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In this September 2025 issue of the *Northern Territory Disease Control Bulletin* acute post-streptococcal glomerulonephritis (APSGN) gets a 'look-in' with a descriptive analysis of the 408 APSGN cases notified in the Northern Territory (NT) in the years 2014 to 2023. An audit of the years 2022 and 2023 further looks at the accuracy and completion of data to assess adherence to public health guidelines with timely notification, data completeness and public health response accurateness being key.

This issue also highlights presentations by NT speakers at the 2025 Mosquito Control Association of Australia and Arbovirus Research in Australia Symposium held in Torquay, Victoria in August 2025. The talks included *Arthropod-borne diseases in the tropical north of Australia; the known unknowns bite back*, *Molecular detection of Japanese and Murray Valley encephalitis virus in NT mosquitoes, 2023/24 and 2024/25 Northern Territory seasons: Mosquito and Mosquito borne disease update* and *Battling the Dengue Mosquito: The fight for an Aedes aegypti-free Northern Territory.*

Public Health Alerts in July 2025 for health staff and the public raised awareness of the marked increase in influenza in Central Australia and the continued need to promote flu vaccines NT wide and also warned of a traveller with infectious measles passing through the NT and the need to ensure people are measles-immune.

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Contents

Audit of the public health response to acute post-streptococcal glomerulonephritis (APSGN) in the Northern Territory

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ABSTRACT

Introduction: *Acute post-streptococcal glomerulonephritis (APSGN) significantly impacts children, particularly in remote Northern Territory (NT). This audit evaluates the completeness and adherence of public health responses to APSGN cases against local NT guidelines.*

Methods: *A descriptive analysis of APSGN notifications from 2014 to 2023 using the NT Notifiable Diseases System (NTNDS) was conducted. Data from the REDCap database, an ancillary database for the NTNDS, for January 2022 to December 2023 were audited for accuracy and completeness, and to assess the adherence to the public health guidelines. Key metrics included timely notifications to the NT Centre for Disease Control (CDC), data completeness, and public health response accuracy.*

Results: *Between 2014 and 2023, APSGN cases increased overall and now show a consistently higher number of notifications ongoing annually and outbreaks are not as marked a feature. REDCap data mirrored NTNDS demographics, with 80% confirmed cases. However, only 60% of notifications were timely to the NT CDC, and 55% of public health actions were completed. Notable gaps included documentation inconsistencies and incomplete follow-ups.*

Conclusion: *This audit reveals significant trends in APSGN notifications, particularly how the disease disproportionately affects Aboriginal and Torres Strait Islander children and a sustained increase in cases is seen as opposed to periodic outbreaks. The audit has highlighted gaps in the current public health response, particularly around notification timeliness and documentation of contact tracing follow up. Recommendations include improving documentation, data collection processes and the data entry system to optimise response efforts. Addressing these issues is crucial for improving APSGN management and outcomes in at risk populations and will ensure accurate assessment of the impact of APSGN.*

Key words: *Streptococcus pyogenes, Group A Streptococcus, GAS, Strep A, acute post-streptococcal glomerulonephritis, APSGN, Aboriginal and Torres Strait Islander people*

INTRODUCTION

Acute post-streptococcal glomerulonephritis (APSGN) is an immune mediated condition of the kidneys characterised by glomerular inflammation and injury following a skin or throat infection with *Streptococcus pyogenes*, known as group *A Streptococcus* (GAS) historically but more recently referred to as Strep A. Globally, APSGN is the most common cause of acute nephritis in children with more than 95% of cases occurring in developing countries.[1]

The highest risk of disease occurs among children between the ages of 5–12 years and is seen in adults with chronic co-morbidities. In Australia APSGN disproportionately affects Aboriginal and Torres Strait Islander children and recent studies have shown that these children have the highest incidence of APSGN reported worldwide.[2-6]

The low incidence in non-Indigenous Australian children implies the presence of modifiable factors associated with socio-economic status, a trend which has also been seen in similar populations, such as Pacific Islander and Māori children. [2, 7, 8]

The epidemiology of APSGN in the Northern Territory (NT) has previously been well reported in the literature between 1991 to 2016, and demonstrates a cyclical pattern of outbreaks occurring every 5 years up to around 2005.[9,10] In the latter years, however, there have been higher numbers of APSGN occurring annually, with less outbreak years.[9] Annual incidence rates of APSGN during the period 2009 – 2016 were found to be exceedingly high at 124.0 cases/100,000 person-years in the under 15-year-old age group. Essentially, like the other sequelae from Strep A infections, rates of APSGN in the younger Aboriginal and Torres Strait Islander population in the NT have not declined over recent years and, if anything, are worsening in the paediatric population.[3, 9, 11]

Historically it was suggested that longer term kidney damage and eventually end-stage renal failure can occur because of APSGN.[12, 15] However, contemporary literature suggests that APSGN is a relatively benign disease, as most children who develop this condition generally have a complete clinical recovery and less than 1% of children will progress to end stage renal failure.[3, 16-18]

In low and middle-income countries, children may have a poorer prognosis and late renal complications such as hypertension, increasing proteinuria and renal insufficiency due to acute kidney injury and incomplete recovery. [14, 19, 20] In clinical practice, only a small proportion of people with APSGN will present with clinical features that require medical treatment, hence, only a minority of people with clinical APSGN are likely detected.[21]

As there is a high burden of disease from APSGN in Aboriginal and Torres Strait Islander peoples in the NT and measures can be taken to decrease transmission of Strep A, APSGN became a notifiable condition under the NT's *Notifiable Diseases Act* in 1991.

Currently cases are reported by medical practitioners, and through syndromic surveillance of emergency department presentations by the NT Centre for Disease Control (CDC). The data is routinely collected for monitoring, protecting, maintaining, and promoting public health. This includes the analysis and reporting of factors impacting on public health including chronic, acute, or emerging health conditions.

Public health action in the NT requires contact tracing of family, household, and other close contacts of all probable and confirmed cases.[22] Contacts receive screening for APSGN symptoms, symptoms of precursors for APSGN such a skin sores, scabies and sore throats, collection of pathology samples if applicable and the subsequent administration of prophylaxis treatment.[22]

The public health response and surveillance of APSGN is undertaken to prevent further cases of APSGN through the prevention of streptococcal infections, which is also beneficial in the prevention of invasive Strep A infections, acute rheumatic fever and rheumatic heart disease.[1] Public health officers located throughout the NT in various health regions (Darwin, Katherine, East Arnhem, Barkly and Alice Springs) oversee the public health follow-up based on the case's residential location. Contact management is typically conducted by the nearest primary healthcare clinic, that may be government-funded, privately run, or Aboriginal-community controlled health services (ACCHOs).

Strep A infections have long been associated with poor living conditions, overcrowding, limitations in hygiene and sanitation and poorer health literacy.

Until a vaccine is available for Strep A, these public health actions remain the most viable preventative measures against APSGN.[23, 24]

An audit of the public health response and collected information against the local public health guidelines for APSGN was requested by the Surveillance and Response team in the NT CDC, with the objectives to:

1. Assess the adherence of public health responses to APSGN cases with local guideline recommendations and targets between January 2022 and December 2023, and
2. Assess the completeness of public health responses to APSGN cases, including information collection and recording.

METHODS

Study Design

A brief descriptive analysis of APSGN notifications between 1991 and 2023 was conducted to understand trends in APSGN over time, with a more in-depth review of notifications between 2014 and 2023 performed to assess who the affected population currently is in the NT and give context for assessing current public health responses.

The completeness and adherence of public health responses for APSGN cases from January 2022 to December 2023 was assessed against the NT Health Public Health Management of APSGN guideline (2024) as the standard.

Of note, the adherence to clinical treatment of cases falls outside the scope of this audit. Key criteria for case and contact management are provided in Table 1.

Table 1. Key criteria for auditing case and contact management of APSGN within NT CDC

Audit area	Criteria to meet
Case management	
Timely notification to CDC	>90% of cases notified within 48 hours of diagnosis
Data completeness	≥95% of required fields completed in REDCap and NTNDS
Contact management	
Timely contact tracing	Contact tracing commenced within 2 weeks from confirmation of index case diagnosis for >80% of cases
Data accuracy between systems	Discrepancy of <5% between entries in REDCap and NTNDS
Adequate documentation	Communication with primary healthcare documented for ≥85% of cases re: contact tracing
	Contact tracing outcomes documented for ≥90% of cases

Sample and data collection

All confirmed and probable APSGN notifications (see Appendix A for NT case definition) were extracted to Excel from the NT Notifiable Diseases System (NTNDS) between 1 January 1991 to 31 December 2023 for the descriptive epidemiological analysis.

All confirmed and probable APSGN cases from the NT CDC REDCap database between 1 January 2022 to 31 December 2023 were included in the audit. Nil exclusions based on case age, location of residence, or other variable were applied. A report was run in REDCap to identify records, and data for all fields were exported to Excel for analysis.

