

## **Mosquito-borne Diseases Surveillance Summary**

Issued on Thursday 08 June 2023 for cases notified to 23:59 PM on Saturday 03 June 2023

### **Summary**

- Four cases of Ross River virus in residents of ISLHD have been notified since the last report was issued, and four cases to date in 2023.
- No cases of Barmah Forest virus in residents of ISLHD have been notified since the last report was issued, and no cases to date in 2023.
- Travel-associated diseases, including malaria and dengue, are uncommon but occur throughout the year. One case of malaria and 11 cases of dengue in residents of ISLHD have been notified to date in 2023.
- In addition to spreading mosquito-borne diseases, nuisance biting from mosquitoes can lead to skin irritation and bacterial skin infections.
- Mosquito numbers in the Wollongong, Kiama, and Shoalhaven areas were low during the 2022-23 mosquito season.
- There were no detections of alphaviruses (Ross River or Barmah Forest viruses) in mosquitoes trapped in ISLHD during the 2022-23 mosquito season.
- There was a single detection of Stratford virus from mosquitoes trapped in Kiama during the 2022-23 mosquito season. No other flaviviruses (Japanese encephalitis, Murray Valley encephalitis, Kunjin, or Edge Hill viruses) were detected.

### **1. Surveillance of Ross River and Barmah Forest virus infections**

In Illawarra Shoalhaven Local Health District (ISLHD), possible exposures for confirmed and probable cases are investigated for [Ross River virus](#) and [Barmah Forest virus](#) as per the NSW Health Control Guidelines.

There are multiple mosquito vectors for Ross River and Barmah Forest viruses. Two of the most common vectors, *Aedes (Ochlerotatus) vigilax* and *Culex annulirostris*, are found throughout ISLHD.

#### **1a. This year (01 January 2023 to 03 June 2023):**

- Four cases of Ross River virus in residents of ISLHD have been notified.
- No cases of Barmah Forest virus in residents of ISLHD have been notified.

#### **1b. This mosquito season (01 October 2022 to 06 May 2023):**

- Three cases of Ross River virus in residents of ISLHD were notified.
- No cases of Barmah Forest virus in residents of ISLHD were notified.

#### **1c. Between 01 January 2015 and 31 December 2022:**

- 193 cases of Ross River virus in residents of ISLHD were notified, with an average of 24 cases per year (5.8 cases per 100,000 population). 78% of Ross River virus cases (150/193) had disease onset in the first half of the year.
- 25 cases of Barmah Forest virus in residents of ISLHD were notified, with an average of 3 cases per year (0.7 cases per 100,000 population). 76% of Barmah Forest virus cases (19/25) had disease onset in the first half of the year.

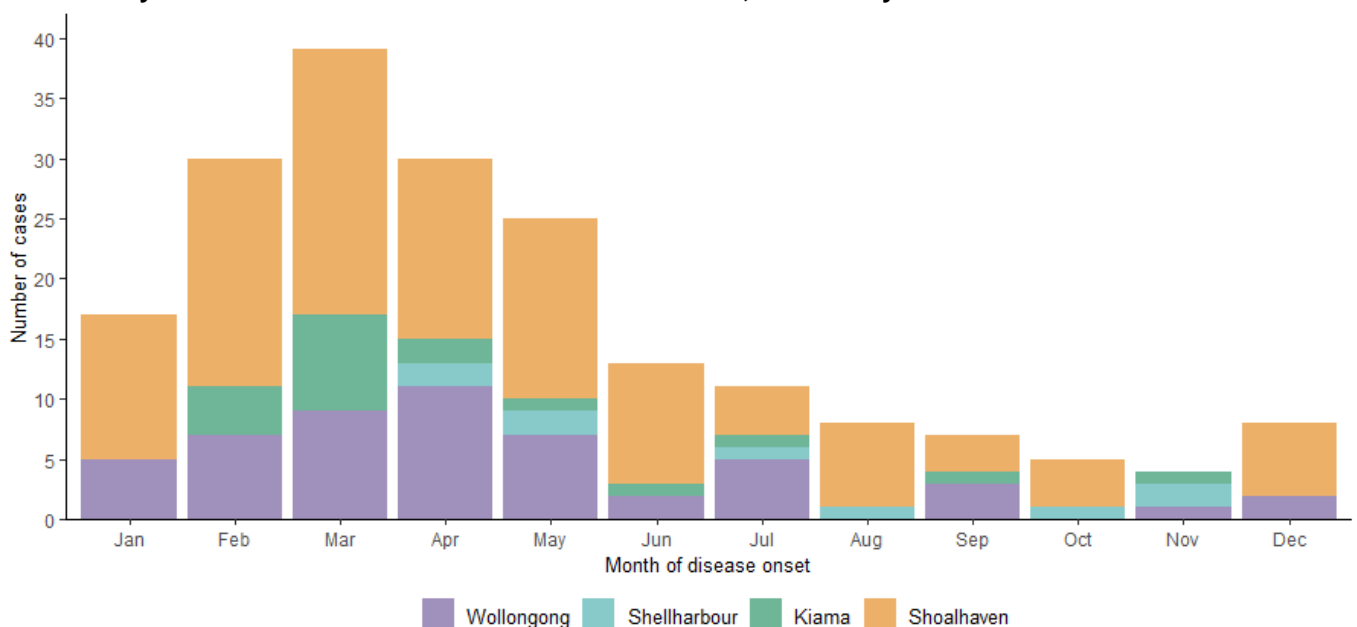
**Table 1: Number of confirmed and probable cases and rates per 100,000 population for Ross River virus and Barmah Forest virus among Illawarra Shoalhaven LHD residents by year of disease onset, 01 January 2015 to 31 December 2022**

