

## Vol. 29, No. 2

### June 2022

ISSN 1440-883X

#### Editor's note:

This June 2022 edition of *The Northern Territory Disease Control Bulletin* is full to overflowing. The regular reporting on pandemic continues to feature with 2 NT COVID-19 Situation Reports included here from the 2<sup>nd</sup> quarter of 2022. One issued 1 April 2022 reports daily COVID-19 case numbers over the previous 3 days ranging from 428 to 524 cases and the other from 30 June reports daily case numbers over the previous 3 days ranging from 304 to 350 cases, generally showing decreased case numbers compared to the remarkable spike of over 1000 cases seen daily on many days in the 1<sup>st</sup> quarter of 2022. The 30 June Report now has a Table showing the number of COVID Care registrations by pathways i.e. COVID in Hospital, COVID of Concern-GP, COVID in Hospital in the Home, COVID Well and To be assessed. Another Figure now shows a graph of the COVID Care registrations daily over a 7 day period that for the 30 June Report totalled 1812 registrations. Two NT CDC COVID-19 Epidemiological Reports are included here, each covering a 2 week reporting period offering a

more in-depth analysis of the NT pandemic situation.

An NT Media release from early April 2022 (page 37-38) reports the finding of Japanese (JE) virus in a number of pigs in the West Daly region of the NT. It also notes that following the initial fatal case of JE reported in the Tiwi Islands in early 2021 no further cases of JE in people have been reported in the NT, however multiple cases of JE have been diagnosed in people interstate and in pigs in piggeries interstate. Territorians are cautioned to protect themselves from mosquito bites – as mosquitoes carry and transmit the JE and other fatal viruses.

Two Health Alerts for influenza (flu) were issued in May. The first on 12 May 2022 announces the early arrival of flu in the NT with over 300 confirmed cases since the end of March 2022 compared to 76 cases of flu notified for all of 2021. An Influenza Update Alert just 2 weeks later on the 27 May 2022 reports 1090 confirmed cases. See pages 39-42.

**Editor:** Vicki Krause  
**Assistant Editor:** Alyson Wright, Kelly Lomas, Linda Ward, Anthea Gomez, Jerry Chen  
Peter Markey, Rosalind Webby, Kimberley McMahon, Michael Nohrenberg  
**Production Design:** Dianne Bell, Jade Tavane and Hayley Pearson  
**Contact:** NT Public Health Unit – Centre for Disease Control & Environmental Health  
p: 8922 8044 or 1800 008 002  
e: [CDCSurveillance.DARWIN@nt.gov.au](mailto:CDCSurveillance.DARWIN@nt.gov.au)  
w: <https://health.nt.gov.au/professionals/centre-for-disease-control>  
m: PO Box 40596, Casuarina, Northern Territory 0811



**ePublication:** [DoH Digital Library: The Northern Territory Disease Control Bulletin 1991 – 2019](#)

Also in May an NT Health Alert was issued reporting 2 cases of monkeypox diagnosed in overseas travellers returning to southern states. Information about the disease and on what clinicians should do if they suspect monkeypox are offered (see pages 43-44).

Alerts regarding an outbreak of acute post streptococcal glomerular nephritis (APSGN), an increase in overall Group A streptococcal (GAS) associated diseases and paediatric hepatitis cases of unknown aetiology being reported internationally were also issued in May and June of 2022 with summaries and links included here.

## Contents

<b>COVID-19 Situation Report: 01 April 2022.....</b>	<b>3</b>
<b>COVID-19 Epidemiology Report: 02 April – 15 April 2022.....</b>	<b>7</b>
<b>COVID-19 Situation Report: 30 June 2022.....</b>	<b>18</b>
<b>COVID-19 Epidemiology Report: 11 – 24 June 2022.....</b>	<b>22</b>
<b>Health alerts issued April to June 2022.....</b>	<b>35</b>
Outbreak of Acute Post Streptococcal Glomerulonephritis (APSGN) .....	35
Flu has arrived.....	35
Increase in Group A Streptococcal associated disease (GAS).....	36
Paediatric hepatitis of unknown aetiology .....	36
Japanese encephalitis virus (JEV).....	37
Influenza Alert Update for NT.....	39
Monkeypox.....	43
<b>Japanese Encephalitis NT Health fact sheet.....</b>	<b>45</b>
<b>Northern Territory disease notifications by onset date and district – 1 January to 31 March, 1<sup>st</sup> quarter, (2021 and 2022).....</b>	<b>47</b>
<b>Graphs of selected diseases and STIs – 1<sup>st</sup> quarter, 2022 .....</b>	<b>49</b>
<b>Comments on selected disease notifications 1<sup>st</sup> quarter 2022 .....</b>	<b>49</b>
<b>Abstracts from peer reviewed published articles related to the Northern Territory.....</b>	<b>51</b>
Immunogenicity, otitis media, hearing impairment, and nasopharyngeal carriage 6-months after 13-valent or ten-valent booster pneumococcal conjugate vaccines, stratified by mixed priming schedules: PREVIX_COMBO and PREVIX_BOOST randomised controlled trials.....	51
Larval habitats of <i>Culicoides ornatus</i> Taylor, 1913 (Diptera: Ceratopogonidae) within the mangroves of Darwin Harbour in the wet-dry tropics of northern Australia.....	52
Neurosyphilis in the Northern Territory of Australia: a clinical guideline .....	52
A call to action: time to recognize melioidosis as a neglected tropical disease.....	53
An outbreak of leptospirosis associated with cattle workers during the wet season, in the Northern Territory of Australia, 2021 .....	53
Melioidosis in the remote Katherine region of northern Australia .....	54
Risk factors for TB in Australia and their association with delayed treatment completion.....	54
Nucleic Acid Preservation Card Surveillance Is Effective for Monitoring Arbovirus Transmission on Crocodile Farms and Provides a One Health Benefit to Northern Australia.....	55
Parathyroid hormone-independent hypercalcaemia secondary to granulomatous inflammation: could this be melioidosis?.....	56

## COVID-19 Situation Report: 01 April 2022

## CDC NT COVID-19

## Situation report – no. 164

Coronavirus  
(COVID-19)

Report Date: 01/04/2022

Reporting period ending 31/03/2022 @ 1600

Table 1: Summary of cases

	31-Mar	30-Mar	29-Mar	Total cases
<b>Cases notified in this reporting period</b>	428	524	515	50377 <sup>^</sup>
Change since last report	428	31	-1	458
<b>Case classification</b>				
Confirmed	53	68	72	13299
Probable	375	456	443	37078
<b>Age group (years)</b>				
<5	30	24	29	3024
5-11	38	46	55	6622
12-19	71	97	101	6193
20-39	150	190	184	20143
40-59	105	140	121	11184
≥60	34	27	25	3211
Not recorded	0	0	0	0
<b>Indigenous status</b>				
Aboriginal and/or Torres Strait Islander	51	91	109	18091
Neither Aboriginal nor Torres Strait Islander	346	386	357	30256
Unknown/Not stated	31	47	49	2030
<b>Vaccination status* (avail since February 2021)</b>				
0	1	4	8	4078
1	3	3	5	3360
2 or more	19	62	65	26685
Ineligible	30	24	29	3033
Unknown	375	431	408	13221
<b>Active cases</b>	2653	2664	2514	
<b>Deaths</b>	0	1	1	35
<b>Region**</b>				
Barkly	2	0	1	1439
Big Rivers	14	31	39	3559
Central Australia	24	20	23	8188
East Arnhem	9	7	7	2628
Top End	370	449	428	32179
Interstate	0	2	3	691
Overseas	0	0	0	302
Not recorded	9	15	14	1391

\*Vaccination status includes self-reported data. \*\*Place of infection or, if unknown, resident location.

<sup>^</sup>Total cases may vary each day due to the addition of historic cases or deletion of duplicates.**Case numbers**

There were 428 cases notified yesterday. The number of cases increased by 31 on 30 March due to the upload of previously notified rapid antigen tests. The net increase for total cases from the last situation report is 458.

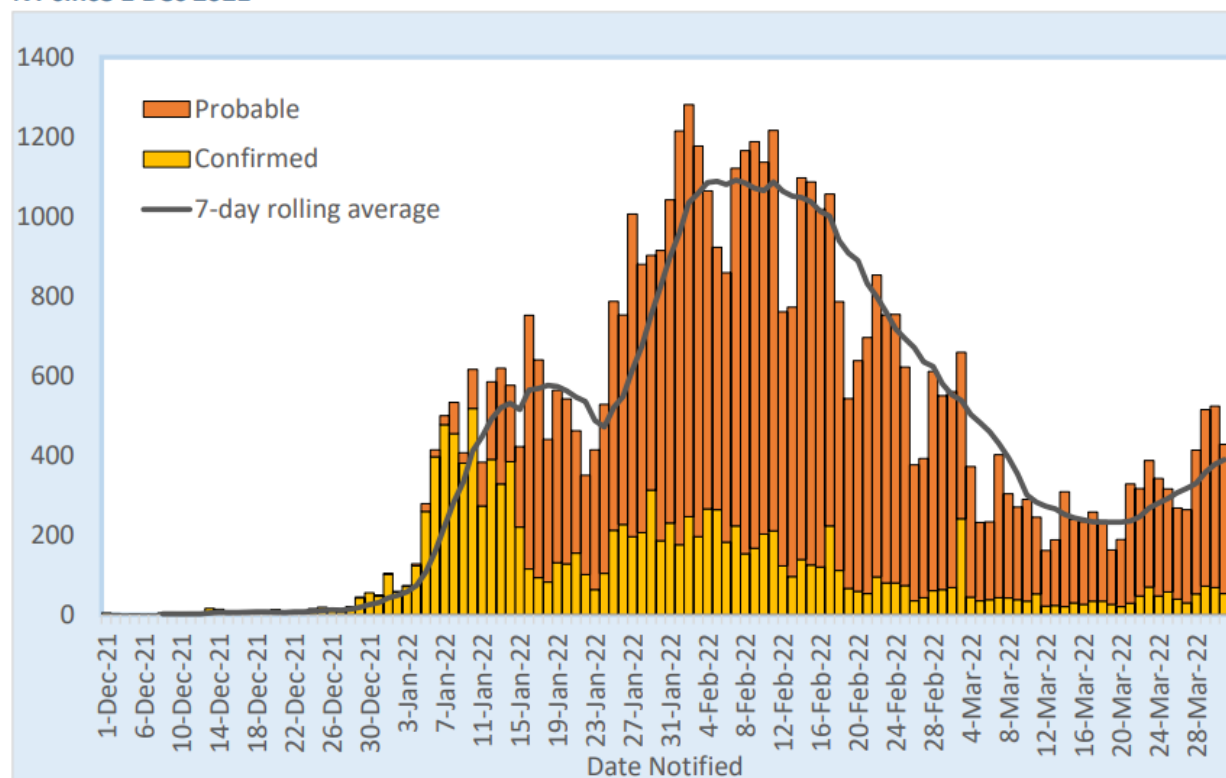
There are 2653 active cases in the NT, of which 76% are non-Indigenous (n=2011/2653), 16% are Indigenous (n=423/2653) and 8% Unknown/Not stated (n=219/2653).

**Table 2: Active cases (% of cases) by local government area**

Local government area*	Count	Percent (%)
Alice Springs	126	4.8
Barkly	10	0.4
Central Desert	2	0.1
Coomalie	3	0.1
Darwin City	1372	51.7
East Arnhem	36	1.4
Katherine	63	2.4
Litchfield	233	8.8
MacDonnell	11	0.4
Palmerston	560	21.1
Roper Gulf	15	0.6
Tiwi Island	0	0.0
Victoria River Daly	102	3.8
Wagait Beach	2	0.1
West Arnhem	26	1.0
West Daly	1	0.0
Interstate	13	0.5
Unincorporated	5	0.2
Unknown	73	2.8
<b>Total</b>	<b>2653</b>	<b>100.0</b>

\*Residential location

**Figure 1: Epidemiological curve of COVID-19 cases by classification and notification date, diagnosed in NT since 1 Dec 2021**



**Table 3. COVID-19 deaths by Indigenous status, sex and age groups**

	Non-Indigenous		Indigenous		Total
	Female	Male	Female	Male	
30-39	0	0	0	1	1
40-49	0	0	4	0	4
50-59	0	0	3	5	8
60-69	1	3	4	4	12
70-79	1	2	4	0	7
≥80	0	2	1	0	3
<b>Total</b>	<b>2</b>	<b>7</b>	<b>16</b>	<b>10</b>	<b>35</b>

Note: There have been no deaths reported in those aged ≤29.

**Figure 2. Cases under 18 years by school age group**

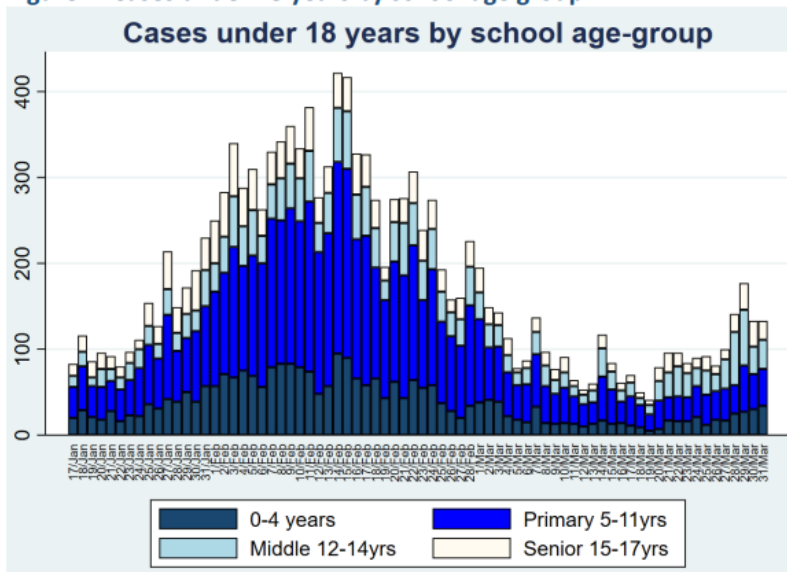


Figure 2 illustrates cases in children under 18 years. There were 133 cases reported yesterday. The highest number of cases for 31 March was reported in the primary school age group (n=43/133).

**Testing**

COVID-19 authorised PCR results are sourced from NT Territory Pathology and Western Diagnostic Pathology (WDP). NT Territory Pathology performs 85-90% of COVID-19 testing in the NT. PCR test results are available on the [Authorised Test Results Dashboard - Power BI Report Server \(corp.nt.gov\)](#) dashboard (NT Government employee access only).

**Figure 3. Authorised PCR tests by authorisation date**

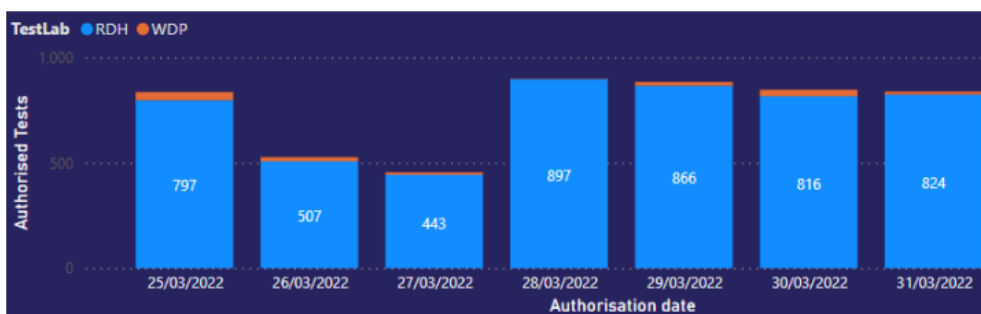


Figure 4. 7-day rolling average of PCR positivity rate (NT and by region)

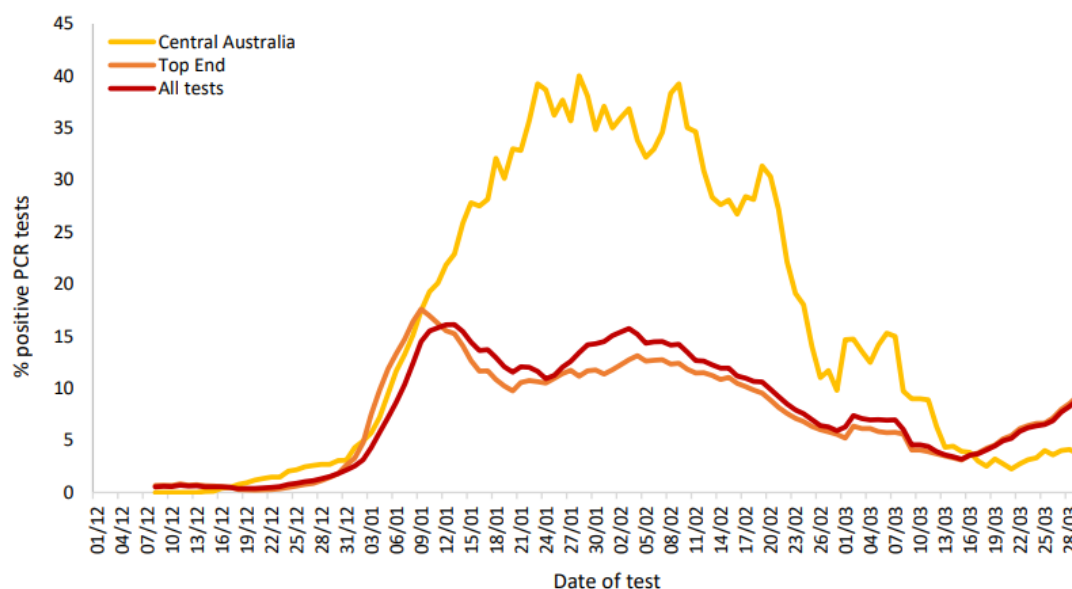


Figure 4 shows the rolling 7-day average of percent positive tests from all PCR tests (NT and by region) 01/12/2021 to 29/03/2022. The overall trend in percent positive PCRs has continued to increase to 8.9%, in line with the increased number of cases.

**Hospitalisation**

As of 30/03/2022 @ 2000, 22 patients were hospitalised due to COVID-19. 2 patients are in ICU and 2 patients are requiring oxygen.

Table 4. COVID-19 hospitalisations (including ICU admissions and patients requiring oxygen)

Hospital	COVID-19 inpatients	ICU	Requiring O <sub>2</sub>
Alice Springs Hospital	3	0	0
Gove District Hospital	0	0	0
Katherine District Hospital	0	0	0
Royal Darwin Hospital	18	2	2
Tennant Creek Hospital	1	0	0
<b>TOTAL</b>	<b>22</b>	<b>2</b>	<b>2</b>

# NT CDC COVID-19 Epidemiology report

## Reporting period 02 April – 15 April 2022

### Summary of reporting periods

Table 1: COVID-19 cases reported over the last three fortnightly reporting periods and cumulative total (21 February 2020 to 15 April 2022)

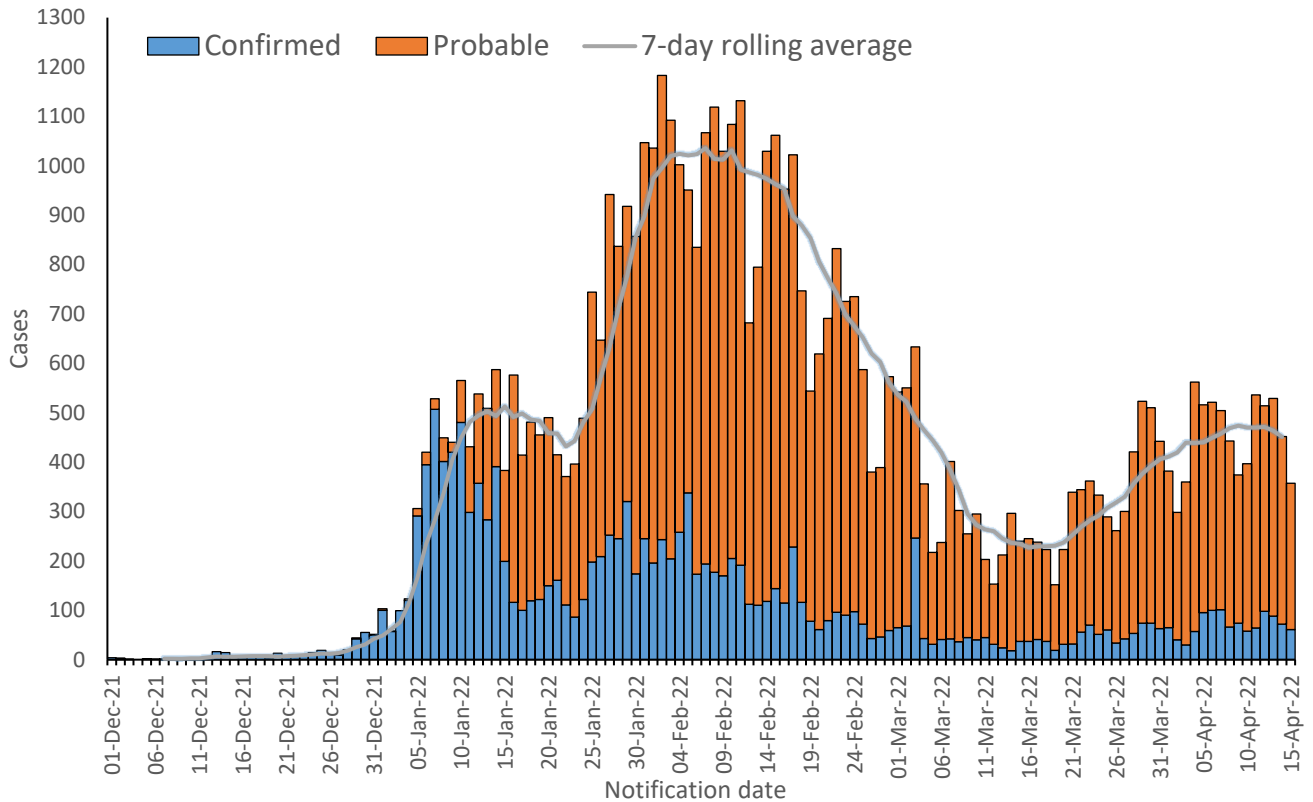
Fortnight period	2/4-15/4	19/3-1/4	4/3-18/3	Cumulative total
<b>Cases notified in the reporting period</b>	6,363	4,893	3,884	<b>56,990</b>
<b>Case classification</b>				
Confirmed	1,004	714	540	<b>14,424</b>
Probable	5,359	4,179	3,334	<b>42,566</b>
<b>Indigenous status</b>				
Aboriginal and/or Torres Strait Islander	743	834	1,163	<b>18,849</b>
Neither Aboriginal nor Torres Strait Islander	5,400	3,881	2,667	<b>36,138</b>
Missing	220	178	54	<b>2,003</b>
Cumulative case rate ratio; Indigenous: Non-Indigenous				<b>1.20</b>
<b>Deaths</b>				
Deaths	3	3	5	<b>39</b>
Cumulative crude case fatality rate*				<b>0.08%</b>
<b>Health region</b>				
Greater Darwin	4,981	3,945	2,523	<b>34,268</b>
Top End	138	184	225	<b>3,453</b>
East Arnhem	193	74	110	<b>2,811</b>
Big Rivers	131	245	342	<b>3,693</b>
Barkly	62	26	77	<b>1,501</b>
Central Australia	549	288	503	<b>8,735</b>
Interstate	130	54	58	<b>1,000</b>
Overseas/missing	179	77	46	<b>1,529</b>
<b>Hospitalisations (since 2 February 2022)</b>				
Mean daily number of inpatients	25	17	33	<b>68</b>
Mean daily number of ICU inpatients	1	1	2	<b>2</b>
Mean daily number on O <sub>2</sub>	5	2	7	<b>11</b>

\*Calculated from cases notified as at 2 April 2022.

