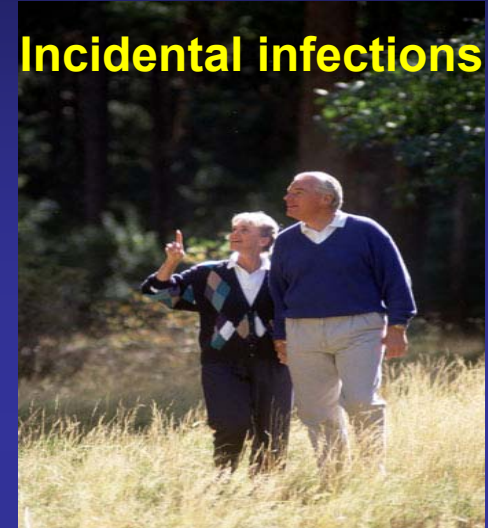


# **Outbreak of West Nile Virus in Southern France in 2003**

**Presented at the request of the European Commission,  
by the Institut de Veille Sanitaire  
at the European Surveillance Network Committee  
(Decision 2119/98/CE), Luxembourg, December 17, 2003**

**Contributors are listed in the last slide of the presentation**

# Transmission Cycle



West Nile virus

West Nile virus

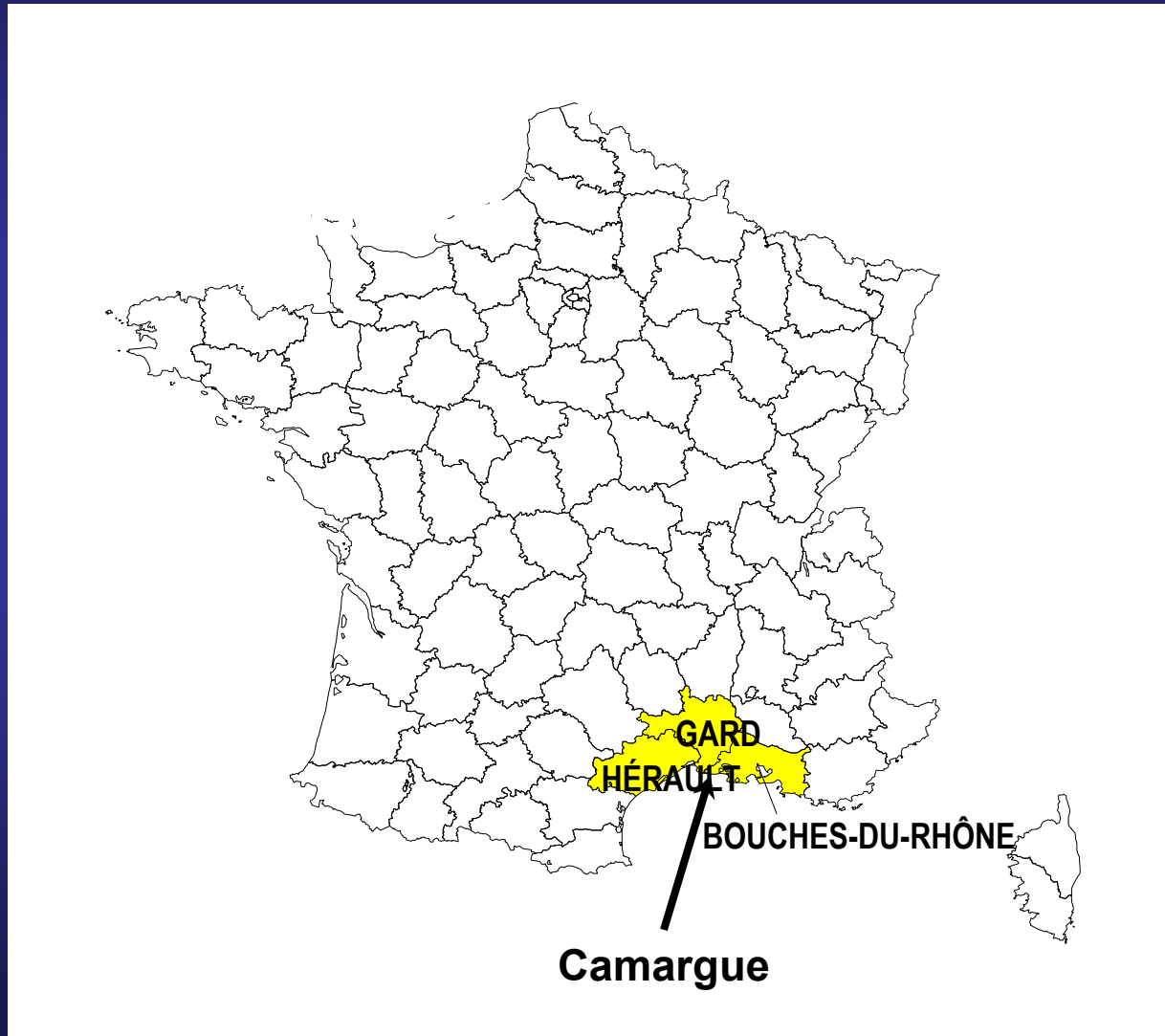


Background

# Background : West-Nile in Camargue

- **Human and equine cases from 1962 to 1965**
- **Epizootic in 2000 in Horses**
- **Surveillance of WNV in humans, horses and birds since 2001**
  - **Horses and sentinel chicken : seroconversion**
  - **Horses : notification and testing of severe febrile neurological syndromes**
