

## Chikungunya: Measures taken to avoid its introduction into New Caledonia

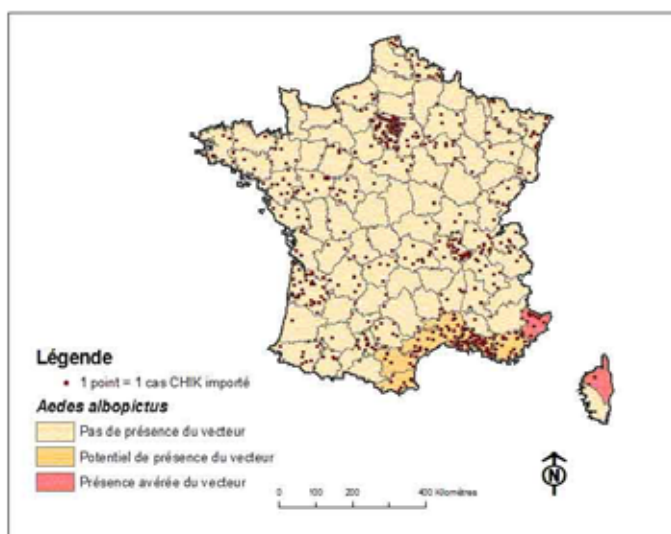
Up until recently the chikungunya virus, first identified in 1953, had been found in Africa, Southeast Asia and India without any particularly serious forms. No one foresaw that the 2005–2006 outbreak in the Indian Ocean would have such a wide scope or that it would be marked by severe and sometimes fatal forms. The Health Monitoring Institute (InVS) of France has estimated that the epidemic on Reunion Island affected more than 266,000 people, including 249 deaths linked to the virus either directly or indirectly<sup>1</sup>.

Travel facilitates the import of infectious diseases into a territory via infected travellers. So, as at 31 July 2006, 794 cases of chikungunya had been imported into metropolitan France and identified through laboratory data<sup>2</sup> (Figure 1). Other European countries have also recorded imported cases.<sup>3</sup>

However, in terms of public health<sup>4</sup>, the real issue is the risk of further propagation within the territory. Once arriving patients are in viremic phases of the illness, the risk of propagation depends on the existence of a vector mosquito and its ability to transmit the virus.

The mosquito *Aedes albopictus* has already been introduced into southern France and several other European countries, but not much research has been done on its ability to transmit the virus in those countries. Recommendations for Europe seem to be oriented towards information, screening capacity and controlling the import of the vector mosquito.

**Figure 1: Geographic distribution of chikungunya cases imported into metropolitan France between May 2005 and 31 July 2006**



In New Caledonia, the mosquito *Ae. aegypti*, a potential chikungunya vector, is very widespread. This situation could facilitate the emergence of a chikungunya outbreak following the arrival of travellers from the islands of the Indian Ocean who could be infected with the virus.

### Measures taken

All the doctors in New Caledonia were informed of the risk in February 2006, and the dengue fever sentinel network was put on alert.

<sup>1</sup> 'Epidémie de Chikungunya à la Réunion', update as at 12 October 2006, prepared by the Reunion Island-Mayotte CIRE.

<sup>2</sup> 'Cas de Chikungunya importés en métropole; avril 2005–30 juin 2006; point au 20 juillet 2006', InVS.

<sup>3</sup> 'Chikungunya risk assessment for Europe: Recommendations for action', E. Depoortere and D. Coulombier, Eurosurveillance.

<sup>4</sup> 'Etude de faisabilité d'un contrôle sanitaire aux frontières à l'aéroport de Beauvais Tillé', Memorandum of ENSP health engineer, Claire Boulet-Desbureau.

Given the epidemic in the Indian Ocean, various criteria were used to assess the risk of introduction of the virus into New Caledonia and its potential impact (Table 1).

**Table 1: Assessment of the risk of introduction of the chikungunya virus to New Caledonia and its subsequent impact (carried out in March and August 2006)**

Criteria	Analysis (March 2006)	Remarks	Analysis (August 2006)	Remarks
<b>1. Severity</b>				
Disease severity	Yes	Recently emerged factor	Yes	-
<b>2. Situation favourable to import</b>				
Indian Ocean epidemic	Yes	High level of activity	No	High drop in activity in Indian Ocean Islands
Passenger flow	Yes	700 visitors a year for Reunion Island and Mayotte	No	Falling flow in the middle of the year
<b>3. Vector situation favourable to propagation</b>				
Existing vector	Yes	<i>Aedes aegypti</i>	Yes	-
<i>Aedes aegypti</i> larval breeding areas	Yes	Entomological indexes on the rise (Noumea and Mont Dore)	No	Falling entomological indexes
Temperatures	No	Dropping	No	Still dropping
Rainfall	No	Decreasing	No	Still decreasing
<b>4. Population-related outbreak potential</b>				
No immunity in NC population	Yes	No immunity	Yes	Still no immunity

This assessment led local health officials to take the following measures from mid-March 2006 through to 31 August, when the arrangements were suspended:

1 - The annual dengue fever control campaign to encourage the community to eliminate *A. aegypti* larval breeding areas linked these actions to chikungunya.

