



Data reflected in this summary of mosquito-borne disease in the Kimberley Region is taken from the Western Australia Notifiable Infectious Disease Database (WANIDD) and includes enhanced surveillance data collected by Population Health Units and Local Governments. (Only locations with notified cases of disease are shown in tables and figures).

Ross River virus (RRV)

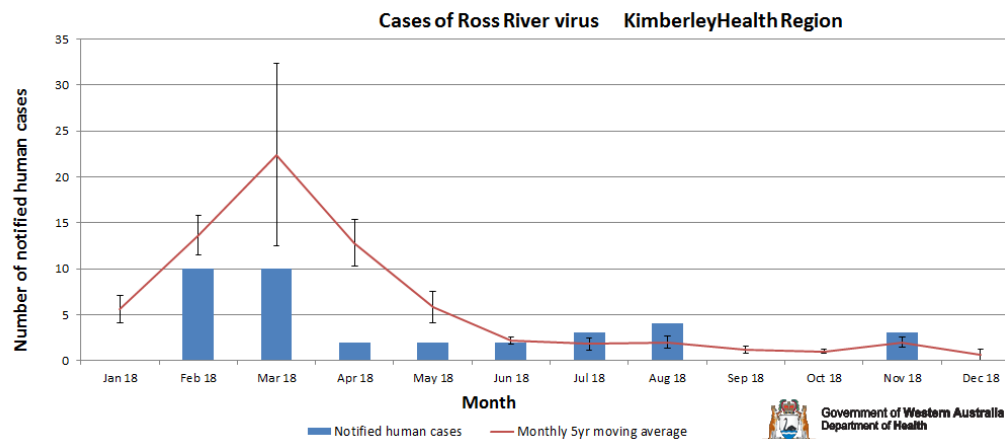
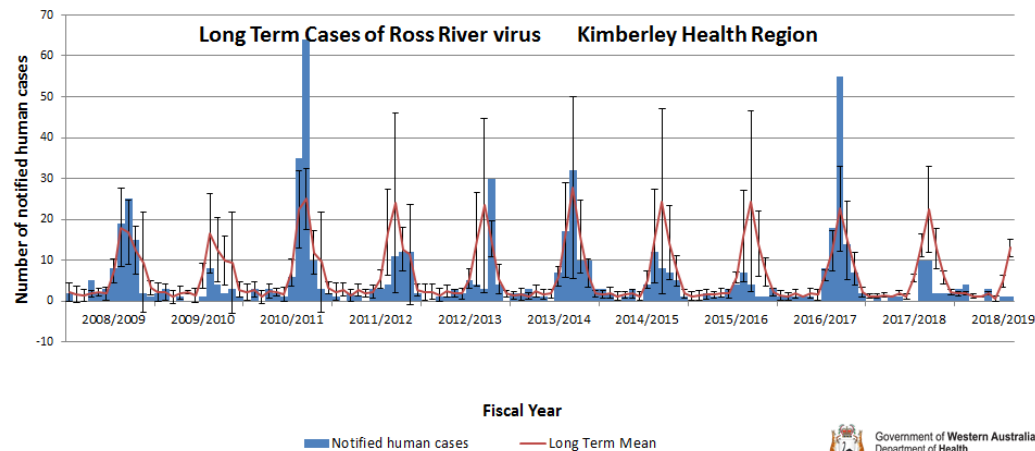
During these two quarters there was a total of 10 RRV cases reported. Three of these were notified by doctor and follow up data are available for two of these cases. The number of RRV cases was significantly higher than the long term monthly mean in July, August and November 2018, but for other months below the long term mean.

RRV 2018	Jul	Aug	Sep	Oct	Nov	Dec	Total
Kimberley	3	4				3	10
Broome (S)	2	2				1	5
BROOME		2				1	3
CABLE BEACH	2						2
Derby-West Kimberley (S)						1	1
DERBY						1	1
Wyndham-East Kimberley (S)	1	2					4
KUNUNURRA	1	2				1	4
Total	3	4				3	10

Barmah Forest virus (BFV)

There was only one BFV case reported during these two quarters. The long term monthly mean is less than two cases per month.

BFV 2018	Jul	Aug	Sep	Oct	Nov	Dec	Total
Kimberley		1					1
Broome (S)		1					1
BILINGURR		1					1
Total		1					1





Murray Valley encephalitis (MVE) and Kunjin (also known as WNV_{KUN}) viruses

Murray Valley encephalitis and Kunjin viruses are endemic in the northern two thirds of WA (specifically the Kimberley region). They are occasionally active in other regions, such as the Gascoyne, Goldfields and Midwest.

Symptoms of Murray Valley encephalitis

The incubation time for MVE varies from 5 to 15 days, but symptoms usually appear within 8 to 10 days after becoming infected. MVE virus causes disease symptoms in approximately 1 in 1000 people that are bitten by an infective mosquito. Most do not develop any symptoms at all.

In adults and older children, symptoms include:

- Fever
- Drowsiness
- Bad headache and stiff neck
- Nausea
- Muscle tremors
- Dizziness.