### Summary of cases

A total of 56,990 cases of COVID-19 have been notified in the Northern Territory (NT) up to 15 April 2022. NT is now in Wave 2 of the outbreak with case numbers climbing and recently plateauing (Figure 1). Wave 2 presents a more gradual increase in cases compared to Wave 1 (January 2022). There continues to be reduced testing and reporting over weekends.

In this fortnightly reporting period, 6,363 cases of COVID-19 were notified which is a 30% increase in cases from the previous report. The highest number of daily cases was notified on 4 April (n=562), with an average of 450 cases per day. From the cumulative cases notified, 54,248 were NT residents, accounting for 22% of the NT population.



**Figure 1: COVID-19 cases by notification date (01 December 2021 – 15 April 2022)**

Note: Confirmed case definition: COVID-19 detected by polymerase chain reaction (PCR). Probable case definition: COVID-19 detected by rapid antigen test (RAT).

**Mortality**

A total of 39 COVID-19 related deaths have been reported since the beginning of the pandemic, including 3 deaths notified during this 2 week reporting period (Table 2). The 3 recent deaths were all non-Indigenous people from Greater Darwin. However, the majority of deaths overall are among Indigenous cases (n=27/39, 69%). The greatest proportion of deaths is still among the older aged groups, with 87% (n=34/39) of deaths in cases older than 50 years. The crude death rate ratio between Indigenous and non-Indigenous has decreased in this reporting period; the death rate among the Indigenous population (36.7 deaths per 100,000 cases) was 5.3 (95%CI 3.5-7.7, p<0.0001) times higher than the non-Indigenous death rate (7.0 deaths per 100,000 cases).

The 39 deaths have been reported across all the NT Health regions (Table 3). While the death numbers are too low for comparison of the rates by regions, the regions with the greatest number of deaths are from Greater Darwin (n=15) and Central Australia (n=11).

**Table 2: Total deaths by Indigenous status, gender and age**

Age (years)	Indigenous		Non-Indigenous		Total
	Female	Male	Female	Male	
<b>30-39</b>	0	1	0	0	<b>1</b>
<b>40-49</b>	4	0	0	0	<b>4</b>
<b>50-59</b>	3	5	0	0	<b>8</b>
<b>60-69</b>	4	4	2	3	<b>13</b>
<b>70-79</b>	4	0	1	3	<b>8</b>
<b>≥80</b>	1	1	1	2	<b>5</b>
<b>Total</b>	<b>16</b>	<b>11</b>	<b>4</b>	<b>8</b>	<b>39</b>

Table 3: Total deaths by NT Health region

Region	Deaths	Proportion of total (%)
Greater Darwin	15	38.5
Central Australia	11	28.2
East Arnhem	4	10.3
Barkly	3	7.7
Big Rivers	3	7.7
Top End	2	5.1
Interstate	1	2.6
<b>Total</b>	<b>39</b>	<b>100</b>

To examine case mortality we only analysed cases reported before 2 April 2022, which was 2 weeks prior to the current reporting period end date. Case fatality rates may be negatively biased if recent cases are included, because those recently diagnosed with COVID-19 have not had time to develop complications and become unwell. Two of deaths reported in this period were cases notified prior to 2 April 2022 (n=36+2=38) and one was subsequent.

Of the 50,245 cases notified prior to 2 April there were 38 deaths with a case fatality rate of 0.76 per 1000 cases. The Indigenous case fatality rate in the NT was 1.44 per 1,000 cases compared to 0.35 per 1,000 cases in the non-Indigenous population (RR 4.1 (95% CI 2.7-6.0, p<0.0001).

Table 4: Case fatality rates by Indigenous status and age (total deaths)

	Non-Indigenous	Indigenous	Total*
Deaths	11	27	38
Cases	31,525	18,720	52,245
Rate per 1,000 cases	0.35	1.44	0.76

\* Those with unknown Indigenous status (3.6%) were distributed according to the proportions of known cases in the same stratum.

## Demographics

Of the 56,990 cases notified, 52.4% were female and 47.9% male. The age groups with the greatest number of cases were 25-29 years and 30-34 years (Figure 2). Figure 3 illustrates the age group and gender specific rates. The age group with the highest rate in males was 10-14 years (n=27,201 per 100,000) and 20-24 year age group for females (n=31,196 per 100,000).

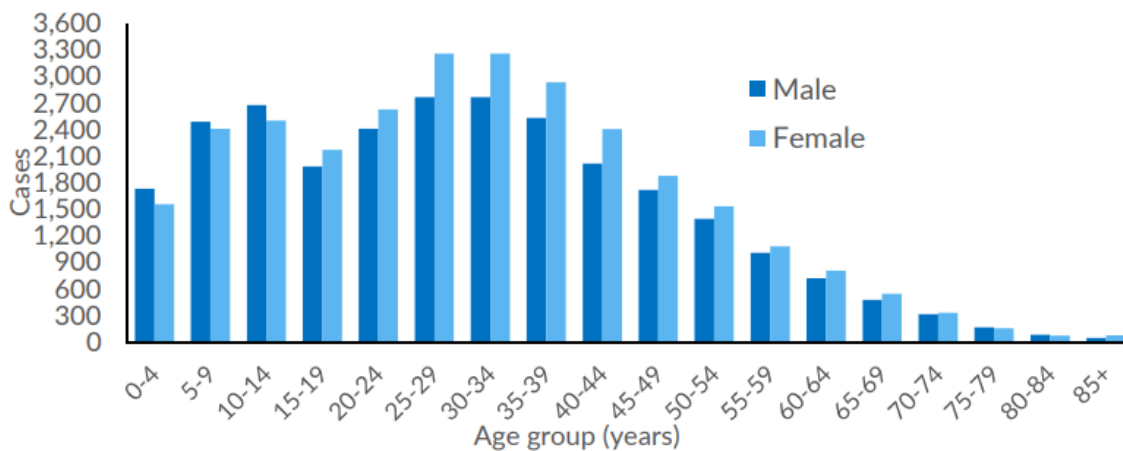
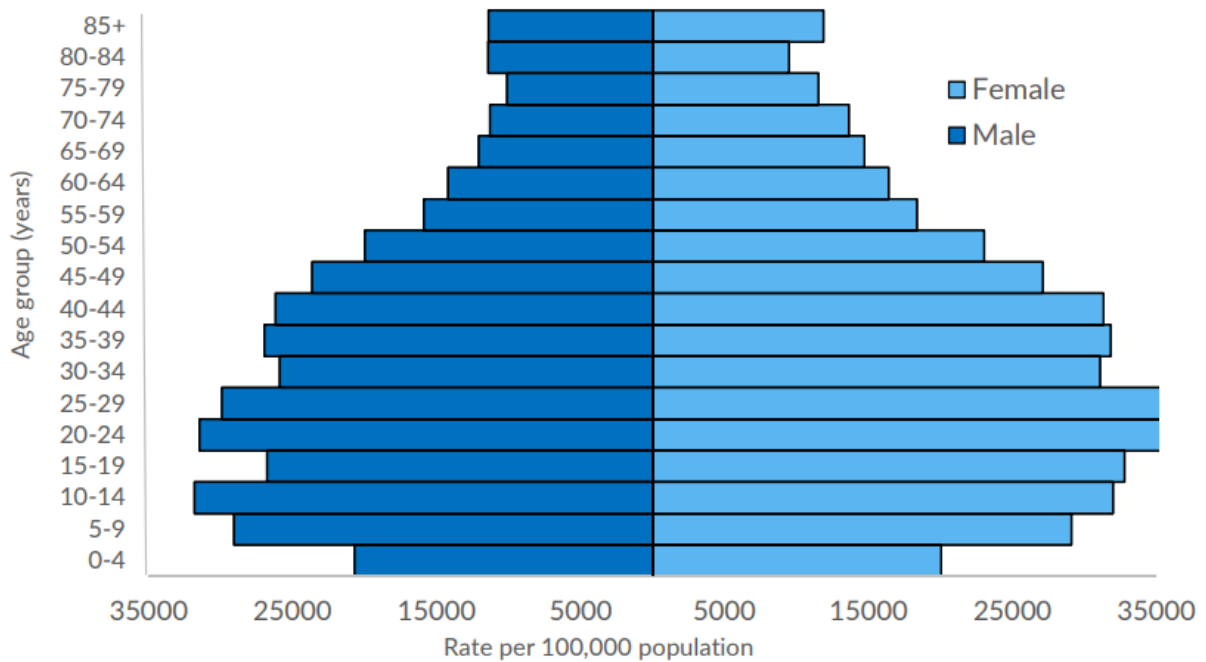


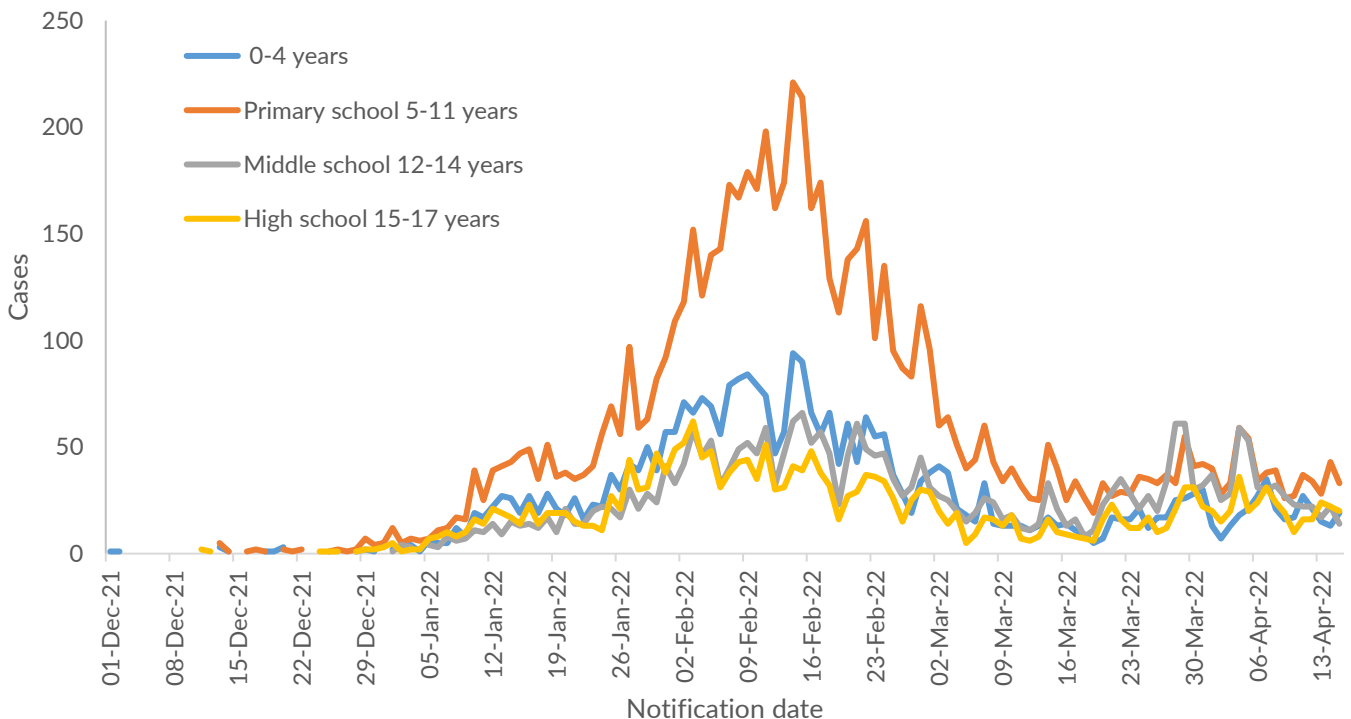
Figure 2: Number of cases by age group and gender



**Figure 3: COVID-19 infection rate by age group and gender**

Cases with unknown gender (n=1335, 2.6%) were distributed according to the proportions of known cases in the same stratum. Rates derived using 2021 NT population data.

Cases in school-aged people increased immediately following the start of school term on 31 January (Figure 4) and peaked at 14 February 2022 (n=418 cases), after the NT-wide peak. Since 14 February, case numbers have declined and daily incidence stabilised. Within the reporting period, the highest daily total among school-aged cases was 172 cases notified on 4 April.



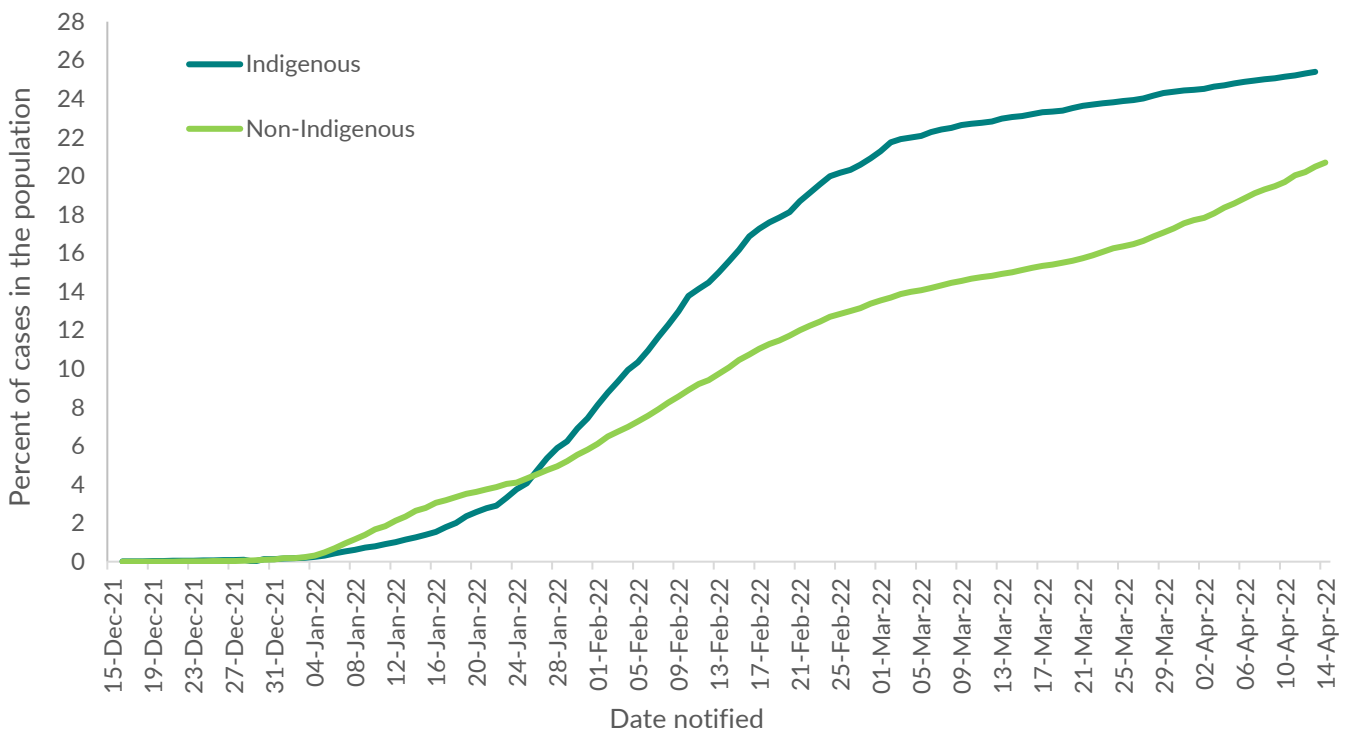
**Figure 4: Daily cases; school aged children by notification date<sup>a</sup>**

<sup>a</sup>School term commenced 31<sup>st</sup> January 2022. Age groups are different sizes, according to school year groupings.

### Aboriginal and Torres Strait Islander peoples

Of the cumulative cases, 18,849 (33.0%) were Indigenous cases, 36,138 (63.4%) non-Indigenous, and 2,003 were of unknown Indigenous status. The proportion of cases within the Indigenous population has stabilised, whilst the proportion of non-Indigenous cases in the population continues to rise (Figure 5). This represents an infection rate of 25.4% of the Indigenous population and 20.7% of the non-Indigenous population as of 18 April 2022. The crude rate ratio of Indigenous cases to non-Indigenous cases was 1.22 (95%CI 1.20–1.24,  $p \leq 0.001$ ).

Rates of infection across age groups in the Indigenous population are similar, whereas rates of infection in the non-Indigenous population are higher among children, youth and young adults compared with older age groups (Figure 6). The highest rate among Indigenous cases were in the age groups: 20-24 years and 25-29 years. The highest rates of infection among non-Indigenous cases was in the 10-14 year age groups. The median age among Indigenous cases was 27 years compared with 30 years for non-Indigenous.



**Figure 5: Cumulative proportion of the NT population that has been infected with COVID-19, by Indigenous status<sup>a</sup>**

<sup>a</sup> Those with unknown Indigenous status (3.5%) were distributed according to the proportions of known cases in the same stratum. Rates derived using 2021 NT population data

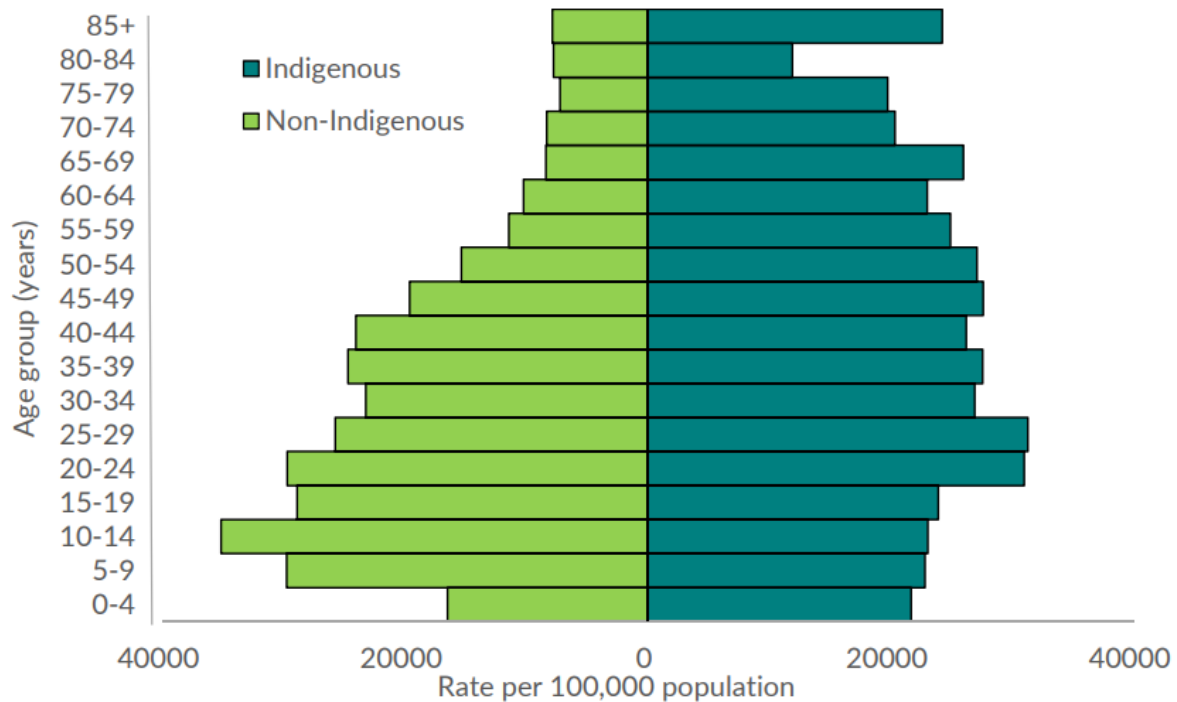


Figure 6: Attack rate by Indigenous status and age group<sup>a</sup>

<sup>a</sup> Those with unknown Indigenous status (3.5%) were distributed according to the proportions of known cases in the same stratum.

### Regions and Local Government Areas

The highest number of cases has occurred in the Greater Darwin region at 34,268 cases. Greater Darwin now has the highest rates of infection since the beginning of the pandemic, 23,182 per 100,000 population, followed by Central Australia with 22,819 per 100,000 and the Barkly Region with 22,224 per 100,000 (Table 5).

The epidemiological curves in Figures 7 illustrate the pattern of spread of COVID-19 in the regions. The increase in case numbers (Wave 2) are most evident in Greater Darwin, Central Australia and East Arnhem (see Figure 7). Case numbers remain low in this reporting period across the other regions.

Table 5: Total cases and rates per 100,000 population, by region and Indigenous status.

Region	Indigenous		Non-Indigenous		Not stated	Total	
	Cases	Rate <sup>ab</sup>	Cases	Rate <sup>ab</sup>		Cases	Rate <sup>ab</sup>
Greater Darwin	5,316	31,872	27,714	21,915	1,238	34,268	23,182
Top End	2,939	23,475	432	9,168	82	3,453	19,699
East Arnhem	1,829	18,346	857	21,452	125	2,811	19,510
Big Rivers	2,402	20,568	1,224	13,374	67	3,693	17,551
Barkly	1,167	23,109	312	14,787	22	1,501	22,224
Central Australia	4,403	27,728	4,138	18,768	194	8,735	22,819
Interstate	103	-	812	-		1,000	-
Unknown/Overseas	690	-	649	-	190	1,529	-
<b>Total</b>	<b>18,849</b>	<b>26,131</b>	<b>36,138</b>	<b>20,943</b>	<b>2,003</b>	<b>5,6990</b>	<b>23,183</b>

\*Those with unknown Indigenous status (3.5%) were distributed according to the proportions of known cases in the same stratum.

<sup>#</sup>Rates derived using 2021 NT population data.