Year	Ross River		Barmah Forest	
	Cases	Rate	Cases	Rate
2015	34	8.5	7	1.7
2016	9	2.2	0	0.0
2017	44	10.7	4	1.0
2018	17	4.1	0	0.0
2019	23	5.5	2	0.5
2020	24	5.6	2	0.5
2021	17	4.0	8	1.9
2022	25	5.8	2	0.5
<b>Total</b>	<b>193</b>	<b>5.8</b>	<b>25</b>	<b>0.7</b>

^ Notification data sourced from Notifiable Conditions Information Management System, Centre for Epidemiology and Evidence, NSW Health.

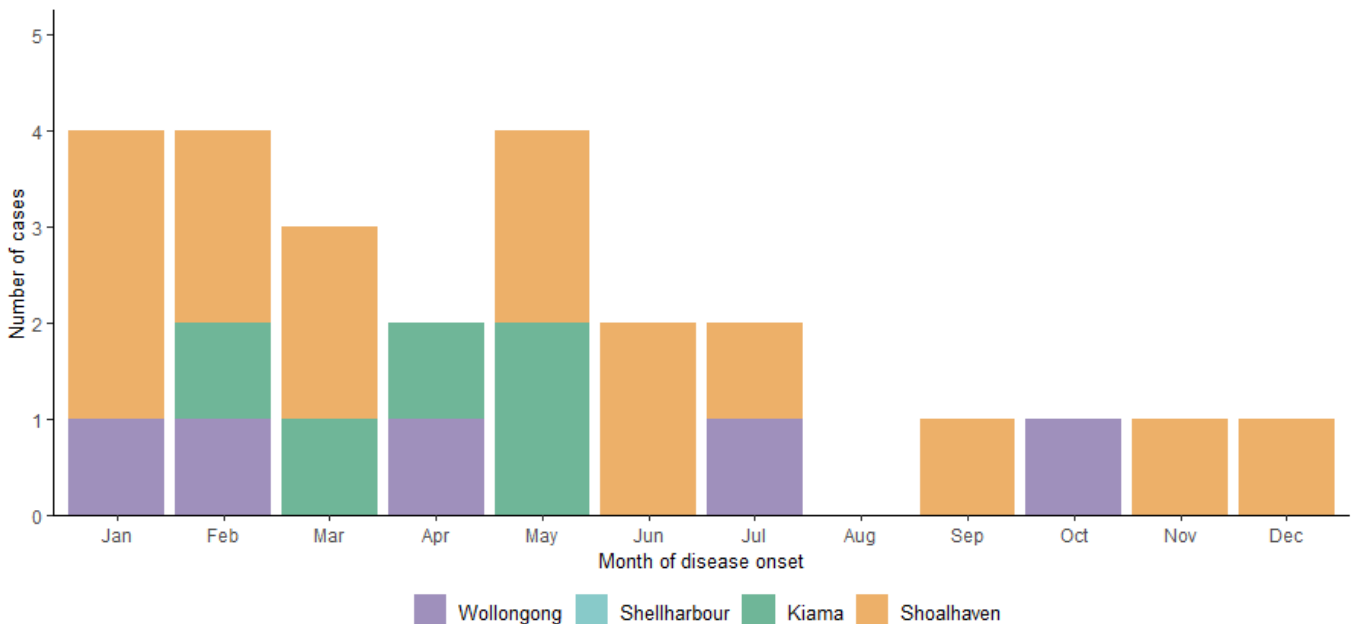
^ Population data sourced from Estimated Resident Populations, Australian Bureau of Statistics.

