

## 11. Vector-borne diseases

### Surveillance objectives

The objectives of vector borne disease surveillance are to:

- Monitor the epidemiology of vector borne diseases in terms of time, person and place;
- Detect outbreaks of vector borne disease to implement appropriate public health interventions and prevent further transmission;
- Guide mosquito control surveillance and control efforts to minimise further infections;
- Communicate the patterns, risks and trends about vector borne diseases to the public, government and other key stakeholders.

### Barmah Forest virus disease

#### Summary of notifications

There were 31 cases of Barmah Forest virus disease notified to the department in 2006, a 63 per cent increase on the 19 cases notified in 2005. Most cases (n=27, 87 per cent) were notified in the first half of the year, particularly March (n=7) and May (n=6); no cases were notified in the last quarter of 2006 (figure 53).

The median age of cases was 39 years (range: 8–75 years); eight cases (26 per cent) were aged between 44 and 49 years. The majority of cases (65 per cent) were females. Residents of Gippsland Region and Loddon Mallee Region (eight cases each) accounted for the most cases; there were three cases from Hume Region, two from Grampians Region and nine were residents of metropolitan Melbourne. The region of residence for one person was unknown.

### Risk factors

Among the nine cases that resided in metropolitan Melbourne, only three were able to be followed up for risk factor information: one reported travel to Queensland during the incubation period. Five cases lived in semi-rural locations on the fringes of metropolitan Melbourne. Risk factor data were unable to be collected for the remainder of cases.

### Outbreak investigations

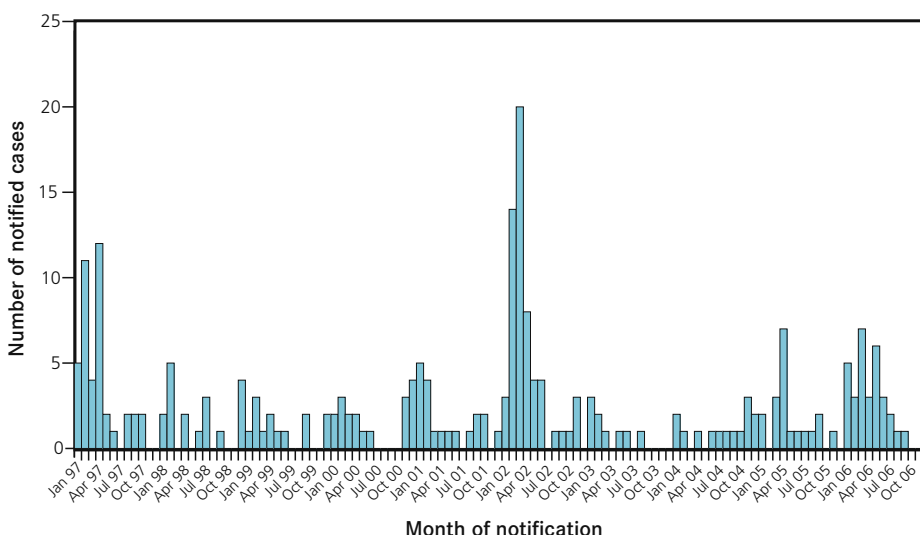
No outbreaks were identified.

### Comment

Although more cases of Barmah Forest virus disease were notified in 2006 than in the previous three years, the season was moderate compared to other years in which there were between 41 and 68 cases (1993, 1996, 1997 and 2002).

Infection with Barmah Forest virus can be prevented by implementation of mosquito control measures in the environment: the use of personal protective measures such as wearing long sleeved clothing; use of suitable mosquito repellent and; avoidance of mosquito prone areas, particularly when mosquitoes are active.

**Figure 53: Notified cases of Barmah Forest virus disease by month, Victoria, 1997–2006**



## Flavivirus infection

### Summary of notifications

Sixteen cases of Flavivirus infection were notified in 2006, the same number as were notified in 2005. Five cases were confirmed as dengue fever. The median age of cases was 36 years (range: 6–71 years) with a majority of the cases (n=10, 63 per cent) in males.

### Risk factors

All cases were followed up for exposure data; there were five cases each that had travelled to Indonesia and Sri Lanka during the incubation period, two had travelled to Malaysia and one each to East Timor and Thailand. Overseas travel (not further specified) was reported for two cases.

### Outbreak investigations

No outbreaks were identified.

### Comment

Dengue virus is not endemic in Australia but periodic outbreaks have occurred in northern Australia following importation of the virus among infected returned travellers or visitors through compatible local mosquito vectors. No vaccine or prophylaxis is available for dengue fever and travellers to endemic areas should take personal protective measures and avoid mosquito prone areas.