The REDCap fields reviewed included patient demographic information, case status, clinical features, laboratory results, hospitalisation status, if the patient had died, contact tracing outcomes, public health response completeness, reason if public health response incomplete, and documentation uploads. Missing or ambiguous data were categorised as 'blank/unknown', after attempts to verify against hospital records where necessary. ABS Remoteness Area classification was assigned to cases based on their postcode of residence. De-identified data were stored and analysed on password protected computers at the NT CDC in Darwin.

Statistics

Descriptive analyses were conducted using Microsoft Excel, reporting continuous variables as means and standard deviations for normally distributed data, or medians and interquartile ranges for skewed data. Categorical data are presented as proportions.

Ethics Statement

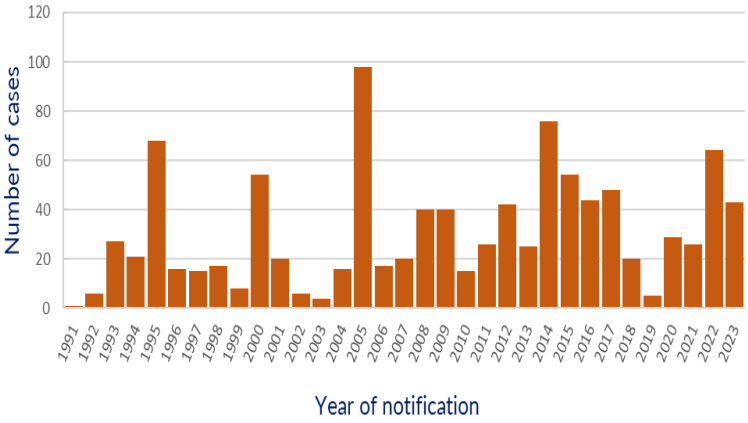
This audit has been approved by the Human Research Ethics Committee of the Northern Territory Department of Health and Menzies School of Health Research (NT HREC Reference Number: 2024-4900).

RESULTS

Descriptive analysis

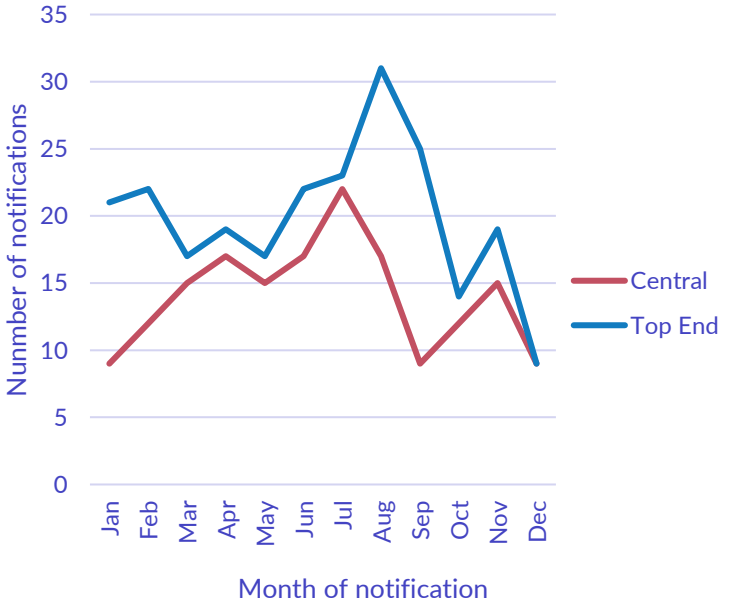
An epidemiological curve for cases of APSGN notified over time, 1991-2023, is presented in Figure 1. As previously noted in the literature, outbreaks historically occurred approximately every 5 years up until the late 2000's, followed by a trend of an increasing baseline of annual case numbers since. The year 2019 was a notable exception – no clear explanation was apparent for the decrease in cases for this year.

Figure 1. APSGN notifications in the Northern Territory from 1991 – 2023



Data from 2014 to 2023 was analysed more in depth to examine recent seasonality. It was noted that the highest number of notifications occurred across the dry season months of July and August, particularly increasing at this time in the Top End compared to Central Australia (Figure 2)

Figure 2. APSGN notifications in the Northern Territory between 2014 and 2023, by month and region



The demographic characteristics of notified APSGN cases between 2014 and 2023 are summarised in Table 2. The median age of cases was 6 years old, with most cases being aged between 4 and 10 years old. Just over 93% of cases were Aboriginal and/or Torres Strait Islander, highlighting the significant disparity between their non-indigenous counterparts in the NT. Central Australia was over-represented in case numbers given their population size, with almost half (42%) of notifications reported in Alice Springs and the Barkly regions. Two thirds (65%) of notified cases resided in 'Very Remote Australia' (ABS Remoteness Area classification) – this foreshadows the challenges and difficulties related to completing public health responses for cases of APSGN in the NT.

Given that our case definition for APSGN requires confirmation with a paediatric consultant, it is perhaps unsurprising that the majority of notifications (89%) had been hospitalised. There may be under-diagnosis and under-ascertainment of cases in community.

The characteristics of sampled APSGN cases extracted from REDCap between 2022 and 2023 used for the audit are also presented in Table 2. There was no significant difference in characteristics noted between this group and the larger sample taken from the NTNDS, supporting the sample from 2022 to 2023 to be reasonably representative of cases of APSGN in the NT over time.

Table 2. Case characteristics of APSGN cases extracted from the NTNDS (2014 to 2023) and REDCap (2022 to 2023)

Characteristic	NTNDS (2014-2023)	REDCap (2022-2023)
APSGN cases	n = 408	n=104
Case status:		
Confirmed – no. (%)	319 (77%)	84 (81%)
Probable – no. (%)	97 (23%)	20 (19%)
Possible (excluded from audit)	0	4 (4%)
Median age – in years (interquartile range)	6 (4 – 10)	6 (4 – 10)
Sex – no. (%)		
Male sex	217 (52%)	56 (54%)
Female sex	199 (48%)	48 (46%)
Not stated	0	2 (2%)
Ethnicity – no. (%)		
Aboriginal	387 (93%)	96 (92%)
Aboriginal and Torres Strait Islander	2 (0.5%)	3 (3%)
Non-Aboriginal and Torres Strait Islander	26 (6.25%)	4 (4%)
Unknown	1 (0.25%)	1 (1%)
Residential location by Region – no. (%)		
Darwin	100 (25%)	33 (32%)
East Arnhem	64 (16%)	13 (12.5%)
Katherine	65 (16%)	11 (10.5%)
Barkly	55 (13%)	16 (15%)
Alice Springs	119 (29%)	26 (25%)
Other – interstate	5 (1%)	5 (5%)
Residential location by Remoteness Area – no. (%)		
Outer Regional Australia	39 (10%)	17 (16%)
Remote Australia	98 (24%)	24 (23%)
Very Remote Australia	265 (65%)	63 (61%)
Unknown (not stated)	6 (1%)	0
Hospitalised		
Yes – no. (%)	364 (89%)	102 (98%)
Median length of stay	6 days	5.5 days
Outcome		
Survived	359 (88%)	99 (95%)
Died	2	2
Not stated	47	3

Audit

Case investigation and management

For the sample audited from 2022 to 2023, a total of 104 cases were identified (see Table 2), exceeding the minimum cohort calculated to be required for this audit. The median age of cases was 6 years old, with slightly more males (54%) in the cohort, and 95% of the cohort identifying as Aboriginal and/or Torres Strait Islander. Only 2 cases in the audit had not been hospitalised and 2 cases captured in the audit were recorded to have died.

The clinical and laboratory characteristics of APSGN that fulfill the case definition for audit cases are summarised in Table 3. The most commonly reported clinical characteristics were high blood pressure (79%), moderate haematuria (77%), facial oedema (65%) and skin sores (52%). The most commonly reported laboratory characteristics were reduced complement C3 (92%), elevated ant streptolysin O titre (ASOT) or anti-DNase B (87%), and haematuria on microscopy (72%). Only 1 case was reported to have had a renal biopsy and the biopsy report was indicative of APSGN, which is the only laboratory definitive evidence to confirm a case of APSGN.

Table 3. Clinical and laboratory characteristics of confirmed and probable cases of APSGN as recorded in REDCap, 2022 – 2023

APSGN cases recorded on REDCap (total = 104)	Number (%)
Clinical characteristics	
Skin sores	54 (52%)
Scabies	14 (14%)
Sore throat	36 (35%)
Facial oedema	68 (65%)
Oedema	37 (36%)
Moderate haematuria	80 (77%)
High blood pressure	82 (79%)
Laboratory characteristics	
Haematuria on microscopy (RBC > 10/ul)	75 (72%)
Reduced C3	96 (92%)
Elevated ASOT or anti-DNAse B	90 (87%)
Positive GAS culture	7 (7%)
Renal biopsy	1 (1%)

Criteria 1: >90% of cases notified within 48 hours of diagnosis

The number of days from diagnosis of APSGN to notification to the NT CDC (by notification received date) are shown in Table 4. Only 60% of cases were notified within 48 hours, thus failing to meet these recommended criteria. 86% of cases were notified within 10 days, and 3 cases (3%) were notified 3 weeks or more after diagnosis.