In young children the symptoms include:

- Fever
- Floppiness
- Irritability
- Drowsiness
- Fits.

The disease can be mild or severe, but in severe cases can lead to coma and death. Patients with the severe form of MVE get worse very quickly with confusion and worsening headaches, increasing drowsiness and possible fits.

People with suspected Murray Valley encephalitis should be taken to the nearest hospital without delay.

Symptoms of Kunjin virus disease

Kunjin causes similar but generally less severe disease symptoms compared to MVE. The majority of infected individuals do not show any symptoms, while the minority of people with Kunjin disease can develop encephalitis which may require immediate medical attention.

Murray Valley encephalitis (MVE) virus

There have been no MVE cases in these two quarters.

The previous case was most likely acquired in the Pilbara or Kimberley regions in June 2018. In 2017 there was one probable case which is currently on hold pending confirmation. Prior to this the last notified cases of MVE in WA were in 2011 in residents or visitors to the Kimberley or Pilbara regions. All cases have occurred between January and June.

MVE cases	Jan	Mar	Apr	May	Jun	Grand Total
1991				1		1
1993	1	2	3	1	2	9
1997				2		2
1998		1				1
2000		2	4	3		9
2001		1				1
2002	1	1				2
2006					1	1C
2008			1			1C
2009		1		1		2C
2011	1	1	4	3		9C
2017				1		1P
2018					1	1C
Grand Total	3	9	12	12	4	40

C = confirmed, P=probable on hold

West Nile virus Kunjin strain (WNV_{KUN})

There were no cases of WNV Kunjin during this period.

The last notified cases of WNV Kunjin were in 2017 from the Kimberley region, with four confirmed, three probable and one unconfirmed case. The confirmed cases were all residents or visitors to the Kimberley region.

C = confirmed, P=probable on hold, u = unconfirmed

WNV Kunjin Cases	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Grand Total
1997									1	1
1998	1									1
1999			1							1
2000				2						2
2001		1								1
2006		1	1							2C
2017			2C	1C	1C	2P/u	1C	1P		8
Grand Total	1	2	4	3	1	2	1	1	1	16

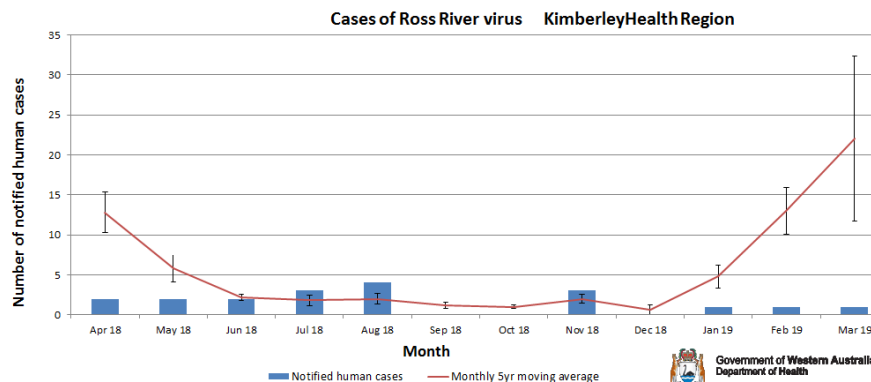
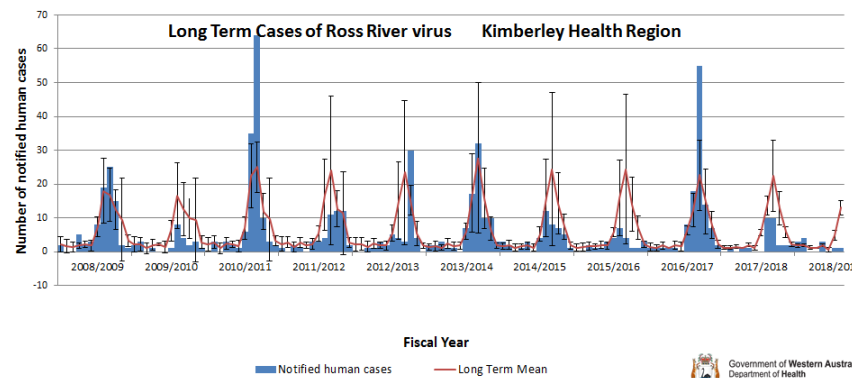


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Ross River virus (RRV)

There was a total of 3 RRV cases reported during this quarter. Two of these were reported by doctor. No follow up data are available. The number of RRV cases was significantly higher than the long term monthly mean in July, August and November 2018, but for other months below the long term mean.

RRV 2019	Jan	Feb	Mar	Total
Kimberley	1	1	1	3
Broome (S)	1			1
BROOME	1			1
Derby-West Kimberley (S)		1		1
DERBY		1		1
Wyndham-East Kimberley (S)			1	1
KUNUNURRA			1	1
Total	1	1	1	3



Barmah Forest virus (BFV)

There was only one BFV case reported from during this quarter. This was reported by doctor but no follow up data are available. The long term monthly mean is less than two cases per month.

