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Sustainable strengthening of the epidemio-surveillance systems in the Middle East Member Countries of the OIE

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Introduction

The concepts of risk assessment and regionalisation have changed due to the huge expansion that has occurred in world trade in animals and animal products. This expansion of trade in live animals and animal products has brought challenges both for exporting and for importing countries to substantiate claims regarding their status in terms of disease control and surveillance [1, 2]. The World Organisation for Animal Health (OIE) has taken numerous initiatives to facilitate and encourage the creation of disease-free zones through the improvement of epidemiological activities.

Furthermore, OIE activities support the improvement of countries' ability to minimise the risk of diseases being transmitted via trade in animals and animal products. In this respect, it is recommended that OIE Member Countries periodically evaluate their disease surveillance systems, taking into consideration environmental and host relationship specificities.

Animal diseases continue to be a serious impediment to economic progress in most countries of the Middle East and the situation is likely to worsen if appropriate steps are not taken. With the emergence in the Region of animal diseases with high impacts on public health (such as highly pathogenic avian influenza), surveillance has become an essential tool for early detection of such diseases and a rapid response [2]. In all Member Countries of the Middle East, it is becoming increasingly evident that the public veterinary sector will not have the capacity to fulfil this function on its own and private veterinarians, veterinary para-professionals and animal producers will be called upon to play an important role in the delivery of animal health services [3, 4].

Increasing attention has been directed towards strengthening the epidemio-surveillance systems in countries of the Middle East Region. Many training activities, performed by the OIE, FAO[2] and WHO[3], have been implemented in various locations with the aim of building the capacity to perform regular epidemiological duties. However, these activities lack sustainability [3].

Decision makers who decide to use animal and public health surveillance as a management tool must recognise that they will need to commit political support and human and financial resources. As with every health system, competent, motivated health workers need to be found or trained and provided with career paths and supervision.

During the 84th General Session of the OIE World Assembly of Delegates, held in May 2016, the OIE Regional Commission for the Middle East adopted 'Sustainable strengthening of the epidemio-surveillance systems in the Middle East Member Countries' as Technical Item I (with questionnaire) to be presented at the 14th Conference of the OIE Regional Commission for the Middle East, to be held in Istanbul, Turkey, from 2 to 6 October 2017. The objective of this survey was to establish baseline information on the current situation in terms of the structure and capacities of epidemio-surveillance systems in Member Countries of the Middle East Region, and to identify activities that could help to address the related challenges in a sustainable manner.

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2 FAO: Food and Agriculture Organization of the United Nations

3 WHO: World Health Organization

OIE official definitions

Veterinary Authority: Governmental Authority of a Member Country, comprising veterinarians, other professionals and para-professionals, having the responsibility and competence for ensuring or supervising the implementation of animal health and welfare measures, international veterinary certification and other standards and recommendations in the *Terrestrial Animal Health Code* (the *Terrestrial Code*) in the whole territory.

Surveillance: The systematic on-going collection, collation, and analysis of information related to animal health and the timely dissemination of information so that action can be taken.

Veterinarian: A person with appropriate education registered or licensed by the relevant veterinary statutory body of a country to practice veterinary medicine/science in that country.

Veterinary para-professional: A person who, for the purposes of the *Terrestrial Code*, is authorised by the veterinary statutory body to carry out certain designated tasks (dependent upon the category of veterinary para-professional) in a territory, and delegated to them under the responsibility and direction of a veterinarian. The tasks for each category of veterinary para-professional should be defined by the veterinary statutory body depending on qualifications and training, and in accordance with need.

Other relevant definitions

Passive surveillance: Data are produced spontaneously, without relying on a specific procedure set up as part of the surveillance system. The case of notifiable diseases provides a good example of this. The data are provided by 'good will' and by the spontaneous activities of doctors and veterinarians, rather than through an active process initiated by the organisations involved in surveillance work [5].

Active surveillance: Data collection is specifically organised, for example by using a sampling strategy, with specimens being collected and analyses being undertaken for the sole purpose of surveillance [5].

Contingency plan: Set of activities, including immediate actions and longer term measures, for responding to an animal health emergency such as disease outbreaks [6].

