

Conclusions of the workshop on West Nile virus surveillance and diagnostic in the Caribbean

Guadeloupe, October 25-27 2005

1. Objectives of surveillance

The main objectives are different between countries where West Nile virus (WNV) is present and others where WNV is not present. For countries where WNV is present, a study of risk factors could be performed. For WNV-free countries, the surveillance will be implemented to detect any WNV circulation.

1.1 Confirmation of WNV circulation

The objective is to confirm that the positivity that has been observed is due to viral circulation and not to vaccination or importation of animals from WN enzootic zones. Two vaccines against WNV are commercially available: an inactivated vaccine (whole dead virus) or a recombinant vaccine (Merial recombitek: live canaripox virus vaccine including only targeting genes). The nature of the vaccine will influence the detection by the epitope blocking ELISA.

Four countries are more specifically concerned by this objective: Barbados, The Dominican republic, Trinidad an Tobago and Jamaica.

1.2 Identify virus circulation

The objective is to detect any virus circulation in a country where no circulation has previously been described, would it be because of the absence of surveys or because of negative results on samples collected during surveys.

Three countries are more specifically concerned by this objective: Dominica, Martinique and Haiti.

1.3 Identify a new virus circulation

The objective is to detect a new virus circulation in a country where circulation has previously been described. The reactivation of the virus cycle may be due to the reintroduction of the virus in the country or to the amplification of a previously low circulation.

This objective concerns more specifically Guadeloupe.

1.4 Identify clinical signs on horses

The objective is to detect any clinical signs on horses, which would be linked to an increased pathogenicity of the virus or to the amplification of the virus circulation. The appearance of clinical signs would suggest an increased risk for public health.

All countries are concerned by this surveillance objective.

2. Methodology

2.1 Retrospective survey on positive cases

These surveys will be implemented to confirm the virus circulation. Whenever possible, positive horses must be traced back in order to determine the origin of their seropositivity. The survey must include questions on the history of movements to identify stays within known enzootic zones or zones where vaccination is used.

2.2 Horse surveys

Transversal surveys

Transversal surveys will be implemented to fulfil the first two objectives: identify virus appearance and confirm its circulation. Surveys should be oriented according to the high risk zones principle, the definition of which has been attempted in Guadeloupe. However, the validity of these risk factors need to be previously confirmed by similar studies in other countries.

It seems difficult to establish a common survey protocol given the different situations of the countries. However, an effort of standardisation of data collected need to be performed for all epidemiological studies. A common data sheet can be conceived and provided to all countries, which could thereafter serve as a basis for a common database.

Sentinel animals

Setting up sentinel horses will enable to monitor any eventual reactivation of the virus circulation. Sentinel animals will be located in zones considered as being at high risk, based on the definition of risk factors identified in Guadeloupe.

2.3 Bird surveys

As for horses, bird surveys will enable to fulfil the first two objectives: identify virus appearance and confirm its circulation. And once again, validated risk factors will be used to target the surveys.

Domestic birds

Protocols for these surveys will be identical to the ones used for horses. It is possible to use samples collected at slaughterhouses if the traceability is sufficient to identify the origin of the animals.

Husbandry practices are also important to determine because birds kept on open air in risk areas will have more chances of being infected.

Wild birds

Apart from wild birds belonging to wildlife reserves, it is possible to use pigeons for antibody detection.

Surveillance combining West Nile and avian influenza

In the current context of avian influenza threat, surveillance of West Nile virus could be combined to that of avian influenza. On domestic birds, this surveillance could be serological but on wild birds swabs will be needed to detect the virus as serology results would be difficult to interpret.

Surveillance of avian influenza could concern both lowly pathogenic (LPAI) and highly pathogenic (HPAI) strains of the virus.

2.4 Passive surveillance

Passive surveillance enables to measure an amplification of viral circulation and/or an increased pathogenicity of the virus. It consists of monitoring the appearance of clinical signs in horses and bird mortality.

Exchanging data on clinical cases and suspicions is not critical at this stage because very few equine cases have been detected in the Neotropics.

It is proposed to share communication device already used in other countries in order to reinforce the sensitizing of surveillance actors. Examples of leaflets will be posted on the CaribVET website.

3. Development of diagnostic capacities in the region

Barbados, the Dominican Republic and Haiti want to implement the epitope blocking ELISA in their laboratory.

