responsibilities for the two sectors should be established at country level in those countries where it has not been established yet.

Epidemiologists, Veterinarians, Entomologists, Laboratory Officials from Public Health and Veterinary Public Health and, when indicated, Biologists or scientists on Environmental issues should be included in this multidisciplinary forum, which should be formally appointed by the related national government.

A *national network for preparedness and response*, working in line with the International Health Regulation should be established, starting from the national Human Public Health and Veterinary Public Health authorities, and including all the actors of the process.

The following points should qualify the entire process:

- A formal agreement between the representatives of the relevant ministries;
- Established meetings on a regular basis;
- The inclusion of Stakeholders: OIE, EFSA, WHO, FAO, EpiSouth representative;
- The capacity to build on/ evaluate/ update the existing contingency plans and harmonize them at the national level;
- A culture of multidisciplinary collaboration at national level within borders as a prerequisite to cross border Epidemic Intelligence and response measures;
- Joint training of HPH VPH;
- Elaboration of regional and international containment plans as suggested by international organizations WHO, FAO, OIE, operating in concordance to the national ones. Fora of national and international spectrum should liaise periodically;
- Quality assurance of data and guidelines it's improvement if indicated. National Fora are very close to reality and they can identify the weaknesses in the process of data collection;
- Advocacy action targeting the policy makers of the country also promoting resource mobilisation towards preparedness and response before a crisis occurs; and
- Evaluation of the Public Health sector function, collaboration, integration, efficiency at national level.

## 10. Monitoring and Evaluation

In order to ensure the implementation of the actions at country level, detailed plans should be prepared by the countries including also schedules and relevant indicators suitable for monitoring the progresses.

The actions across countries can be supported by EpiSouth and the detailed plan with schedule and monitoring indicators is being developed as integral part of EpiSouth Plus proposal.

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## ANNEX

### Outline of the 13 Countries on the 5 Priority Zoonoses

*The Outline of the 13 countries that participated in the parallel session on Zoonoses in the 2<sup>nd</sup> EpiSouth Project Meeting which took place in Athens, in December 2007, is analyzed below. The countries participating were: Greece, Romania, Albania, Israel, Spain, Jordan, Slovenia, Turkey, Cyprus, Italy, Kosovo, Morocco. Data from France were also provided.*

#### **1. Brucellosis**

Of the 13 countries endemic for Brucellosis were 11 countries.

In all 11 the human epidemiology for Brucellosis was known and in 10 the epizootiology was known.

Of the 11 countries endemic for Brucellosis, policies strategies and programs operate in 9 and in 2 there are no data.

Among the 11 countries endemic with Brucellosis national exchange of information occurs in 10 but regular epidemiologic information occurs only in 6 of countries.

Among the 11 countries endemic with Brucellosis International exchange of information is a common practice in 9 countries.

Detection of increased incidence in humans and prevalence in animals is followed by information exchange in national level in 9 of the 11 countries.

Detection in novel geographic areas is followed by information exchange in national level in 7 of the 11 countries.

Detection in novel animal species is followed by information exchange in national level in 5 of the 11 countries.

#### **2. Leishmaniasis**

Of the 13 countries endemic for leishmaniasis were 10 countries.

In all 10 the human epidemiology for leishmaniasis was known and in 8 the epizootiology was known.

Of the 10 countries endemic for leishmaniasis, policies strategies and programs operate in 7 and in 1 there are no data and in 2 there are no policies strategies and programs.

Among the 10 countries endemic with leishmaniasis national exchange of information occurs in 7 but regular epidemiologic information occurs only in 4 of countries.

Among the 10 countries endemic for Leishmaniasis International exchange of information is a common practice in 9 countries.

Detection of increased incidence in humans and prevalence in animals is followed by information exchange in national level in 8 and 4 respectively of the 10 countries.

Detection in novel geographic areas is followed by information exchange in national level in 6 of the 10 countries.

Detection in novel animal species is followed by information exchange in national level in 3 of the 10 countries.

Detection of the vector in novel area is followed by information exchange in national level in 5 of the 10 countries.

#### **3. Campylobacteriosis**

Among 13 countries, 9 countries are endemic and 4 countries lack data.

In all 9 the human epidemiology for campylobacteriosis was known and in 6 the epizootiology was known.