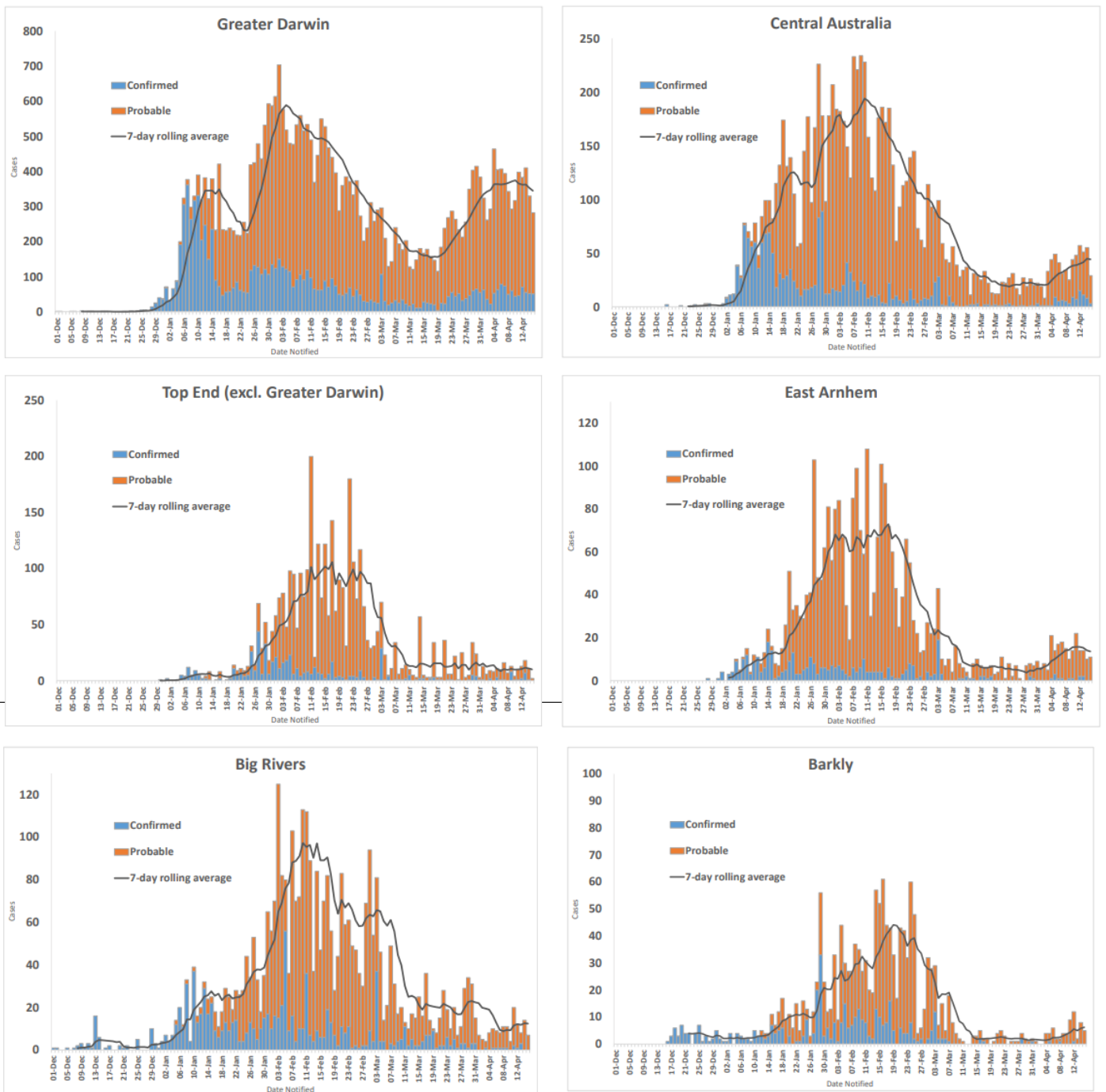
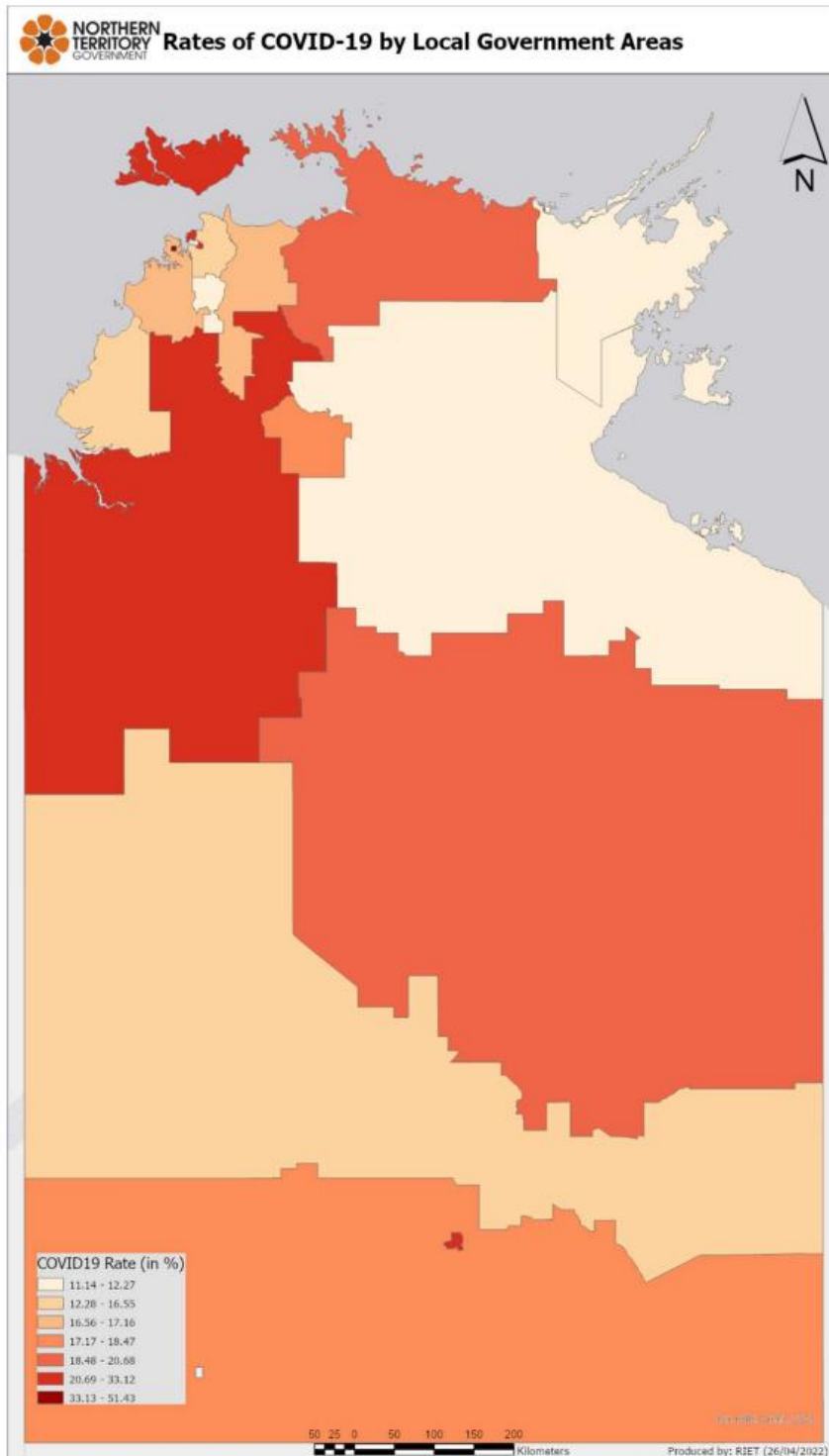


Figure 7: Epidemiological curves of cases notified, by region, since 1 December 2021.

Figure 8 geographically represents the different cumulative rates of infection within local government areas (LGAs). The highest rates were in Tiwi Islands and Victoria Daly Regional Councils. Central Australia and Darwin city also have rates above 24%. The lowest rates were in the Roper Gulf and Coomalie Community Government Council.



**Figure 8: Cumulative rates of COVID-19 infection by Northern Territory Local Government Areas**  
(Map courtesy of Department of Chief Minister and Cabinet)

### Testing and whole genome sequencing

In this reporting period, the 7-day average PCR test positivity rate has increased 2.0% compared to the average reported at the end of the previous fortnight. As at 15 April, the average PCR test positivity rate was 8.2% in Central Australia compared to 10.9% in the Top End. Denominators for testing data (i.e. total tests performed) have become difficult to assess since the introduction of RATs and decline in overall numbers of PCR tests. The number of PCR tests is particularly low in regional areas, such as Central Australia.

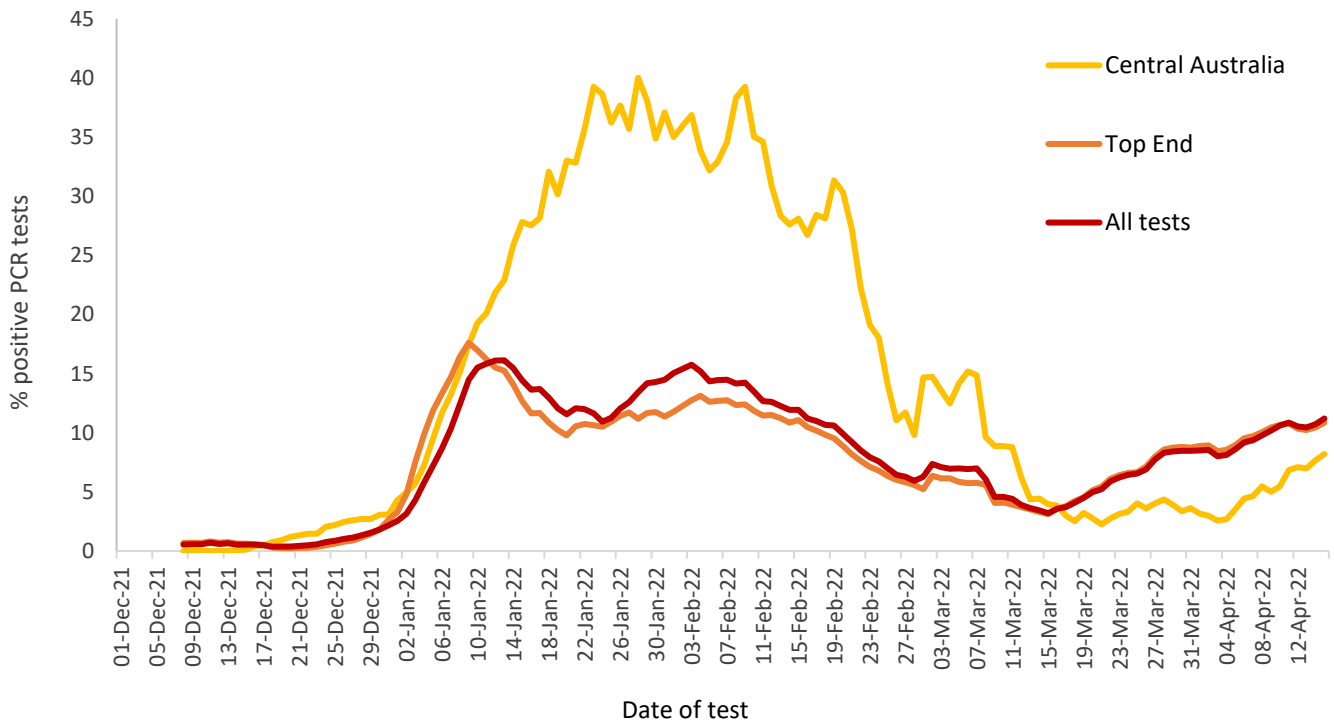


Figure 9: 7-day rolling average of PCR test positivity rate. 1 December 2021 – 15 April 2022

Territory Pathology undertakes whole genome sequencing (WGS) on a small number of PCR tests in order to determine circulating strains and to detect variants (to date 353 samples have had WGS; 226 since 1 December 2022). PCR samples prioritised for WGS are hospitalised cases and those in remote areas, which may not be representative of the total population. The dominant variant has changed throughout the outbreak (Figure 10). In December 2021, for samples with WGS there was an even distribution of variant Omicron (BA.1) (23/44) and Delta (21/44). In January and February 2022, the dominant variant was Omicron BA.1 and in March/April there has been an increasing number of Omicron sub-lineage BA.2 cases (n=30/56 March, n=12/14 April). Note the figures in April are inclusive of results up to 15 April 2022.

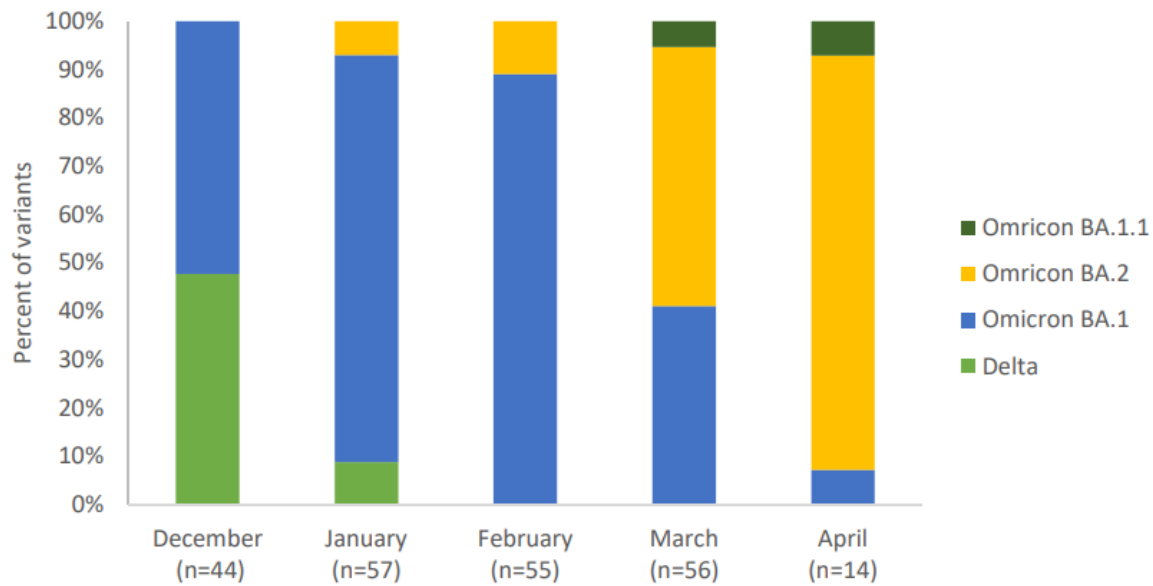


Figure 10: Proportion of COVID-19 variant (sub-lineage) identified from whole genome sequencing by month, December 2021 -April 2022

### Hospitalisation

The number of cases in hospital has increased since the beginning of April 2022, following Wave 2 of cases (Figure 11), but this has not corresponded with an increase in cases in intensive care units (ICU). In this reporting period, the mean daily number of COVID-19 inpatients was 25 (range 12-27), with a daily average of 1 patient (range 0-2) in ICU and 5 patients (range 0-10) requiring oxygen.

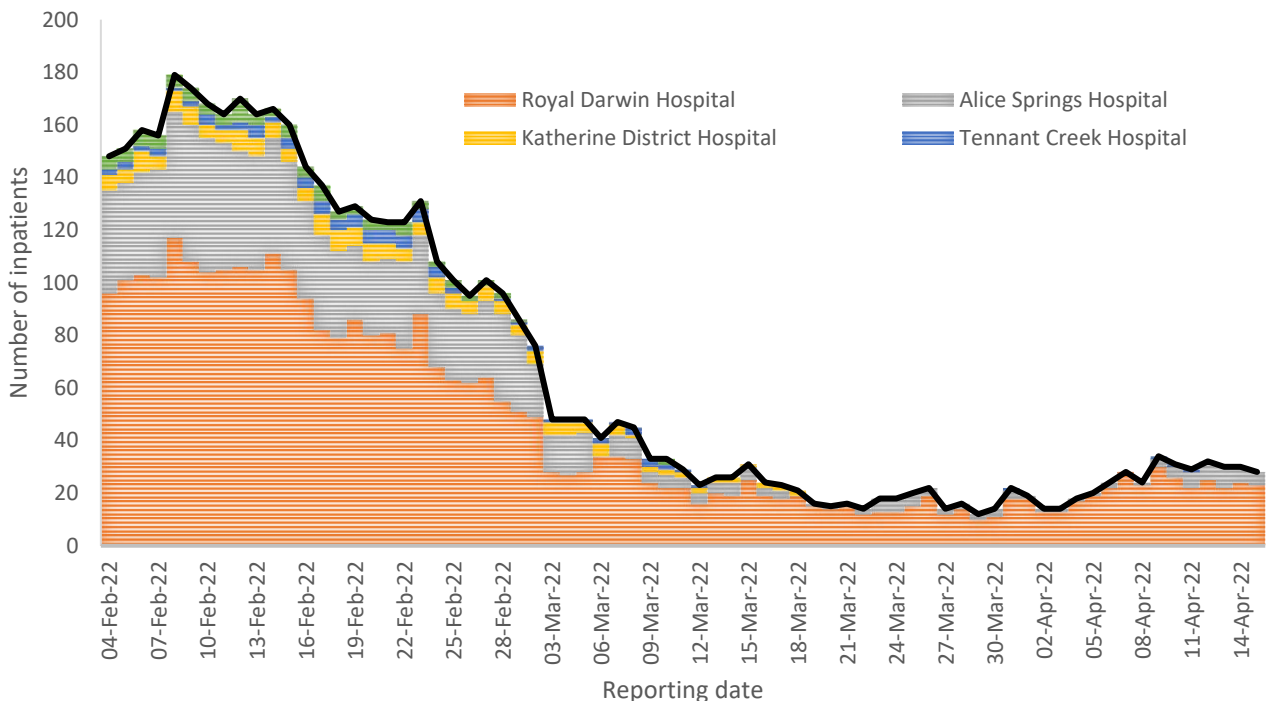


Figure 11: Daily number of inpatients in Northern Territory hospitals due to COVID-19 since February 2022

Data provided by all hospitals, and collated by Office of the Chief Health Officer. Palmerston Hospital is included in total numbers of Royal Darwin Hospital.

## Data source

The data for this report were extracted from the Centre for Disease Control's outbreak database, REDCap. Prior to early January 2022 all cases were based on PCR results only. Positive rapid antigen tests (RATs) were reported as probable cases after this time. Most RAT data has relied on website registration of positive results through the NT coronavirus website. As such, there is likely to be an under reporting and there is the potential underestimation of case numbers.

To improve the accuracy of rate estimates, cases with unknown Indigenous status were distributed according to the proportion of known cases in the same stratum. Data in epidemiological curves has been reported based on notification date.

Rates for Figure 8 were sent to Department of Chief Minister and Cabinet who produced the map. Data on hospitalisations was provided by relevant hospitals and collated by the Office of the Chief Health Officer.

This report was prepared by the Surveillance section and the COVID-19 Unit at the Centre for Disease Control.

# COVID-19 Situation Report: 30 June 2022

## CDC NT COVID-19 Situation report – no. 254

**Coronavirus  
(COVID-19)**

Report Date: 30 June 2022

Reporting period ending: 29 June 2022 @1600

Table 1: Summary of COVID-19 cases

	29-Jun	28-Jun	27-Jun	Total
<b>Cases notified in this reporting period</b>	350	335	304	78407 <sup>^</sup>
Change since last report	350	+4		354
<b>Case classification</b>				
Confirmed	50	79	37	18206
Probable	300	256	267	60201
<b>Age group (years)</b>				
≤4	7	21	16	4230
5-11	20	22	14	8366
12-19	15	17	14	8623
20-39	148	125	115	31110
40-59	99	99	96	19281
≥60	61	51	49	6794
Not recorded	0	0	0	3
<b>Indigenous status</b>				
Aboriginal and/or Torres Strait Islander	55	49	39	21797
Neither Aboriginal nor Torres Strait Islander	280	275	263	54679
Missing	15	11	2	1931
<b>Vaccination status* (available since February 2021)</b>				
0	15	11	8	5499
1	6	3	6	4887
2	30	40	37	28667
3 or more	269	225	226	29330
Ineligible or exempt	7	21	16	4295
Missing	23	35	11	5729
<b>Active cases</b>	1785	1791	1719	
<b>Deaths</b>	0	1	0	53
<b>Region**</b>				
Barkly	7	6	5	1859
Big Rivers	13	28	27	5017
Central Australia	80	72	82	12545
East Arnhem	2	10	11	3430
Top End	190	184	152	52130
Interstate	34	24	23	2729
Overseas	5	4	3	600
Not recorded	19	7	1	97

\*Vaccination status includes self-reported data. \*\*Resident location or place of infection, if unknown.

<sup>^</sup>Total cases may vary each day due to the addition of historic cases or deletion of duplicates.

### COVID-19 case numbers

There were 350 cases notified yesterday. There was an additional 4 cases added on 28 June. The net increase for total cases from the last situation report is 354.

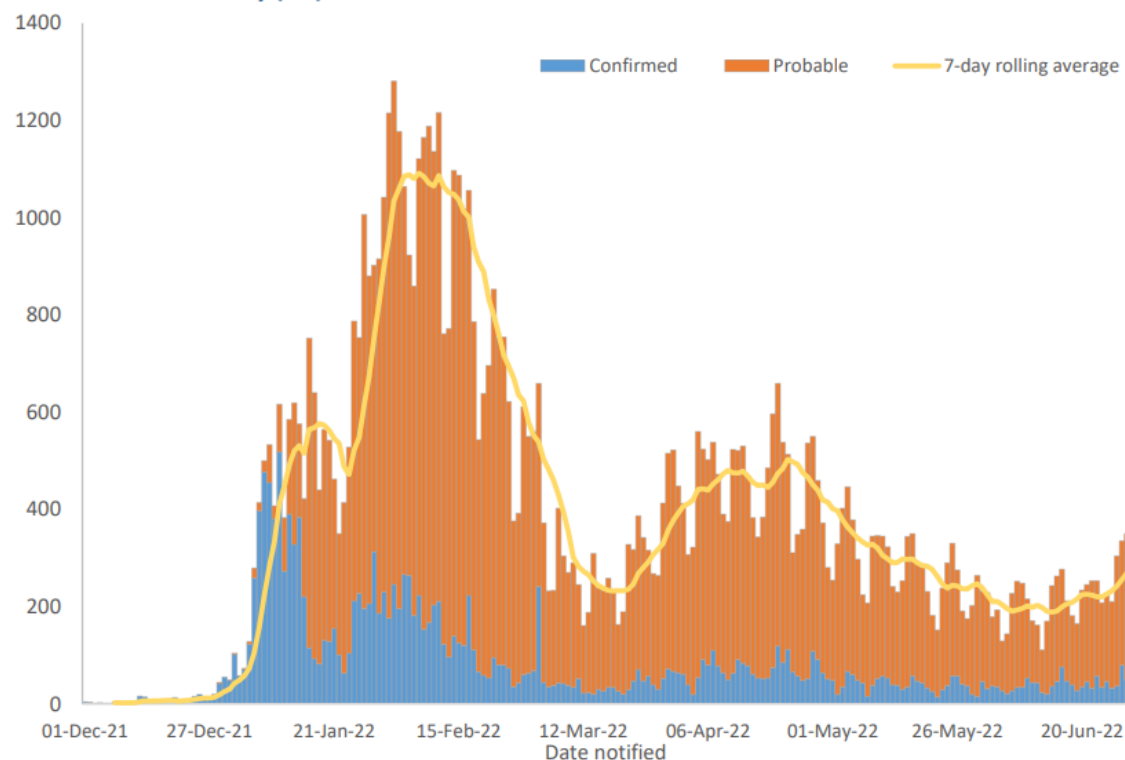
There are 1785 active cases in the NT, of which 85% are non-Indigenous (n=1516/1785), 13% are Indigenous (n=230/1785) and 2% are missing Indigenous status (n=39/1785). Active case numbers are predominantly in urban centres of Darwin City, Palmerston and Alice Springs (Table 2). There is a notable proportion of active cases from interstate (n=159, 9.1%).