Longitudinal studies employ continuous or repeated measures to follow particular individuals over prolonged periods of time – often years or decades. They are generally observational in nature, with quantitative and/or qualitative data being collected on any combination of exposures and outcomes, without any external influence being applied. This study type is particularly useful for evaluating the relationship between risk factors and the development of disease, and the outcomes of treatments over different lengths of time. Similarly, because data are collected for given individuals within a predefined group, appropriate statistical testing may be employed to analyse change over time for the group as a whole, or for particular individuals [7].

Materials and methods

In order to evaluate the epidemio-surveillance system in the Middle East Region, a questionnaire was sent by e-mail to the Delegates of the 20 Member Countries of the Region. Members were asked to respond to a questionnaire that included 26 questions relating to three aspects of surveillance systems, namely:

(i) Structure of the epidemio-surveillance system within the country;
(ii) Capacity of the epidemio-surveillance system at the Veterinary Authority; and
(iii) Challenges facing the Veterinary Authority's epidemio-surveillance system.

The responses to the questionnaire were collected in a database and analysed. For each question, this report provides information on the number of responses received and the results obtained (Appendix 1).

The analysis of the responses will be presented and discussed during the 14th Conference of the OIE Regional Commission for the Middle East with the aim of building a shared vision in the Region addressing, in a sustainable manner, strengthening of epidemio-surveillance as well as the challenges ahead for the current systems.

Results and discussion

- *Response to the questionnaire*

Out of the 20 Member Countries of the Region, 16 (80%) responded to the questionnaire[4]. This response rate is considered high and clearly indicates a strong interest in the topic among Member Countries of the OIE Regional Commission for the Middle East. As a general comment on the results of the survey, it is important to note that a high level of variability was observed in the responses, showing disparities in current situations and expectations in Member Countries of the Region. Some of the results indicate a need for additional work by countries and organisations to strengthen their efforts on surveillance and outbreak investigation.

The results presented below are compiled from the 16 questionnaires returned by Member Countries of the Region.

- *Structure of the epidemio-surveillance system within the country*

The results show that, in all respondent countries, the Veterinary Authority is the main body responsible for performing surveillance. A special unit/department for epidemiology exists in 81% of the respondent countries. Four (25%) of the respondent countries have no special office for risk assessment within their structure. However, all 16 respondent countries indicated that they use the World Animal Health Information System (WAHIS) data for information on countries' disease status. A special outbreak investigation team exists in 12 (75%) of the respondent countries. In nine of these countries, the team does not include epidemiologists. The lack of such expertise in the context of outbreak investigation may adversely affect the quality of service provided and, furthermore, lead to the wrong decisions being taken by high officials. In the Region, it appears that veterinary para-professionals have a major role in executing outbreak investigation tasks, when needed. Among the 16 respondent countries, 81% have an accredited National Surveillance Plan, 88% have a control strategy for at least one disease and 94% have a contingency plan for at least one disease. Ten (67%) of the respondent countries indicated that they have all three types of plans. The most frequently reported control strategies are for foot and mouth disease (FMD), brucellosis and highly pathogenic avian influenza (HPAI). The most frequently reported contingency plans are for HPAI, Newcastle disease and Middle East respiratory syndrome coronavirus (MERS-CoV). The majority of respondents (94%) indicated that they collaborate with other governmental agencies in the country in the event of an outbreak, especially for diseases of public health importance. Brucellosis and MERS-CoV were the main diseases cited in this context, reflecting the 'One Health' approach in countries of the Middle East.

- *Capacity of the epidemio-surveillance system at the Veterinary Authority*

When asked about the existence of a regular capacity-building programme in the field of surveillance and outbreak investigation, 8 (50%) respondents indicated that they have no such programme. For the eight respondents with a training programme, the number of training sessions delivered during the previous six months ranged from 0 to 17 and during the previous 12 months ranged from 1 to 31. The majority (69%) of the 16 respondent countries have no statistical support in their departments. This could affect the quality of reports and, therefore, the decisions that need to be taken during disease outbreaks. Only 7 (44%) of the respondents clearly indicated the existence of collaboration between the Veterinary Authority and academia for duties such as training and field work. When asked about the involvement of the private sector in surveillance activities, 7 (44%) of the respondents indicated that no such private–public sector relationship exists. This is a concern, as the involvement of the private sector in the surveillance and control strategies of a country is essential for the success of these strategies. There was a considerable variation in the number of outbreak investigations carried out by the different respondent countries in the Region: in some countries the number was extremely high and in others very low. This point will need further investigation. Most respondent countries depend on serological assays for their surveillance programmes. Nevertheless molecular biology diagnostic capacities exist in almost all of them. The number of technical staff working in diagnostic laboratories at state and local level varies. However, the number of laboratory staff working at the local level is significantly lower than the number at state level. This suggests that laboratory services need to be improved at local level (five respondent countries reported zero laboratory staff working at local level).