Table 4. Time to notification after diagnosis of APSGN, 2022-2023

No. of days from diagnosis to notification	Number (%)
0 (same day notification)	48 (44%)
1 (24 hrs)	8 (7%)
2 (48 hrs)	10 (9%)
3 (72 hrs)	5 (5%)
4 (96 hrs)	7 (6%)
5-9 days	16 (15%)
10-14 days	7 (6%)
15-20 days	4 (4%)
>20 days	3 (3%)

Criteria 2: ≥95% of required fields completed in REDCap and NTNDS

The completeness of fields relating to case status has been focussed on as an example of this criteria for this audit, as significant issues were observed. While 84 cases were recorded in REDCap as confirmed, and 20 cases were recorded as probable (see Table 2), a number of the clinical and laboratory criteria (as listed in Table 3) were not ticked or information was not recorded to validate their presence.

Notably, 16 confirmed cases did not have 'moderate haematuria' checked, and 17 confirmed cases did not have 'haematuria on microscopy' checked – both of which are necessary to fulfill the confirmed case definition. The missing evidence is summarised in Table 5.

Table 5. Completeness of clinical and laboratory data entry in REDCap, 2022 – 2023

APSGN cases recorded on REDCap (total = 104)	Number of cases (%)
No. of confirmed cases missing clinical evidence	
Facial oedema and/or peripheral oedema and/or hypertension	6 (5.8%)
Moderate haematuria	16 (15.4%)
No. of confirmed cases missing laboratory evidence	
Haematuria on microscopy (RBC > 10/ul)	17 (16.3%)
Evidence of recent streptococcal infection	2 (2%)
Reduced C3	0
Missing 2 or more categories	1 (1%)
No. of probable cases missing clinical evidence	
Facial oedema and/or peripheral oedema and/or hypertension	1 (1%)
Moderate haematuria	4 (4%)
Case status only based on REDCap documentation of criteria	
Confirmed	41 (56 total cases)
Probable	15 (56 total cases)
Rejected	48 [not cases]

Cross-checking with other fields and clinical records indicated that cases had most likely been classified correctly, however, if the REDCap documentation alone was used to assess cases, the cases would drop to 41 confirmed and 15 probable cases for a total of 56 cases, and 48 cases rejected altogether. It was also noted there is no check box in REDCap to record that a paediatrician or nephrologist has confirmed APSGN as the most likely diagnosis, despite being a required criterion of the case definition. Only 22 (26%) of the confirmed cases and 10 (50%) of the probable cases referenced a doctor's consultation in free text areas. Criteria 2 has also not been passed during this audit.

Contact management

Criteria 3: Contact tracing commenced within 2 weeks from confirmation of index case diagnosis for >80% of cases

The public health responses were timely, with 84% of cases receiving follow-up on the same day as notification, and 91% within 24 hours (Table 6). Per the NT APSGN guidelines, contact tracing is recommended to commence within 14 days of confirmation of the case. Recognising that notification can be delayed, confirmation date in REDCap is recorded as onset of symptoms, and this is the date used to start the 14-day period for this audit. Overall, 70% of contact tracing began within 14 days of symptom onset (Table 6), failing to meet this criterion. It is recognised that with delayed notifications, achieving the goal of this criteria consistently may be challenging.

Criteria 4: Discrepancy of <5% between entries in REDCap and NTNDS

The information collected in the NTNDS is simple and focuses on personal information and the dates of notification and public health response, and whether the case was hospitalised or died. In terms of these fields, there was less than 5% discrepancy between entries. This is likely because REDCap is used as the information source to inform the NTNDS entry by the data manager.

Criteria 5: Communication with primary healthcare documented for ≥85% of cases regarding contact tracing

Contact tracing and management was conducted equally by NT government (NTG) run clinics, and Aboriginal Community Controlled Health Organisations (ACCHO), each performing 38% of the responses and equates to 76% of all notified cases (Table 6). Where cases were located in hospitals and contacts were able to be seen, NT CDC staff performed 20% of the contact tracing follow-up. Every instance of outsourced contact tracing and management was documented in REDCap, successfully meeting this criterion (Table 6).

Criteria 6: Contact tracing outcomes documented for ≥90% of cases

Completed contact tracing forms were only attached 58% of case records, and only 17% of records with 'unable to complete public health response' checked had a reason listed. It was also noted that most information from the scanned forms is not entered into REDCap and is effectively unable to be analysed. Although 98% of cases had one of the 'public health action completed' field boxes checked, and technically the audit criteria have been met, there is much improvement to be done on further documenting why public health actions cannot be completed if public health response approaches are to be critically evaluated in the future.

Table 6. Public health response characteristics for NT APSGN cases, 2022 - 2023

APSGN cases recorded on REDcap (total = 104)	Number (%)
PHC provider responsible for contact tracing follow up	
ACCHO	40 (38%)
CDC	21 (20%)
NTG clinics	39 (38%)
Non-government funded clinics (Private GP practice)	4 (4%)
Public health action taken	
Contact tracing and advice	43 (42%)
Contact tracing and prophylaxis	33 (31%)
Follow up of case	27 (26%)
No action required	1 (1%)
Time from notification to public health response	
0 (same day notification)	87 (83.7%)
1 (24 hrs)	8 (7.7%)
2 (48 hrs)	4 (3.8%)
3 (72 hrs)	2 (1.9%)
4 (96 hrs)	2 (1.9%)
5-7 days	1 (1%)
Time from onset of symptoms to contact tracing	
0 (same day)	3 (3%)
1 (24 hrs)	7 (7%)
2 (48 hrs)	12 (12%)
3 (72 hrs)	11 (11%)
4 – 7 days	24 (23%)
7 – 14 days	16 (15%)
>14 days	9 (9%)
Blank/not stated	22 (21%)
APSGN public health response form sent to PHC provider?	
Yes	84 (81%)
No	20 (19%)
APSGN public health response form completed?	
Yes	38 (37%)
Partially completed	22 (21%)
No form attached to case record/not completed	44 (42%)
Public health action completed – no. (%)	
Yes	57 (55%)
Not yet	18 (17%)
Unable to complete	27 (26%)
Does not require public health response	1 (1%)
Blank	1 (1%)
Reason public health action not completed – no. (%)	
Primary health care staffing restraints	8 (8%)
Unable to locate contact	7 (7%)
Contact refused	6 (6%)
Case refused to provide contacts	0
Blank	83 (80%)

DISCUSSION

This audit was completed to evaluate the completeness and accuracy of REDCap records for cases of APSGN notified between January 2022 and December 2023. We found that only 3 of the 6 described criteria for this audit were met, with gaps in documentation, a lack of timeliness of notification, and a lack of translatability of contact tracing documentation into analysable and meaningful data. Response to cases once they were notified was timely, and the translation of data from REDCap to NTNDS was accurate. There are a number of areas to improve regarding achieving targets set out in the guidelines and created for this audit, which will ultimately assist in evaluating and improving public health responses overall.

This audit revealed that only 60% of cases were notified within the recommended 48 hours, which facilitates rapid and timely management of contacts. The flow-on effect of this may have then been apparent in the timeliness of contact tracing relevant to symptom onset, with only 70% of contact tracing commencing within the recommended 14-day timeframe. APSGN is a diagnosis that requires amalgamation of clinical signs and judgement, in addition to laboratory analyses and thus is a medical practitioner-notifiable disease. While the NT CDC performs some rudimentary syndromic surveillance of emergency coding of presentations to the emergency department, it is not a perfect system and still mostly relies on clinicians knowing APSGN is notifiable and contacting the NT CDC. Ongoing and repeated education of clinicians is necessary to increase the proportion of cases notified within 48 hours of diagnosis – a mandatory training module for onboarding hospital clinicians regarding public health and notifiable diseases which includes APSGN may improve this metric.

An important finding of this audit was incomplete or incorrectly completed sections of the REDCap form related to case classification and outcomes of public health responses. Concerningly, just over half of confirmed cases did not have the correct criteria checked and documented in REDCap and would be rejected if case classification was based on REDCap documentation alone. Although there is a step in REDCap where the Head of Surveillance and Response 'signs off' each entry, with competing workloads and long REDCap forms, scrutiny is not being applied to each record. REDCap can be configured with branching logic to assign a case status based conditionally on responses checked – this process could be instituted for ticking the criteria for APSGN, so that cases cannot be classified as confirmed or probable without the right evidence being documented. Similarly, a mandatory field should be introduced to describe the reason why public health responses were not completed. The data quality and monitoring functions of REDCap could be used more efficiently to improve the data quality for APSGN. Regular refreshers for staff on the business rules for REDCap and APSGN would also help in improving data quality.

