An apparent recent decline in importations of dengue from Papua New Guinea into north Queensland

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Although there is a paucity of information about dengue in Papua New Guinea, information gathered through surveillance in north Queensland in the early 1990s clearly documented that multiple serotypes of dengue viruses were circulating in that country.[1,2] Indeed, several importations from Papua New Guinea have initiated large outbreaks of dengue in north Queensland.[3,4]

Although the dengue viruses are not endemic in north Queensland, the principal vector, *Aedes aegypti*, is endemic. This means that the region is prone to outbreaks of dengue: each one being initiated by a traveller from abroad who is viraemic (i.e. infectious to *Ae. aegypti* mosquitoes) whilst in north Queensland. For this reason, surveillance for viraemic importations of dengue is a priority disease control activity in the region.[2]

Over the last decade, 1999–2008, 97 viraemic importations of dengue into north Queensland were notified, with a mean of 9.7 (range 4–17) cases per year (Figure). Of note, importations from Papua New Guinea predominated in the years 1999–2003, being responsible for 24 (51%) of the 47 importations over those 5 years. However, in the most recent 5 years, 2004–2008, importations from Papua New Guinea have been much less frequent, being responsible for only 6 (12%) of the 50 notifications (Figure).

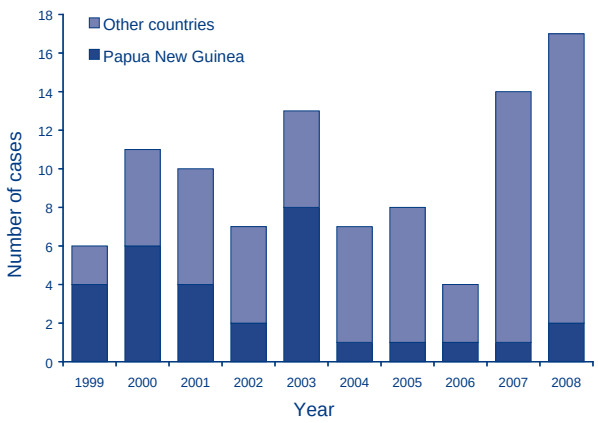
This apparent recent decline in dengue importations from Papua New Guinea into north Queensland could be quite coincidental. For example, perhaps in the recent years there could have been fewer susceptible travellers or expatriates in Papua New Guinea, or there may have been milder disease, not necessitating travel to Australia for diagnosis and management. Perhaps there could have been a trough in the periodicity of hyperendemic dengue in these years.

Nevertheless, it is possible that there is another explanation. An exotic mosquito, *Aedes albopictus*, was recognised as being established in several Torres Strait islands for the first time in 2005.[5] *Ae. albopictus* is an aggressive periurban Asian mosquito that has displaced local populations of *Ae. aegypti* in many locations.[6] However, although *Ae. albopictus* is able to transmit dengue viruses, it is a considerably less efficient vector of dengue than *Ae. aegypti*.[7,8]

The apparent decline in dengue importations from Papua New Guinea began in 2004, and *Ae. albopictus* was first recognised in the Torres Strait the following year. Container surveys in coastal villages in the Western Province of Papua New Guinea indicate that *Aedes albopictus* is prevalent in these locations (Ritchie SA, van den Hurk AF, unpublished data).

Therefore a plausible hypothesis is that *Ae. albopictus* has displaced *Ae. aegypti* in urban centres in Papua New Guinea frequented by travellers and expatriates (e.g. Port Moresby, Lae) from about 2004. This would result in these urban centres being populated with a considerably less efficient vector of dengue, thereby lowering the risk of travellers and expatriates in these centres acquiring dengue (and subsequently importing it into north Queensland).

Figure. Viraemic importations of dengue into north Queensland, 1999–2008



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