**Figure 1: Number of confirmed and probable cases of Ross River virus among Illawarra Shoalhaven LHD residents by month of disease onset and LGA of residence, 01 January 2015 to 03 June 2023**



^ Notification data sourced from Notifiable Conditions Information Management System, Centre for Epidemiology and Evidence, NSW Health.

**Figure 2: Number of confirmed and probable cases of Barmah Forest virus among Illawarra Shoalhaven LHD residents by month of disease onset and LGA of residence, 01 January 2015 to 03 June 2023**



^ Notification data sourced from Notifiable Conditions Information Management System, Centre for Epidemiology and Evidence, NSW Health.

## 2. Surveillance of other mosquito-borne diseases not believed to be locally acquired

In ISLHD, possible exposures for confirmed and/or probable cases of mosquito-borne diseases that are not believed to be locally acquired are investigated as per the NSW Health Control Guidelines for [malaria](#), [dengue](#), [Japanese encephalitis](#), [Murray Valley encephalitis](#), [Kunjin/West Nile virus](#), [Yellow Fever](#), [Zika virus](#), and [Chikungunya](#). These diseases are most commonly associated with international travel, particularly to Asia, Central and South America, and Sub-Saharan Africa.

### 2a. Malaria:

- 1 case of malaria in an ISLHD resident has been notified during 2023. This case was acquired overseas in Papua New Guinea.
- Between January 2015 and December 2022, 17 cases of malaria in residents of ISLHD were notified. These cases were all acquired overseas in sub-Saharan Africa, Asia, or the western Pacific.
- While Australia was declared free of endemic malaria in 1983, sporadic locally acquired cases have occurred in northern Australia. Malaria is transmitted by certain types of *Anopheles spp.* mosquitoes which are not endemic to ISLHD, but are found in far northern Australia (Queensland, Northern Territory, and Western Australia).

### 2b. Dengue:

- 11 cases of dengue in ISLHD residents have been notified during 2023. These cases were all acquired overseas in Indonesia, Thailand, or Vietnam.
- Between January 2015 and December 2022, 111 cases of dengue in residents of ISLHD were notified. These cases were all acquired overseas, most commonly in Indonesia or Thailand.
- The most common mosquito vectors for dengue (*Aedes aegypti* and *Aedes albopictus*) are not endemic to ISLHD, but are found in Far North Queensland and the Torres Strait.

**2c. Japanese encephalitis and Murray Valley encephalitis:**

- In February 2022, NSW Health issued an alert following the detection of Japanese encephalitis virus in several pig farms in the west of NSW. Thirteen cases in humans, including two deaths, were notified in NSW residents during the 2021-22 mosquito season. One case in an NSW resident was notified during the 2022-23 mosquito season. Further information about Japanese encephalitis in NSW is available [here](#).
- During the 2022-23 mosquito season, Murray Valley encephalitis virus was detected through routine mosquito and sentinel chicken surveillance across much of the western districts of NSW. Four cases in residents of Murrumbidgee LHD were notified during the 2022-23 mosquito season.
- No cases of Japanese encephalitis or Murray Valley encephalitis in ISLHD residents have been notified to date.
- While the establishment of ongoing local transmission of Japanese encephalitis or Murray Valley encephalitis is believed to be unlikely in ISLHD, at least one of the known mosquito vectors for these viruses, *Culex annulirostris*, has been regularly detected in the region.