Just over three quarters of contact tracing and contact management was outsourced to NTG run clinics and ACCHO in mostly remote areas across the NT. We recognise this is time consuming and the NT is fortunate to benefit from the support and engagement required for a with public health response from these overstretched service providers. Documentation was sent back to NT CDC for 58% of cases regarding contact tracing which was then scanned and uploaded to REDCap and not referred to again. There is no capacity to link REDCap records for contacts who may become cases in the future, and short of manually downloading and reading handwritten records there is little way to audit the effectiveness of public health responses from this perspective.

While the return of the contact tracing form is an obligation which ensures that feedback about the contact tracing outcomes is received, in its current form it does little to further public health response evaluation or research. REDCap has a survey function which could be utilised to send forms out to practices which can be completed online – this may improve return rates, documentation of challenges and barriers to completing contact management, and provide the ability to link contacts and new cases.

The epidemiological analysis shows that APSGN cases remain high in the Aboriginal population in the NT, particularly affecting children, and there has been minimal reduction in the incidence of APSGN over the past 20 years. The true incidence of APSGN is difficult to determine because of the under-ascertainment of milder or subclinical cases in community and the transient nature of the illness. These factors also make carrying out timely public health responses challenging, and the effectiveness of giving antibiotics to contacts difficult to evaluate with good evidence. The improvement of documentation about contact tracing, antibiotic administration, and education activities would greatly assist in future research that sought to evaluate whether this is an effective public health intervention for the amount of effort which is required – and currently provided by primary healthcare – or whether it is pushing the proverbial boulder uphill against the social and environmental determinants of Strep A transmission.

LIMITATIONS

While some recommendations were made in the guidelines, such as reporting within 48 hours and the commencement of contact tracing within 14 days, there were overall few metrics outlined in the guideline or in the literature about thresholds for data completeness and accuracy. Similar clinical audits were reviewed, and advice provided by the Flinders University guide for medical student clinical audits was considered in choosing the targets for criteria related to data completeness and accuracy. A follow-up audit may consider proportional improvements from the previous audit given that some of the aspects of notification and contact management are beyond the control of NT CDC. The characterisation of APSGN cases is also limited to those generally unwell enough to be in hospital and reported by hospital clinicians. There is likely under-representation of cases in community in this sample, and by other restrictive aspects of the case definition.

CONCLUSION

APSGN disproportionately affects Aboriginal and Torres Strait Islander children and young people, often from very remote communities across the NT. Strep A infection is recognised as a marker of poverty and disadvantage, and APSGN is one of its complications with conflicting evidence in the literature about its long-term health impacts. Public health responses focus on reducing invasive infections with Strep A and its complications such as APSGN by delivering antibiotics and opportunistic skin checks. These efforts, however, are labour intensive and rely on primary healthcare providers who already carry a large burden of health management and prevention. Improving the notification of and documentation for APSGN public health responses and sharing this more widely may assist in understanding what is working, what is not, and what needs to be critically evaluated in APSGN prevention to provide the most effective and efficient interventions for communities across the NT

ACKNOWLEDGMENT

The staff at the NT Centre for Disease Control are acknowledged and thanked for their work on the public health responses, sharing of knowledge, and assistance with data collection for this study.

APPENDIX A: Case definitions for confirmed, probable, and possible cases of APSGN in the NT

Confirmed, Probable and Possible Cases

Confirmed case:

A confirmed case requires either:

1. Laboratory definitive evidence only

OR

2. Laboratory suggestive evidence AND clinical evidence

Probable case: A probable case requires clinical evidence only.

Possible case: A possible case requires laboratory suggestive evidence only

Laboratory Evidence

Laboratory definitive evidence: Renal biopsy suggestive of APSGN.

Laboratory suggestive evidence

1. Haematuria on microscopy (RBC >10/µl) AND

2. Evidence of recent streptococcal infection (positive GAS culture from skin or throat, or elevated ASO titre or Anti-DNase B) AND

3. Reduced C3 level

Clinical Evidence

1. Facial oedema and/or peripheral oedema and/or hypertension AND

2. Moderate haematuria (e.g. 2+ red blood cells on urinalysis/dipstick) AND

3. The consultant paediatrician or nephrologist considers APSGN to be the likely diagnosis

APSGN Guideline: Northern Territory guidelines for acute post-streptococcal glomerulonephritis

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NT Health Fact sheet

Group A Streptococcus Infection

What is Group A streptococcus?

Group A streptococcus (GAS) is a bacterium that often lives in people's throats or on their skin. Most of the time this germ does not make people sick.

Illnesses most commonly caused by GAS are sore throats ('strep throat') or skin infections (sometimes referred to as 'school sores').

Some people who have GAS infections go on to develop complications such as acute rheumatic fever and post-streptococcal glomerulonephritis (heart and kidney diseases) but these are uncommon.

Occasionally, it does cause other severe and even life-threatening sickness referred to as invasive GAS or iGAS (see below).

How is it spread?

GAS spreads among infected people via skin contact and actions such as sneezing and kissing.

Invasive GAS disease

Severe, sometimes life-threatening, disease can occur when GAS invades parts of the body such as blood, muscles or lungs. These infections are called invasive GAS disease (iGAS). Two of the most severe forms are necrotising fasciitis and streptococcal toxic shock syndrome.

Necrotising fasciitis destroys muscles, fat and skin tissue.

Streptococcal toxic shock syndrome causes a rapid drop in blood pressure which causes organ failure (e.g. failure of the kidneys, liver, lungs).

For what to do when someone close to you has an iGAS infection look at the invasive group A streptococcus infection poster.

Why invasive GAS disease happens

When GAS bacteria gain 'entrance' and overwhelm the body's defences, iGAS diseases can occur. This may happen when the person's skin defence is broken with a sore or cut and the bacteria invade.

People with chronic illnesses or illnesses that affect the immune system may be more vulnerable to iGAS. Rarely, people with no known risk factors have developed iGAS disease.

NT HEALTH

NORTHERN TERRITORY GOVERNMENT

Group A Streptococcus Infection Fact Sheet

Who is at risk?

Most people who come in contact with GAS will not develop invasive GAS disease. Some will have a throat or skin infection but most will have no symptoms at all.

Although healthy people can get iGAS disease those most at risk are:

- children <5 years of age, especially infants
- people aged >65 years
- Indigenous people
- people living in crowded conditions or where good hygiene is hard to maintain
- people with chronic illnesses (eg. cancer, diabetes, chronic lung, heart, liver and kidney diseases) and those with heavy alcohol consumption (consume over 20 standard drinks a week or binge drinking)
- people with skin and soft tissue infections such as cellulitis
- people who use medications such as steroids for a long time
- children with a recent (2 weeks) history of chickenpox.

Risk and advice for contacts of people with iGAS disease

The risk of secondary cases of iGAS occurring in contacts is not entirely clear but is considered low. The Centre for Disease Control (CDC) will follow up people diagnosed with iGAS disease to consider management of their recent and close contacts. In some circumstances the CDC will recommend close contacts receive antibiotics to kill the GAS.

Any contacts with signs of a sore throat or an infected wound, especially if fever occurs, should seek medical care and inform the care giver that they are a potential contact of an iGAS case.

Prevention

Good hygiene is the mainstay of preventing all forms of GAS disease.

To reduce the spread of bacteria wash your hands, especially after coughing and sneezing and before preparing, eating or serving foods.

People with 'strep throats' should stay at home for 24 hours after taking an effective antibiotic.

Treatment

Prompt antibiotic therapy is required and most people need admission to hospital for medicine and monitoring.

People with necrotising fasciitis may require surgery to remove damaged tissue.

Contact

For more information contact the Public Health Unit's Centre for Disease Control in your region.

The full list of contacts of contacts can be found at NT Health.

NT HEALTH

Japanese Encephalitis and Murray Valley Encephalitis viruses moving beyond the Northern Territory: lessons and remaining unknowns from a One Health response in Australia

***Bart J Currie*[1], *Nina Kurucz*[2], *Vicki L Krause*[3]**

[1]Menzies School of Health Research, Charles Darwin University and Royal Darwin Hospital
[2]Medical Entomology, Centre for Disease Control, NT Health
[3]Centre for Disease Control, NT Health

In February 2021 a 45yo female from the Tiwi Islands north of Darwin, Northern Territory (NT) was admitted to Royal Darwin Hospital (RDH) intensive care unit (ICU) with progressive decrease in consciousness following 2 days of fever and confusion. Sadly, her condition steadily deteriorated and despite intubation and ventilation she died 2 weeks later. An astute intensive care physician had raised the possibility of Murray Valley encephalitis (MVE). While MVE is well recognised as epizootic in Australia's tropical northwest (Pilbara and Kimberley, Western Australia and Top End, NT) we had never documented a case from the Tiwi Islands. Testing of initial serum, urine and cerebrospinal fluid (CSF) was all negative for flaviviruses, but subsequent serology from day 13 was positive – but for antibodies to both MVE and Japanese encephalitis (JE) viruses (MVEV and JEV). Post-mortem CSF was also positive for IgM antibodies of both MVEV and JEV.