**Table 2: Active cases (% of cases) by local government area**

Local government area*	Count	Percent (%)
Alice Springs	388	22.2
Barkly	28	1.6
Belyuen	1	0.1
Central Desert	5	0.3
Coomalie	1	0.1
Darwin City	582	33.3
East Arnhem <sup>1</sup>	39	2.2
Katherine	105	6.0
Litchfield	122	7.0
MacDonnell <sup>2</sup>	19	1.1
Palmerston	275	15.7
Roper Gulf	2	0.1
Tiwi Island	2	0.1
Victoria Daly	8	0.5
Wagait	3	0.2
West Arnhem	5	0.3
West Daly	2	0.1
Interstate	159	9.1
Unincorporated	1	0.1
Unknown	3	0.2
<b>Total</b>	<b>1750</b>	<b>100</b>

\*Residential location. <sup>1</sup>Includes the Unincorporated Areas of Nhulunbuy and Alyangula. <sup>2</sup>Includes the Unincorporated Area of Yulara.

**Figure 1: Epidemiological curve of COVID-19 cases by classification and notification date, diagnosed in the Northern Territory (NT) since 1 Dec 2021**



**Table 3: COVID-19 deaths by Indigenous status, sex and age groups**

	Non-Indigenous		Indigenous		Total
	Female	Male	Female	Male	
30-39	0	0	0	1	1
40-49	0	0	4	0	4
50-59	0	0	3	5	8
60-69	2	6	5	5	18
70-79	2	4	4	0	10
≥80	3	6	2	1	12
<b>Total</b>	<b>7</b>	<b>16</b>	<b>18</b>	<b>12</b>	<b>53</b>

Note: There have been no deaths reported in cases aged ≤29 years.

**Testing**

COVID-19 authorised PCR results are sourced from Territory Pathology and Western Diagnostic Pathology (WDP). Territory Pathology performs 85-90% of COVID-19 testing in the NT. PCR test numbers are available on the [Authorised Test Results Dashboard - Power BI Report Server](#) dashboard (NT Government employee access only).

**Figure 2: Authorised PCR tests by authorisation date**

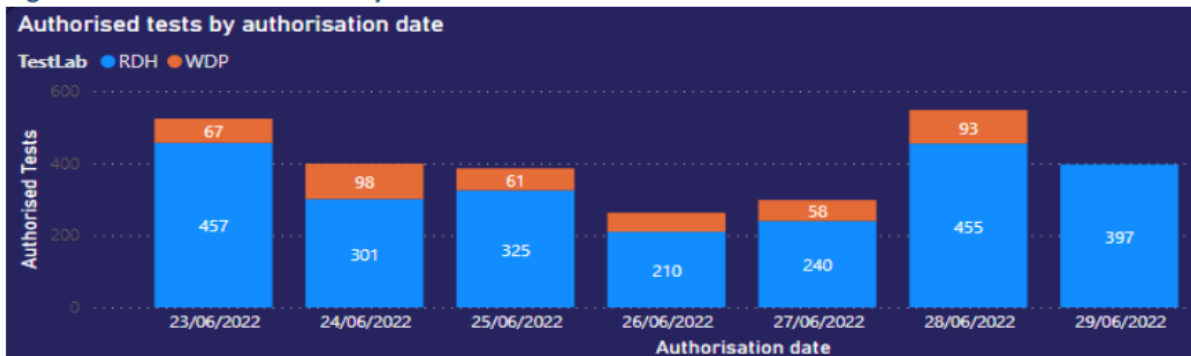
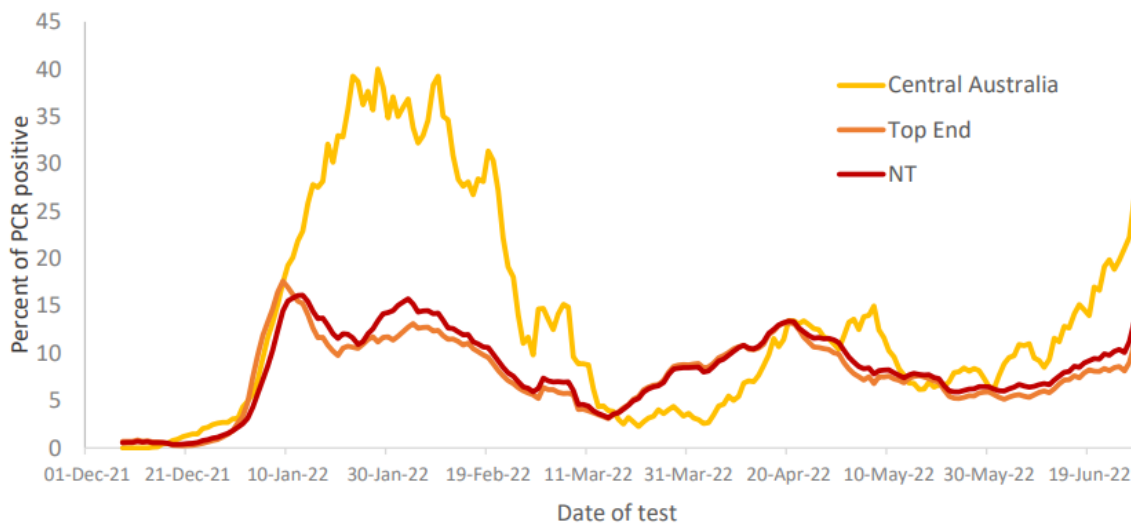


Figure 3 shows the rolling 7-day average of percent positive PCR tests in the NT and by region from 1 December 2021 to 28 June 2022. For all tests the rolling 7-day average is 13.4%, and by regions, Top End is 10.9% and Central Australia is 26.3%. The Central Australia numbers can fluctuate due to reduced PCR testing (average number of PCR tests in Central Australia in the last 7 days was 41 tests/day).

**Figure 3: 7-day rolling average of PCR positivity rate, NT and by region**



### COVID-19 Hospitalisations and Covid Care registrations

There were 15 patients in hospital due to COVID-19, with 2 patients in ICU (of which 1 is ventilated) and 2 patients requiring oxygen.

**Table 4: COVID-19 hospitalisations (including ICU admissions and patients requiring oxygen)**

Hospital	COVID-19 inpatients	ICU	Requiring O <sub>2</sub>
Alice Springs Hospital	3	1	1
Gove District Hospital	1	0	0
Katherine District Hospital	0	0	0
Royal Darwin Hospital*	11	1	1
Tennant Creek Hospital	0	0	0
<b>Total</b>	<b>15</b>	<b>2</b>	<b>2</b>

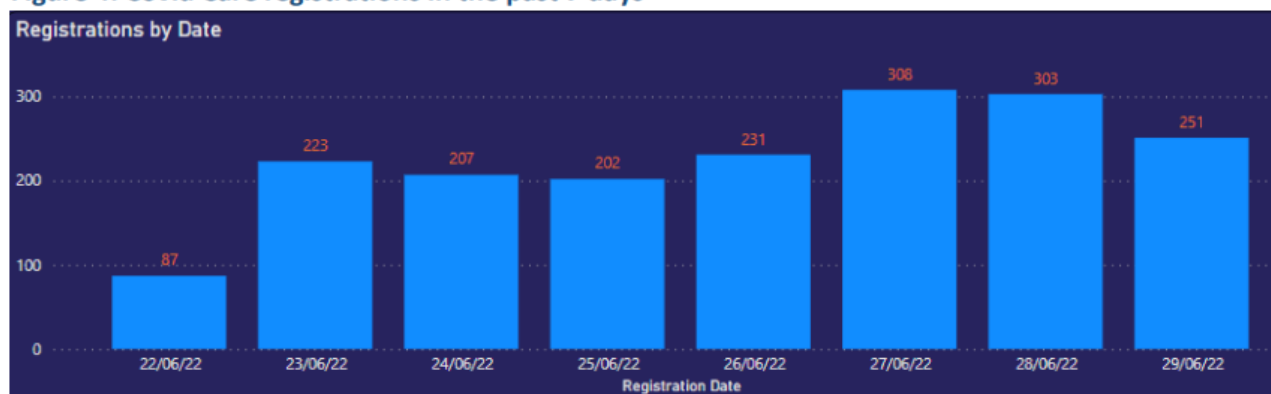
\* Includes Palmerston Regional Hospital

There were 341 new Covid Care registrations yesterday, including 71 COVID of Concern – GP, 134 COVID Well and 136 awaiting assessment. Covid Care registrations figures are available by region and pathway on the [Covid Care NT Registrations Dashboard - Power BI Report Server](#) dashboard (NT Government employee access only).

**Table 5: Covid Care registrations by pathway**

Covid Care pathway	New registrations 29-Jun	Past 7 days
COVID in Hospital	0	6
COVID of Concern – GP	71	493
COVID of Concern – Hospital in the Home	0	20
COVID Well	134	1041
To be assessed	136	252
<b>Total</b>	<b>341</b>	<b>1812</b>

**Figure 4: Covid Care registrations in the past 7 days\***



\*7 day period from 22 June 2022 @ 1600 – 29 June 2022 @ 1600

# NT CDC COVID-19

## Epidemiology report #9

Reporting period 11 June - 24 June 2022

### Summary of reporting periods

Table 1: COVID-19 cases for the last three fortnightly reporting periods and cumulative total (21 February 2020 to 24 June 2022)

Fortnight period	11/6-24/6	28/5-10/6	14/5-27/5	Cumulative total
<b>Cases notified in the reporting period</b>	3,006	2,863	3,591	77,073
<b>Case classification</b>				
Confirmed	580	485	574	17,973
Probable	2,426	2,378	3,017	59,100
<b>Indigenous status</b>				
Aboriginal and/or Torres Strait Islander	384	384	472	21,619
Neither Aboriginal nor Torres Strait Islander	2,571	2,404	2,980	53,556
Missing	51	75	139	1,898
Cumulative Indigenous: Non-Indigenous rate ratio				
<b>Deaths</b>				
Deaths	1	3	3	53
Cumulative crude case fatality rate				0.07%
<b>Health region</b>				
Greater Darwin	1,555	1,149	2,184	47,333
Top End	56	59	133	4,357
East Arnhem	58	68	74	3,406
Big Rivers	187	162	197	4,934
Barkly	41	21	69	1,842
Central Australia	758	476	581	12,270
Interstate	338	242	270	2,811
Overseas/missing	12	29	83	120
<b>Hospitalisations (since 2 February 2022)</b>				
Mean daily number of inpatients	17	15	20	47
Mean daily number of ICU inpatients	0.9	0.2	1.2	1.5
Mean daily number requiring oxygen	1.6	1.4	3.2	6.9

#### Changes from the previous report:

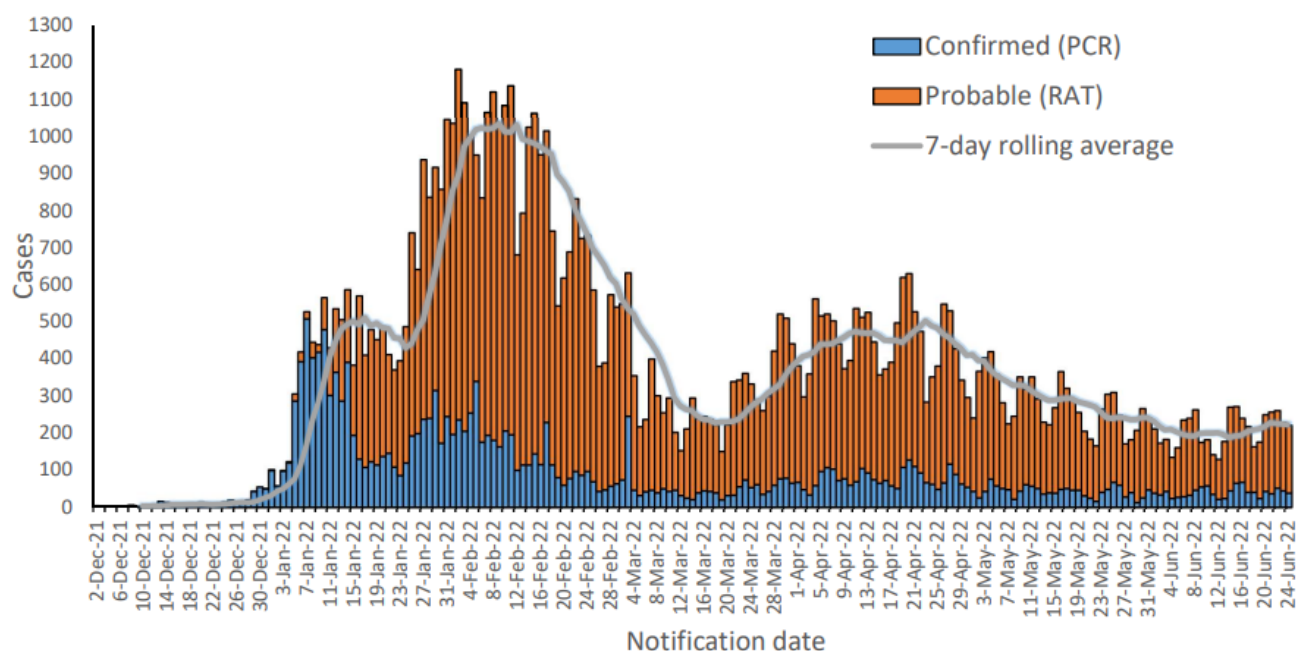
- There was a 5% increase in case numbers compared to previous fortnight: from 2,865 notified in previous fortnight to 3,006 cases notified in this fortnight.
- The severity of COVID-19 illness has remained stable. Only 1 death reported in this fortnight and there were similar numbers of cases hospitalised, in ICU and requiring oxygen compared to the previous fortnight.
- There is dominance of BA.2 lineage among the samples sequenced, but in this fortnight there was an increase in the circulation of BA.4 and BA.5 in the NT (see Figure 11).
- This report includes the addition of PCR testing rates by Indigenous status – Figure 10. PCR testing rates are particularly low among the Indigenous population and in this fortnight there were 55 tests per 100,000 population.

## Summary of cases

A total of 77,073 cases of COVID-19 have been notified in the Northern Territory (NT) up to 24 June 2022. This includes 17,973 confirmed cases and 59,100 probable cases. Since the start of the pandemic, 29.9% (n=73,574) of the NT population have had COVID-19. This total excludes overseas and interstate cases (n=2,867) who were diagnosed in the NT and people who have had greater than one infection recorded in the NT COVID-19 case dataset (n=623).

In this fortnightly reporting period (11 June to 24 June 2022) 3,006 new cases of COVID-19 were notified (Figure 1). Notifications increased by 5% from than the previous fortnight (Table 1). In this period, the highest number of daily cases was notified on 15 June (n=272); case numbers ranged from 129 cases to 272 cases per day.

Less than 1% of cases (n=650) have been identified as a reinfection. Among cases identified as reinfections, the median time between COVID-19 infections was 117 days (range 30-837 days). Of all reinfections, 61% were female (n=397) and 72% were non-Indigenous (n=465).



**Figure 1: COVID-19 cases by notification date since 02 December 2021 to 24 June 2022**

Note: Confirmed case definition: COVID-19 detected by polymerase chain reaction (PCR). Probable case definition: COVID-19 detected by rapid antigen test (RAT).

## Mortality

There has been a total of 53 COVID-19 related deaths since the beginning of the pandemic, including one death notified during this reporting period (Table 2). Since the beginning of the pandemic, the majority of deaths have been Indigenous people (n=30/53, 57%) and in the older age groups, with 90% (n=48/53) of deaths in people older than 50 years.

Deaths have been reported across all NT Health regions (Table 3). There is no statistically significant difference in death rates across the regions; the region with the greatest number of deaths was Greater Darwin (n=26), followed by Central Australia (n=11).

Table 2: Total deaths by Indigenous status, gender and age group

Age (years)	Indigenous		Non-Indigenous		Total
	Female	Male	Female	Male	
30-39	0	1	0	0	1
40-49	4	0	0	0	4
50-59	3	5	0	0	8
60-69	5	5	2	6	18
70-79	4	0	2	4	10
≥80	2	1	3	6	12
<b>Total</b>	<b>18</b>	<b>12</b>	<b>7</b>	<b>16</b>	<b>53</b>

Table 3: Total deaths by NT Health region

Region	Deaths	Percent (%)
Greater Darwin	26	48.1
Central Australia	11	21.2
Big Rivers	5	9.6
East Arnhem	4	7.7
Barkly	4	7.7
Top End	2	3.9
Interstate	1	1.9
<b>Total</b>	<b>53</b>	<b>100</b>

To examine case fatality rates, we used only cases reported before 11 June 2022, which was 2 weeks prior to reporting period end date. Case fatality rates can be biased downward if recent cases are included because those recently diagnosed with COVID-19 have not had time to develop complications and become unwell.

Of the 74,068 cases notified prior to 11 June, there were 53 deaths with a crude case fatality rate of 0.72 per 1,000 cases. The case fatality rate was 3.1 (95%CI 2.1–4.5,  $p \leq 0.0001$ ) times greater in the Indigenous cases compared to non-Indigenous cases (Table 4): 1.38 per 1,000 Indigenous cases and 0.44 per 1,000 non-Indigenous cases.

Table 4: Case fatality rates by Indigenous status

	Non-Indigenous	Indigenous	All*
Deaths	23	30	53
Cases	52,308	21,760	74,068
<b>Rate per 1,000 cases</b>	<b>0.44</b>	<b>1.38</b>	<b>0.72</b>

\* Those with unknown Indigenous status (2.5%) were distributed according to the proportions of known cases in the same stratum.

## Demographics

Of the 77,073 cases notified, 52% were female compared to 48% male. The age groups with the greatest number of cases was 25-29 year and 30-34 years for both males and females (Figure 2).

Figure 3 illustrates the age and gender specific rates. The 20-24 year age group has the highest rates, at 44,517 cases per 100,000 population among females and 36,031 case per 100,000 population among males. The rates were generally lower among male age groups compared to females except among those aged 80-84 years and those greater than 85 years.

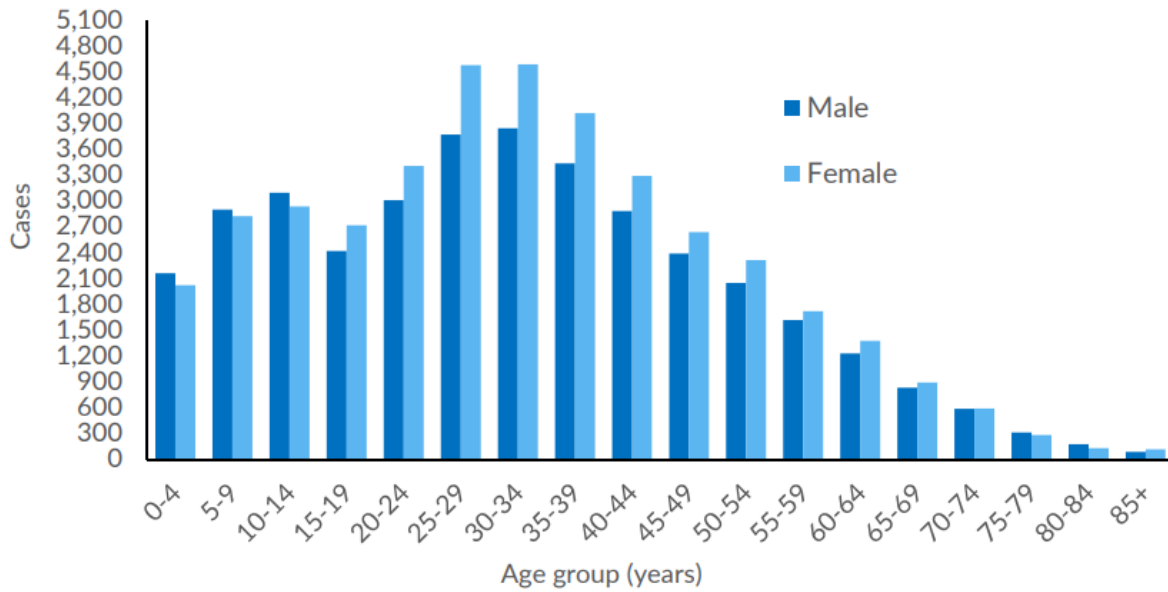


Figure 2: Number of cases by age group and gender

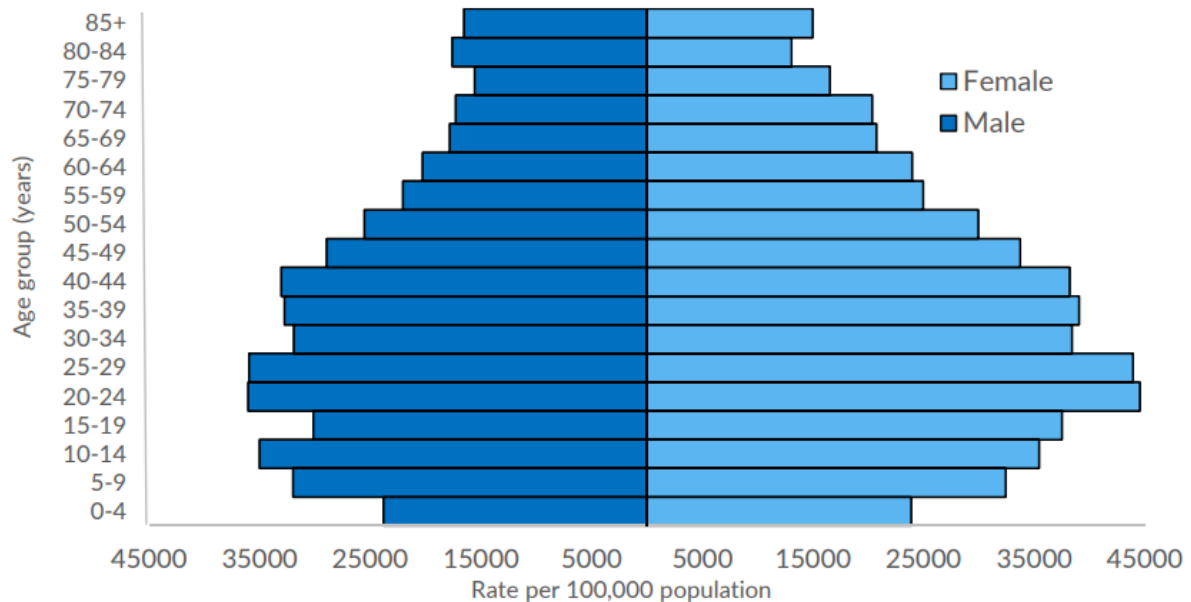


Figure 3: COVID-19 infection rate by age group and gender (cumulative)

Cases with unknown gender (n=1,130 1.5%) were distributed according to the proportions of known cases in the same stratum. Rates derived using 2021 NT population data.

In this reporting period, case numbers among school aged children remained low; the highest number of school aged cases was on 14 June 2022 at 49 cases and ranged from 14 to 49 cases per day.