Of the 9 countries endemic for campylobacteriosis, policies strategies and programs operate in 4 and in 5 there are no policies strategies and programs.

Among the 9 countries endemic with campylobacteriosis national exchange of information occurs in 6 but regular epidemiologic information occurs only in 2 of countries.

Among the 9 countries endemic for Campylobacteriosis International exchange of information is a common practice in 7 countries.

Detection of increased incidence in humans and prevalence in animals is followed by information exchange in national level in 5 of the 9 countries.

Detection in novel geographic areas is followed by information exchange in national level in 4 of the 9 countries.

Detection in novel animal species is followed by information exchange in national level in 3 of the 9 countries.

#### *4. Rabies*

Between the 13 countries 5 are endemic for rabies.'

In all 5 the human epidemiology for rabies was known and in 4 the epizootiology was known.

Of the 5 countries endemic for rabies, policies strategies and programs operate in 4.

In all 5 national exchange of information occurs as well as regular epidemiologic information takes place.

Among the 5 countries endemic for Rabies, International exchange of information is a common practice in 5 countries.

Detection of increased incidence in humans and prevalence in animals is followed by information exchange in national level in all 5 countries.

Detection in novel geographic areas is followed by information exchange in national level in 4 of the 5 countries

Detection in novel animal species is followed by information exchange in national level in 2 of the 5 countries

#### *5. West Nile Virus infection (WNV)*

WNV is endemic in 4 of the 13 countries.

In all 4 human epidemiologic data and epizootologic data are known.

Policies practices programs operate in all 4.

In all 4 national exchange of information occurs as well as regular epidemiologic information takes place.

Among the 4 countries endemic for WNV, International exchange of information is a common practice in all 4 countries.

Detection of increased incidence in humans and prevalence in animals is followed by information exchange in national level in all 4 countries.

Detection in novel geographic areas is followed by information exchange in national level in all 4 countries.

Detection in novel animal species is followed by information exchange in national level in 4 countries.

#### *6. Criteria for Intersectoral Exchange of Information*

Of the 13 countries 9 confirm that all the below mentioned items could be used in the future for intersectoral exchange of information, providing signals of alert (so as to prevent or achieve timely containment of an outbreak).

- 1 Increase in the human incidence in a country
- 2 Increase in the carriage rate in animals in a country
- 3 Distribution of human disease or animal carriage to novel geographic areas of a country
- 4 Detection of the pathogen in novel animal species
5. Expansion of the vectors (WNV, leishmaniasis) to novel geographic areas

Among 13 countries 4 countries, as in other fields did not provide answer (ND) at this field.

#### *Conclusions*

1. A wide spectrum of different national practices among the 13 countries is clear in the analysis above regarding Brucellosis, Leishmaniasis, Campylobacteriosis, and Rabies. West Nile Virus infection triggers similar activities in endemic countries.

2. It is evident that the Human Public Health either lacks collaboration with the Veterinary Public Health in national level, or that the Veterinary Public Health sector has not been mobilized to collect epizootologic data.

3. Also the identification of geographic range of animal reservoirs and/or vectors are not widely used practices.

4. The National level information exchange between the two sectors occurs, but commonly not on a regular basis.

5. All 9 countries that answered the last question confirm that Increase in the human incidence in a country, Increase in the carriage rate in animals in a country, Distribution of human disease or animal carriage to novel geographic areas of a country, Detection of the pathogen in novel animal species and Expansion of the vectors (WNV, leishmaniasis) to novel geographic areas are useful indices, providing signals of alerts. They should trigger information exchange between the two sectors both at national and international levels.

	Brucellosis	Leishmaniasis	Campylobacteriosis	Rabies	West Nile Virus
Endemic	11	10	9	5	4
Epidemiology	11	10	9	5	4
Epizootiology	10	8	6	4	4
Policies	9	7	4	4	4
Strategies	9	7	4	4	4
Programs	9	7	4	4	4
Nationalinfoexchange	10	7	6	5	4
Regular nat info exch	6	4	2	5	4
Internationalinfoexch	9	9	7	5	4
Alerthumanincrease	9	8	5	5	4
Alertanimalincrease	9	4	5	5	4
Alertnovelgeogr	7	6	4	4	4
Alertnovelanimalspecies	5	3	3	2	4
Alertexpansionvectors	-----	5	-----	-----	4

# APPENDIX

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