4 Afghanistan, Bahrain, Cyprus, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Oman, Qatar, Saudi Arabia, Syria, Turkey, United Arab Emirates, Yemen

Clearly, 12 (80%) of the respondents depend on passive surveillance data for generating their annual reports. For the proper execution of control strategies, active surveillance must be implemented and evaluated on a regular basis. Among the diseases for which surveillance has been performed, respondent countries most frequently cited HPAI, FMD, brucellosis and bluetongue. Among more specific surveillance studies, longitudinal studies were reported to exist in 8 (50%) respondent countries. Ten of the respondent countries (63%) support and encourage the publication of surveillance results, which clearly supports knowledge sharing and transparency. Only 6 (38%) of the respondent countries participate in a regional or sub-regional epidemio-surveillance network. Lack of communication and networking between Member Countries of the OIE Regional Commission for the Middle East is a major constraint. The cost of surveillance programmes remains a major constraint to their implementation. Indeed, eight (50%) of the respondents clearly indicated that their departments do not have a sufficient budget to run the different programmes.

- *Challenges facing the Veterinary Authority's epidemio-surveillance system*

The main challenges facing the Veterinary Authority's epidemio-surveillance system were reported to be as follows (each reported by 10 [62%] of the respondent countries): shortage of field support staff; shortage of laboratory technical staff; budgetary constraints; insufficient level of capacity building; and difficulty in obtaining diagnostic materials. International organisations such as the OIE pay particular attention to the needs of their members and, on a regular basis, schedule training workshops on a wide variety of topics of interest to veterinarians, in both the public and the private sector. Involvement of Veterinary Authorities in awareness-raising is relatively poor (about 50% of respondent countries indicated that their Veterinary Authority does not organise any awareness-raising workshops on its epidemiological work for senior management at Ministry level).

When asked to rate their country's level of success in implementing surveillance programmes, 56% of countries rated it as 'successful', the remainder (44%) rating it as 'neutral (neither successful nor unsuccessful)'.

Lastly, respondents were asked to list the most important actions that the OIE could take to support building/improving the epidemio-surveillance systems in their country. The actions most frequently cited were training of relevant OIE national Focal Points and facilitation of communications.

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Appendix 1

Frequencies obtained from the completed questionnaires (n=16)

1.1. Does the *Veterinary Authority* have surveillance duties?

		Frequency	Percent
Valid	Yes	16	100.0

1.2. Does the Veterinary Authority have an epidemiology department/unit?

		Frequency	Percent
Valid	Yes	13	81.3
	No	3	18.7
	Total	16	100.0

1.4.1. Does the *Veterinary Authority* have a risk assessment department/unit?

		Frequency	Percent
Valid	Yes	12	75.0
	No	4	25.0
	Total	16	100.0

1.5. Does the *Veterinary Authority* have a specialised outbreak investigation team?

		Frequency	Percent (n=16)
Valid	Yes	12	75.0
	No	3	18.8
	Total	15	93.8

1.6. The present outbreak investigation team consist of:

Composition of the outbreak team	No. of countries
Veterinarian	14
Veterinary para-professional	10
Epidemiologist	7
Microbiologists	7

1.7. Is there an accredited National Surveillance Plan?

		Frequency	Percent
Valid	Yes	13	81.3
	No	3	18.7
	Total	16	100.0

1.8.1. Does your country have control strategies for specific diseases?

		Frequency	Percent
Valid	Yes	14	87.5
	No	2	12.5
	Total	16	100.0

1.8.2. Does your country have contingency plans for specific diseases?

		Frequency	Percent
Valid	Yes	15	93.7
	No	1	6.3
	Total	16	100.0

1.8.3. Does your country have a command chain structure for specific diseases?

		Frequency	Percent
Valid	Yes	11	68.7
	No	5	31.3
	Total	16	100.0

1.8.3. Disease for which control strategies or contingency plans exist (ranked according to number of times mentioned)

Type	Disease
Control strategy	1. FMD 2. Brucellosis 3. HPAI 4. PPR 5. Tuberculosis 6. MERS-CoV
Contingency plan	1. HPAI 2. MERS-CoV 3. New strains of FMD 4. Rabies 5. Glanders 6. BSE