The possibility that this may be the first case of JE acquired within the NT was raised, noting that this would have to be from a local infection in the resident of the Tiwi Islands and not an imported case. JE was confirmed when post-mortem thalamic tissue was PCR positive for JEV viral RNA when tested on an 'in-house' assay at RDH. Subsequent whole genome sequencing of thalamic tissue sent to CSIRO Australian Centre for Disease Preparedness (ACDP) also confirmed this and showed genotype IV JEV.

So, the Australian JEV epidemic had begun, although it was not until almost a year after this sentinel case that the epidemic became evident when the pig industry in southern Australia was rocked by the occurrence across multiple commercial piggeries of mummified stillborn piglets. Human cases of JE also occurred in southeast Australia in early 2022 and on March 4th, 2022, JE was declared a Communicable Disease Incident of National Significance (CDINS) by the combined weight of Australia's Chief Veterinary Officer and Chief Medical Officer. Responding to the JE epidemic that was impacting on the Australian pig industry and causing severe morbidity and some mortality in humans in Australia's eastern States raised many challenges. This required working on a One Health approach spanning jurisdictions, State and Commonwealth Departments of Health and Agriculture and professionals in both human and animal health who previously had limited occasions to work together.

Of note, in the NT an active Zoonosis Committee had been meeting for almost three decades to link human and veterinary health staff from NT departments and the Northern Australian Quarantine Strategy (NAQS – established 1989). In response to the fatal JE 2021 case, the One Health approach involved NT Medical Entomology and Environmental Health, clinicians from RDH, public health staff from NT CDC, veterinarians from NT DPI and other Berrimah Veterinary Laboratory staff, the patient's primary health care

clinic, GPs and family, NAQS staff, laboratory staff from NT pathology, PathWest and ACDP, and the Tiwi Land Council and rangers. Adult mosquito trapping and larval mosquito surveys were undertaken on the Tiwi Islands, and feral pigs were sampled during 2021 and subsequent years. Nevertheless, no JEV has been detected on the Tiwi Islands from mosquitoes using PCR assays and no evidence of JEV exposure was found in the feral pigs on serology. Extensive public health messaging was also undertaken with the local community.

Possibilities to explain the incursion of JEV to the Tiwi Islands include JEV-infected migratory water birds, wind-blown JEV-infected mosquitoes, visiting fishing boats or other vessels or planes harbouring rogue JEV-infected mosquitoes. Phylogenetic analysis of the 2021 Tiwi Island JEV genome and genomes from subsequent southern Australian human and pig JE cases and JEV from mosquitoes showed all to be closely related genotype IV JEV, with the genetically nearest overseas genotype IV JEV being from Indonesia. However, there was no clear temporal or geographical structure across the genomes to pin down a time of entry to Australia or define specific movements of JEV within Australia, except to support one or possibly two incursions into northern Australia before 2021, with subsequent explosive spread to and amplification in southeast Australia.

By winter 2022 there had been a reported 45 human JEV cases in the epidemic, with 7 being fatal, and over 80 infected piggeries. Of note, in addition to the Tiwi Islands case, in April and May 2021 there were 2 interstate elderly travellers to the Top End of the NT who developed severe encephalitis requiring intubation and ventilation in ICU. Both survived and based on serology testing both were initially formally notified as MVE. It was only after the improvements in serological testing in Australia in 2022 that 1 of the cases was confirmed as definite JE and not MVE and the other was considered on retesting to be more likely to be JE than MVE, although limited availability of sera meant this was not definitive. In addition, the last of the 45 reported human JE cases was from June 2022 in a 7-year-old child from a remote Top End community. So, the 2022 JE epidemic in southeast States was bookended by two and possibly three JE cases from the NT in 2021 and the June 2022 NT case after the winter conditions extinguished further human and pig cases in southeast Australia.

Expectations were that it was very likely that JEV had spread so far within Australia during 2021-2022 that it was likely to have established foci of persistence, such as in feral pigs as the most recognised JEV-amplifying host. As such, endemicity in northern Australia and epizootic summer JE outbreaks in southern Australia were predicted for the future. Therefore, when several cases of encephalitis presented in southeast Australia in the summer months of late 2022, they were initially thought to be JE but the issues of cross reactions between antibodies to MVEV and JEV were again raised with the serology testing. It soon became apparent that it was not JE that was occurring in 2023 but was what became the largest outbreak of MVE in Australia since 1974 (58 cases), with 23 confirmed MVE cases between January 1st and July 31st, 2023. Phylogenetic analysis of human and mosquito viruses showed 2 circulating MVEV genotypes in 2023, both previously documented in northern Australia; G1A in northern Australia, likely spreading from there to the southeastern States and G2 only in northern Australia.

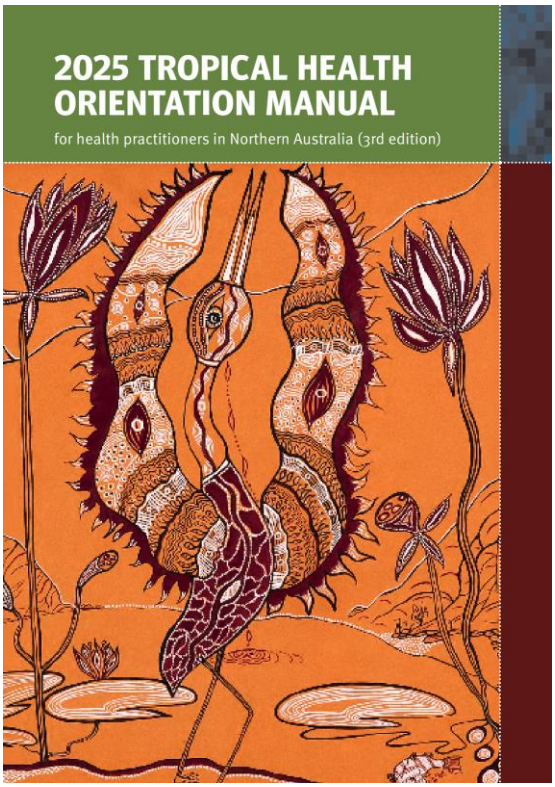
Confounding expectations and predictions, there were no human or pig cases of JE in Australia in 2023 while the MVE outbreak was occurring. While there were also no 2023 JEV positive results in the southeast States from mosquito sampling PCRs or sentinel chicken serology, there were some early 2023 JEV PCR positive mosquito pools from the expanded NT mosquito surveillance program. This supported that, despite no human or pig cases in 2023, JEV was still

present, at least in northern Australia. Of note the Commonwealth declaration of JE as a CDINS was stood down on June 16th 2023, with the national coordination and management wound back and responsibilities handed to the States and Territory jurisdictions.

Since December 2024 there have once again been human cases of JE in Victoria, New South Wales and north Queensland, but the NT has had no case of JE since June 2022. The ongoing transmission cycles of JEV in southeast Australia in the 2024-2025 summer have been confirmed by virus detection in mosquitoes and feral and commercial pigs. While there were no cases of JE detected in Western Australia throughout the 2022 epidemic and since, northwest Western Australia (Pilbara and Kimberley) continued to have active MVEV transmission in 2024 including some MVE fatalities.

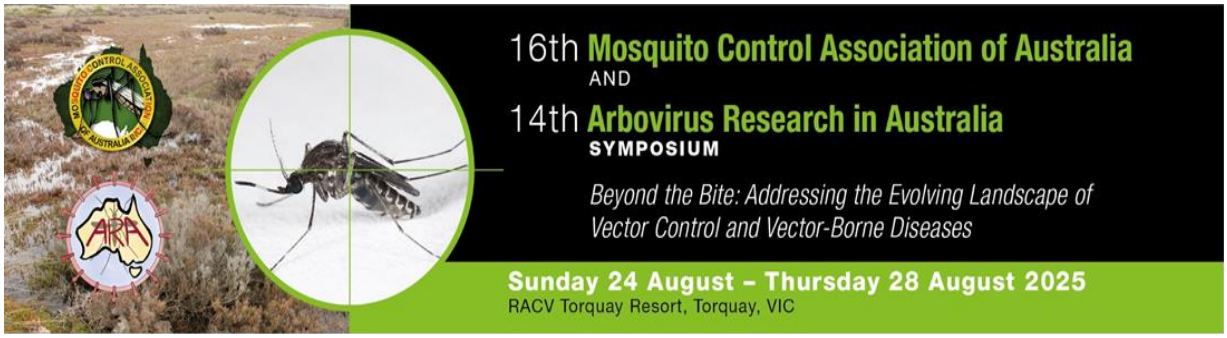
So, what will the JEV and MVE stories be for northern and southeast Australia in the 2025-2026 summer and beyond? Sensible predictions and modelling both require data we currently do not have and what is clear is that our understanding of the epidemiology in Australia of these two grim viruses is still very limited. The comparative roles of wind-blown infected mosquitoes and migratory bird hosts for both viruses and amplifying (feral) pig hosts for JEV will be different for JEV and MVEV and for each will also vary in space and time linked to seasonal and changing climate and habitat factors. On the positive side, the increasing data from the success of direct virus detection through PCR of mosquito pool collections and feral pig tonsils (for JEV) strengthen the argument that our national surveillance efforts need substantially more funding and enhanced coordination. Meanwhile, it has been noted that; “With still limited or no feral pig surveillance in much of the country, the best current surveillance for JEV in Australia is unfortunately the sentinel humans scattered throughout rural Queensland, NSW and Victoria”