## Malaria

### Summary of notifications

There were 117 cases of malaria notified in 2006, an increase of nine cases (eight per cent) on the 108 cases notified in 2005. The median age of cases was 27 years (range: 1–89 years); the modal age groups of cases were 20–24 years and 35–39 years (figure 54). Nearly three-quarters of the cases were male.

Infection with *Plasmodium vivax* accounted for 62 cases (53 per cent) of malaria and a further 38 cases (32 per cent) were due to *P. falciparum* (table 36). There were nine cases caused by *P. ovale* and eight cases were mixed *P. falciparum* and *P. ovale* infections.

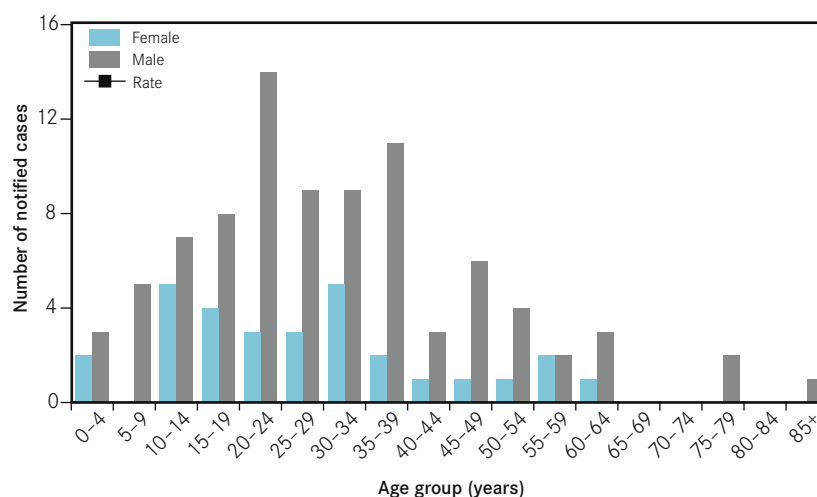
### Risk factors

The most commonly reported country of acquisition of infection was Papua New Guinea, accounting for 36 cases (31 per cent) followed by India with 13 cases (11 per cent); most infections acquired in both these countries were *P. vivax* (table 36). A further 32 cases (27 per cent) were reportedly acquired in Africa.

There were 26 cases (22 per cent) in new humanitarian arrivals, a decrease of nine cases compared to 2005; 21 of these cases were *P. falciparum* and mixed *P. falciparum* and *P. ovale* infections, 17 of which were from Africa (country of acquisition for four cases was not specified). There were three *P. ovale* infections in humanitarian arrivals from Africa and two *P. vivax* infections in humanitarian arrivals from Asia.

Additional risk factor data were collected from 37 cases (32 per cent). Of these, 11 (30 per cent) reported routine use of mosquito repellent, 11 reported routine use of protective clothing and nine (24 per cent) reported routine use of mosquito screens and nets. There were 13 cases (35 per cent) that reported regular compliance with prophylaxis, 13 cases with irregular compliance, six cases (16 per cent) that did not take prophylaxis and five cases for which prophylaxis data were not collected. There were five cases that reported regular compliance with prophylaxis as well as routine use of protective clothing and mosquito screens, nets and repellent.

Figure 54: Notified cases of malaria by age group and sex, Victoria, 2006



**Table 36: Notified cases of malaria by species and reported country of acquisition**

Country of acquisition	Species			<i>P. falciparum</i> and <i>P. ovale</i>
	<i>P. falciparum</i>	<i>P. ovale</i>	<i>P. vivax</i>	
Afghanistan	0	0	1	0
Burundi	2	0	0	1
Congo	1	0	0	0
Côte d'Ivoire	0	0	0	1
Fiji	1	0	0	0
India	1	0	12	0
Indonesia	0	0	2	0
Kenya	7	1	0	0
Malawi	0	1	0	0
Nigeria	2	0	1	0
Pakistan	0	0	2	0
Papua New Guinea	5	3	27	1
Sierra Leone	3	1	0	1
Solomon Islands	0	0	3	0
Sudan	3	1	0	0
Tanzania	3	0	0	0
Thailand	0	0	1	0
Uganda	1	1	0	0
Vanuatu	1	0	6	0
Zambia	1	0	0	0
Not specified	7	1	7	4
<b>Total</b>	<b>38</b>	<b>9</b>	<b>62</b>	<b>8</b>

### Outbreak investigations

No outbreaks were identified.