  - **Humans : notification and testing of encephalitis seen in local hospitals of three districts (Hérault, Gard and Bouches du Rhône)**
  - **National Reference Centre and associated laboratory**

# Location of Camargue and of the three districts (in yellow) included in the surveillance of West-Nile, France



# Location of horse epizootic, 2000



# What Camargue looks like !



2003 outbreak



# Alert

- **October 6th : first human case notified to InVS**
  - Onset August 28th
  - Residence in Var district (outside Camargue)
  - Traveled to the French Riviera and Spain during the 2 weeks prior onset

**Place of contamination ??????**

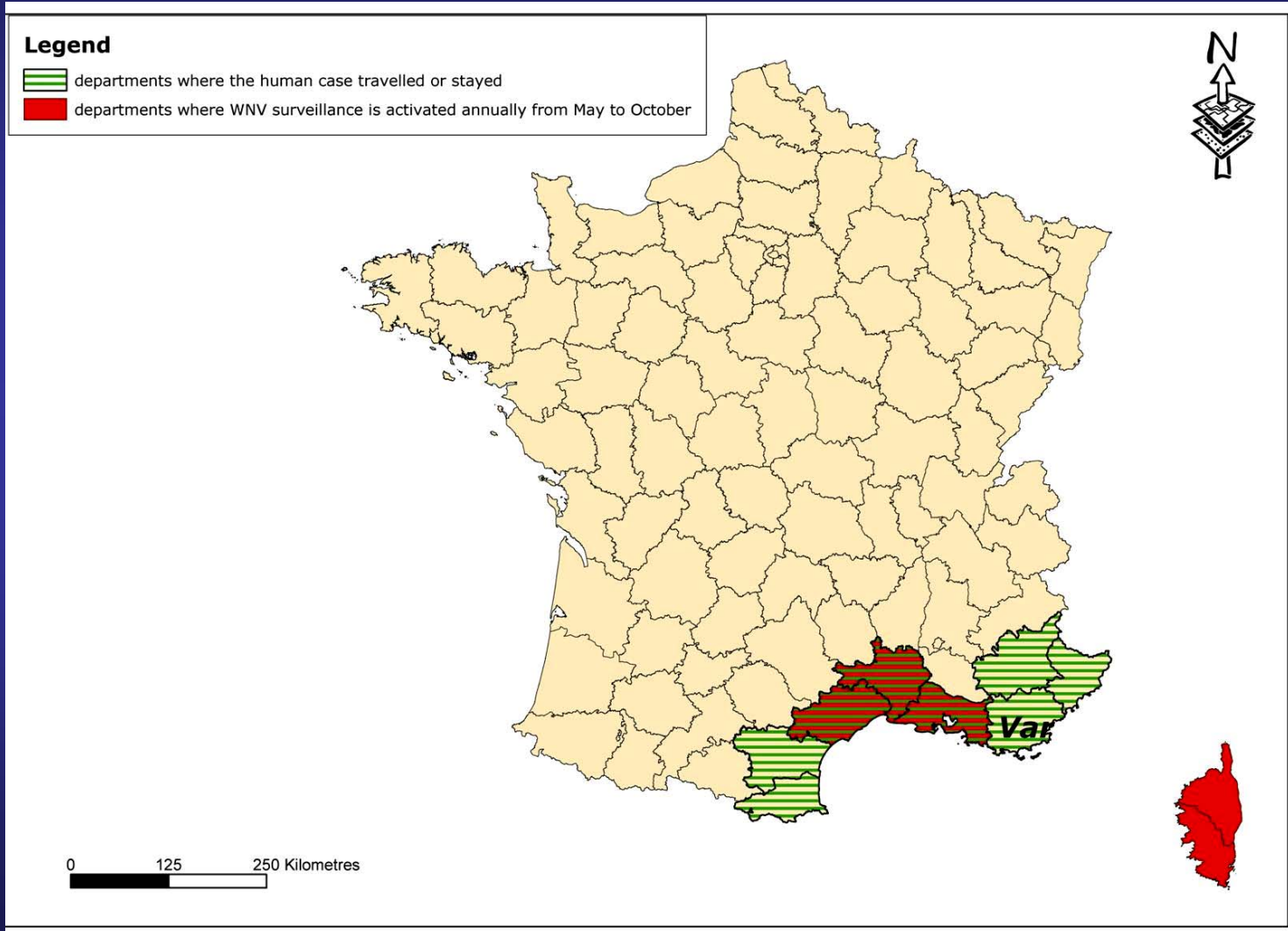
**Alert of other surveillance partners**

