March 2023

The South Australian arbovirus and mosquito monitoring report

Current hierarchy of response level 3 **HIGH**

The South Australian (SA) arbovirus and mosquito monitoring report summarises the most recent available data to inform the current level of risk of mosquito-borne disease in SA. This data determines the appropriate graded response in accordance with the SA Arbovirus Coordinated Control and Operations Plan (the Plan) hierarchy of response (HoR). The HoR is dependent upon on-going data and trends identified by surveillance activities, weather forecasting and disease notifications.

The broad areas of flood plain associated with the River Murray provide breeding opportunities for the main Murray Valley encephalitis virus (MVEV) and Japanese encephalitis virus (JEV) vector mosquito, *Culex annulirostris*. This is particularly significant after a period of high and prolonged river flow, when floodwaters recede and during times of high spring and summer rainfall spanning the months of September through to April. The most current River Murray flow report is available on the WaterConnect website here.

Meteorological data

Rainfall in March was 63% below average (1961–1990) for SA as a whole, making it the state's driest March since 2019. Most areas of the Pastoral districts recorded less than 10 mm during the month and less than 50% of the average. Rainfall totals in March were higher than average at most sites across Adelaide and the Hills.

The mean maximum temperature for SA as a whole was 1.81 °C warmer than average (1961–1990), the tenth-highest on record for March (since 1910) and highest since 2019. The mean minimum temperature for SA was 0.99 °C warmer than average (1961–1990). The overall mean temperature for SA was 1.40 °C warmer than average (1961–1990). Mean maximum temperatures for March were cooler than average at all sites across Adelaide and the Hills, as the month ended with a week of cool to mild temperatures.

The El Niño–Southern Oscillation (ENSO) is currently neutral (neither La Niña nor El Niño). Oceanic and atmospheric indicators for the tropical Pacific Ocean are at neutral ENSO levels. International climate models suggest neutral ENSO conditions are likely to persist through the southern hemisphere autumn. Long-range forecasts of ENSO conditions made in early autumn have lower accuracy than those made at other times of the year. However, there are some signs that El Niño may form later in the year. Hence the Bureau has issued an El Niño WATCH, meaning there is a 50% chance of El Niño in 2023.

Source: Australian Government, Bureau of Meteorology

Exotic mosquito detection

On 7 March 2023, HPP was informed by the Department of Agriculture, Fisheries and Forestry (DAFF) that during their routine surveillance for exotic mosquitoes, an adult female *Aedes aegypti* mosquito was detected at Adelaide Airport. This detection was confirmed by the DAFF and NSW Health Pathology. *Aedes aegypti* is an exotic species, not present in SA. Establishment of this species presents a public health risk to residents of / visitors to SA.

A risk assessment by the medical entomology team in NSW, SA Health and DAFF recommended chemical control measures be implemented as soon as possible during the airport curfew period (11pm - 6am) to eradicate any potential establishment of the exotic species. HPP attended the airport on 8 March 2023 and conducted receptacle and drain surveys within a 600-metre radius of the trap where the *Aedes aegypti* mosquito was detected.

Additional surveillance was also undertaken at known waterbodies within a 1km radius of the of the trap where the *Aedes aegypti* mosquito was detected. Where required, HPP undertook treatment with S-methoprene pellets. DAFF will continue to conduct enhanced surveillance at the airport for at least one month. No further detections of *Aedes aegypti* have been reported to HPP.

Government of South Australia
SA Health

Northern Adelaide mosquito surveillance program trapped mosquito data

The 2022-23 northern Adelaide mosquito surveillance program commenced on 6 September 2022. Mosquito surveillance is conducted weekly at six locations. Mean trap abundance data shows decreased abundance at all trap locations compared to the 2021-22 mosquito season and increased abundance at four trap locations compared to the 2020-21 mosquito season. See table 1.