2 - At Tontouta Airport, measures were taken to try to avoid introduction and propagation of the virus. Rapid research showed that most people arriving from islands in the Indian Ocean come to New Caledonia via Sydney (Australia) and Japan. Broad arrangements were made for this boarding zone – the so-called main area (Zone 1) – with partial arrangements in the other zones (Zone 2). These measures are described in Table 2.

**Table 2: Control measures designed to avoid introduction and propagation of the chikungunya virus in New Caledonia (March 2006)**

Boarding		1	2
		Japan, Sydney	Brisbane, Auckland, Wallis, Nadi, Vanuatu, Papeete
<b>International and local outbreak surveillance</b>		+	+
<b>Detection</b>	Individual health report forms (areas recently visited, possible clinical symptoms, place of residence in New Caledonia)	+	+
	DASS* team present at arrival	+	-
	Detecting fever through the use of a thermal imaging camera	+	-
<b>Control</b>	Protocol for suspected cases of chikungunya	+	-
	Information to people coming from risk zones	+	-
	Perifocal control of exposed persons (from risk zones)	+	+

(Japan: Tokyo + Osaka from 13/03 to 04/05/06, then just Tokyo from 05/05 to 31/08/06)

\*DASS=Direction des Affaires Sanitaires et Sociales

Two nurses were hired and trained to conduct, with the assistance of DASS's Health Activities Department, passenger control at the arrival of flights from Zone 1, using the defined protocol (Figure 2).

Passengers were asked to fill out individual health report forms (FDS) before disembarking. The form provided information on recently visited areas, clinical symptoms and place of residence in New Caledonia. Given the urgency of the situation, the form designed for avian influenza was used.

A thermal imaging camera was used to detect fever in passengers. In the event of positive results, the body temperature was verified by another method and the patient was asked about other symptoms. Only acute phases (viremic) were investigated (relapses were excluded).

In suspected cases, the protocol set out the possibility of giving the visitor a free chikungunya blood test and providing advice on how to avoid being bitten by mosquitoes during the first few days of the illness.

Information was provided to passengers arriving from risk areas, and the toll-free number set up for avian influenza was used for chikungunya (Figure 3).

These arrangements required an on-site team of at least two people.

**Figure 3: Information provided to passengers from risk areas**



In addition to these controls, the FDS were analysed within 24 hours and mosquito control measures were begun by township authorities at the passenger's place of residence in New Caledonia in the event of a recent stay in an area of exposure, whatever the clinical evidence might be.

Beginning in May 2006, a mid-term assessment of the system's usefulness put the Osaka boarding area in Zone 2, while arrivals from Tokyo remained in Zone 1. Also, use of the thermal camera was halted at that time, given the decrease in the Indian Ocean epidemic.

**Report as at 31 August 2006**

**Table 3: Activity at Tontouta between 13 March and 31 August 2006**

Boarding zone	1	2	Total
Number of flights arrived and treated	304	277	581
Number of FDS	44,155	29,596	73,751
Number of FDS with visits to risk areas	403	30	433
% FDS at risk/total FDS	<b>0.91</b>	<b>0.10</b>	<b>0.59</b>

► In regard to detecting exposure to the virus due to visits to areas where it was being transmitted, some 433 passengers reported stays in at least one risk area during the 12 days preceding their arrival. Some reported stays in two or even three risk areas (Table 4).

**Table 4: Analysis of FDS with risk area visited (as at 31 August 2006)**  
(35 travellers visited 2 countries at risk, 2 travellers visited 3 countries at risk)

	Reunion Island	Mauritius	Madagascar	Mayotte	Malaysia	India	Total
<b>Total</b>	268	73	2	10	79	40	472
<b>%</b>	<b>56.8</b>	<b>15.5</b>	<b>0.4</b>	<b>2.1</b>	<b>16.7</b>	<b>8.5</b>	<b>100.0</b>

► No cases of acute viremic chikungunya were detected at the border or in the population. Two of the three positive cases reported were relapses (Table 5). The third positive case was in the initial phase of the illness but beyond the viremic phase, and so it was felt that there was no risk of local transmission of the virus. The thermal imaging camera did detect some instances of fever but they were not related to the illness under investigation.