BFV 2019	Jan	Feb	Mar	Total
Kimberley		1		1
Wyndham-East Kimberley (S)		1		1
KUNUNURRA		1		1
Total		1		1

Murray Valley encephalitis (MVE) and Kunjin (also known as WNV_{KUN}) viruses

There have been no cases of MVE or Kunjin virus disease reported in WA during this quarter. The most recent MVE case was reported in June 2018 from the Pilbara or Kimberley regions. The most recent Kunjin activity in WA occurred between April to August in 2017, with five confirmed cases being reported from the Kimberley region.



El Niño conditions are associated with a decrease in rainfall and tidal activity.

La Niña brings wetter and warmer-than-normal weather which can increase mosquitoes and mosquito borne diseases.

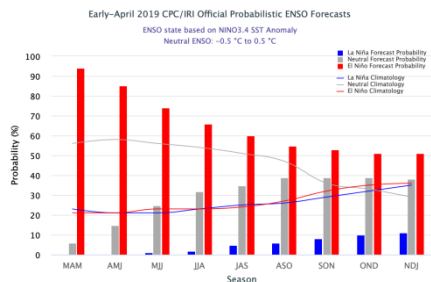
ENSO Wrap-Up issued by Australian BOM 30 April 2019
Outlooks indicate short-lived El Niño likely

The Bureau's *ENSO Outlook* remains at **El Niño ALERT**. This means the chance of El Niño developing in 2019 is approximately 70%. Although the surface of the tropical Pacific Ocean remains warmer than average, water below the surface of the ocean has been gradually cooling. A cooling of water at depth can lead to a cooling of the ocean surface, which may reduce the length of an event if one develops. Most climate models indicate surface warmth in the Pacific Ocean will remain at El Niño-like levels at least through May. The longer the ocean surface warmth remains, the more likely it is that the atmosphere will respond, and El Niño will develop. **If El Niño does develop in May, it's likely to be short lived.** El Niño typically brings drier than average conditions for eastern Australia during winter–spring, and warmer days across the southern two-thirds of the country. **The Indian Ocean Dipole (IOD) is currently neutral.** Climate outlooks indicate the IOD is likely to remain neutral for the remainder of autumn. However, by September half of the models predict a positive IOD will form, with the rest indicating neutral conditions will persist. A positive IOD typically means drier than average conditions for southern and central Australia during winter-spring.

IRI ENSO Forecast issued 19 April 2019

(International Research Institute for Climate and society)

ENSO Alert System Status: **El Niño Advisory** A weak El Niño is likely to continue through the Northern Hemisphere summer 2019 (65% chance) and possibly autumn (50-55% chance).



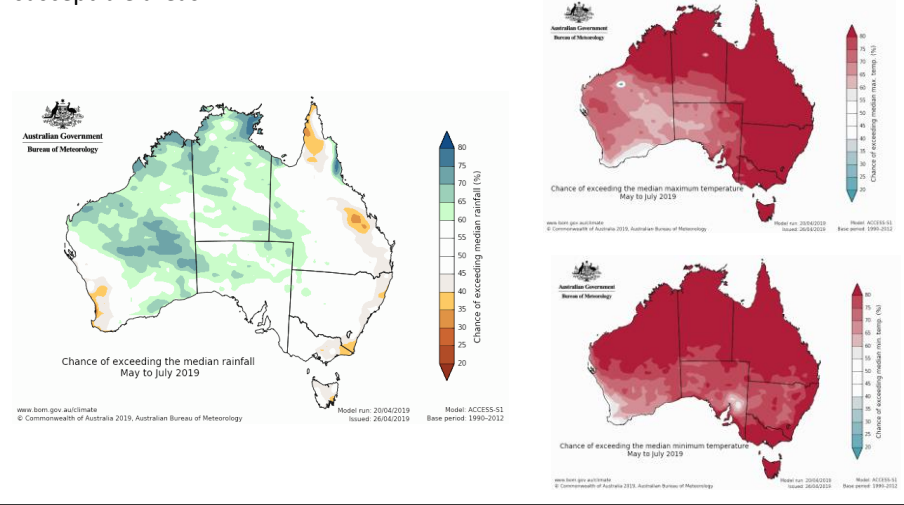
Climate outlook issued by Australian BOM 26 April 2019

Drier May in the east, wetter May–July for western and central Australia

While May is likely to be drier, the three months from May to July show most of southern Australia have no strong tendency towards above or below average rainfall. A wetter than average three months is likely for large parts of northwestern and central Australia, but many of these areas typically receive little or no rainfall at this time of the year, meaning only a small amount of rainfall is needed to exceed the median.

Warmer than average days and nights likely for most of Australia

Warmer than average days and nights during May to July are very likely (greater than 80% chance) for large parts of northern Australia, with chances reducing in the southwest. For northern Australia, the chances of being warmer than average are very high; greater than 80%. However, the forecast for drier than average conditions could bring more cloud-free nights, increasing the risk of frost in susceptible areas.



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