Mosquitoes from northern Adelaide traps collected on the 10th and 24th March were submitted to the Agriculture Victoria laboratory enumeration, speciation and viral screening for JEV, MVEV, Ross River virus (RRV), Barmah Forest virus (BFV) and West Nile virus/Kunjin (WNV/KUN). No viruses were detected.

Table 1: Northern Adelaide mosquito surveillance program trapping mean trap abundance data March 2023 three-year comparison.

Trap location	2021	2022	2023
Globe Derby Park Racetrack	22	284	27
Daniel Avenue Wetland	49	831	98
Swan Alley	1183	4555	1604
TI Quarantine Station	2017	3088	690
TI Power Station	585	863	320
Mawson Lakes	49	333	63

SA Health regional surveillance and control officers trapped mosquito data

To support the JEV response in SA, regional surveillance officers have been employed to conduct surveillance and control activities in regional areas located outside of local council mosquito surveillance and control programs.

Regional officers engage with key local stakeholders and conduct surveillance and control activities across several council areas. They attended caravan parks, local businesses, and public events in multiple council areas during March. The purpose of these activities was to promote Fight the Bite messaging and provide information, resources and advice to local communities.

Regional officers undertook adult mosquito surveillance in the Gerard aboriginal community south of Barmera on 7 March 2023 after gaining permission from a Gerard community representative. Adult mosquito and larval surveillance were undertaken. No larvae were identified, and mosquito numbers were moderate (<50-99) however, 92% of all trapped mosquitoes were the main MVEV and JEV vector mosquito, *Culex annulirostris*.

Regional officers also travelled to the Anangu Pitjantjatjara Yankunytjatjara (APY lands) with an officer from SA Health's Health Protection Operations during the week of 20 March 2023. The Department for Education provided advice and assistance in relation to work health and safety issues in the region and facilitated engagement with school principals.

Mosquito traps were set at multiple locations, including school sites in Indulkana (Iwantja), Mimili, Fregon (Kaltjiti), Ernabella (Pukatja) and Pipalyatjara. A trap was also set at an accommodation block at Umuwa. Educators and students participated in trapping at Indulkana Anangu school and Pipalyatjara school assisted by collecting and shipping mosquitoes trapped at their school.

Windy weather conditions at the Pipalyatjara school site resulted limited mosquitoes being trapped; however elevated levels of mosquito activity were reported in the area. Observations made during the trip identified potential breeding locations as a result of damaged overflow pipework and pooling water.

Table 2 details the results of adult mosquito surveillance undertaken by regional officers during March. *Culex annulirostris* accounted for a significant proportion of the mosquitoes trapped in several areas.

Table 2: SA Health regional surveillance and control officer's mosquito surveillance data March 2023.

Council area	Mean trap abundance	Mean abundance *Culex annulirostris*
Alexandrina Council (JEV Team)	146	61
APY Lands (JEV Team)	18	0
Berri Barmera Council (JEV Team)	45	30
Town of Gawler (JEV Team)	22	6
Gerard Community Lands Trapping (JEV Team)	64	59
District Council of Loxton Waikerie (JEV Team)	73	63
Rural city of Murray Bridge (JEV Team)	118	77
City of Onkaparinga (JEV Team)	21	1
Port Pirie Area (JEV Team)	16	0.5
Renmark Paringa (JEV Team)	47	35

Local council mosquito surveillance trapped mosquito data

In response to the detection of JEV in SA the number of local councils undertaking routine adult mosquito trapping increased from eight to seventeen compared to the 2021-22 season. Surveillance areas and the frequency of trapping have been expanded for the 2022-23 season and councils in high-risk areas set between four and six adult mosquito traps in their local area fortnightly (increased from monthly). All other councils trap at frequencies determined by risk in their council area. Each batch of mosquitoes from local council traps were submitted to the Agriculture Victoria laboratory to be processed according to trap location, counted, identified to species level, then ground and screened for JEV, MVEV, RRV, BFV and WNV/KUN.