**HSCDS alert**

- **October 9th : first equine case identified in France**
  - Onset mid-September
  - Living in the Var
  - Had not traveled before onset

**Origin of contamination : Var**

# Districts where the case could have acquired West-Nile infection, France, 2003



# Case definitions

- **Suspected case** : fever, and altered mental status ranging from confusion to coma with or without additional signs of brain dysfunction, aseptic CFS, no aetiology identified, and no history of travel in an endemic country during the 3 weeks before the onset of symptoms.
- **Probable case** : a suspected case with virus-specific immunoglobulin M (IgM) antibodies demonstrated in CSF or serum by antibody-capture enzyme immunoassay (EIA) during the acute phase of the disease, or demonstration of virus-specific serum immunoglobulin G (IgG) antibodies in a late specimen.
- **Confirmed case** : a probable case with the isolation of virus, or demonstration of specific viral antigen, or genomic sequences in tissue, blood, cerebrospinal fluid (CSF), or other body fluid or IgM antibody by sero-neutralization.

# Investigations carried out

## Human case finding of encephalitis

- retrospective and prospective
- through all hospitals along the French Riviera from Italy to Spain
- from August 1st to November 30th

## Seroprevalence and incidence study in blood donors

- first phase : the Var, August 1st- October 15th
- second phase : all other departments of the French Riviera

## Equine case finding

- retrospective and prospective, all French Riviera districts

## Seroprevalence in horses

- 981 horses tested within a radius of 20 km from human and equine cases

## Mosquitoes capture and testing around the residence of cases

# Results

# Human cases

- **7 human cases**
  - 6 confirmed
  - 1 probable case
- **Four males, 3 females**
- **Age 27-73 years (mean 48)**
- **3 patients with encephalitis, 4 with fever and no neurological signs**
- **Onset : August 14th – August 28th**
- **All living in on city of Var district**
- **No human cases after August 28, 2003**