References available on request



Tropical Health Orientation Manual (THOM) 2025 - Menzies

Northern Territory presentations at the 2025 Mosquito Control Association of Australia and Arbovirus Research in Australia Symposium



***Speakers at the conference are bolded in the abstracts

Arthropod-borne diseases in the tropical north of Australia: the known unknowns bite back

Currie B J

Global and Tropical Health Division, Menzies School of Health Research and Infectious Diseases Department, Royal Darwin Hospital, Darwin, Northern Territory, Australia

Major impacts on surveillance and control of pathogens in Australia include: Geographical boundaries between the States and Territories; Political and legislative boundaries between each of the seven jurisdictions and the Commonwealth; and Professional boundaries between human health staff, veterinarians, laboratory scientists, researchers and entomologists. Lessons learnt from COVID-19 helped when the next Communicable Disease Incident of National Significance was declared on March 4th, 2022 – the Japanese encephalitis (JE) epidemic. However large gaps remain in our understanding of the why, where and how of the JE outbreak and the spread of the virus (JEV) nationally. After a winter recess many were expecting the return of JEV, only for 2023 to have no JE notifications but Australia's largest outbreak of Murray Valley encephalitis (MVE) since 1974. Since December 2024, JE has returned in the eastern states and MVE cases continue in Western Australia. Surprisingly in 2025 there has been no JEV or MVEV detected in the Northern Territory through human and mosquito surveillance. Northern Australia also contends with endemic scrub typhus and imported malaria and zika, chikungunya and dengue viruses, as well as sporadic local transmission of dengue and malaria in north Queensland.

Molecular detection of Japanese and Murray Valley encephalitis virus in NT mosquitoes

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Journal of Vector Ecology 50(2), 82-92, (2 July 2025) https://doi.org/10.52707/1081-1710-50.2-82

In 2021, Japanese encephalitis virus (JEV) reverse transcription quantitative RT-qPCR testing of mosquitoes was used for the first time in the Northern Territory (NT) in an attempt to determine the presence of circulating JEV and identify probable vector mosquito species. All test results for 2021 and 2022 returned negative for JEV. Testing resumed in January 2023, with mosquitoes also tested for Murray Valley encephalitis virus (MVEV) following an outbreak resulting in eight confirmed human cases. Mosquito pools tested positive by RT-qPCR for both viruses on several occasions, confirming the suitability of this method for flavivirus surveillance. *Culex annulirostris* (Skuse) and *Cx. gelidus* (Theobald) tested RT-qPCR positive for both viruses in 2023, incriminating them as JEV and MVEV vectors in the NT. *Aedes normanensis* (Taylor) also tested positive for JEV and MVEV, identifying this species as a probable vector species for both viruses in the NT. While *Cx. annulirostris* is known to be the principal MVEV vector in the NT, the fact that all three vector mosquito species potentially play a part in the JEV transmission cycle is of major public health concern. While *Cx. tritaeniorhynchus* (Giles) did not test positive to JEV in 2023, this species is the principal JEV vector in SE Asia and could potentially play a role in JEV transmission in the NT. Genotyping of viruses from the NT mosquitoes confirmed the continued circulation of genotype IV JEV and showed that both genotypes 1A and 2 of MVEV were co-circulating in the NT in 2023.

2023/24 and 2024/25 Northern Territory seasons. Mosquito and mosquito borne disease update

A Warchot, *N Kurucz, S Fricker, W Pettit, J Carter, N Copley, W Speed, B Smitheram, J Gamuza, J McHugh and D Armstrong*

Medical Entomology, Centre for Disease Control, NT Health, Darwin, NT

The 2023/24 season was characterised by the appearance of El Nino conditions and a subsequent late start to the wet season. However, once the rain arrived, it made up for the late start. For the NT as a whole, the 2023–2024 rainfall was 798.3 mm, 57% above the 1961–1991 average, the sixth highest on record and the highest since 20111. Darwin, the most populous city in the NT, recorded slightly above average rainfall. Above average rainfall usually creates ideal conditions for mosquito breeding and mosquito borne disease activity. Some areas in the NT were affected by very high vector mosquito numbers, particularly the inland semi-arid areas. Murray Valley encephalitis virus activity was detected in mosquitoes collected from the tropical north and semi-arid zones. Despite the high rainfall and abundance of vector mosquitoes, Ross River virus cases remained below the 5-year mean.

The 2024/25 wet season was much different to 2023/24 for many areas of the NT, with mostly average rainfall recorded during the first four months of the wet season, and some areas of below average rainfall. In addition, tides were of a higher magnitude during September to December 2024 compared to the previous year. This change was reflected by much lower vector mosquito numbers in semi-arid areas of the NT, and high northern salt marsh mosquito abundance in coastal areas. Did the change in rainfall and vector mosquito abundance affect mosquito borne disease activity?

Battling the Dengue Mosquito: The Fight for an *Aedes aegypti*-free Northern Territory

B Smitheram[1], ***S. Fricker*[1]**, *N Kurucz*[1]

[1]*Medical Entomology, Centre for Disease Control, NT Health, Darwin, NT*

The dengue mosquito, *Aedes aegypti*, is not established in the Northern Territory. The detection of *Aedes aegypti* in Tennant Creek, in February 2021 triggered an ongoing elimination campaign. Initial surveys confirmed its presence throughout the town, prompting intensive control efforts.

The campaign follows protocols developed during previous successful elimination programs in the NT, involving property inspections, multiple treatment rounds, and a requirement of one wet season without detections before elimination can be declared. Control methods include source reduction, insecticide application and chlorine/detergent treatments to destroy eggs. Adult trapping was also deployed to locate breeding sites. Transport hubs were inspected regularly to mitigate the risk of further dispersal.

The program continues to face environmental and anthropogenic challenges. Tennant Creek received above average rainfall from 2022 to 2024, complicating elimination efforts. Receptacle reduction efforts in the community have encountered challenges with engagement and participation. Rainfall was below average in early 2025 and the outlook suggests dryer and warmer conditions will persist through to May 2025. This presentation details the suppression and elimination methods used to restore the NT's dengue-free status and the challenges encountered

From left to right: Allan Warchot, Nina Kurucz, Bart Currie & Stephen Fricker from the Medical Entomology unit at 2025 Mosquito Control Associations of Australia Conference, August 2025

Media and health alerts

Public health alerts were issued on **Influenza and Measles** by the NT Centre for Disease Control (CDC) between July and September 2025. Below are excerpts from these alerts, noting some may no longer be active at the time of publishing this issue.

The full Infuenza alert is available on the following pages.

Current and previous health alerts can be viewed at the NT Health website.

Influenza

There was a marked increase in influenza notifications in Central Australia, with 80 cases notified in the Alice Springs region during 2-8 July 2025. Cases also increased in the Barkly region.

Alice Springs Hospital experienced very high numbers of presentations to the Emergency Department and hospital admissions related to

influenza and influenza-like illnesses. Since this year, 29% of cases in Central Australia were children under the age of 15 years. 76% of notified cases were people identifying as Aboriginal.

Read the full alert issued 11 July 2025 and on the next page.

Measles

A person with measles travelled through the Northern Territory between 17-23 July 2025, while unknowingly infectious. As a result, clinicians in the NT were strongly encouraged to consider measles in their differential diagnosis for anyone presenting with fever and rash, even if they have not travelled.

Read the full alert issued 28 July 2025.

NORTHERN TERRITORY GOVERNMENT

Centre for Disease Control

NT HEALTH

⚠ Public Health Alert

Issued: 11 July 2025
Issued by: Director, Centre for Disease Control
Issued to: All clinicians

Influenza spike in Central Australia – likely to spread

Summary

There has been a marked increase in influenza notifications in Central Australia, with 80 cases notified in the last week in the Alice Springs region (see Figure). There have also been cases recently increasing in the Barkly region. It is expected that over the next few weeks cases of influenza will also spike in regions in the Top End.

Notifications have been observed across all age groups, with 29% of notifications in Central Australia this year to-date being children less than 15 years old. One in every ten notifications (11%) have been for children less than 5 years old, who are a group who are eligible for free influenza vaccination (see *vaccination* below). Aboriginal people are also over-represented, with 76% of notified cases identifying as Aboriginal – all Aboriginal people over 6 months old are also eligible to receive free influenza vaccines.