CIRAD will contact Dr Blitvich (Fort Collins) to get antigens and controls before doing the distribution of reagents. An inter laboratory assay will be done to validate the transfer of ELISA method.

Important remark:

Concerning the shipment of samples to CIRAD:

- Storage conditions: samples frozen transported with ice packs in polystyrene box sent by express mail (Fedex, DHL)
- Good identification of samples, use a tap to cover the label to avoid any erasing of markers
- Use of screw tubes or eppendorfs sealed with parafilm
- Provide an electronic list of the samples (send by E mail) and a paper list with samples

4. Country-specific observations

4.1 Barbados

The country will focus on determining the origin of the seropositive horses, although the high number of race horses, which travel frequently within the country, will make it difficult. The origin of horses will be clarified. Barbados will wait for the results of 450 bird and horses samples already sent to CIRAD before implementing any other sampling. If necessary, CIRAD will be process new samples from Barbados.

In Barbados, the large sampling will enable to do a risk analysis and establish risk factors. This analysis will be compared to results obtained in Guadeloupe. The main problem in Barbados is the high number of race horses and their high mobility.

Results on risk factors will be shared with other countries in order to decide the targeted areas where surveillance for introduction of West Nile will be done most efficiently.

4.2 Dominican Republic

The primary objective is to identify the origin of positive horses. No seroconversion was observed in the areas considered at high risk (Los Haitises Park) whereas the central region (La Vega), where WNV was not expected, had a high prevalence in horses.

Seropositivity could be linked to vaccination or to an inappropriate processing of the samples. A tracking of positive horses, which are mainly race horses, will be done but information on vaccination will be difficult to obtain by official ways.

First, the epitope blocking ELISA test will be repeated on positive samples in order to confirm the results. Secondly, results will be confirmed by seroneutralisation tests (Fort Collins or other laboratories) in order to verify the specificity of the sera.

Further sampling will be done in the central area (on race horses and common horses) and in other areas (3 or 4 regions which may be at risk) both on horses and birds. The aim is to confirm negative results for the high risk areas.

4.3 Dominica

The horse population is limited in Dominica (total number of 27 horses) and hence not really adapted as a good indicator of WNV circulation. 19 out of 20 horses tested were WNV negative. There will be an increased passive surveillance (raised awareness for unusual bird mortality). In parallel, WNV circulation surveillance can consist in doing sampling on horses every year after the bird migration period. An extended study on birds can be performed. The strategy followed can be: minimum samplings in birds in areas which can be considered as risky areas (based on the risk analysis study in Guadeloupe).

4.4 Haiti

The analysis of 160 equine samples from 4 different areas will be performed at CIRAD. New horse samples from other areas will also be provided.

Depending on the results, 2 strategies will be applied. If there are any WNV positive samples in horses, the sampling will be extended to migrant birds. If there are none, a passive surveillance will be implemented.

4.5 St Lucia:

There is no WNV surveillance in Saint Lucia. An individual initiative from a veterinarian from Guadeloupe enabled to obtain and analyse samples. Tests were done on 37 horses which were all WNV negative. Saint Lucia is mainly doing passive surveillance on bird and horse mortality.

4.6 Jamaica

There is a need to set up a survey on horse populations. Human surveillance has already started with testing for any encephalitis or meningitis case.

4.7 Martinique

A passive surveillance on bird mortality and clinical signs in horses is organised. An annual survey on equine is scheduled in the main areas considered as risky regions (based on the risk factors identified in Guadeloupe). The study will be restricted in terms of number of samples.

5. Publication strategy and diffusion of information

The difficulty to publish papers on WNV is increasing. A publication describing the presence of WNV in a country is not sufficient anymore. The publication strategy is to do a common paper on WNV describing the regional situation. All the participants agree with this principle but a confirmation by the different authorities will be necessary. Participants from Barbados, Jamaica and Dominican Republic would like to implement more surveys before doing a common paper. The deadline for the submission of the regional paper is June 2006. Thierry Lefrançois will present some of the regional results during the ASTMH meeting in Washington in December with the agreement of the participants.

All the presentations of the workshop will be included on the CaribVET Website.

6. Avian influenza

There is a common will from all the participants to do a new FCR project on avian influenza in the Caribbean islands, which could also include West Nile surveillance. CIRAD will contact all the participants by Email in order to build this new project. Samples recently collected for WNV surveillance (waterfowl in Barbados for example) can be processed for avian influenza. Jamaica is also interested and wants to be involved in the future project.