**2d. Other flaviviruses:**

- Kunjin, Edge Hill, and Stratford viruses were detected through mosquito and sentinel chicken surveillance in several sites across Western NSW and Murrumbidgee LHDs during the 2022-23 mosquito season, but less frequently than Murray Valley encephalitis virus. Stratford virus was also detected in mosquitoes trapped in Kiama. There were no human cases of these viruses in NSW residents notified during the 2022-23 mosquito season.
- No cases of other flaviviruses (including Kunjin, Zika, or Yellow Fever) have been notified in residents of ISLHD during 2023.
- Between January 2015 and December 2022, five cases of Zika in residents of ISLHD were notified. These cases were all acquired overseas in Mexico, Nicaragua, or Samoa.
- There are multiple mosquito vectors for flaviviruses, including *Culex annulirostris* (Kunjin, Edge Hill), *Aedes (Ochlerotatus) vigilax* (Stratford, Edge Hill), *Aedes aegypti* (Yellow Fever, Zika), and *Aedes albopictus* (Zika). *Culex annulirostris* and *Aedes (Ochlerotatus) vigilax* are found in ISLHD, while the Australian distribution of *Aedes aegypti* and *Aedes albopictus* is currently restricted to Far North Queensland and the Torres Strait.

**2e. Other alphaviruses:**

- No cases of other alphaviruses (including Chikungunya or Sindbis) have been notified in residents of ISLHD during 2023.
- Between January 2015 and December 2022, six cases of Chikungunya in residents of ISLHD were notified. These cases were all acquired overseas in Indonesia, Thailand, or the Philippines.
- There are multiple mosquito vectors for alphaviruses, including *Aedes aegypti* and *Aedes albopictus* (Chikungunya), and *Culex spp.* (Eastern Equine Encephalitis, Western Equine Encephalitis). *Culex spp.* are found in ISLHD, while the Australian distribution of *Aedes aegypti* and *Aedes albopictus* is currently restricted to Far North Queensland and the Torres Strait.

**Table 2: Number of confirmed and/or probable cases of other mosquito-borne diseases among Illawarra Shoalhaven LHD residents by year of disease onset, 01 January 2015 to 31 December 2022**

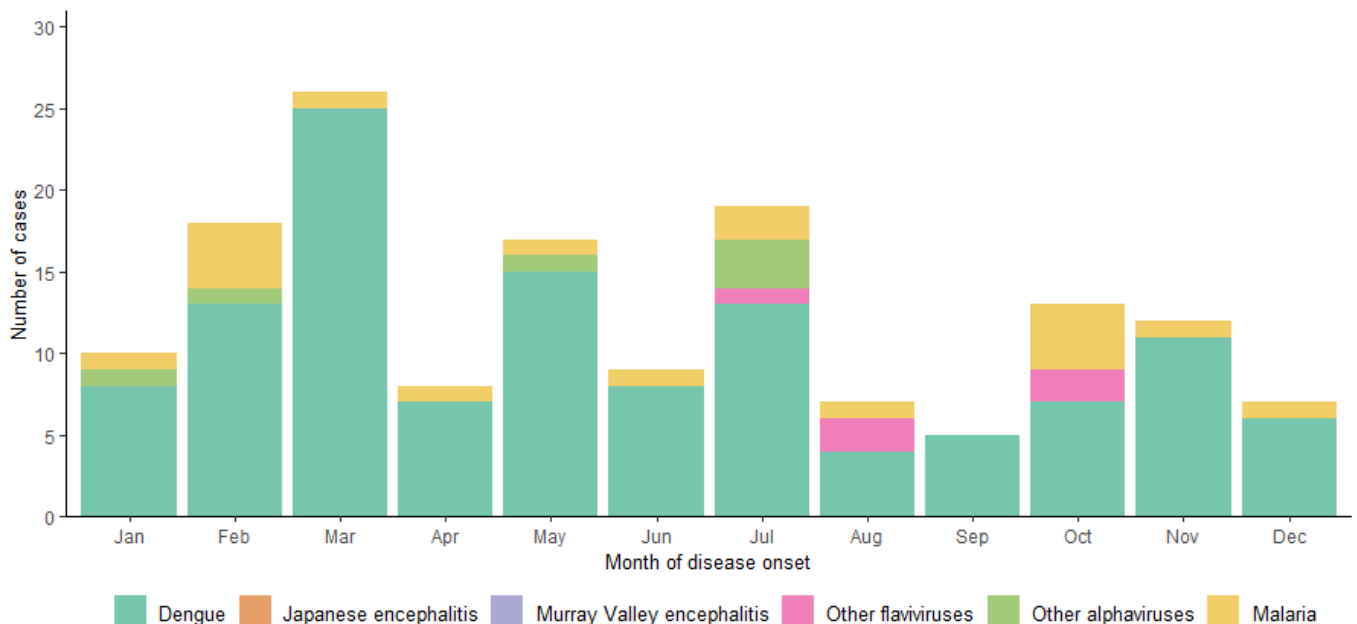
Year	Malaria	Dengue	Japanese encephalitis	Murray Valley encephalitis	Other flaviviruses	Other alphaviruses
2015	5	28	0	0	0	2
2016	2	20	0	0	5	2
2017	2	15	0	0	0	0
2018	3	18	0	0	0	0
2019	4	24	0	0	0	2
2020	1	0	0	0	0	0
2021	0	0	0	0	0	0
2022	0	6	0	0	0	0
<b>Total</b>	<b>17</b>	<b>111</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>6</b>

