TERRESTRIAL ANIMAL HEALTH STANDARDS COMMISSION REPORT

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NEW

CHAPTER 3.X.X.

GENERAL GUIDELINES FOR SURVEILLANCE OF ARTHROPOD VECTORS OF ANIMAL DISEASES

1. Introduction

Vector-borne diseases are of increasing importance economically and to human and animal health.

Environmental (including climate change), sociological and economical changes may affect the distribution and impact of these diseases.

Improved understanding of the distribution and population dynamics of the vectors is a key element for assessing and managing the risks associated with vector-borne animal and zoonotic diseases.

The OIE *Terrestrial Animal Health Code* contains guidelines for the surveillance of several vector-borne diseases.

The need has arisen to complement these general surveillance guidelines with additional general guidelines for the surveillance of vectors themselves. This Appendix only addresses surveillance for arthropod vectors.

For the purpose of trade, it must be noted that there is no conclusive relationship between the presence of a vector(s) and the *disease* status of a country/zone, and also that the apparent absence of a vector(s) does not by itself confirm vector-free status.

A vector may be broadly defined as:

> *", in infectious disease epidemiology, an insect or any living carrier that transports an infectious agent from an infected individual or its wastes to a susceptible individual or its food or immediate surroundings. The organism may or may not pass through a development cycle within the vector". (Dictionary of Epidemiology, John M. last, 4th Edition 2001)*

A Decision Tree with respect to vector surveillance is reflected in Figure 2.

2. Objectives

The objective of these *Guidelines* is to provide methods for:

- gathering up-to-date information on the spatial and temporal distribution and abundance of vectors of the arthropod-borne OIE-listed diseases and emerging diseases;

- monitoring changes in the spatial and temporal distribution and abundance of these vectors;

- collecting relevant data to inform risk assessment (including vector competency) and risk management of these vector-borne diseases.

3. Sampling methodology

a) Sampling plan

i) The state of existing knowledge should be assessed to determine whether or not historical data on the vector or the disease exist for the country or zone.

ii) The sampling plan should consider the following:

- the known aspects of the biology and ecology of the vector(s),

- the presence, distribution and abundance of the vectors' host animal populations,

- the environmental, ecological and topographic conditions of relevance to vector ecology.

iii) Sampling should be aimed at:

- establishing vector presence in the country or zone,

- describing the distribution of the vector(s) within the country or zone,

- providing additional information on vector density and spatial/temporal variability (both over the short- and the long-term).

iv) The sampling plan should be designed to provide representative estimates, with a minimum of bias, of the indicators listed in item 3 above. Consideration should be given to the following:

The recommended general approach to sampling is via a three-stage hierarchy:

- Stratification based on ecological criteria (where possible),

- subdivision of strata into spatial sampling units, and

- establishment of actual sampling sites within selected spatial sampling units.

If adequate historical data and/or expert opinion are available, the sampling plan may be further refined or targeted by defining strata which are as homogenous as possible with respect to the following known or suspected risk-factors:

- domestic or wild populations of host animals preferred by the vector,

- vector habitat suitability,
- climatic patterns (including seasonal),
- areas endemically and/or epidemically affected by the disease of concern,
- areas of known vector occurrences,
- fringe zone(s) around areas of known vector occurrences,
- areas in which the disease(s) or vector(s) of concern have not been reported currently or historically,
- each stratum (or the whole country or zone, if not stratified) should be divided into spatial sampling units according to standard methodologies such as a grid system,
- the number and size of the spatial sampling units should be defined to provide representative estimates of the indicators listed in item 3 above,
- the number and location of actual sampling sites within each spatial sampling unit also should be defined to provide representative estimates of the indicators listed in item 3 above,
- different levels of sampling intensity (spatial sampling unit size, number of units sampled, number of sites sampled within units, and sampling frequency) may be applied to different strata into which the country or zone has been divided. For example, more intensive sampling might be carried out in strata where vector presence seems most likely, based on biological or statistical criteria.

b) Sampling methods

Many sampling methods have been developed for the capture of vector arthropods, and these differ according to the disease/vector system under consideration.

i) The collection methods used should be adapted as required to ensure reasonable confidence of collecting the vector(s) of concern.

ii) Collection methods should secure the various developmental stages (such as eggs, larvae, nymphs, adults) and adult age categories, as appropriate to the species in question, required to estimate population survival rates and population dynamics in relation to disease transmission.

iii) Different collection methods may be required to secure samples from a single vector species, depending on the life stage or place of capture (such as from the environment or from the host animals). The collection method must be appropriate to the species and life stage of interest.

The collection methods should preserve the vector(s) to allow for subsequent complete taxonomic analysis (using both morphological and molecular techniques) and detection and/or isolation of pathogenic agent(s).

c) Data management, analysis and interpretation

Data management and analytical methodologies should be done in accordance with Chapter 1.4.).