



Report on a year of dengue surveillance in New Caledonia (2001)

Introduction

Over the past decade, New Caledonia has been affected by a number of dengue fever epidemics. Throughout this period, low background virus activity persisted between epidemics. It is likely that this situation of dengue endemicity ceased in June 1999, since which time no new biologically confirmed case has been reported.

This favourable situation results from the combined effect of drier weather, restricting mosquito breeding, and the effectiveness of the vector control action taken.

In 2001, the risk of a fresh epidemic was high because of the multiplication of type 1 dengue outbreaks in the Pacific and particularly in French Polynesia, where more than 32,000 people were affected, with eight fatalities. This threat materialised in some 20 imported cases and a local transmission cluster, which, fortunately, was swiftly contained.

The 2001 Sentinel Network

The structure of the sentinel network was reviewed early in 2001. It comprises 19 centres distributed over the whole country (as against 32 in 2000) and involves some 20 practitioners.

Province	Number of sentinel sites
Islands	3
North	3
South (outside Nouméa)	5
Nouméa	8
Total	19

Results obtained

➤ Diagnostic algorithm

The laboratory now systematically tests for viral RNA (PCR) on early samples (day 1 to day 6 after emergence of the fever). This technique, which enables rapid response, is highly suited to the current situation in which a possible index case is sought.

With later samples (after day 6), screening targets specific IgMs.

On every possible occasion, a pair of samples, one early and one late, are requested in order to study the dynamics of the virological and serological parameters.



➤ [Overall results \(see Figure 1\)](#)

Number of patients tested			Patients testing positive for dengue
Total activity	Activity supplied by the Sentinel Network	Patients having provided repetitive samples (2 or more)	
956	192 (20.1 %)	75 (7.8%)	21 (2.2%)

88.5% of the samples from the Sentinel Network were taken during the early phase of the disease (day 1 to day 5), most frequently on the second day.

The 21 positive cases of dengue can be broken down as follows:

- cases confirmed by identification of the viral RNA: 16
- cases confirmed by IgM seroconversion on two successive samples: 1
- cases confirmed by the presence of IgMs on a single sample *and* by a strong epidemiological argument (patient recently returned from an active virus transmission zone or had contact with a carrier recently returned from French Polynesia): 4

➤ [Virus types responsible and geographical origin of positive cases](#)

Virus Type	Geographical origin	Number of cases
1, confirmed by PCR	French Polynesia	13
	Samoa	2
1, probable (IgM + context)	French Polynesia	2
	Secondary case resulting from contact with a carrier returning from French Polynesia	2
2, confirmed by PCR	Indonesia	1
Unknown	India	1

➤ Activity of the various sentinel sites

Network sentinel sites	Number of suspected cases reported
Territorial Hospital (emergencies: adults)	18
Territorial Hospital (emergencies: children)	16
Centre Médical Polyvalent	14
Dr Darjana (Nouméa-Sud)	14
Dr F. Vangheluwe (Vallée du Tir)	32
Dr Vergé (Rivière Salée)	7
Army Health Service	21
Dr Langeron (Ducos)	11
Institut PASTEUR	6
Other sites in Nouméa	30
Drs Bezert and Ledos (Bourail Medical Centre)	2
Dr Michel Robin (Thio Medical Centre)	3
Dr Laurent (Isle of Pines Medical Centre)	2
Dr de Barbeyrac (Yaté Medical Centre)	1
Dr Alain Joas / Dr PY Virieu (Dumbéa)	0
Other sites in the Southern Province	3
Dr Lefèvre (Koumac Hospital)	1
Dr Pichereau (Poindimié Hospital)	4
Dr Domingue (Houailou Medical Centre)	6
Other sites in the Northern Province	1
Chépénéhé Medical Centre, Lifou	0
La Roche Medical Centre, Maré	0
Ouloup Medical Centre, Ouvéa	0

➤ Demographic and geographical characteristics of patients

A majority of the 192 patients examined by the sentinel network are males (59.5%); the average age is 30 years (ranging from 0-73 years).

