Viraemic importations of dengue into north Queensland, 2009

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Although dengue viruses are not endemic in north Queensland, the vector mosquito, *Aedes aegypti*, is present in urban settings in the region and on some Torres Strait islands. This means that north Queensland is prone to outbreaks of dengue, each one apparently initiated by a viraemic traveller recently arrived from a dengue-affected country abroad. For this reason, it is essential that viraemic importations of dengue from overseas into north Queensland are promptly recognised and notified so that appropriate mosquito-control measures can be rapidly implemented.

There were 28 laboratory-confirmed viraemic importations of dengue from overseas into north Queensland in 2009. (For public health purposes, in north Queensland the duration of viraemia is considered to be from 1 day before until 12 days after the onset of symptoms.[1]) This is the highest number of such importations recognised in any 1 year on record; previously the highest was 17 importations in 2008.[2] Four separate outbreaks of dengue occurred in north Queensland early in 2009, two of which had continued from 2008 into 2009. The increased awareness and testing surrounding those outbreaks may have increased the likelihood of detecting a newly imported case. Nevertheless, the recent increasing trend in importations[2] is consistent with the deteriorating dengue situation globally.[3]

Most (57%) of the infections were acquired in South East Asian countries (Table 1); these cases were acquired throughout the year. However, 32% were acquired in the South Pacific island nations (Samoa, Vanuatu, Fiji, Cook Islands and Tonga); all of these South Pacific cases were acquired in the first 4 months of the year. Again, there were relatively few (only 2) viraemic importations of dengue from Papua New Guinea.[2]

All 4 dengue virus serotypes were detected among the viraemic importations (Table 2). Four of the infecting viruses could not be serotyped because of serological cross-reactions. However one of these led to a serotype 1 outbreak (described below), and two were almost certainly serotype 4 as they were both acquired in South Pacific island nations.[4] The prominence of serotype 4 infections acquired in the South Pacific islands (8, but probably 10 cases) is striking. This is a reflection upon the widespread serotype 4 epidemic throughout the region since mid-2008,[4] and the burgeoning South Pacific island migrant population in north Queensland, several of whom acquired the infection while visiting their country-of-origin.

Table 1: Region/country where the viraemic importations of dengue were acquired

Region/country where the infections were acquired	Number of viraemic importations into north Queensland in 2009
South East Asia	16
South Pacific island nations	9
Papua New Guinea	2
Indian sub-continent	1

Table 2: Dengue virus serotypes detected among the viraemic importations

Dengue virus serotype	Number of viraemic importations into north Queensland in 2009
1	6
2	4
3	6
4	8
Not able to be serotyped	4

Two of the viraemic importations initiated outbreaks of dengue in north Queensland:

i. A 28-year-old woman became unwell a day after returning to Innisfail (~80 km south of Cairns) from Vanuatu. She saw a local medical practitioner the following day; dengue (subsequently identified as serotype 4) was notified 4 days after the consultation. She was viraemic in Innisfail for 6 days before mosquito-control measures were taken, and led to an outbreak with a total of 35 cases that lasted for 15 weeks.

ii. Local transmission of dengue was recognised in 2 suburbs of Townsville in late October to early November. The serotypes were soon identified

as type 1, and genotyping subsequently confirmed that serotype 1 viruses from the 2 suburbs were identical. During the outbreak investigation a 64-year-old man, who had become ill a day after returning from Timor-Leste in late September, was recognised. He saw a local medical practitioner 5 days after the onset; the practitioner diagnosed an influenza-like illness but did not consider dengue. The man had very strong links to cases in the 2 suburbs, and was subsequently shown to have had a secondary dengue infection, but his infecting serotype could not be identified. The outbreak consisted of a total of 10 cases and lasted 7 weeks (as of the end of 2009).

The median delay between the initial medical consultation in north Queensland and the notification of the cases to the local Public Health Unit was 3 days, with a range between 0 (when the notification occurred on the same day as the consultation) and 61 days (this importation was only recognised retrospectively during the investigation of an outbreak; see above). It is encouraging that the timeliness of the notifications has improved when compared with that documented in 31 importations into north Queensland over a decade ago (Table 3).[1] The improvement is probably mainly due to increased awareness among local medical practitioners, but the recent introduction of NS1 antigen testing (which is particularly useful early in the illness[5]) at the 2 main hospital laboratories in north Queensland may also have contributed.

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Table 3: The timeliness of the notifications of the viraemic importation in the 1990s, compared with that in 2009

	December 1994 to November 1998 (n=31)	2009 (n=28)
Median delay (days)	5.5	3
Notified on day of initial consultation	4 (13%)	6 (21%)
Notified within 48 hours of initial consultation	8 (26%)	11 (39%)
Notified within a week of initial notification	19 (61%)	24 (86%)