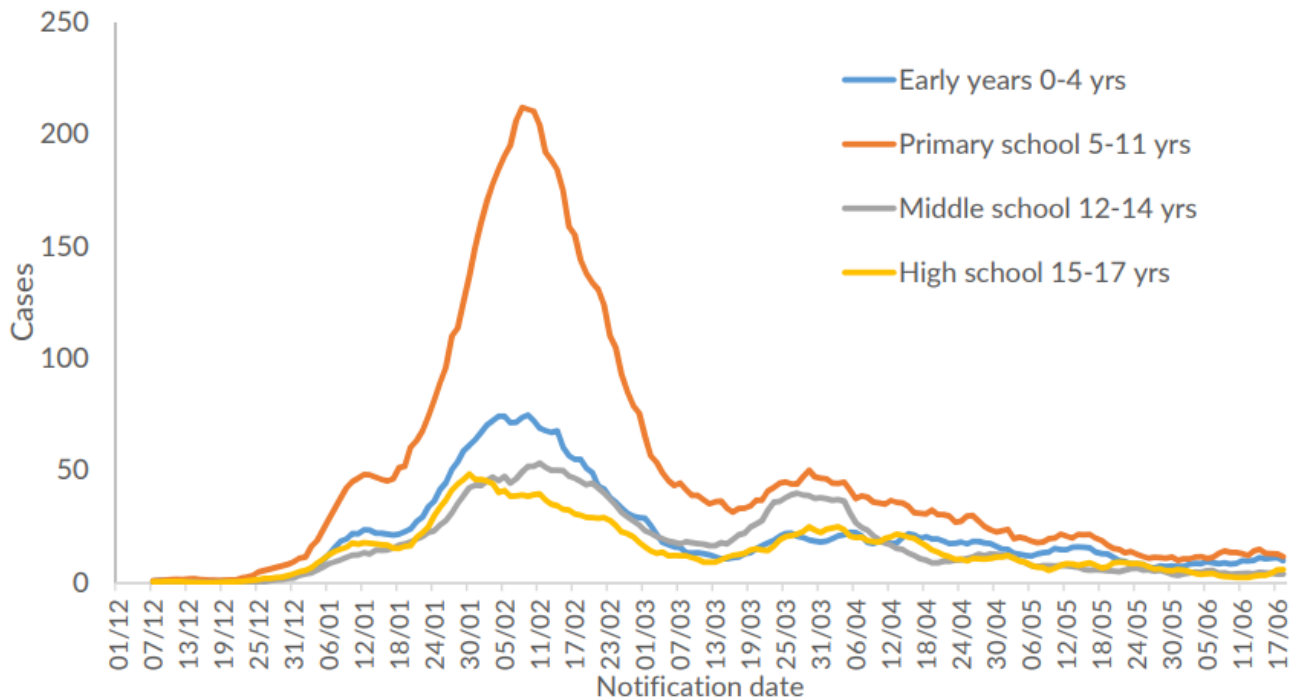


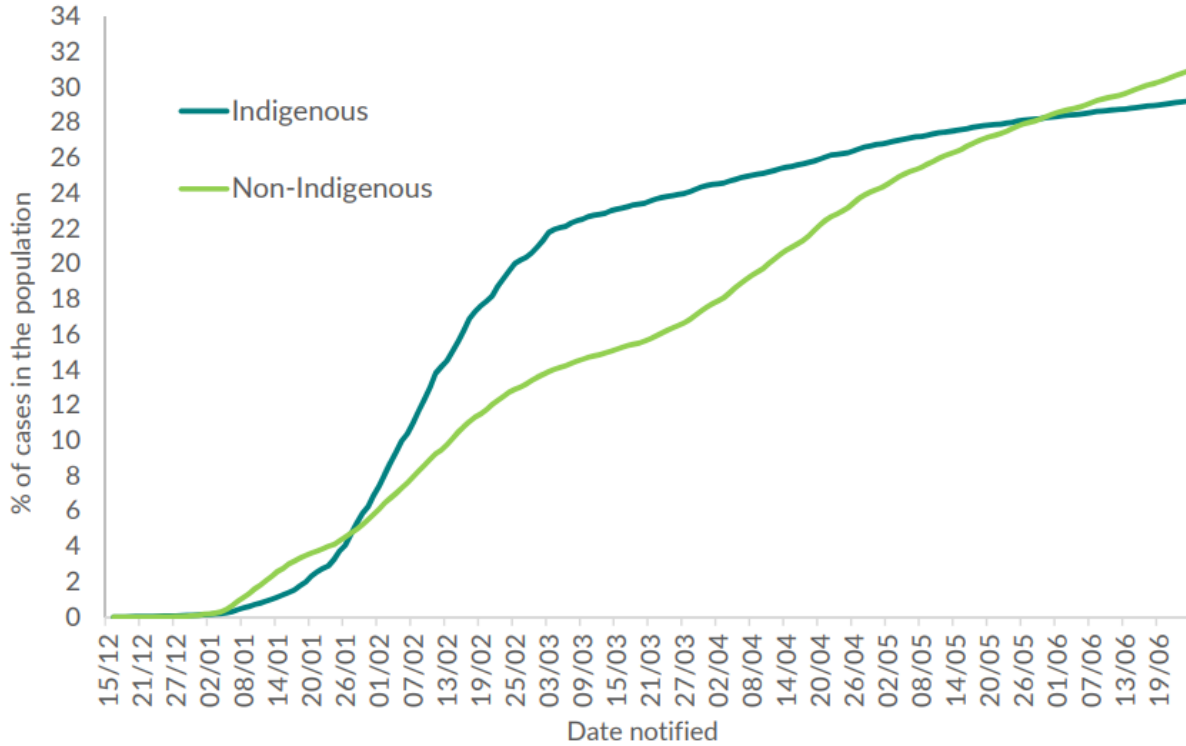
Figure 4: Rolling 7 day average of school aged cases by date of notification<sup>a</sup>

<sup>a</sup>School term commenced 31<sup>st</sup> January 2022. Age groups are different sizes, according to school year groupings.

## Aboriginal and Torres Strait Islander peoples

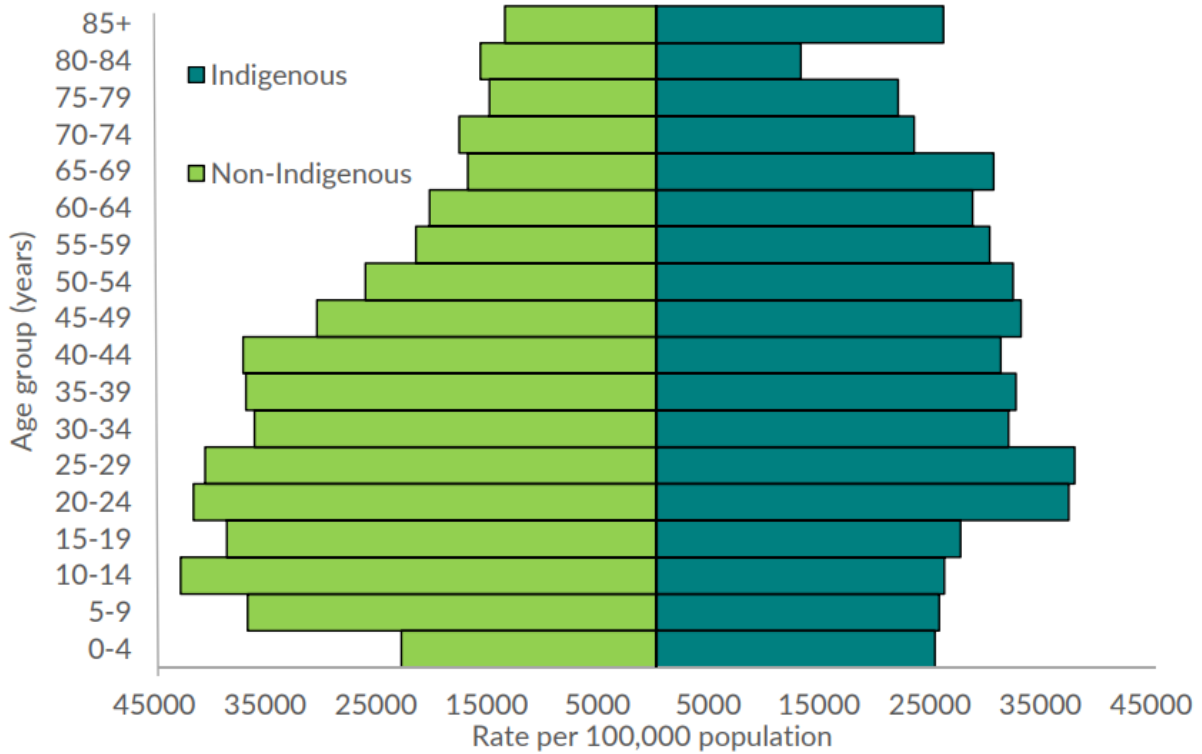
There have been 21,620 (28.0%) cases in the Indigenous population and 53,555 (69.5%) in the non-Indigenous population, with 1,895 (2.5%) cases of unknown Indigenous status. The cumulative incidence rates for the non-Indigenous population (30.9%) is now higher than that of the Indigenous population (29.2%), see Figure 5. This may be due to better cases ascertainment. Note: testing and registering of results may not be as complete in the Indigenous population (see Figure 10 for rates of testing by Indigenous status).

Rates of infection across the age groups in the Indigenous population were similar, whereas rates of infection in the non-Indigenous population were higher among children (10-14 years) and young adults (20-24 years & 25-29 years) compared with older age groups (Figure 6). The highest rates among Indigenous cases were in the age groups: 20-24 years and 25-29 years. The highest rate of infection among non-Indigenous cases was in the 10-14 year age group, which had the highest rate overall at 42,998 cases per 100,000 population. The median age among Indigenous cases was 28 years compared with 32 years for non-Indigenous cases.



**Figure 5: Cumulative proportion of the NT population that has been infected with COVID-19, by Indigenous status<sup>a</sup>**

<sup>a</sup> Those with unknown Indigenous status (2.5%) were distributed according to the proportions of known cases in the same stratum. Rates derived using 2021 NT population data



**Figure 6: Attack rate by Indigenous status and age group<sup>a</sup>**

<sup>a</sup> Those with unknown Indigenous status (2.5%) were distributed according to the proportions of known cases in the same stratum. Rates derived using 2021 NT population data

## Regions and Local Government Areas

In this current reporting period, urban areas continue to have the greatest cumulative case rates. Both Greater Darwin and Central Australia (includes Alice Springs) with the largest urban centres have cumulative case greater than 32,000 per 100,000 (Table 5). There is likely to be reduced testing and reporting in more regional and remote areas of the NT. The Indigenous rates are higher than non-Indigenous case rates in all regions, except East Arnhem (Table 5).

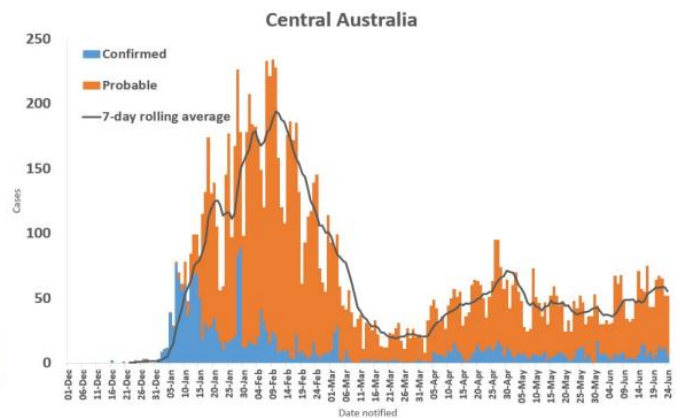
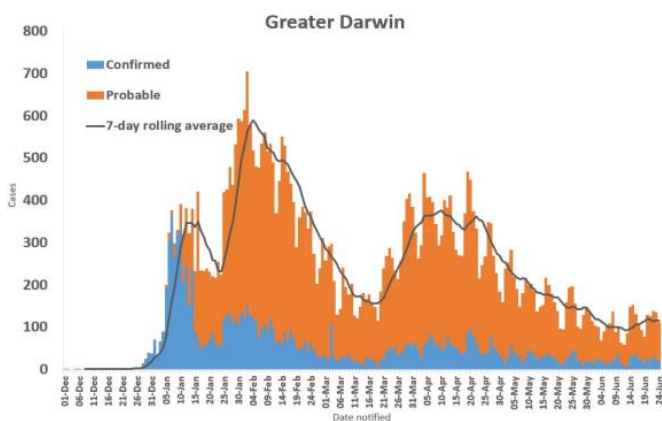
The epidemiological curves in Figures 7 illustrate the pattern of spread of COVID-19 in the regions. In this period, case numbers continued to decrease in the Greater Darwin region, and stabilised across the other regions.

Table 5. Cumulative COVID-19 cases and rates per 100,000 population by region and Indigenous status

Health region	Indigenous		Non-Indigenous		Unknown	Total	
	Cases	Rate <sup>ab</sup>	Cases	Rate <sup>ab</sup>		Cases	Rate <sup>ab</sup>
Greater Darwin	6,679	39,617	39,466	30,990	1,188	47,333	32,021
Top End	3,561	28,274	719	15,259	77	4,357	24,856
East Arnhem	2,008	19,923	1,285	32,165	113	3,406	23,640
Big Rivers	2,830	24,110	2,040	22,290	64	4,934	23,448
Barkly	1,318	26,015	503	23,839	21	1,842	27,273
Central Australia	5,046	31,523	7,052	31,985	172	12,270	32,053
Interstate	172	n/a	2,420	n/a	219	2,811	n/a
Unknown/Overseas	6	n/a	70	n/a	44	120	n/a
<b>Total</b>	<b>21,620</b>	<b>29,775</b>	<b>53,555</b>	<b>31,037</b>	<b>1,898</b>	<b>77,073</b>	<b>31,352</b>

<sup>a</sup>Those with unknown Indigenous status (2.5%) were distributed according to the proportion of known cases in the same stratum.

<sup>b</sup>Rates derived using 2021 NT population data.



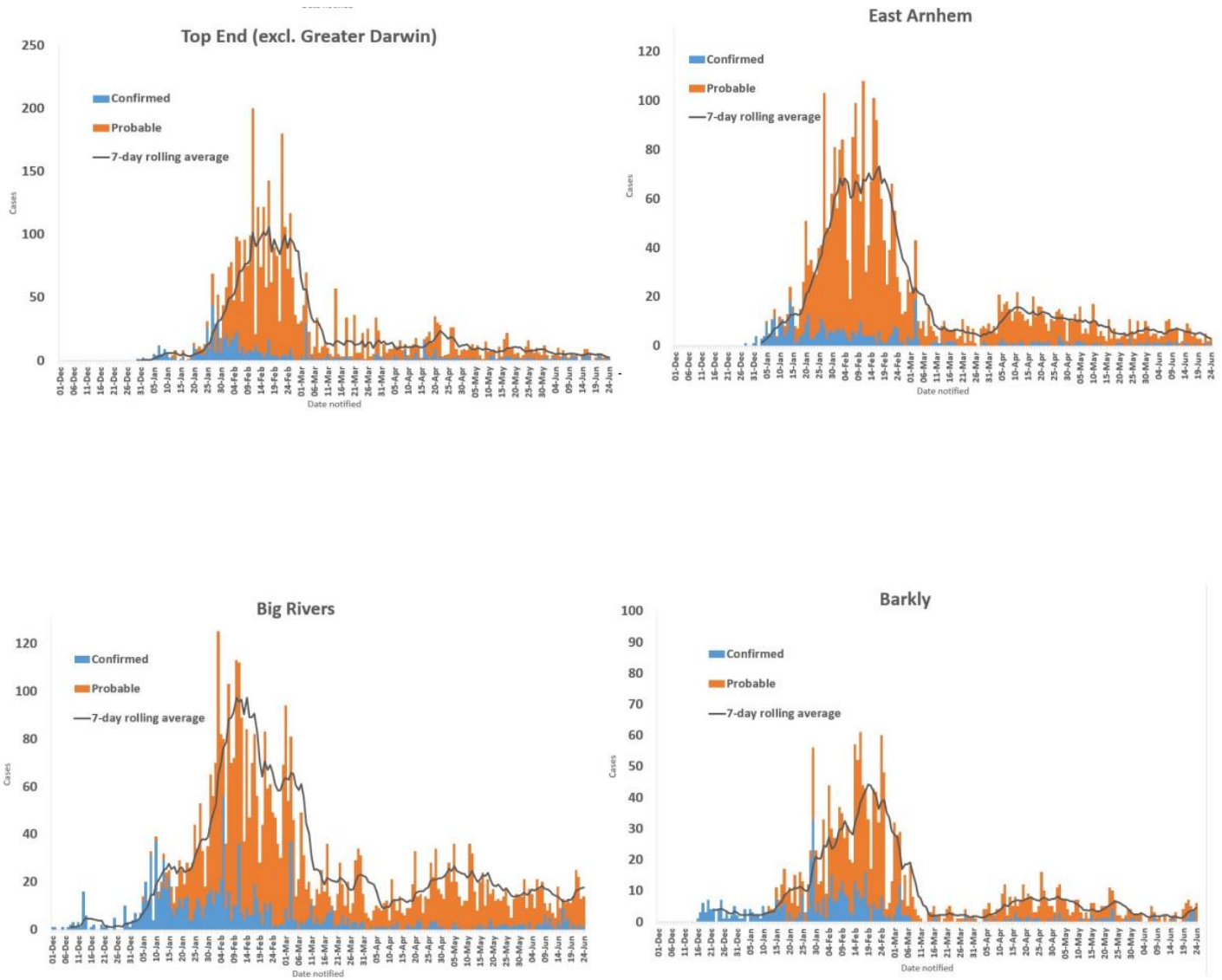


Figure 7: Epidemiological curves of cases notified, by region since 1 December 2021

Figure 8 presents the cumulative rates of infection within local government areas (LGAs).

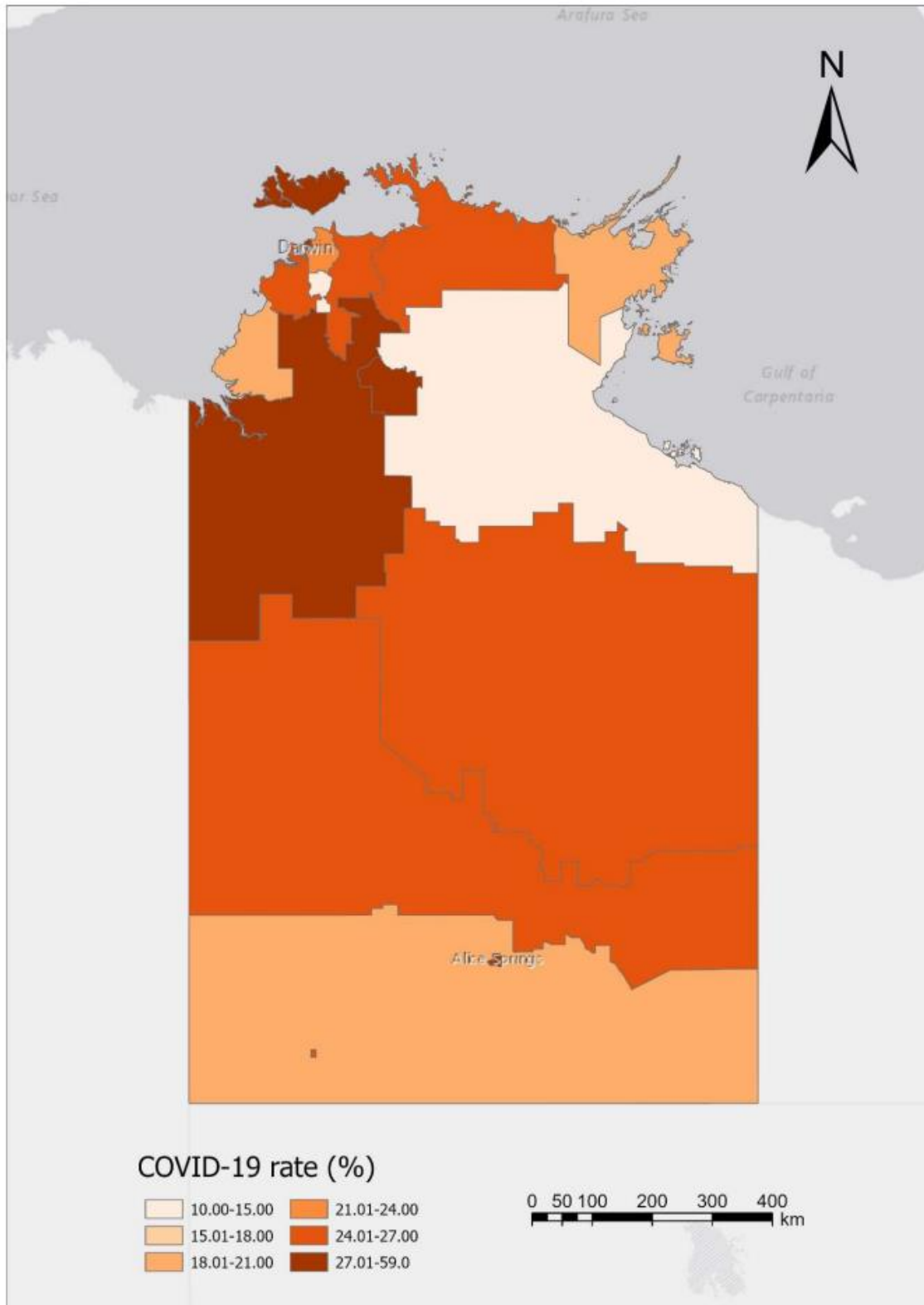


Figure 8: Cumulative rates of COVID-19 infection by Northern Territory Local Government Areas

### Testing and whole genome sequencing

In the end of this reporting period, the 7-day average PCR test positivity rate for the NT was 10.3%, which is similar to the previous period. The average PCR test positivity rate was 19.6% in Central Australia compared to 8.5% in Top End. PCR testing rates in regional areas were low, in this period an average of 41 tests per day were notified in Central Australia. The low testing rate can result in large fluctuations in the positivity rates.

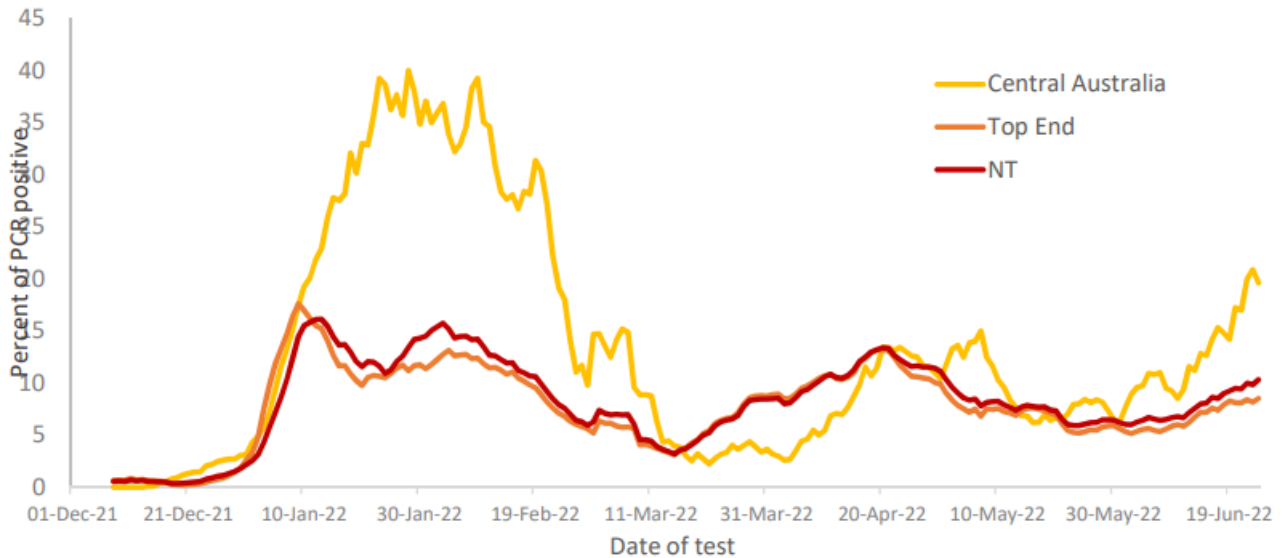


Figure 9: PCR test, rolling 7-day average positivity rate. 1 December 2021 – 24 June 2022

PCR testing rates have been low since the NT moved to prioritise rapid antigen testing. The rates of PCR testing are particularly low in Aboriginal and Torres Strait Islander population (see Figure 10), and have remained consistently below 100 tests per 100,000 since early March 2022. In this fortnight, the rate of PCR testing was 55 per 100,000 for Indigenous population compared to 171 per 100,000 for the non-Indigenous population.