^ Notification data sourced from Notifiable Conditions Information Management System, Centre for Epidemiology and Evidence, NSW Health.

^ Other mosquito-borne flaviviruses include Kunjin, West Nile, Zika, Yellow Fever, Stratford, and Edge Hill viruses.

^ Other mosquito-borne alphaviruses include Chikungunya, Sindbis, Eastern Equine Encephalitis, and Western Equine Encephalitis viruses.

**Figure 3: Number of confirmed and/or probable cases of other mosquito-borne diseases among Illawarra Shoalhaven LHD residents by month of disease onset, 01 January 2015 to 03 June 2023**



^ Notification data sourced from Notifiable Conditions Information Management System, Centre for Epidemiology and Evidence, NSW Health.

^ Other mosquito-borne flaviviruses include Kunjin, West Nile, Zika, Yellow Fever, Stratford, and Edge Hill viruses.

^ Other mosquito-borne alphaviruses include Chikungunya, Sindbis, Eastern Equine Encephalitis, and Western Equine Encephalitis viruses.

### **3. Mosquito surveillance in Illawarra Shoalhaven LHD**

- Mosquito surveillance provides an early warning of increased risk of mosquito-borne diseases to inform public health communications. Mosquito trapping and sentinel chicken surveillance is undertaken across NSW every year from late November to April through the [NSW Arbovirus Surveillance and Mosquito Monitoring Program](#).
- The NSW Arbovirus Surveillance and Mosquito Monitoring Program produces weekly reports that provide mosquito trapping data, results from sentinel chicken flocks, and weather and tidal information relevant to mosquito abundance.
- During the 2022-23 mosquito season mosquito trapping commenced in three sites across the Wollongong, Kiama, and Shoalhaven LGAs. There are currently no sentinel chicken flocks within ISLHD.
- The predominant species of mosquitoes in ISLHD that may pose a risk to human health are *Aedes (Ochlerotatus) vigilax* and *Culex annulirostris*. These species are known vectors of alphaviruses (Ross River and Barmah Forest viruses) and flaviviruses (Japanese encephalitis, Murray Valley encephalitis, Kunjin, Edge Hill, and Stratford viruses). In addition to spreading mosquito-borne diseases, nuisance biting from mosquitoes can lead to skin irritation and bacterial skin infections.
- Mosquito numbers in the Wollongong, Kiama, and Shoalhaven LGAs were low during the 2022-23 mosquito season. There was a single detection of Stratford virus from mosquitoes trapped in Kiama during the 2022-23 mosquito season. No other flaviviruses (Japanese encephalitis, Murray Valley encephalitis, Kunjin, or Edge Hill viruses) or alphaviruses (Ross River or Barmah Forest viruses) were detected.
- Thank you to Wollongong, Kiama, and Shoalhaven local councils for their contribution to this important monitoring program.

### **4. Mosquito-borne disease notification in NSW**

- Under the *NSW Public Health Act 2010*, public health laboratories, general practitioners, and hospitals are required to notify of any case of human vector borne disease listed as a scheduled medical condition.
- Further information about mosquito-borne diseases, including [fact sheets](#), [control guidelines](#), and [notification data](#) is available on the NSW Health website.