**Table 5: Chikungunya cases (suspected and laboratory confirmed) in New Caledonia as at 31 August 2006**

No.	Date*	Stay in an area where the virus is being transmitted	Time between the end of the stay in an area where the virus is being transmitted (or onset of the illness indicated by*) and sample	PCR***	IgM***	Differential diagnosis made afterwards*
1	13/01/06	Yes	10 days*	ND	+**	
2	10/02/06	Info unavailable	Info unavailable	ND	-	
3	28/02/06	Yes	> 1 month	ND	+	
4	08/03/06	Yes	Info unavailable	-	-	Dengue fever
5	10/03/06	No	N/A	-	NR	Hepatitis A
6	14/03/06	No	N/A	-	-	Influenza A
7	23/03/06	Info unavailable	Info unavailable	ND	-	
8	30/03/06	Yes	Info unavailable	-	-	Urinary infection
9	14/04/06	Yes	3 months	ND	+	
10	11/05/06	No	N/A	ND	-	
11	11/05/06	No	N/A	ND	-	

ND: not done, N/A: not applicable, NR: not requested, \*\*: by Pasteur Cerba France, \*\*\*: by IPNC

- Passengers were provided with needed information.
- Renewed energy was put into mobilisation against larval breeding areas.
- Border health control arrangements were tested “in real time”, which indirectly improved influenza pandemic preparedness tools and procedures.

**Dr Martine Noel**

Health Monitoring and Border Control  
Health Action Department  
New Caledonia Office of Health and Social Affairs

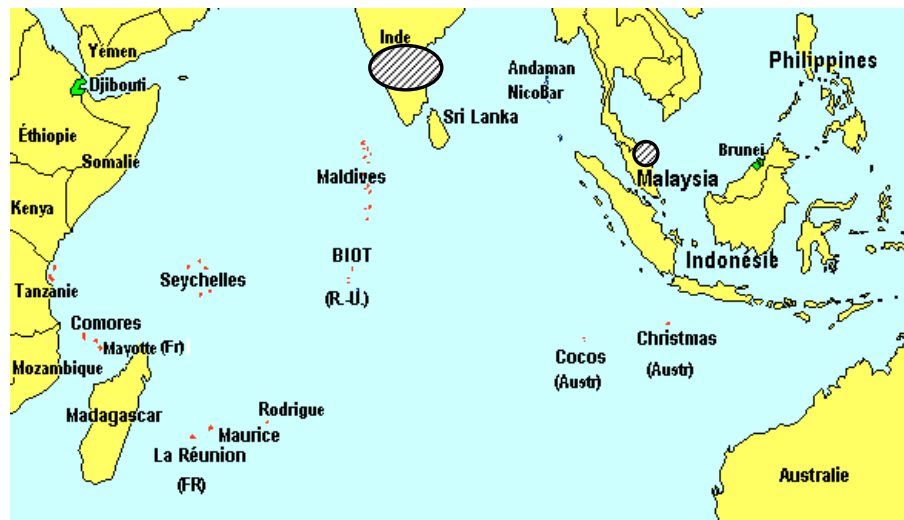
**Figure 2: Protocol for the Tontouta control team (updated in June 2006)**

**CHIKUNGUNYA checklist and procedures to be followed (as at 29 June 2006)**  
 for the DASS NC team at Tontouta Airport  
 Dr Martine NOEL – SAS – DASS NC

**If necessary: tel. no. of the DASS health monitoring doctor on call: .....**

**Objective:** Avoid introduction of the virus into New Caledonia.

**If the traveller has come from one of the countries involved:**



- Reunion Island
- Seychelles
- Comoros
- Mayotte
- Mauritius
- Madagascar (Toamasina)
- India (Maharashtra, Karnataka, Orissa, Andhra Pradesh)
- Malaysia (Pérak)

① **Exact address** and **telephone number** in New Caledonia to begin perifocal control measures (spraying, larvae control) around the residence

② **Look for symptoms of chikungunya:**

- fever (100%)
- joint pain (100%)
- headache (74%)
- myalgia (64%)
- skin rash (33%)

**Exclude relapses:** Only keep the dates of the first episode!!!



**If symptoms = YES:**

- Advise on care (consult a doctor, rest, analgesics: preferably paracetamol)
- Advise on avoiding mosquito bites for the first five days of symptoms of the illness (long clothing, mosquito nets)
- Give a can of **mosquito repellent** (use spray 3 times a day for the first 5 days of symptoms of the illness)
- Fill out the Pasteur Institute's dengue fever **information form** but mark "CHIKUNGUNYA" (to be given to the patient)
- Send the person to the Pasteur Institute for a free **blood test** (not on an empty stomach)

**If symptoms = NO:**

- **Self-surveillance**
- Give a "CHIKUNGUNYA" **information sheet**
- **The patient should consult a doctor if they get ill**, and mention their stay in an affected country