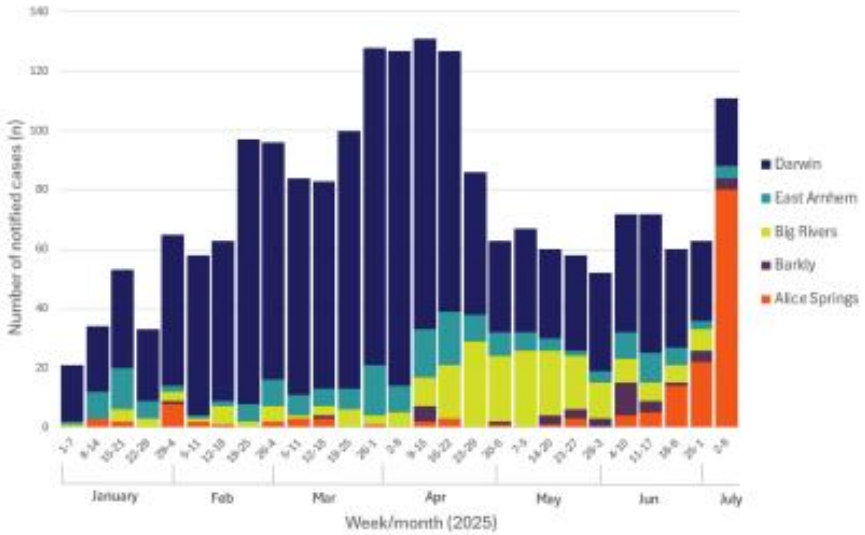

Figure: Influenza notifications received between 1 January to 8 July 2025, by NT region

Further national surveillance information is also available here.

Centre for Disease Control
Public Health Division

(08) 8922 8044 or 1800 008 002
CDCSurveillance.DARWIN@nt.gov.au

Health services in the Alice Springs Hospital (ASH) are currently experiencing very high numbers of presentations to the Emergency Department and hospital admissions related to influenza and influenza-like illnesses. **We urge all clinicians to be alert for cases of influenza and influenza-like illness in your community, take advantage of all opportunities to vaccinate against influenza, and encourage other behaviours which minimise transmission of respiratory viruses.**

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

- **Vaccinate** everyone over 6 months, but in particular those eligible for free vaccine as deemed at higher risk. This year's flu vaccine is now available. See here for more information. Offer the vaccine routinely to all those over 6 months of age.
- **Test** cases of influenza-like illness (ILI) for flu, COVID, and RSV. This includes sending to the lab for testing if it is not available at point of care. ILI is defined as an acute respiratory illness with symptoms including fever and cough.
- **Treat** suspect 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.

Vaccination information

Influenza vaccine is available and can be administered at the same time as other vaccines including COVID-19 and pneumococcal vaccines.

Who is eligible for the funded (free) influenza vaccine?

- Adults ≥ 65 years of age (recommended Fluad® Quad)
- 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 2025 (NT)	
Age	**Vaccine Brand**
6 months to 64 years	Flucelvax® Quad 0.5ml or Vaxigrip® Tetra 0.5ml*
65 years and older	Fluad® Quad 0.5ml

**FluQuadri® 0.5ml also available for children 6 months to less than 5 years old*

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Actions

Vaccinate

Please keep offering vaccine all year round. Influenza coverage in 2025 is only 54% for NT residents 65 years and over and 24% in children 6months to <5 years.

Test

All patients presenting with ILI should be tested for influenza, COVID, and RSV using a nose/throat swab. Send 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 of influenza and are indicated for people with suspected influenza based on clinical, laboratory or epidemiological grounds. Further information on oseltamivir is available on the NT Centre for Disease Control factsheet.

Prevent spread

All respiratory infections are contagious and have the potential to cause serious illness, particularly in the vulnerable. Any person who has acute respiratory symptoms should not attend childcare, school or work and should wear a surgical mask in the public setting. 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.

Prepared by Dr Hayley Dyke, Head of Surveillance and Response

Approved by Dr Vicki Krause, Director Centre for Disease Control

Public Health Division, NT Health

Scan QR code for more on Public Health Alerts

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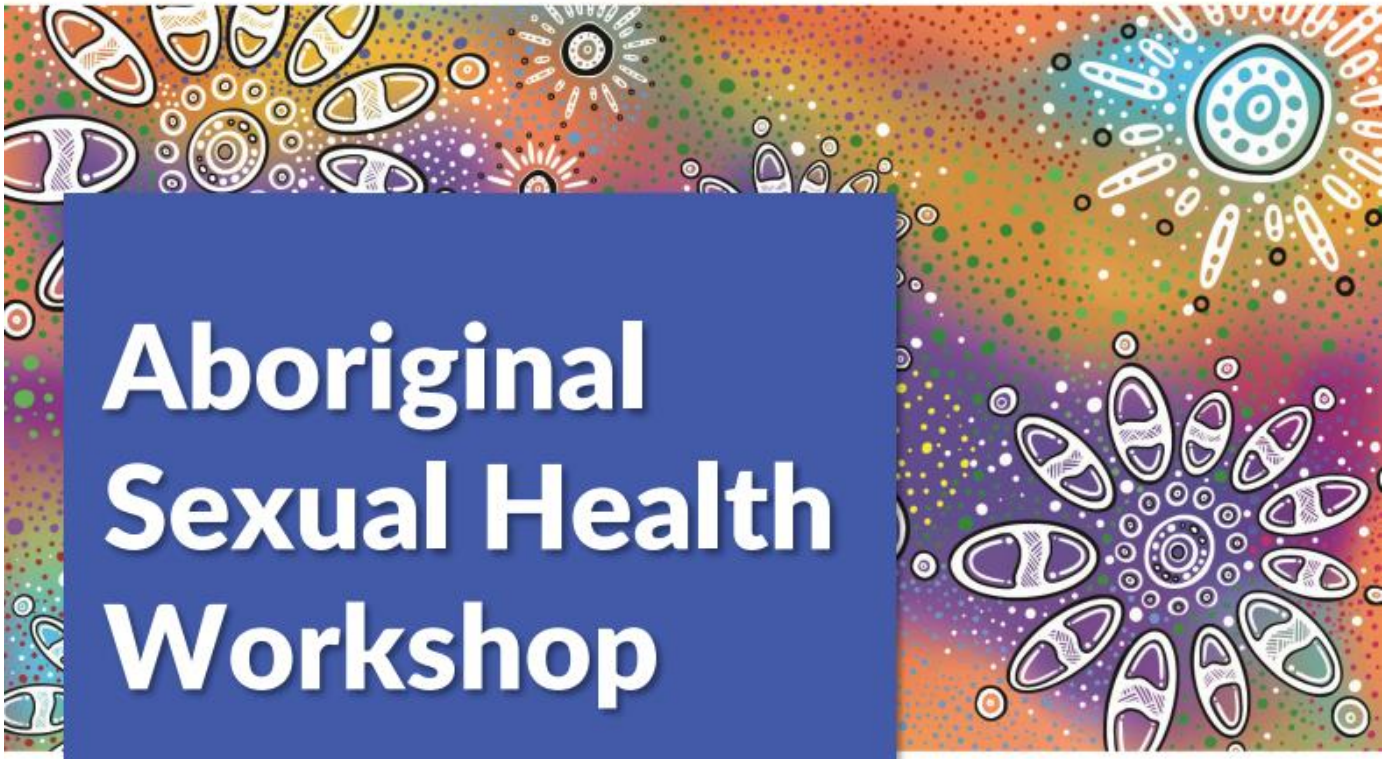
NT HEALTH



Aboriginal Sexual Health Workshop

Attention: Aboriginal Health Practitioners, Aboriginal Health Workers, Aboriginal Community Workers

The Aboriginal Sexual Health workshop is an Aboriginal-led and designed workshop, that aims to build confidence and combat the shame & stigma in our mob, when discussing sexual health. This workshop is for clinical and non-clinical Aboriginal workforces.

This is a safe and unique space to share our experiences, community stories, successes and challenges, new ideas and helpful resources.

NAATSIHWP CPD CERTIFIED 10 CPD Hours ENDORSED

WHEN:

Thursday 12th and Friday 13th February 2026

WHERE:

TIO Stadium
70 Alba Road, Marrara

Save the date!