# Blood donors

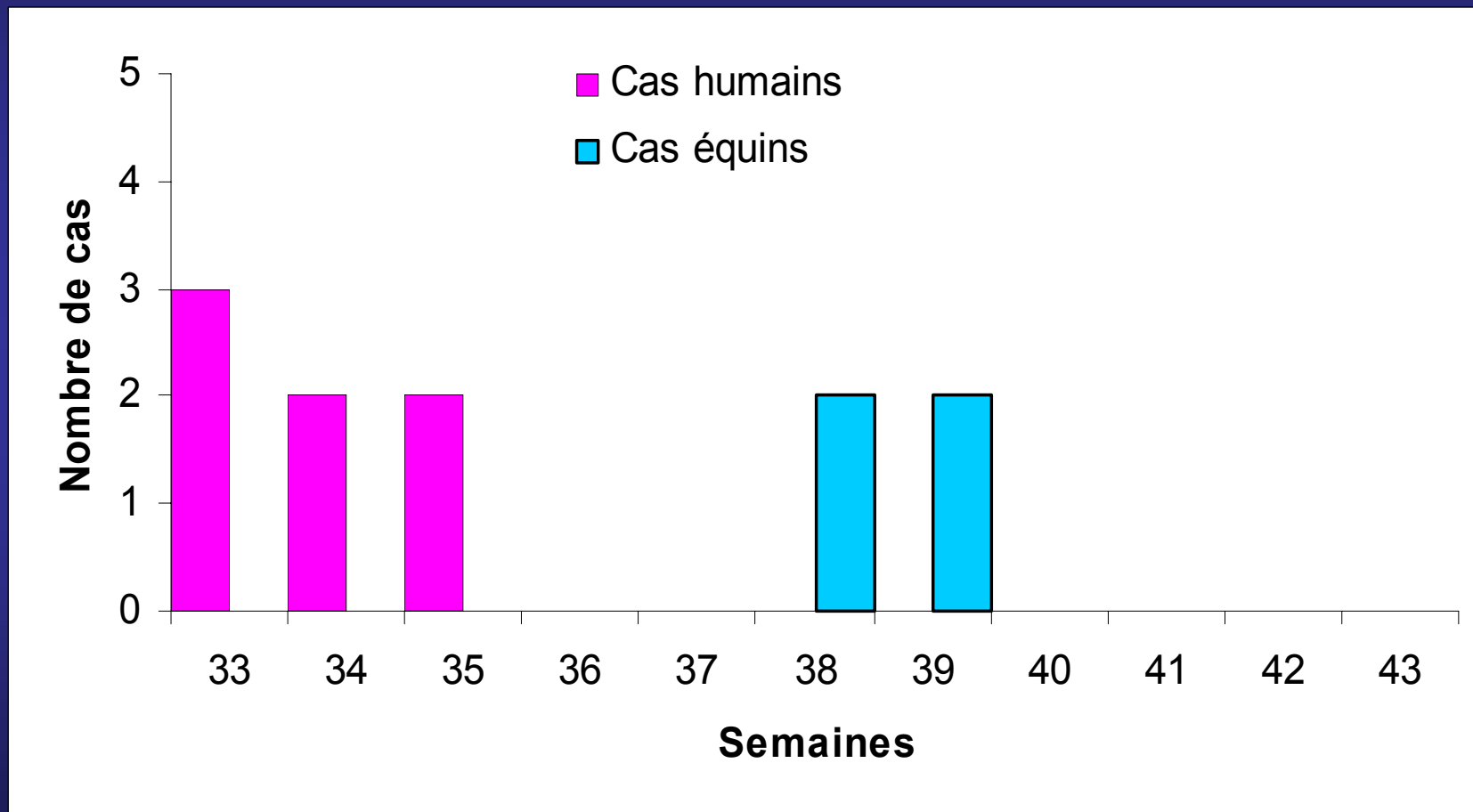
- **Var district :**
  - 2000 blood donations tested
  - 2 IgM positive, both living in the same city of residence as the cases
- **Others districts of the French Riviera :**
  - 8000 blood donations to be tested
  - Previous sera of regular donors (80%) positive will be tested retrospectively to identify seroconversion
  - Estimate of person-years at risk to derive an estimate of incidence

# Equine cases

- **5 equine cases**
  - 4 horses with encephalitis,
  - 1 asymptomatic
- **Onset : September 17th – 23th**
- **Living in the Var district**
- **No equine cases after September 23, 2003**