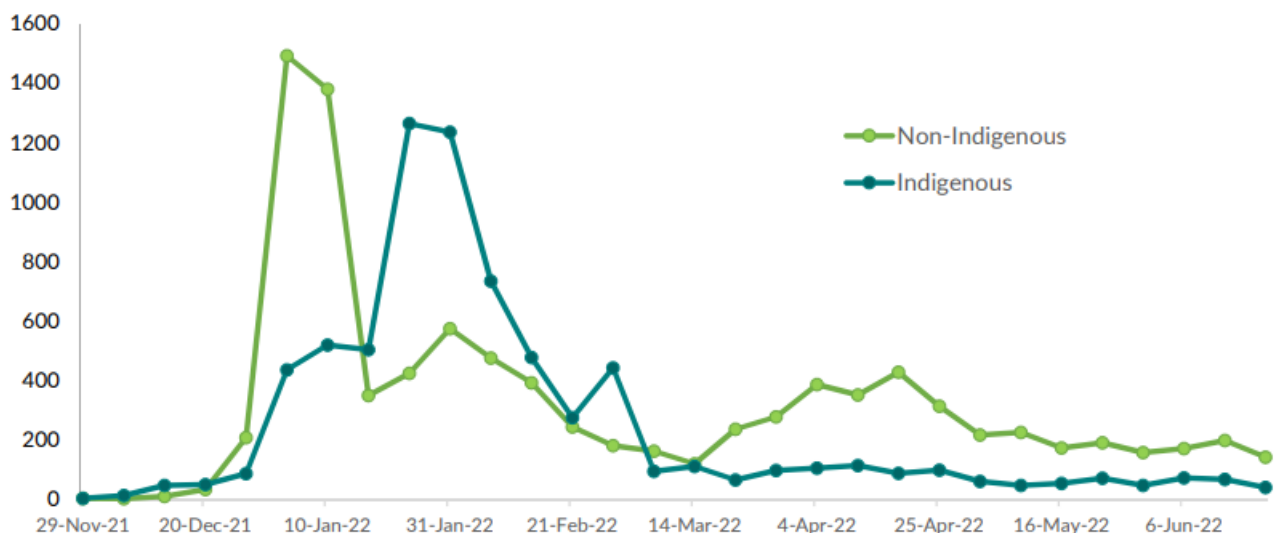


Figure 10: Weekly PCR testing rates per 100,000 population by Indigenous status, 29 November 2021 – 24 June 2022

Territory Pathology undertakes whole genome sequencing (WGS) on a small number of PCR tests in order to identify circulating strains and detect new variants (to date 681 samples have been WGS, 559 since 1 December 2021). PCR samples prioritised for WGS are primarily cases who are: international travellers, hospitalised or from remote areas. In this reporting period, Omicron BA.4 and BA.5 have recently been identified in the NT. Omicron sub-lineage BA.2 continues to be the most prevalent strain in NT, with dominance of BA.2 in samples sequenced in April (n=89/95), May (n=89/90) and June (n=76/121).

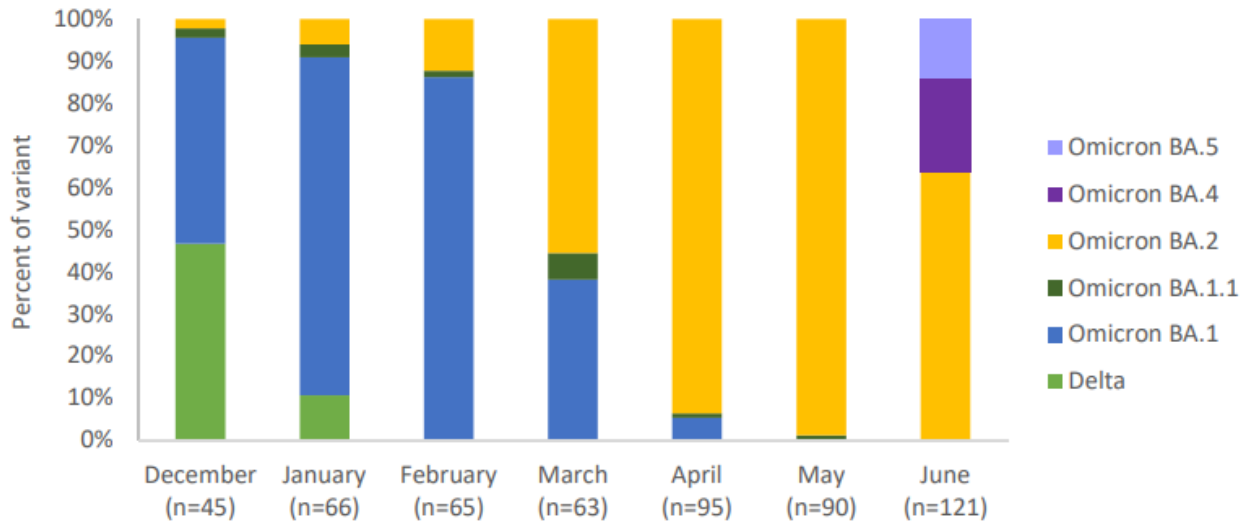


Figure 11: Proportion of COVID-19 variant (sub-lineage) identified from samples whole genome sequenced by month, up to 24 June 2022

### Hospitalisation

The number of hospitalised cases has continued to decrease since May across all hospitals. The majority of hospital admissions remain in urban hospitals (Figure 11). In this reporting period, the mean daily number of COVID-19 inpatients was 17 (range 12-23), with an average of 2 patients per day requiring oxygen (range 0-3) and 1 patient per day in ICU (range 0-2).

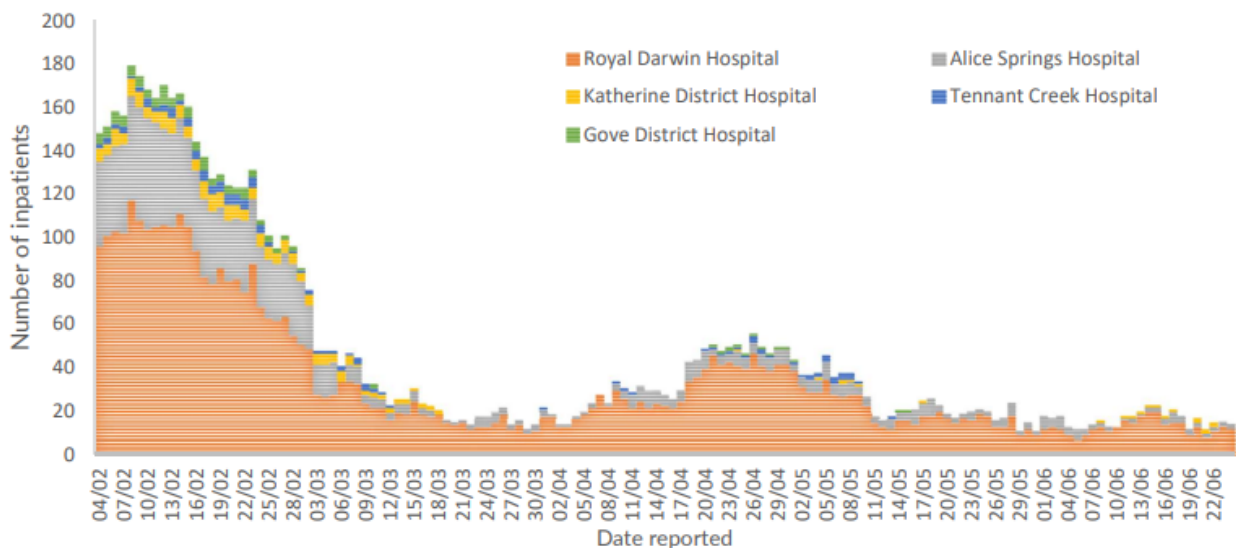


Figure 12: Daily number of inpatients in Northern Territory hospitals due to COVID-19 since 4 February 2022. Data provided by all hospitals. Palmerston Hospital is included in total numbers of Royal Darwin Hospital.

## Aged care

Cases among residential aged care are of particular concern and are followed up as a high risk setting. In this reporting period, COVID-19 cases were notified from 1 resident and 6 staff. Since the beginning of the pandemic, 453 cases have been notified from residential aged care settings, including 179 residents and 274 staff (Figure 12). In this outbreak, the notification of positive cases among residents usually follows notification from staff and/or other visitors. Of all COVID-19 related deaths, 7/53 have been aged care residents.

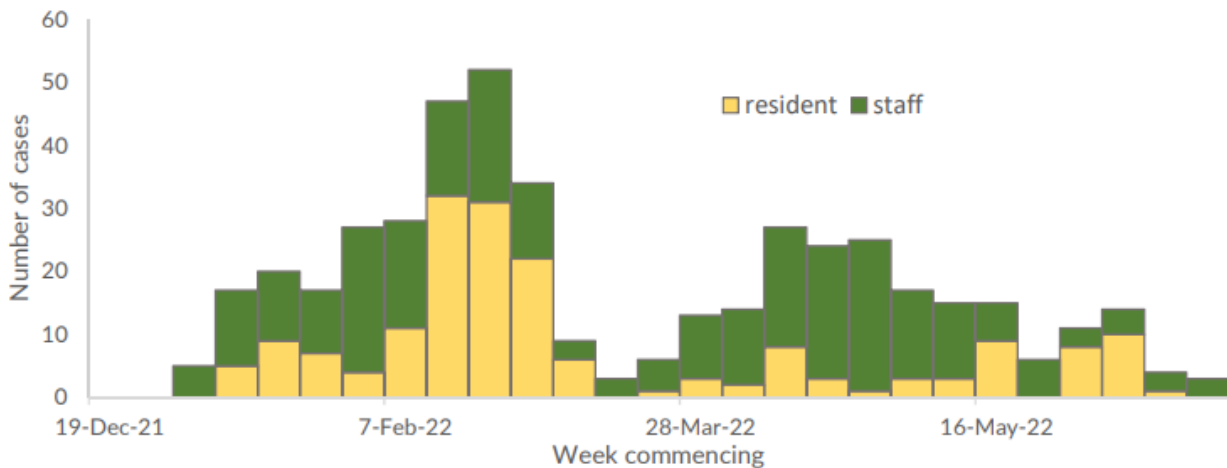


Figure 12: Weekly number of cases in residential aged care settings, by resident and staff since 19 December 2021

## Vaccination rates

Vaccination against COVID-19 remains the key public health strategy for reducing severity of the disease. In major urban areas of Darwin, Palmerston and Alice Springs, vaccination rates are over 85% for those 5 years and older with two doses. For those 16 years and older in major urban areas, vaccination rates for booster or third dose are over 75%. Figure 13 displays the vaccination rates for 5 years and older with 2 doses across NT remote health centres as of 16 June 2022. In a number of remote areas, particularly in Central Australia and Barkly regions, vaccination rates are between 50% and 70% (Figure 13). Figure 14 displays the vaccination rates for 16 years and older with a booster or third dose across NT remote health centres as of 16 June 2022. For many remote areas in Central Australia and Barkly regions, vaccination rates for a booster or third dose are between 30% and 60% (Figure 14).

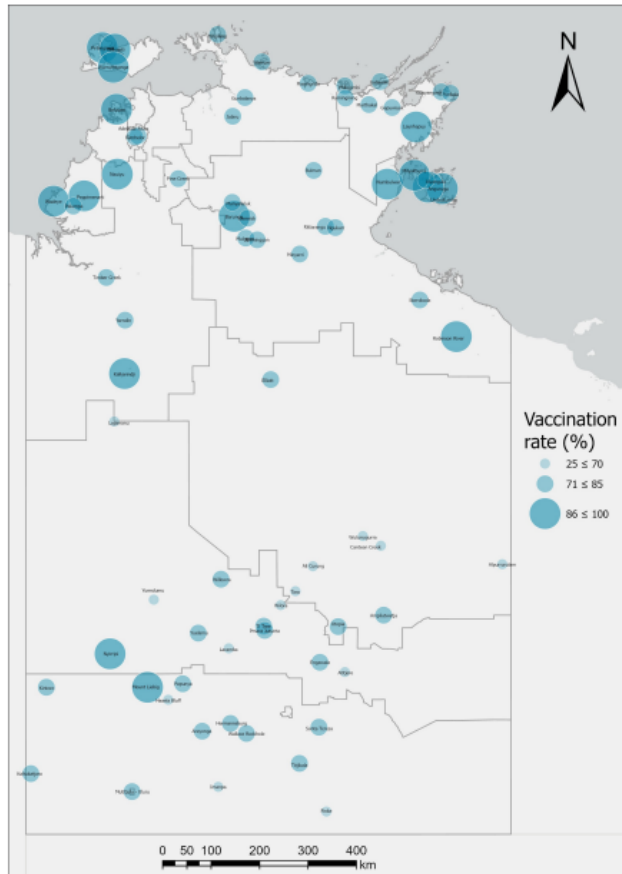


Figure 13: COVID-19 vaccination rates by NT remote communities for 5 years and older receiving two doses, 16 June 2022

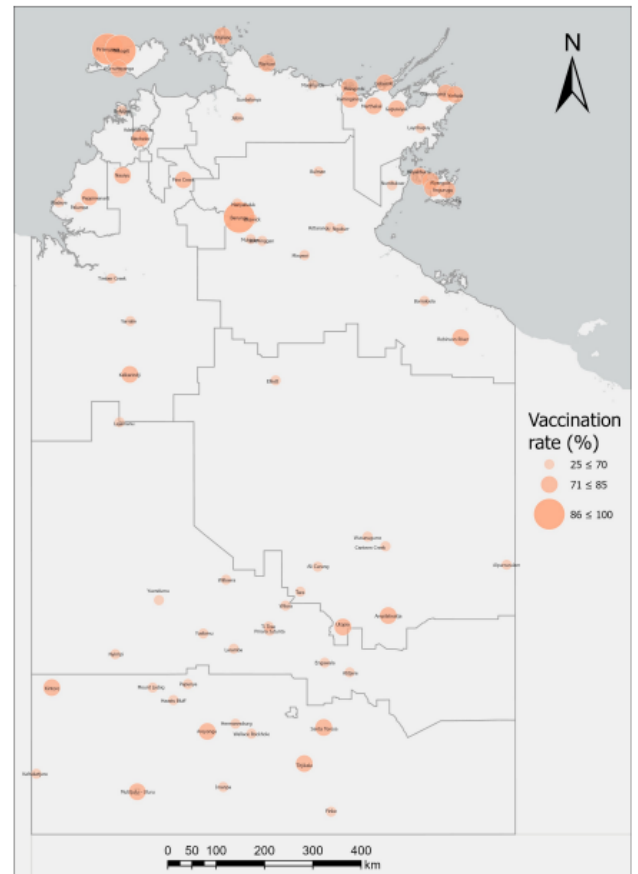


Figure 14: COVID-19 vaccination rates by NT remote communities for 16 years and older receiving three doses, 16 June 2022

## Data source

The COVID-19 data for this report were extracted from the Centre for Disease Control's (CDC) outbreak database, REDCap. Prior to early January 2022 all cases were based on PCR results only. Positive rapid antigen tests (RAT) were reported as probable cases after this time. Most RAT data has relied on website registration of positive results through the NT coronavirus website. As such, there is likely to be an under reporting and there is the potential underestimation of case numbers.

To improve the accuracy of rate estimates, cases with unknown Indigenous status were distributed according to the proportion of known cases in the same stratum. Data in epidemiological curves has been reported based on notification date.

This report was prepared by the Surveillance section and the COVID-19 Unit at the Centre for Disease Control.

## Health alerts issued April to June 2022



NORTHERN  
TERRITORY  
GOVERNMENT

Centre for Disease Control  
NT HEALTH

### Public Health Alert

The following public health alerts and media release were issued by Centre for Disease Control (CDC) between April and June 2022. Below are excerpts from the health alerts, noting these alerts may no longer be active at the time of publishing this issue. Current and previous health alerts can be viewed at the [NT Health website](#).

#### Japanese encephalitis virus (JEV)

Evidence of the Japanese encephalitis virus (JE) was detected in a small number of feral pigs in the West Daly region. This is the first detection of JE in the NT since the fatal human case that occurred on the Tiwi Islands in early 2021. Read the [full media release here](#), or view on pages 37-38.

#### Outbreak of Acute Post Streptococcal Glomerulonephritis (APSGN)

Since 28 March 2022, 6 cases of acute post-streptococcal glomerulonephritis (APSGN) have been notified from communities across the NT, with most of these being from Central Australia and the Barkly Region. Historical data suggest that when 4 or more cases of APSGN occur anywhere in the NT within a 2 week period, APSGN disease is more likely to be occurring Territory-wide. Therefore, clinicians need to be on the lookout for children with skin sores or tonsillitis and treat with appropriate antibiotics immediately. Scabies often are present and will need to be treated as

infestation may promote the development of skin sores. Read the [full alert](#) issued 3 May 2022.

#### Flu has arrived

Seasonal influenza has arrived in the Northern Territory (NT). This is the first time significant numbers of laboratory-confirmed cases have been notified since early 2020. There have been over 300 laboratory-confirmed cases notified since the end of March 2022 compared to 76 for the whole of 2021. The strategy for flu control is - Vaccinate. Test. Treat. Prevent. Read the [full alert](#) issued 12 May 2022

#### Influenza Alert Update for NT

Influenza (flu) continues to spread throughout the Northern Territory (NT). There have now been 1090 laboratory-confirmed cases notified since the end of March compared to 76 for the whole of 2021. The majority of cases have been in Alice Springs, Central Australia and Darwin. There remains a higher proportion of cases among Indigenous people compared to non-Indigenous people in all regions except Darwin. Read the [full alert here](#), or view pages 39-42.

## Monkeypox

Two probable cases of monkeypox have been identified in Australia (New South Wales and Victoria) in returned travellers in the past week. Read the [full alert here](#), or view pages 43-44.

## Increase in Group A Streptococcal associated disease (GAS)

In the past 4 weeks there has been an increase in Acute Post-Streptococcal Glomerulonephritis (APSGN), invasive Group A Streptococcal (iGAS) and Acute Rheumatic Fever (ARF) notifications across the NT. With high rates of Group A Streptococcus circulating in the NT, clinicians should be on heightened alert and encourage actions to reduce GAS transmission and related conditions. This includes promoting hand washing, increased skin hygiene and prompt treatment for sore throats ('strep throat'), skin infections, and scabies and supporting and promoting those on

secondary prophylaxis to prevent ARF to be timely and consistent with their preventive treatment. Read the [full alert](#) issued 31 May 2022.

## Paediatric hepatitis of unknown aetiology

An increase in cases of acute, severe hepatitis of unknown aetiology has been reported in children 16 years and under in many countries. Most cases have been in children under 5 years. Between 5 April and 26 May 2022, there have been 650 probable cases reported from 33 countries. There has not been evidence of increased incidence of unexplained paediatric hepatitis in Australia.

Common infectious causes, viral hepatitis A, B, C, D and E have not been detected. It is suggested human adenovirus may be a causative pathogen, having been found in a high proportion of cases.

Hepatitis, 'not otherwise specified' is a notifiable condition to be reported in the NT. Read the [full alert](#) issued 27 June 2022.

[Top of the Document](#)

## Japanese encephalitis virus (JEV)

Media Release



NT Health

### Japanese encephalitis risk in the NT

7 April 2022

NT Health is urging Territorians to stay vigilant and take precautions against mosquito bites after evidence of the Japanese encephalitis virus (JE) was detected in a small number of feral pigs in the West Daly region.

Since the first fatal JE case occurred in early 2021 on the Tiwi Islands, there have been no further cases in people in the Northern Territory. However, recently JE has been confirmed in multiple people interstate, including in New South Wales, Queensland, South Australia and Victoria, as well as at a number of piggeries.

Nina Kurucz, Director of the Medical Entomology Unit, NT Health, said JE is a serious disease spread by mosquitoes that can infect humans and animals, such as pigs, some birds and horses.

“JE cannot be transmitted from human to human, or by eating meat from an infected animal,” Ms Kurucz said.

“JE infection in humans is most commonly asymptomatic but, on rare occasions, it can result in severe disease and even death. Symptoms can include fever, headache, neck stiffness, vomiting, confusion, seizures and paralysis.

“People who believe they may be infected with the JE virus should seek urgent medical assistance.”

In response to recent cases interstate, JE surveillance has increased in the NT, expanding on an ongoing program which commenced following the fatal case recorded in the Territory last year.

To date, all mosquito samples tested in NT have been negative for JE.

The NT Chief Veterinary Officer, Dr Sue Fitzpatrick, said that as the Territory has no commercial piggeries, free, voluntary testing is being undertaken on domestic pigs registered through the property identification code (PIC) system by staff from the Department of Industry, Tourism and Trade (DITT).

“Pig owners are asked to be highly vigilant for signs of this disease and report unexplained pig miscarriages or stillbirths or neurological signs in young piglets. Horse owners are also asked to report any cases of neurological signs to their local vet for investigation, and hunters should be on alert for signs of JE in feral pigs,” Dr Fitzpatrick said.

“DITT is working with landholders who have had JE detected in feral pigs on their property.

“JE is a notifiable disease. This means animal owners and hunters should report suspicious or unusual signs in animals to the Emergency Animal Disease Watch hotline on 1800 675 888.”

Samples are also being taken from feral pigs in partnership with the Australian Government’s Northern Australia Quarantine Strategy staff.

While there is no specific treatment for JE, a vaccine is available. It is important to take steps to avoid mosquito bites, such as:

- Wear protective light-coloured clothing with long sleeves, long trousers and socks in areas where mosquito bites are likely;
- Avoid outdoor exposure near wetlands and flooded areas, especially after sundown;
- Use a protective repellent containing DEET, picaridin or oil of lemon eucalypt (PMD) and other mosquito protection devices;
- Ensure infants and children are adequately protected against mosquito bites;
- Consider insecticide barrier treatments by pest control companies for use around residential grounds;
- Ensure windows and doors have screens to prevent mosquitoes from entering houses.