Most of these people live in Nouméa and surrounding urban areas. Their places of residence are distributed as follows:

Place of residence	Number	%
Nouméa	123	64.1
Mont Dore	17	8.9
Dumbéa	7	3.6
Païta	4	2.1
Other Southern Province locations	10	5.2
Northern Province	13	6.8
Islands Province	2	1.0
Overseas	2	1.0
Not specified	14	7.3

19% of all patients (36 out of 192) had recently travelled outside New Caledonia, while 90% of those with a positive diagnosis (19 out of 21) had travelled.

➤ Clinical characteristics of patients

In addition to fever, which is considered as an obligatory patient inclusion criterion, a number of simple and typical symptoms were reported on the data and notification form. These can be broken down as follows:

Symptom present	Total patients in network		Unconfirmed cases		Confirmed cases	
	Number = 192		Number = 171		Number = 21	
	Number	%	Number	%	Number	%
Sudden onset	123	64.1	105	61.4	18	85.7
Aches/myalgia	152	79.2	134	78.4	18	85.7
Headaches	156	81.2	139	81.3	17	80.9
Rash	20	10.4	14	8.2	6	28.6
Retro-orbital pains	69	35.9	59	34.5	10	47.6
Haemorrhaging	13	6.8	11	6.4	2	9.5
Signs of shock	1	0.5	0	0	1	4.8
Nausea and vomiting	38	19.8	33	19.3	5	23.8

The most frequently identified symptoms in included patients were aches, myalgia and headaches. The most specific signs announcing a positive case were the sudden onset of fever and the presence of a skin rash: The frequency of these signs is significantly higher in patients with a confirmed biological diagnosis ($p < 0.05$).

Analysis

In 2001, New Caledonia was significantly exposed to the threat of a dengue epidemic arriving from neighbouring countries and territories, in particular from French Polynesia, to and from which there is frequent travel. In the Pacific region, the circulation of the type 1 virus began at the end of 2000, being reported from Palau first. The major epidemic then occurred from February to November in French Polynesia. It began in the island of Bora Bora and gradually spread to most of the rest of the group. Other outbreaks were reported from Samoa, Tokelau, Cook Islands and Hawaii. In New Caledonia, the first cases imported from French Polynesia arrived in mid-June, while the spread of the virus reached huge proportions in Tahiti. Despite the rapid response from the sentinel network and the vector control services, a local cluster was reported in one of the city's northern neighbourhoods (Rivière-Salée) where two autochthonous cases were identified. Fortunately, the combination of strong peri-focal control measures and prevailing weather conditions, which at that time were unfavourable to the multiplication of *Aedes*, meant that this outbreak had no serious consequences. From June to October, 17 patients returning with dengue from travel in the region were identified.

Two other imported cases should be mentioned: one type 2 coming back from Indonesia and another, unidentified, from India.

Most of the 21 diagnosed cases were uncomplicated forms. A single patient presented a haemorrhagic form (hematuria and hemoptysis) and was treated by the hospital emergency service and rapidly cured.

The number of patients recruited by the sentinel sites is almost three times higher than in 2000 and the proportion of activity provided by the surveillance network to the arbovirus laboratory has increased from 8.2% to 20%. This clearly shows that the sentinel doctors have been more actively involved this year.

Conclusion

As at 31 December 2001, no sign that the type 1 dengue had become endemic was visible in New Caledonia, despite repeated virus introductions. This can be explained by:

- the probably satisfactory level of sensitivity of the current sentinel network;
- the mobilisation and unfailing effectiveness of the vector control services in the city of Nouméa and in its surrounding suburbs;
- rapid information transfer between the various dengue-control players;
- the many public information campaigns carried out.

However, this favourable situation does not formally exclude low-level transmission occurring in the territory, with the risk of an outbreak when weather conditions are favourable to vector propagation. This justifies extra vigilance in the sentinel network in the early part of 2002.

Alain BERLIOZ-ARTHAUD

IPNC, Centre de Biologie Médicale
New Caledonia