Table 3: Local council mosquito surveillance trapping mean abundance data March 2021-23 three-year comparison.

Council	2021	2022	2023
Adelaide Plains Council	-	-	33
Alexandrina Council	29	142	37
Berri Barmera Council	18	116	22
Clare and Gilbert Valleys Council	-	-	11
Coorong District Council	7	169	122
District Council of Elliston	-	-	59
Regional Council of Goyder	-	-	11
Kangaroo Island Council	-	-	-
District Council of Loxton Waikerie	41	459	55
Mid Murray Council	37	140	42
Mount Barker District Council	-	18	16
Rural City of Murray Bridge	114	237	100
City of Playford	-	-	23
Renmark Paringa Council	19	162	13
City of Salisbury	-	194	28
District Council of Southern Mallee	-	-	34
Whyalla City Council	-	-	31

Table 3 details the mean March trap abundance data in SA from local council traps for three seasons (where applicable). The available data shows decreased mean trap abundance in nine council areas compared to the 2021-22 mosquito season and increased mean trap abundance in five council areas compared to the 2020-21 mosquito season.

Table 4 details the mean trap abundance data for *Culex annulirostris* from local council mosquito traps. The data shows increased mean *Culex annulirostris* abundance at five of the River Murray councils compared to the previous two seasons.

Table 4: *Culex annulirostris* mean trap abundance data by local council area March 2021- 23 three-year comparison.

Council	2021	2022	2023
Adelaide Plains Council	-	-	0.9
Alexandrina Council	0.0	0.5	4
Berri Barmera Council	4.8	45.75	11
Clare and Gilbert Valleys	-	-	4
Coorong District Council	0.8	0.75	22
District Council of Elliston	-	-	0
Regional Council of Goyder	-	-	4.5
Kangaroo Island Council	-	-	-
District Council of Loxton Waikerie	7.7	61.8	89
Mid Murray Council	13.6	31.2	61
Mount Barker District Council	-	1.8	1
Rural City of Murray Bridge	5.0	43	67
City of Playford			4
Renmark Paringa Council	7.4	129	20
City of Salisbury	-	16.78	8
District Council of Southern Mallee	-	-	22
Whyalla City Council	-	-	0

Arbovirus isolations from trapped mosquitos (whole trap grinds)

Table 5 details the arbovirus isolations from mosquitoes trapped by local councils and SA Health regional officers during March 2022. WNV/KUN was detected in trapped mosquitoes in the Berri Barmera Council area and BFV was detected in trapped mosquitoes in the Rural City of Murray Bridge. No other viruses were detected in trapped mosquitoes in March.

Table 5: Arbovirus isolations from whole trap grinds 2022-23.

Arbovirus	JEV	MVEV	RRV	BFV	WNV/KUN
March 2023	0	0	0	1	1
Season to date	0	10	19	13	2

South Australian sentinel chicken surveillance program

In response to the JEV situation, HPP increased the number of sentinel chicken flocks in high-risk locations from six to ten. Chicken flocks in high-risk locations are bled throughout the mosquito season. The blood is tested for JEV, MVEV and WNV/KUN antibodies, which if present indicates that the chicken has been bitten by a mosquito carrying one of these viruses.

Sentinel chicken flock bleeds for the season commenced during September. Bleeds were undertaken weekly throughout March; no viruses were detected. Table 6 details positive detections of arbovirus in sentinel chickens for the 2022-23 season.

Table 6: Positive detections of arbovirus in sentinel chickens for the 2022-23 season.

Flavivirus	JEV	MVEV	WNV/KUN
Season to date	0	8	1

Animal surveillance

Further to the animal surveillance results reported during February, SA Health was notified by the Department of Primary Industries and Regions (PIRSA) of serology surveillance results during March which suggested that a small number of horses may have been infected with MVEV or JEV. In response HPP conducted targeted adult mosquito surveillance in affected areas.