More information about JE and the current outbreak is available on the Australian Government Department of Health [website](#).

Further details about JE in animals, including signs of the disease, are available online at: [nt.gov.au/japanese-encephalitis](http://nt.gov.au/japanese-encephalitis)

Media Contacts:

Russel Guse 0436 933 810 (NT Health)

Jessica Tapp 0409 640 859 (DITT)

# Influenza Alert Update for NT



NT HEALTH

Centre for Disease Control  
Ground Floor, Block 4 Royal Darwin Hospital  
Rocklands Drive, Tiwi NT 0810

Postal address  
GPO Box 40596  
Casuarina, NT, 0811

E [CDCSurveillance.DARWIN@nt.gov.au](mailto:CDCSurveillance.DARWIN@nt.gov.au)

T 08 8922 8044

File reference  
EDOC2022/252629

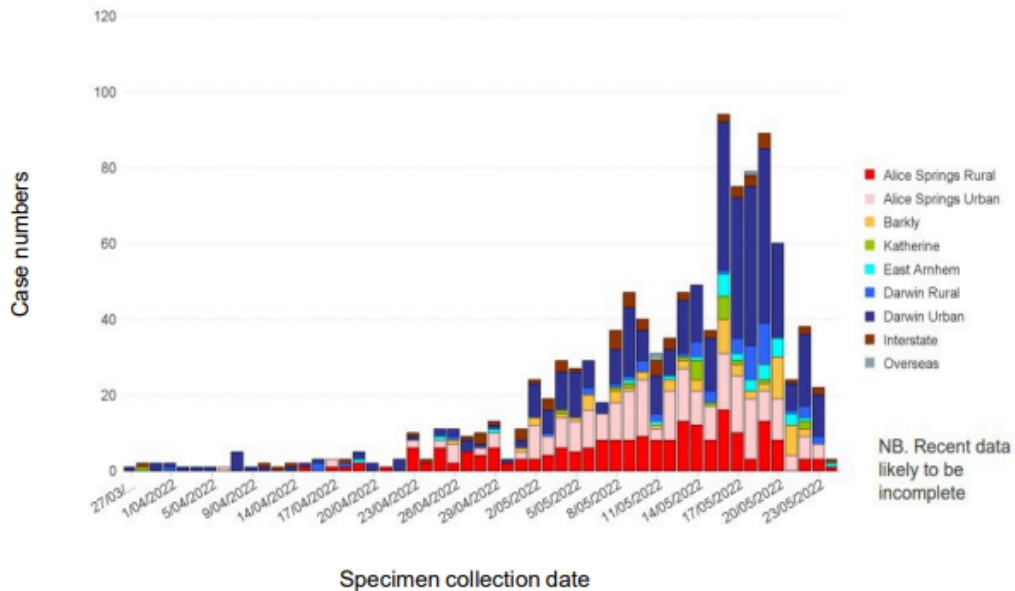
27 May 2022

Dear Colleague,

## Influenza Alert Update for NT

Influenza (flu) continues to spread throughout the Northern Territory (NT). This is the first time significant numbers of laboratory-confirmed cases have been notified since early 2020. There have been 1090 laboratory-confirmed cases notified since the end of March compared to 76 for the whole of 2021. The majority of cases have been in Alice Springs, Central Australia and Darwin. There remains a higher proportion of cases among Indigenous people compared to non-Indigenous people in all regions except Darwin. It seems to be mainly affecting middle-aged adults and is a mixture of H1N1 and H3N2.

### Influenza cases in the NT by region and specimen date



The 2022 flu season has the potential to be severe, with respect to both spread and severity. Due to historically low numbers in recent years there is likely to be low levels of herd immunity among

the NT population. It is important to be alert for cases of influenza in your community and to promote vaccination.

Further national surveillance information is available [here](#).

### The strategy for flu control - Vaccinate. Test. Treat. Prevent.

- **Vaccinate** everyone over 6 months, but in particular those eligible for free vaccine as they are at higher risk. This year's flu vaccine is now available. See [here](#) for more information.
- **Test** cases of influenza-like illness (ILI) for flu and COVID. Please request influenza *and* COVID PCR tests on lab pathology if point of care testing is not available for both. ILI is defined as an acute respiratory illness with symptoms including fever and cough.
- **Treat** suspected flu cases with antivirals for flu if they are high risk, moderately unwell or deteriorating.
- **Prevent spread** by promoting the use of masks in symptomatic people and using personal protective equipment (PPE). Isolate cases and promote hand hygiene, social distancing and cough etiquette.

### Vaccinate

Influenza vaccine is now available and **can be given at the same time**, or any time before or after, any of the COVID-19 vaccines.

#### Who is eligible for the funded influenza vaccine?

- Adults ≥ 65 years of age.
- All children aged 6 months to less than 5 years.
- Aboriginal people aged 6 months and over.
- All people aged 6 months and over with a medical condition increasing the risk of severe influenza and its complications. See [here](#) for a list of medical conditions.
- Pregnant women in all trimesters.

Quadrivalent Influenza Vaccine 2022	
Age	Vaccine Brand
6 months to 64 years of age	Fluarix Tetra® 0.5ml or Vaxigrip® Tetra 0.5ml
65 years and older	Fluad® Quad 0.5ml

### Test

Test all patients presenting with Influenza-like illness (ILI) for influenza and COVID. ILI is considered an acute respiratory infection with measured fever of  $\geq 38C^{\circ}$ , **and** cough or sore throat **and** onset within the last 10 days.

Send a viral PCR for COVID and Influenza to the lab if not available at point of care. Follow the current advice regarding testing for other respiratory illnesses.

## Treat

Antivirals such as oseltamivir (Tamiflu®) reduce morbidity and symptoms, and are indicated for people with influenza-like illness who might have flu based on clinical or epidemiological grounds. **It is particularly important to administer oseltamivir in those at high risk of complications/severe disease from influenza and those who have high-risk contacts.**

### High Risk patients include:

- Persons aged ≥65 years of age
- Pregnant women
- Neonates with moderate or severe malnutrition
- Aboriginal or Torres Strait Islander people over 6 months
- People with other pre-disposing conditions such as:
  - Cardiac disease (excluding simple Hypertension)
  - Chronic respiratory conditions
  - Diabetes mellitus
  - Chronic metabolic diseases
  - Chronic renal or liver disease
  - Haemoglobinopathies
  - Down syndrome
  - Immunosuppression (including, cancers, HIV infection, immunosuppressive drugs)
  - Chronic neurological conditions
  - Children aged 6 months to 10 years on long term aspirin therapy
  - Children with failure to thrive
  - Obesity
  - Homelessness

### When to give oseltamivir:

- Give in all patients with moderate to severe ILI/confirmed influenza as soon as possible following the onset of symptoms.
- It is not necessary to obtain laboratory confirmation of influenza before commencing oseltamivir when flu is highly suspected.
- All patients requiring hospital admission should be given oseltamivir regardless of how long they have had symptoms.
- If patients are being transferred to hospital, oseltamivir should be given prior to transfer, if possible.
- Oseltamivir should be considered for adults and children with ILI/confirmed influenza who are in close contact with high risk individuals as it may reduce viral shedding and disease transmission.

### Who should NOT receive oseltamivir:

- Anyone with a known allergy to oseltamivir or any of its ingredients.

Information regarding side effects and dosage can be found on the oseltamivir factsheet [here](#). Dosing for children <12 months of age may require discussion with a paediatrician, and dosing for those with severe renal impairment (GFR<10ml/min or on dialysis) should be discussed with a renal specialist.

### Prevention and length of infectiousness

All respiratory infections are contagious and have the potential to cause serious illness, particularly in the vulnerable. **Adults are infectious for up to 24 hours prior to the onset of flu symptoms.**

Patients are considered no longer infectious if 24 hours have elapsed since the resolution of fever, provided either:

- They have received **3 days of anti-influenza medication** OR
- **5 days have elapsed since onset of respiratory symptoms**

Immunosuppressed individuals may shed the virus for longer periods. The ability to transmit the virus is higher when cough and fever are present.

#### **Recommendation:**

**Any person who has acute respiratory symptoms should not attend childcare, school or work, and should wear a surgical mask in the public setting.**

When attending a health care facility individuals with possible influenza should be seated at least 1.5 metres away from other patients, or preferably in a separate area from other patients. Health staff consulting patients with possible ILI should wear an N95 mask, gloves, gown and eye protection, and perform hand hygiene prior to and following each patient care encounter.

Please contact your regional NT Centre for Disease Control for further advice.

Yours sincerely,

Dr Vicki Krause

Director Centre for Disease Control – Environmental Health

Darwin	89228044	Katherine	89739041	Nhulunbuy	89870357
Tennant Creek	89324259	Alice Springs	89517540		

# Monkeypox



NT HEALTH

Centre for Disease Control  
Ground Floor, Block 4 Royal Darwin Hospital  
Rocklands Drive, Tiwi NT 0810

Postal address  
GPO Box 40596  
Casuarina, NT, 0811

[ECDCSurveillance.DARWIN@nt.gov.au](mailto:ECDCSurveillance.DARWIN@nt.gov.au)

T 08 8922 8044

File reference  
EDOC2022/236599

20 May 2022

## Health Alert: Monkeypox

Two probable cases of monkeypox have been identified in Australia (New South Wales and Victoria) in returned travellers in the past week. There are 15 confirmed cases detected in other non-endemic countries (countries outside of Africa), including the United Kingdom, Portugal and the USA, with a further 38 cases suspected in Spain, Portugal and Canada. Most cases have been identified in those identifying as gay, bisexual or men who have sex with men.

**If clinicians do suspect monkeypox they need to discuss the case with the Infectious Diseases Physician on-call who will involve the Territory Pathology specialist for testing requirements.**

**Isolate the patient and ask them to wear a surgical mask while discussing the case.**

### Monkeypox

Monkeypox is a viral zoonotic disease which is transmitted to humans through close contact with an infected animal (most common), person or contaminated materials. The monkeypox virus is related to smallpox, however is less contagious and causes less severe disease. It usually occurs in West and Central Africa and detection can follow in people returning from these countries. Local transmission has been observed in the current cases in non-endemic countries.

Human to human transmission can occur through direct mucosal or skin contact with lesion material or via respiratory droplets, and can be passed on by direct contact during sexual activity or contact with clothing and linen used by an infected person.

### Symptoms

Clinical symptoms of monkeypox include:

- fever
- malaise
- chills
- body aches
- headache
- lymphadenopathy (usually prominent)
- rash – starting as a macular rash which is often first noticed in the mouth before spreading to the face, arms and legs. The rash typically develops through papular, vesicular, pustular and crust phases before sloughing off and leaving scars.

The disease is usually self-limiting with symptoms lasting for 2-4 weeks. Occasionally severe cases can occur with a case fatality ratio of 3-6%. The incubation period after exposure to the virus varies between 6-13 days up to 21 days.

### Recommendations

**Clinicians are asked to look out for signs and symptoms of monkeypox, especially in returned travellers, or contacts of returned travellers and those with a clinically compatible rash.**

**Sexual Health clinicians need to be particularly alert for the disease, as presentations currently have been picked up in these settings elsewhere.**

**Clinicians should implement standard contact and droplet precautions if monkeypox is suspected. Contact the infectious diseases physician on-call via Royal Darwin Hospital switchboard to discuss the case before collecting specimens.**

### Treatment

There is no specific treatment available for monkeypox infection.

Thank you for being alert to possible cases of monkeypox in your practice.

Yours sincerely,

Dr Vicki Krause  
Director Centre for Disease Control – Environmental Health

#### Centre for Disease Control (CDC) phone numbers:

Darwin	8922 8044
Katherine	8973 9049
Nhulunbuy	8987 0357
Tennant Creek	8962 4259
Alice Springs	8951 7540

NT Infectious Disease Specialist is available through the Royal Darwin Hospital switchboard on 8922 8888

## NT Health Fact sheet

# Japanese Encephalitis

## What is Japanese Encephalitis?

Japanese encephalitis (JE) is a vaccine preventable disease caused by the JE virus. The disease presents most commonly as an acute encephalitis which is inflammation of the brain tissue.

## How is it spread?

The JE virus is spread by the bite of an infected mosquito. It cannot be spread from person to person.

Pigs and wild water birds such as herons and egrets play an important role in the spread of JE virus. The virus multiplies in infected pigs, leading to very high levels in their blood. Mosquitoes feeding on infected pigs or water birds are highly likely to pick up the virus and may then spread it to humans.

## Where and when is the virus found?

JE virus is widespread throughout Asia.

In 1995 the first human case of JE in Australia was reported from Badu Island in the Torres Strait, with a few further cases reported since from the Torres Strait and one from the mainland on Cape York.

The first case of JE in the Northern Territory (NT) occurred on the Tiwi Islands in February 2021 and an outbreak of JE was detected in Australia's eastern states in early 2022. JE was declared a Communicable Disease Incidence of National Significance on 4 March 2022 with an undertaking to better understand the extent of JE virus in Australia and to put control measures in place including a vaccination roll out starting with those individuals determined to be most at risk.

The risk to humans is greatest during or just after the wet season when large numbers of the common banded mosquito are present. Humid conditions allow mosquitoes to live longer, which provides more chance for a mosquito to pick up the virus from an animal and live long enough to pass it on to humans. Currently, the risk in the NT is considered high in areas close to wetlands where mosquitoes, water birds and feral pigs are present and there is significant exposure to mosquitoes. In 2022, the JE virus has been found in feral pigs across the Top End of the NT, with the mosquitoes capable of spreading the virus also widespread.

## How serious is Japanese Encephalitis?

JE is a potentially fatal disease, however it is estimated that only 1 in 30-300 people bitten by an infected mosquito will become ill. Of people who develop the disease, 10 to 30% will die, up to 50% will recover but have permanent disability and about 25% will recover completely. Disease occurs in all age groups, however JE vaccines offer robust protection.

## What are the symptoms?

It usually takes five to 15 days between getting bitten and becoming unwell. Symptoms include; headaches, fever, seizures or fits (especially in young children), neck stiffness, drowsiness, confusion and progression to delirium and coma in severe cases.

## What is the treatment?

There is no specific treatment for JE disease.

## How can Japanese Encephalitis be prevented?

There are two ways to prevent JE:

1. Vaccination
2. Avoid being bitten by mosquitoes using personal protective measures - protection against mosquito bites is always recommended in the NT to guard against any mosquito borne disease. It is always important to ensure children are protected from mosquito bites.

### Vaccination

A JE vaccine is available and is recommended for:

- travellers spending one month or more in rural areas of Papua New Guinea, East Timor or Asia, particularly if travel is during the wet season, and/or there is considerable outdoor activity and/or the standard of accommodation is suboptimal
- travellers spending a year or more in Asia (except Singapore), even if most of the stay is in urban areas
- all residents (over one year of age) of the outer islands in the Torres Strait
- anyone who will be living or working on the outer islands of the Torres Strait for a cumulative total of 30 days or more during the wet season (Nov to April)
- NT residents or visitors according to the risk-based NT JE Vaccination Strategy, targeting those in particular occupational groups or visiting/residing in areas of greatest risk

Read more about [JE vaccines](#) on the Australian Government's health website.

### Personal protective measures

- Avoid being outside when mosquitoes are most active, from just before sunset, during the night and early in the morning.
- Avoid areas with numerous mosquitoes in close proximity to wetlands, especially where birds and feral pigs might be present.
- Use protective clothing in outdoor situations including covering feet, legs, and arms. Loose, light-colored clothing is best.
- Use personal repellents containing DEET, picaridin or oil of lemon eucalypt (PMD) on areas of exposed skin in combination with protective clothing.
- Use mosquito coils, or candle heated or gas operated devices using insecticide treated pads for patio and veranda or relatively sheltered or low wind outdoor situations.
- Ensure fly-screens in houses or caravans are in good condition.
- If camping out, either sleep in a mosquito-proof tent or under a mosquito net. Repellents only protect against mosquito bites for up to 4 hours, not all night.

For more information on protection measures see [Protecting yourself against mosquitoes](#)

For more information on mosquitoes and virus ecology contact [Medical Entomology at the Centre for Disease Control](#) on 8922 8901.

## Northern Territory disease notifications by onset date and district – 1 January to 31 March, 1<sup>st</sup> quarter, (2021 and 2022)

	Alice Springs		Barkly		Darwin		East Arnhem		Katherine		N T	
	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021
Acute Post Strep GN	3	4	0	1	2	2	0	0	0	0	5	7
Adv Vacc Reaction	28	22	6	0	152	76	5	6	9	4	200	108
Campylobacteriosis	9	14	0	4	81	61	0	8	7	7	97	94
Chickenpox	1	1	0	0	12	6	0	1	1	0	14	8
Chlamydia	180	222	20	15	278	332	25	47	53	69	556	685
Chlamydial conj	0	2	0	1	1	10	0	0	1	2	2	15
Coronavirus (COVID-19)	1,772	0	224	0	9,683	74	186	0	575	0	12,440	74
Crusted scabies	1	6	0	3	12	10	4	6	2	3	19	28
Cryptosporidiosis	11	1	1	1	4	52	1	1	2	2	19	57
Gastro - related cases	0	0	0	0	0	2	0	0	0	0	0	2
Gonococcal infection	190	207	24	8	135	121	11	16	46	58	406	410
Group A strep invasive	4	10	1	1	9	3	1	1	3	3	18	18
Hepatitis B - chronic	1	0	1	0	4	1	0	1	0	0	6	2
Hepatitis B - unspec	0	2	1	0	3	4	0	0	0	0	4	6
Hepatitis C - unspec	5	2	0	2	14	21	2	0	1	0	22	25
H Influenzae b	1	0	0	0	0	1	0	0	0	0	1	1
H Influenzae non-b	1	1	1	1	2	0	0	0	0	0	4	2
HIV	0	1	0	0	3	2	0	1	0	0	3	4
HTLV1 asyptom/unspec	15	13	0	1	2	1	0	0	0	3	17	18
HTLV1 TSP	0	1	0	0	0	0	0	0	0	0	0	1
Influenza	0	0	0	0	5	7	0	0	1	0	6	7
Japanese Encephalitis	0	0	0	0	0	1	0	0	0	0	0	1
Lead - elevated	0	0	0	0	85	62	1	14	0	0	86	76
Legionellosis	0	1	0	1	1	3	0	0	0	1	1	6
Leprosy	0	0	0	0	0	1	0	0	0	0	0	1
Leptospirosis	0	0	0	0	5	13	0	0	0	1	5	14
LGV	0	0	0	0	0	1	0	0	0	0	0	1
Listeriosis	0	0	0	0	0	0	0	0	1	0	1	0
Melioidosis	1	0	0	0	28	13	5	0	2	1	36	14
Meningococcal infection	2	0	0	0	0	0	0	0	0	0	2	0
Mumps	0	0	0	0	0	0	0	1	0	0	0	1
Non TB Mycobacteria	0	0	0	0	3	5	0	0	0	0	3	5
Pertussis	1	0	0	0	0	3	0	0	0	0	1	3
Pneumococcal disease	1	5	0	0	5	4	0	1	0	2	6	12
Rheumatic Fever	16	32	8	0	10	17	5	10	10	5	49	64
Rheumatic heart disease	5	12	1	1	7	10	2	6	4	9	19	38
Ross River Virus	5	1	7	0	25	28	0	13	5	4	42	46
Rotavirus	2	2	0	0	3	2	0	0	0	0	5	4
RSV infection	0	0	0	0	5	0	0	0	1	0	6	0
Salmonellosis	9	13	3	8	79	84	5	4	7	11	103	120
Shigellosis	7	11	1	1	13	14	4	10	0	6	25	42
STEC/VTEC	0	1	0	0	0	0	0	0	0	0	0	1
Syphilis < 2y duration	32	31	4	2	11	11	2	6	2	7	51	57
Syphilis > 2y or unk duration	1	2	2	1	7	4	0	0	1	2	11	9

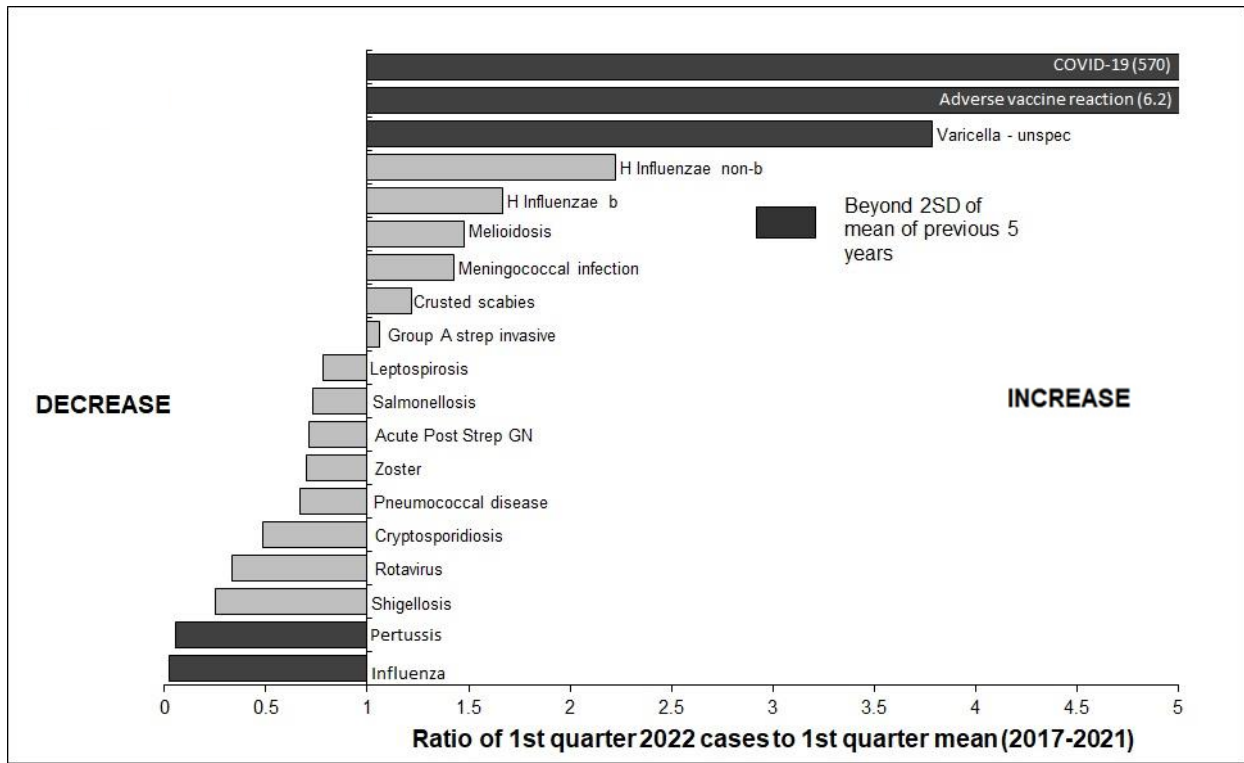
	Alice Springs		Barkly		Darwin		East Arnhem		Katherine		NT	
	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021
Syphilis congenital	1	0	0	0	0	0	0	0	0	0	1	0
Trichomoniasis	160	216	40	37	190	236	37	80	71	77	498	646
Tuberculosis	0	1	0	0	6	8	0	0	2	1	8	10
Varicella - unspec	2	0	0	0	24	23	1	0	1	0	28	23
Vibrio food poisoning	0	0	0	0	1	0	0	0	0	0	1	0
Vibrio invasive	0	0	0	0	1	0	0	0	0	0	1	0
Yersiniosis	0	0	0	0	4	0	0	0	2	0	6	0
Zoster	4	18	0	6	61	67	7	3	7	4	79	98
<b>Sum:</b>	<b>2,471</b>	<b>855</b>	<b>345</b>	<b>95</b>	<b>10,976</b>	<b>1,396</b>	<b>304</b>	<b>236</b>	<b>817</b>	<b>282</b>	<b>14,913</b>	<b>2,864</b>

There were no malaria or dengue notifications for this reporting period.