1.9. Do you collaborate with other governmental agencies in the event of an outbreak of a zoonotic disease?

		Frequency	Percent
Valid	Yes	15	93.7
	No	1	6.3
	Total	16	100.0

2.1. Is there a regular epidemiology capacity-building programme at the *Veterinary Authority*?

		Frequency	Percent
Valid	Yes	8	50.0
	No	8	50.0
	Total	16	100.0

2.2. Number of training sessions (in the field of epidemiology) at the *Veterinary Authority* during the past 6 months and during the past 12 months

	Respondents	Minimum No. of training sessions	Maximum No. of training sessions	Mean No. of training sessions
During the past 6 months	8	0.00	17.00	3.7333
During the past 12 months	8	1.00	32.00	6.6667

2.3. Is there a statistical analysis office at the Veterinary Authority?

		Frequency	Percent
Valid	Yes	5	31.2
	No	11	68.8
	Total	16	100.0

2.4. Does the Veterinary Authority have a capacity-building agreement with an academic institution?

		Frequency	Percent
Valid	Yes	7	43.7
	No	9	56.3
	Total	16	100.0

2.5. Does the Veterinary Authority support the participation of the private sector (private veterinarians and private laboratories) in surveillance?

		Frequency	Percent
Valid	Yes	9	56.2
	No	7	43.8
	Total	16	100.0

2.10. Are there on-going longitudinal studies on any diseases?

		Frequency	Percent
Valid	Yes	8	50.0
	No	8	50.0
	Total	16	100.0

2.11. Does the Veterinary Authority participate in regional or sub-regional epidemio-surveillance networks?

		Frequency	Percent
Valid	Yes	6	37.5
	No	10	62.5
	Total	16	100.0

2.12. Does the Veterinary Authority encourage publication of the results of surveillance projects?

		Frequency	Percent
Valid	Yes	10	62.5
	No	6	37.5
	Total	16	100.0

2.13. Is the available budget for surveillance at the Veterinary Authority sufficient to implement an adequate surveillance programme?

		Frequency	Percent
Valid	Yes	8	50.0
	No	8	50.0
	Total	16	100.0

3.1. Which of the following challenges are applicable to your country's Veterinary Authority?

Challenges	Frequency of selection by respondent
Shortage of field support staff	10
Shortage of Laboratory technical staff	10
Budgetary constraints	10
Insufficient level of capacity building	10
Lack of adequate legislation (for control plans, accredited surveillance programmes, etc.)	5
Lack of field equipment	6
Difficulty in obtaining diagnostic materials	10
Problems with transportation (inability to carry out surveillance)	1

3.2. Does the Veterinary Authority organise awareness-raising workshops on its epidemiological work for senior management at Ministry level?

		Frequency	Percent
Valid	Yes	8	50.0
	No	8	50.0
	Total	16	100.0

3.3. How successful has your country been in implementing surveillance programmes?

Success category	No. of countries
Highly successful	0
Successful	9
Neutral (neither successful nor unsuccessful)	7
Unsuccessful	0
Highly unsuccessful	0

3.4. What are the three most important actions that the OIE could take to support building/improving the surveillance system in your country?

OIE actions	No of countries that selected as		
	1st priority	2nd priority	3rd priority
Advocating improved transparency	3	1	2
Supporting OIE Member Countries with building capabilities through OIE PVS Pathway	4	7	2
Updating relevant OIE standards on surveillance	5	4	3
Facilitating twinning projects	4	4	3
Training of relevant OIE national Focal Points (Animal Disease Notification, etc.)	8	3	1
Facilitating communication between relevant Reference Centres and Member Countries	7	4	4
Ensuring WAHIS+ will be more user-friendly and compatible with nation surveillance databases	0	3	4
Facilitating links between OIE Member Countries and relevant technical organisations	5	1	3