Arbovirus notification data

All confirmed and probable arbovirus infections detected in humans in SA are notifiable under the *South Australian Public Health Act 2011*. The two most common locally acquired arbovirus infections notified in SA are infections with RRV and BFV. Figure 1 details arbovirus notification data 2019-23 by month.

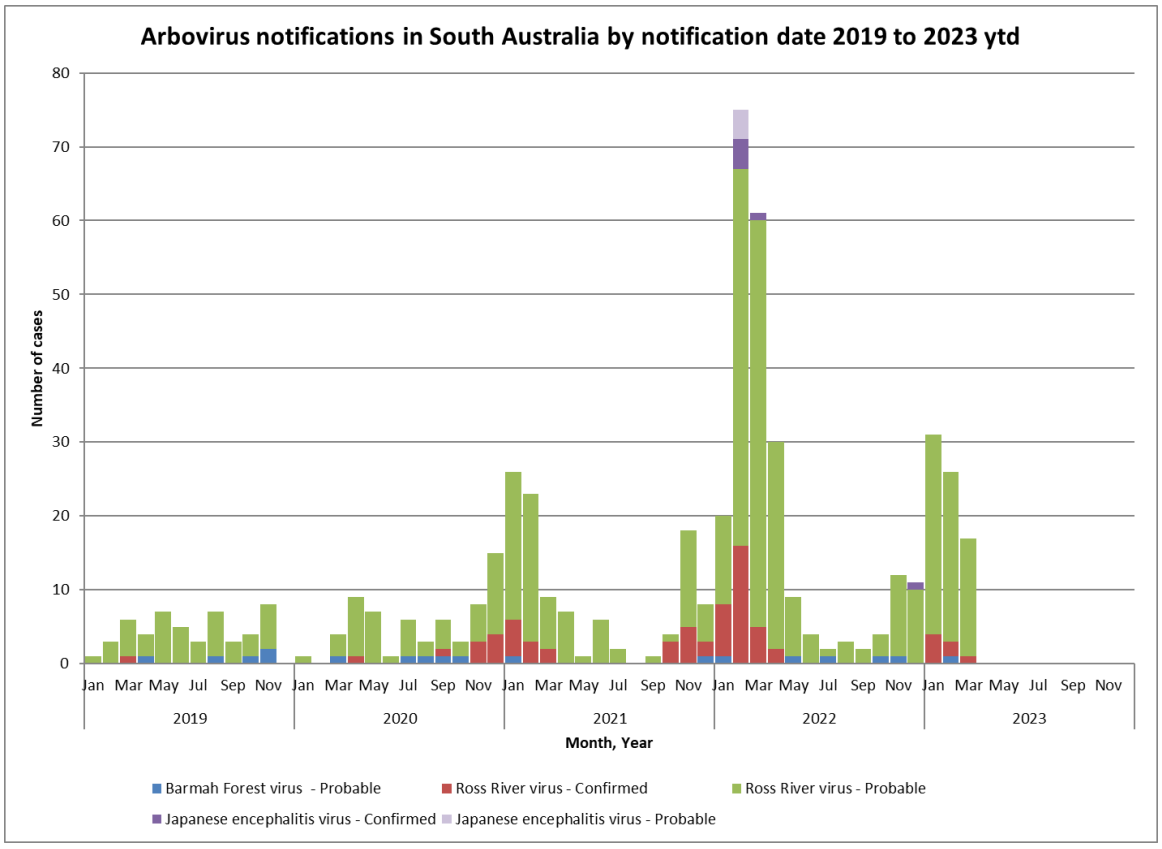

Figure 1: Arbovirus in South Australia by notification month – 01 January 2019 to 31 March 2023

Source: Communicable Disease Control Branch, SA Health.

Further information

For further information regarding mosquito borne disease see the SA Health website here.

For further information regarding Japanese Encephalitis virus see the SA Health website here.

For mosquito management resources and information for environmental health officers see the SA Health website here.

For more information

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