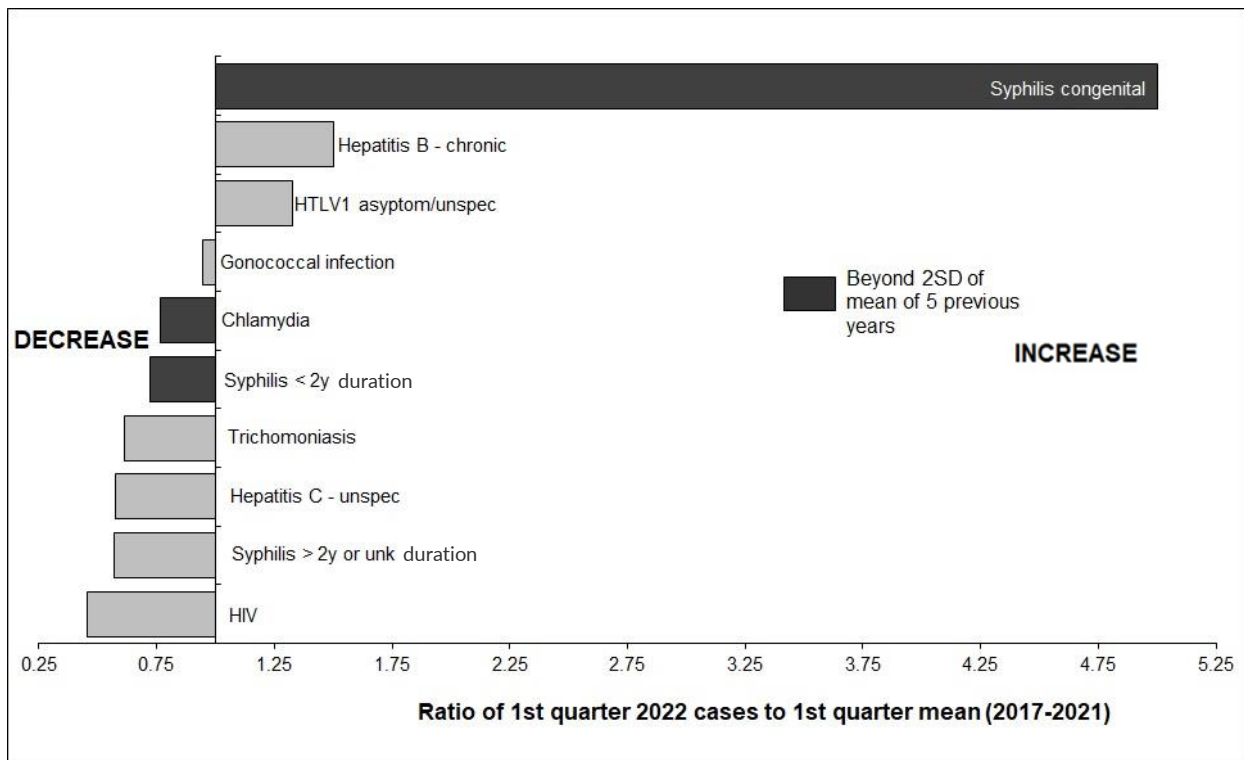
[Top of the Document](#)

## Graphs of selected diseases and STIs – 1<sup>st</sup> quarter, 2022

Ratio of the number of notifications in 1<sup>st</sup> quarter of 2022 to the 1<sup>st</sup> quarter, 5 year mean (2017 – 2021):  
Selected diseases



Ratio of the number of notifications in 1<sup>st</sup> quarter of 2022 to the 1<sup>st</sup> quarter, 5 year mean (2017 – 2021):  
Sexually transmitted infections (STIs)



## Comments on selected disease notifications 1<sup>st</sup> quarter 2022

### COVID-19

There were 12,440 confirmed cases of COVID-19 notified in the 1<sup>st</sup> quarter of 2022 compared to the 5 year 1<sup>st</sup> quarter mean of 21.8 cases. There was a surge in COVID-19 cases in early 2022 following the lifting of travel and quarantine restrictions which began on 21 December 2021. COVID-19 was only gazetted as a notifiable condition in the NT in 2020.

### Adverse vaccine reaction

There were 200 adverse vaccine reactions notified in the 1<sup>st</sup> quarter of 2022 compared to the 5 year 1<sup>st</sup> quarter mean of 32.2 cases. This is due to the increased number of COVID-19 vaccinations administered, and the high ascertainment of adverse vaccination reactions pertaining to this vaccine.

### Varicella – unspecified

There were 28 notifications of varicella (unspecified) in the 1<sup>st</sup> quarter of 2022 compared to the 5 year 1<sup>st</sup> quarter mean of 7.4 notifications. This was due to a change in the public health response to notifications of varicella – previously, vigorous public health investigation was undertaken to determine whether the varicella infection was classified as chickenpox or shingles. The public health response is no longer as comprehensive.

### Pertussis

There was only 1 case of pertussis compared to the 1<sup>st</sup> quarter 5 year mean of 18.8 cases.

### Influenza

There were only 6 cases of influenza in the 1<sup>st</sup> quarter of 2022 compared to the 1<sup>st</sup> quarter 5 year mean of 231 cases.

### Congenital syphilis

There was a case of congenital syphilis in the 1<sup>st</sup> quarter of 2022 – the 5 year 1<sup>st</sup> quarter mean is 0.2 cases. The last case of congenital syphilis was notified in 2020.

### Chlamydia

There were 556 notifications of chlamydia in the 1<sup>st</sup> quarter of 2022 compared to a 5 year 1<sup>st</sup> quarter mean of 727 cases. This corresponded with a decrease in STI testing rates which was observed during the quarter.

### Syphilis <2y duration

There were 51 notifications of syphilis <2y duration in the 1<sup>st</sup> quarter of 2022 compared to a 5 year 1<sup>st</sup> quarter mean of 70.6 cases (72% decrease). This corresponded with a decrease in STI testing rates which was observed during the quarter.

[Top of the Document](#)

## Abstracts from peer reviewed published articles related to the Northern Territory

### Immunogenicity, otitis media, hearing impairment, and nasopharyngeal carriage 6-months after 13-valent or ten-valent booster pneumococcal conjugate vaccines, stratified by mixed priming schedules: PREVIX\_COMBO and PREVIX\_BOOST randomised controlled trials

Leach AJ, Wilson N, Arrowsmith B, Beissbarth J, Mulholland EK, Santosham M, Torzillo PJ, McIntyre P, Smith-Vaughan H, Chatfield MD, Lehmann D, Binks M, Chang AB, Carapetis J, Krause V, Andrews R, Snelling T, Skull SA, Licciardi PV, Oguoma VM, Morris PS

*The Lancet Infectious Diseases*. 2022;Volume 22: Issue 9, 1374 – 1387

[https://doi.org/10.1016/S1473-3099\(22\)00272-9](https://doi.org/10.1016/S1473-3099(22)00272-9)

**Background:** Australian First Nations children are at very high risk of early, recurrent, and persistent bacterial otitis media and respiratory tract infection. With the PREVIX randomised controlled trials, we aimed to evaluate the immunogenicity of novel pneumococcal conjugate vaccine (PCV) schedules.

**Methods:** PREVIX\_BOOST was a parallel, open-label, outcome-assessor-blinded, randomised controlled trial. Aboriginal children living in remote communities of the Northern Territory of Australia were eligible if they had previously completed the three-arm PREVIX\_COMBO randomised controlled trial of the following vaccine schedules: three doses of a 13-valent PCV (PCV13; PPP) or a ten-valent pneumococcal Haemophilus influenzae protein D conjugate

vaccine (PHiD-CV10; SSS) given at 2, 4, and 6 months, or SSS given at 1, 2, and 4 months followed by PCV13 at 6 months (SSSP). At age 12 months, eligible children were randomly assigned by a computer-generated random sequence (1:1, stratified by primary group allocation) to receive either a PCV13 booster or a PHiD-CV10 booster. Analyses used intention-to-treat principles. Co-primary outcomes were immunogenicity against protein D and serotypes 3, 6A, and 19A. Immunogenicity measures were geometric mean concentrations (GMC) and proportion of children with IgG concentrations of 0.35 µg/mL or higher (threshold for invasive pneumococcal disease), and GMCs and proportion of children with antibody levels of 100 EU/mL or higher against protein D. Standardised assessments of otitis media, hearing impairment, nasopharyngeal carriage, and developmental outcomes are reported. These trials are registered with ClinicalTrials.gov (NCT01735084 and NCT01174849).

**Findings:** Between April 10, 2013, and Sept 4, 2018, 261 children were randomly allocated to receive a PCV13 booster (n=131) or PHiD-CV10 booster (n=130). Adequate serum samples for pneumococcal serology were obtained from 127 (95%) children in the PCV13 booster group and 126 (97%) in the PHiD-CV10 booster group; for protein D, adequate samples were obtained from 126 (96%) children in the PCV13 booster group and 123 (95%) in the PHiD-CV10 booster group. The proportions of children with IgG concentrations above standard thresholds in PCV13 booster versus PHiD-CV10 booster groups were the following: 71 (56%) of 126 versus 81 (66%) of 123 against protein D (difference 10%, 95% CI -2 to 22), 85 (67%) of 127 versus 59 (47%) of 126 against serotype 3 (-20%, -32 to -8), 119 (94%) of 127 versus 91 (72%) of 126 against

serotype 6A (-22%, -31 to -13), and 116 (91%) of 127 versus 108 (86%) of 126 against serotype 19A (-5%, -13 to 3). Infant PCV13 priming mitigated differences between PCV13 and PHiD-CV10 boosters. In both groups, we observed a high prevalence of otitis media (about 90%), hearing impairment (about 75%), nasopharyngeal carriage of pneumococcus (about 66%), and non-typeable H influenzae (about 57%). Of 66 serious adverse events, none were vaccine related.

**Interpretation:** Low antibody concentrations 6 months post-booster might indicate increased risk of pneumococcal infection. The preferred booster was PCV13 if priming did not have PCV13, otherwise either PCV13 or PHiD-CV10 boosters provided similar immunogenicity. Mixed schedules offer flexibility to regional priorities. Non-PCV13 serotypes and non-typeable H influenzae continue to cause substantial disease and disability in Australian First Nation's children.

**Funding:** National Health and Medical Research Council (NHMRC)

### Larval habitats of *Culicoides ornatus* Taylor, 1913 (Diptera: Ceratopogonidae) within the mangroves of Darwin Harbour in the wet-dry tropics of northern Australia

Shivas M A, Bellis G A, Gopurenko, D, Webb C, Whelan, P I

*Austral Entomology*. 2022; 61: 209- 224

<https://doi.org/10.1111/aen.12590>

Larval habitats of the pest biting midge *Culicoides ornatus* were identified and characterised in a macrotidal mangrove creek system in Darwin Harbour in the wet-dry tropics of northern Australia. Sampling was undertaken during the mid to late dry season using submersible emergence traps to indicate larval activity. Substantial emergence was found in two well separated and distinctly different habitats: open creekbanks

covered in *Avicennia marina* (Grey Mangrove) pneumatophores in the upper reaches of small tidal creeks and broad relatively flat areas dominated by *Sonneratia alba* (Mangrove Apple) at the mouth of the creek system. Intervening areas along creeklines were lined by *Camptostemon schultzei* (Kapok Mangrove) and did not support emergence activity. Adults emerging from each habitat were conspecific, based on comparison of mitochondrial COI gene sequences and a range of morphological characters. Nine different haplotypes were identified from 26 adults, with four haplotypes common to both habitats.

Neighbour-joining analysis resolved all the haplotypes as a single highly supported clade with an average sequence difference of 1.6%. Features common to the two habitats included occurrence in sheltered mangrove-lined estuaries; occurrence in soft, fine, silt mud; presence of mangrove pneumatophores; and an open vegetation structure providing partial shade.

Dense vegetation appeared to be a limiting factor. The tidal creek habitat was similar to *C. ornatus* habitats previously described from the east coast of Australia, but neither the *Sonneratia* zone nor other habitats at such a low tidal elevation have been previously associated with *C. ornatus*. This is the first detailed account of the larval biology of this important mangrove breeding pest species. The identification of likely *C. ornatus* breeding sites in Darwin Harbour and other similar ria coastlines of northern Australia should be possible from aerial photographs using the habitat descriptions presented in this paper.

### Neurosyphilis in the Northern Territory of Australia: a clinical guideline

Birrell JM, Lowe M, Gunathilake M, Krause VL

*Internal Medicine Journal*. 2022.

<https://doi.org/10.1111/imj.15691>

**Background:** The Northern Territory (NT) of Australia is currently experiencing a syphilis epidemic. Neurosyphilis is commonly considered in the differential diagnosis for patients presenting with neurologic conditions such as dementia and stroke in the NT.

**Aims:** To explore the local epidemiologic, diagnostic and treatment complexities of neurosyphilis in the NT and produce a guideline for clinical practice.

**Methods:** A database search was undertaken and local and global neurosyphilis guidelines were analysed. A guideline was created based on findings of the critical review and consultation with local multidisciplinary experts.

**Results:** Neurosyphilis is frequently encountered in the NT but studies suggest it is often undertreated. Dementia is the most common clinical presentation locally. Establishing a diagnosis of neurosyphilis is complex and requires stepwise evaluation of clinical, laboratory and radiological findings.

**Conclusions:** A clinical guideline and algorithm have been developed for the diagnosis and management of patients with neurosyphilis.

### A call to action: time to recognize melioidosis as a neglected tropical disease

Savelkoel J, Dance DAB, Currie BJ, Limmathurotsakul D, Wiersinga WJ

*Lancet Infect Dis* 2022;22(6):e176-e182.

[https://doi.org/10.1016/s1473-3099\(21\)00394-7](https://doi.org/10.1016/s1473-3099(21)00394-7)

Melioidosis is a tropical infection caused by the soil bacterium *Burkholderia pseudomallei*. Despite the substantial impact of this often overlooked pathogen on both the health-care systems and economies of numerous low-income and middle-income countries around the world, melioidosis is

not officially classified as a neglected tropical disease (NTD) by WHO. Melioidosis causes a higher estimated disease burden and mortality than many other recognised NTDs, with deaths primarily occurring among rural poor populations in low-income and middle-income countries. Fortunately, the impact of melioidosis in a region can be reduced once awareness is established of its known or suspected endemicity. In this Personal View, we provide evidence in support of official recognition of melioidosis as an NTD. We urge member states to request that WHO revisit their NTD list and appeal to government and philanthropic organisations to establish programmes in endemic countries to control melioidosis in order to reduce its global health burden.

### An outbreak of leptospirosis associated with cattle workers during the wet season, in the Northern Territory of Australia, 2021

Brown DR, Peiris R, Waller C, Stedman EM, Fitzpatrick SE, Krause VL, Draper ADK

*Commun Dis Intell* (2018) 2022;46.

<https://doi.org/10.33321/cdi.2022.46.23>

An outbreak of leptospirosis occurred in the Top End of the Northern Territory, Australia, during the wet season in early 2021. There were 14 outbreak cases; most were male (12/14; 86%) and non-Indigenous (13/14; 93%) with a median age of 22 years (range 19–52 years). We conducted a descriptive case series to investigate the outbreak. We determined that the outbreak was most likely due to higher than usual rainfall in a workplace with exposure to cattle, heightened by wearing clothing and footwear which offered little protection, with limited use of personal protective equipment (PPE). Increased and ongoing education for cattle industry workers, and

promotion of the use of appropriate clothing and PPE, may minimise the risk of future outbreaks. Australia's national surveillance case definition for leptospirosis should be reviewed to incorporate the use of nucleic acid testing in the detection of leptospirosis.

**Keywords:** outbreak; leptospirosis; *Leptospira*; cattle; Northern Territory; rainfall

## Melioidosis in the remote Katherine region of northern Australia

*Hodgetts K, Kleinecke M, Woerle C, Kaestli M, Budd R, Webb J, Ward L, Mayo M, Currie BJ, Meumann EM*

*PLoS Negl Trop Dis* 2022;16(6):e0010486

<https://doi.org/10.1371/journal.pntd.0010486>

Melioidosis is endemic in the remote Katherine region of northern Australia. In a population with high rates of chronic disease, social inequities, and extreme remoteness, the impact of melioidosis is exacerbated by severe weather events and disproportionately affects First Nations Australians. All culture-confirmed melioidosis cases in the Katherine region of the Australian Top End between 1989-2021 were included in the study, and the clinical features and epidemiology were described. The diversity of *Burkholderia pseudomallei* strains in the region was investigated using genomic sequencing. From 1989-2021 there were 128 patients with melioidosis in the Katherine region. 96/128 (75%) patients were First Nations Australians, 72/128 (56%) were from a very remote region, 68/128 (53%) had diabetes, 57/128 (44%) had a history of hazardous alcohol consumption, and 11/128 (9%) died from melioidosis. There were 9 melioidosis cases attributable to the flooding of the Katherine River in January 1998; 7/9 flood-associated cases had cutaneous melioidosis, five of whom recalled an inoculating event injury sustained wading through flood waters or cleaning up after the flood. The 126 first-episode clinical *B. pseudomallei* isolates

that underwent genomic sequencing belonged to 107 different sequence types and were highly diverse, reflecting the vast geographic area of the study region. In conclusion, melioidosis in the Katherine region disproportionately affects First Nations Australians with risk factors and is exacerbated by severe weather events. Diabetes management, public health intervention for hazardous alcohol consumption, provision of housing to address homelessness, and patient education on melioidosis prevention in First Nations languages should be prioritised.

## Risk factors for TB in Australia and their association with delayed treatment completion

*Coorey NJ, Kensitt L, Davies J, Keller E, Sheel M, Chani K, Barry S, Boyd R, Denholm J, Watts K, Fox G, Lowbridge C, Perera R, Waring J, Marais B, Viney K*

*Int J Tuberc Lung Dis.* 2022;26(5):399-405.

<https://doi.org/10.5588%2Fijtld.21.0111>

**Background:** Australia has a low incidence of TB and has committed to eliminating the disease. Identification of risk factors associated with TB is critical to achieving this goal.

**Methods:** We undertook a prospective cohort study involving persons receiving TB treatment in four Australian jurisdictions. Risk factors and their association with delayed treatment completion (treatment delayed by at least 1 month) were analysed using univariate analyses and multivariate logistic regression.

**Results:** Baseline surveys were completed for 402 persons with TB. Most (86.1%) were born overseas. Exposure to a person with TB was reported by 19.4%. Diabetes mellitus (10.2%), homelessness (9.2%), cigarette smoking (8.7%), excess alcohol consumption (6.0%) and mental illness (6.2%) were other common risk factors. At follow-up, 24.8% of patients had delayed

treatment completion, which was associated with adverse events (34.1%, aOR 6.67, 95% CI 3.36–13.27), excess alcohol consumption (6.0%, aOR 21.94, 95% CI 6.03–79.85) and HIV co-infection (2.7%, aOR 8.10, 95% CI 1.16–56.60).

**Conclusions:** We identified risk factors for TB and their association with delayed treatment completion, not all of which are routinely collected for surveillance purposes. Recognition of these risk factors should facilitate patient-centred care and assist Australia in reaching TB elimination.

**Keywords:** tuberculosis, TB, risk factors, surveillance, Australia

### Nucleic Acid Preservation Card Surveillance Is Effective for Monitoring Arbovirus Transmission on Crocodile Farms and Provides a One Health Benefit to Northern Australia

*Kurucz N, McMahon JL, Warchot A, Hewitson G, Barcelon J, Moore F, Moran J, Harrison JJ, Colmant AMG, Staunton KM, Ritchie SA, Townsend M, Steiger DM, Hall RA, Isberg SR, Hall-Mendelin S*

*Viruses* 2022, 14(6)

<https://doi.org/10.3390/v14061342>

The Kunjin strain of West Nile virus (WNV<sub>KUN</sub>) is a mosquito-transmitted flavivirus that can infect farmed saltwater crocodiles in Australia and cause skin lesions that devalue the hides of harvested animals. We implemented a surveillance system using honey-baited nucleic acid preservation cards to monitor WNV<sub>KUN</sub> and another endemic flavivirus pathogen, Murray Valley encephalitis virus (MVEV), on crocodile farms in northern Australia. The traps were set between February 2018 and July 2020 on three crocodile farms in

Darwin (Northern Territory) and one in Cairns (North Queensland) at fortnightly intervals with reduced trapping during the winter months. WNV<sub>KUN</sub> RNA was detected on all three crocodile farms near Darwin, predominantly between March and May of each year. Two of the NT crocodile farms also yielded the detection of MVEV viral RNA sporadically spread between April and November in 2018 and 2020. In contrast, no viral RNA was detected on crocodile farms in Cairns during the entire trapping period. The detection of WNV<sub>KUN</sub> and MVEV transmission by FTA<sup>TM</sup> cards on farms in the Northern Territory generally correlated with the detection of their transmission to sentinel chicken flocks in nearby localities around Darwin as part of a separate public health surveillance program. While no isolates of WNV<sub>KUN</sub> or MVEV were obtained from mosquitoes collected on Darwin crocodile farms immediately following the FTA<sup>TM</sup> card detections, we did isolate another flavivirus, Kokobera virus (KOKV), from *Culex annulirostris* mosquitoes. Our studies support the use of the FTA<sup>TM</sup> card system as a sensitive and accurate method to monitor the transmission of WNV<sub>KUN</sub> and other arboviruses on crocodile farms to enable the timely implementation of mosquito control measures. Our detection of MVEV transmission and isolation of KOKV from mosquitoes also warrants further investigation of their potential role in causing diseases in crocodiles and highlights a “One Health” issue concerning arbovirus transmission to crocodile farm workers. In this context, the introduction of FTA<sup>TM</sup> cards onto crocodile farms appears to provide an additional surveillance tool to detect arbovirus transmission in the Darwin region, allowing for a more timely intervention of vector control by relevant authorities.

**Keywords:** mosquitoes; Kunjin virus; flaviviruses; surveillance; sentinel chickens; FTATM cards; virus isolation; saltwater crocodile

**Letter –  
Parathyroid hormone-independent  
hypercalcaemia secondary to  
granulomatous inflammation: could  
this be melioidosis?**

*Grace SG, Currie BJ, Kumar S*

*Intern Med J 2022;52:893-894.*

<https://doi.org/10.1111/imj.15776>

**No abstract – Letter to the Editor**

[Top of the Document](#)