# Human and equine cases of West-Nile by week of onset Var, France, August-September 2003



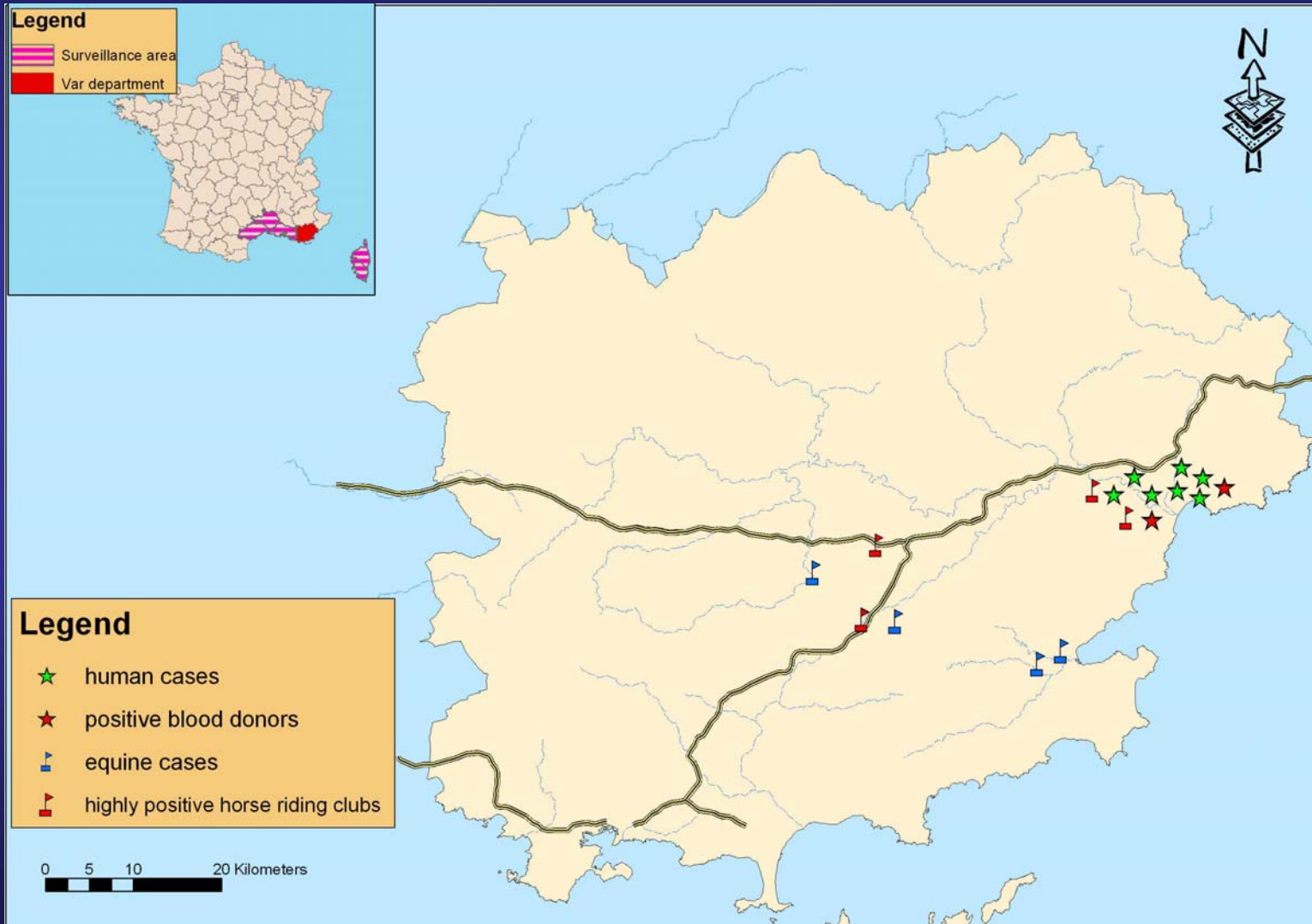
# Seroprevalence in horses

- **32 horse-riding clubs included**
- **981 horses tested**
- **5 clubs : no positive horses**
- **10 clubs : 2.5 – 11 % IgG positive**
- **5 clubs : 35 - 95% IgG positive**
- **All in the Var district**

# Mosquitoes

- **84 mosquitoes captured around the residence of cases in October**
  - **56 *Culex pipiens***
  - **9 *Culiseta annulata***
  - **11 *Ochlerotatus Caspius***
  - **8 others**
- **None positive for the West Nile virus**

# Geographical distribution of cases of West Nile infection among humans and horses, of positive blood donors and highly positive horse riding clubs, Var, France, 2003



# Discussion

## 7 human cases and 5 horses

- Human cases very clustered in time and space
- Equine cases clustered 20km from human cases and one month later

## Studies in blood donors

- Indicate low level of circulation of the virus
- Further results expected to estimate the risk of asymptomatic infection among regular blood donor and estimate the risk associated with blood donation

# Discussion (2)

- **Control measures :**
  - **Communication to the general public : individual protections**
  - **Blood donors and transplantation :**
    - **Revision of deferral criteria for potential blood donors**
    - **Follow-up of recipients**
- **Link with outbreaks in North Africa in 2003 ?**
- **Extend and strengthen of surveillance in France**
- **Adapt recommendations for blood donors according to results of current studies**
- **With no specific surveillance cases are missed**
- **Strategy for Europe ?**

# Institutions implicated in the outbreak investigation

- *Institut de Veille Sanitaire*
- *Cellule Interrégionale d'Épidémiologie Sud*
- *Centre National de Référence des Arbovirus*
- *Laboratoire de diagnostic des Arbovirus du Service de Santé des Armées*
- *Agence Française de Sécurité Sanitaire des Aliments*
- *Direction générale de l'Alimentation*
- *Direction Générale de la Santé*
- *Entente Interdépartementale de Démoustication Méditerranée*
- *Office National de la Chasse et de la Faune Sauvage*
- *Direction Départementale des Affaires Sanitaires et Sociales du Var*
- *Direction Départementale des Services Vétérinaires du Var*
- *Établissement français du Sang Alpes Méditerranée*
- *Centre Hospitalier Universitaire de Nice*
- *Centre hospitalier de Fréjus*

**This paper was produced for a meeting organized by Health & Consumer Protection DG and represents the views of its author on the subject. These views have not been adopted or in any way approved by the Commission and should not be relied upon as a statement of the Commission's or Health & Consumer Protection DG's views. The European Commission does not guarantee the accuracy of the data included in this paper, nor does it accept responsibility for any use made thereof.**