### Comment

Australia has been certified by the World Health Organization as malaria free so incidence in Victoria is a function of the number of travellers to, or arrivals from, endemic areas and the extent to which preventive measures are undertaken. Malaria can be a fatal disease and early diagnosis with prompt treatment is essential. The disease is

endemic in areas of Asia, Africa and Central and South America. Travellers should be informed of the four principles of malaria prevention: be aware of the risk, the incubation period and the main symptoms; avoid being bitten by mosquitoes, especially between dusk and dawn; take antimalarial drugs to suppress infection where appropriate and; immediately seek diagnosis and treatment if fever develops one week or more after entering an area where there is a malaria risk.

## Ross River virus disease

### Summary of notifications

There were 252 cases of Ross River virus disease notified in 2006, an increase of nearly 4.5 times the cases notified in 2005 and more than two times the average number of cases notified annually in the previous five years (figure 55). Most cases were notified in the first quarter, with 59 per cent of the year's cases notified by the end of February and 79 per cent by the end of March.

The median age of cases was 43 years (range: 9–83 years) with the highest numbers of notified cases and notification rates in the 30–34 and 45–49 years age groups (figure 56). In general, notified cases were evenly distributed by sex with a slight majority (52 per cent) in males.

More than half the notified cases in 2006 were residents of the two most northern regions of Victoria: Loddon Mallee Region (83 cases, 33 per cent) and Hume Region (62 cases, 25 per cent). Cases residing in metropolitan regions comprised a further 24 per cent of cases.

### Risk factors

Among the 60 cases with a reported residence in metropolitan Melbourne, 27 cases reported travel to Hume Region or Loddon Mallee Region, one each reported travel to Gippsland Region and Barwon-South Western Region, 15 reported travel interstate (New South Wales, Queensland, South Australia and Western Australia) and one reported overseas travel to Fiji. Information was unable to be collected for nine of the cases with a metropolitan residence.

Additional risk factor data were collected for 132 cases (52 per cent). Of these cases, living, working or playing near a mosquito breeding site was the most common risk factor reported (table 37). Approximately one half and one quarter of cases reported use of flyscreens on windows and doors and use of repellent respectively.

### Outbreak investigations

Although a large generalised increase in notified cases – particularly in the north of the state – was observed in 2006, no specific infection source foci were identified.

### Comment

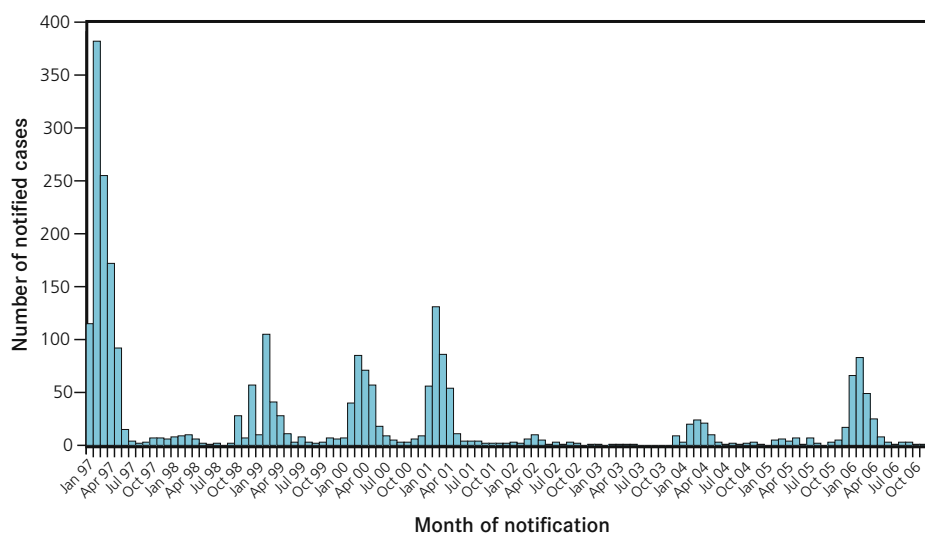
Preventive measures for Ross River virus disease are the same as described for other mosquito-borne diseases.

**Table 37: Notified cases of Ross River virus disease by risk factor, Victoria, 2006**

Risk factor*	Cases (per cent)
Live/work/play near a mosquito breeding site	68 (52)
Use of flyscreens on doors/windows	64 (48)
Camping	42 (32)
Use of repellent	37 (28)
Swimming	31 (23)
Gardening	25 (19)
Fishing	16 (12)
Bushwalking	13 (10)
Other outdoor activity	10 (8)
Waterskiing	9 (7)
Golfing	2 (2)

\* Multiple risk factors reported.

**Figure 55: Notified cases of Ross River virus disease by month, Victoria, 1997–2006**



**Figure 56: Notified cases and notification rates of Ross River virus disease by age group and sex, Victoria, 2006**