Registrations, will be sent out in December

Contact Natasha Tatipata

08 89441321

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NORTHERN TERRITORY GOVERNMENT

Northern Territory disease notifications by onset date and district – 1 April to 30 June, 2nd quarter (2024 vs. 2025)

	Alice Springs		Barkly		Darwin		East Arnhem		Katherine		N T	
	2025	2024	2025	2024	2025	2024	2025	2024	2025	2024	2025	2024
Acute Post Strep GN	0	4	0	1	1	1	1	0	0	2	2	8
Adv Vacc Reaction	1	0	0	0	10	1	0	0	1	0	12	1
AIDS	0	0	0	0	0	0	0	0	0	0	0	0
Amoebiasis	0	0	0	0	1	1	0	1	0	0	1	2
Anthrax	0	0	0	0	0	0	0	0	0	0	0	0
Arbovirus NOS	0	0	0	0	0	0	0	0	0	0	0	0
Aust Bat Lyssavirus	0	0	0	0	0	0	0	0	0	0	0	0
Avian influenza	0	0	0	0	0	0	0	0	0	0	0	0
Barmah Forest	1	1	0	1	0	2	0	0	1	0	2	4
Botulism	0	0	0	0	0	0	0	0	0	0	0	0
Brucellosis	0	0	0	0	0	0	0	0	0	0	0	0
Campylobacteriosis	13	8	1	3	45	50	3	2	7	4	69	67
Chancroid	0	0	0	0	0	0	0	0	0	0	0	0
Chickenpox	3	0	1	0	8	6	1	1	0	1	13	8
Chikungunya	0	0	0	0	0	0	0	0	0	0	0	0
Chlamydia	264	238	38	26	137	372	28	33	74	81	541	750
Chlamydial conj	0	0	0	0	1	2	0	0	1	0	2	2
Cholera	0	0	0	0	0	0	0	0	0	0	0	0
Ciguatera	0	0	0	0	0	0	0	0	0	0	0	0
CJD	0	0	0	0	0	0	0	0	0	0	0	0
Congenital Rubella	0	0	0	0	0	0	0	0	0	0	0	0
COVID-19	57	137	7	16	205	742	9	63	26	67	304	1,025
Crusted scabies	4	4	2	0	8	16	5	6	5	3	24	29
Cryptosporidiosis	4	3	0	3	13	7	0	0	3	0	20	13
Dengue	1	0	0	0	11	22	0	1	0	0	12	23
Diphtheria	0	0	0	0	0	0	0	0	1	0	1	0
Donovanosis	0	0	0	0	0	0	0	0	0	0	0	0
Food/water borne dis	0	0	0	0	0	0	0	0	0	0	0	0
Gastro - related cases	0	0	0	0	0	0	0	0	0	0	0	0
Gonococcal conj	0	1	0	0	0	0	0	0	0	0	0	1
Gonococcal infection	280	252	35	25	80	154	13	30	61	62	469	523
Gonococcal neon ophth	0	0	0	0	0	0	0	0	0	0	0	0
Group A strep invasive	10	10	3	3	17	13	3	2	0	1	33	29
Hendra virus	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis A	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis - acute viral	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis B - chronic	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis B - new	1	0	0	0	0	2	0	0	0	0	1	2
Hepatitis B - unspec	11	4	0	0	33	22	1	5	1	2	46	33
Hepatitis C - chronic	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis C - new	0	1	0	0	0	3	0	0	0	1	0	5
Hepatitis C - unspec	3	4	2	0	7	11	0	0	3	0	15	15

(Table continued the next page)

	Alice Springs		Barkly		Darwin		East Arnhem		Katherine		N T	
	2025	2024	2025	2024	2025	2024	2025	2024	2025	2024	2025	2024
Hepatitis D	0	0	0	0	1	0	0	0	0	0	1	0
Hepatitis E	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis NOS	0	0	0	0	0	0	0	0	0	0	0	0
H Influenzae b	0	0	0	0	0	0	0	0	0	0	0	0
H Influenzae non-b	1	1	0	0	0	1	0	0	0	0	1	2
HIV	0	4	0	2	5	12	0	0	0	1	5	19
HTLV1 adult TCL	0	1	0	0	0	0	0	0	0	0	0	1
HTLV1 asyptom/unspec	8	7	3	1	1	2	0	0	1	1	13	11
HTLV1 TSP	0	0	0	0	0	0	0	0	0	0	0	0
HUS	0	0	0	0	0	0	0	0	0	0	0	0
Hydatid	0	0	0	0	0	0	0	0	0	0	0	0
Influenza	69	607	36	40	720	866	108	270	205	62	1,138	1,845
Japanese Encephalitis	0	0	0	0	0	0	0	0	0	0	0	0
Kunjin Virus	0	0	0	0	0	0	0	0	0	0	0	0
Lead - elevated	3	0	0	1	1	50	0	4	0	2	4	57
Legionellosis	1	0	0	0	0	2	0	0	1	0	2	2
Leprosy	0	0	0	0	1	0	0	1	0	0	1	1
Leptospirosis	0	0	0	0	2	1	0	0	0	0	2	1
LGV	0	0	0	0	0	2	0	0	0	0	0	2
Listeriosis	0	0	0	0	0	1	1	0	0	0	1	1
Lyssavirus NOS	0	0	0	0	0	0	0	0	0	0	0	0
Malaria	0	0	0	1	8	8	0	0	0	0	8	9
Measles	0	0	0	0	0	0	0	0	0	0	0	0
Melioidosis	0	0	0	1	12	11	4	3	4	3	20	18
Meningococcal infection	0	1	0	0	0	0	0	0	0	0	0	1
MERS	0	0	0	0	0	0	0	0	0	0	0	0
Mpox virus infection	0	0	0	0	0	0	0	0	0	0	0	0
Mumps	0	0	0	0	0	2	0	0	0	0	0	2
MVE	0	0	0	0	0	0	0	0	0	0	0	0
Non TB Mycobacteria	0	0	0	0	2	5	0	0	0	0	2	5
Ornithosis	0	0	0	0	0	0	0	0	0	0	0	0
Paratyphoid	0	0	0	0	0	0	0	0	0	0	0	0
Pertussis	7	3	5	2	11	6	0	1	6	1	29	13
Plague	0	0	0	0	0	0	0	0	0	0	0	0
Pneumococcal disease	3	6	1	1	2	2	2	0	3	3	11	12
Poliomyelitis	0	0	0	0	0	0	0	0	0	0	0	0
Q Fever	0	0	0	0	0	2	0	0	0	0	0	2
Rabies	0	0	0	0	0	0	0	0	0	0	0	0
Rheumatic Fever	10	14	7	9	13	8	2	3	9	5	41	39
Rheumatic heart disease	13	10	0	5	8	7	3	2	7	6	31	30
Ross River Virus	0	0	0	1	14	14	0	0	0	3	14	18
Rotavirus	2	4	0	1	33	21	2	0	0	2	37	28
RSV infection	15	181	1	11	220	321	66	14	41	60	343	587
Rubella	0	0	0	0	0	0	0	0	0	0	0	0
Salmonellosis	15	11	6	2	64	82	6	3	9	7	100	105
SARS	0	0	0	0	0	0	0	0	0	0	0	0

(Table continued the next page)

	Alice Springs		Barkly		Darwin		East Arnhem		Katherine		N T	
	2025	2024	2025	2024	2025	2024	2025	2024	2025	2024	2025	2024
Shigellosis	4	7	4	3	7	12	2	2	2	2	19	26
Smallpox	0	0	0	0	0	0	0	0	0	0	0	0
STEC/VTEC	0	0	0	0	0	0	0	0	1	1	1	1
Strongyloidiasis extra-int	0	0	0	0	0	0	0	0	0	0	0	0
Syphilis	0	0	0	0	0	0	0	0	0	0	0	0
Syphilis < 2y	23	27	4	1	63	25	19	5	14	7	123	65
Syphilis > 2y or unk	7	2	1	1	10	7	2	0	6	5	26	15
Syphilis congenital	0	0	0	0	0	0	0	0	0	0	0	0
Tetanus	0	0	0	0	0	0	0	0	0	0	0	0
Trichomoniasis	210	237	68	40	161	269	93	87	94	98	626	731
TTP	0	0	0	0	0	0	0	0	0	0	0	0
Tuberculosis	1	0	0	0	3	6	0	0	0	1	4	7
Tularaemia	0	0	0	0	0	0	0	0	0	0	0	0
Typhoid	0	0	0	0	0	1	0	0	0	0	0	1
Typhus	0	0	0	0	1	0	0	0	0	0	1	0
Varicella - unspec	2	4	0	2	38	10	2	0	0	4	42	20
Vibrio food poisoning	0	0	0	0	1	0	0	0	0	0	1	0
Vibrio invasive	0	0	0	0	0	0	0	1	0	0	0	1
Vibrio parahaemolyticus infection	0	0	0	0	2	0	0	0	0	0	2	0
Viral Haemorrhagic Fevers	0	0	0	0	0	0	0	0	0	0	0	0
Yellow Fever	0	0	0	0	0	0	0	0	0	0	0	0
Yersiniosis	0	1	0	0	7	4	0	0	0	0	7	5
Zika	0	0	0	0	0	4	0	0	0	0	0	4
Zoster	11	7	1	1	56	86	6	5	1	4	75	103
Sum:	**1,058**	**1,802**	**226**	**204**	**2,044**	**3,277**	**382**	**545**	**588**	**502**	**4,298**	**6,330**

Dengue notifications for April to June 2025

Number of cases	Origin of infection	NT Region notified
9	Indonesia (Bali)	Darwin
1	Thailand	Darwin
1	Philippines	Alice Springs
1	Cook Islands	Darwin

More information about Dengue.

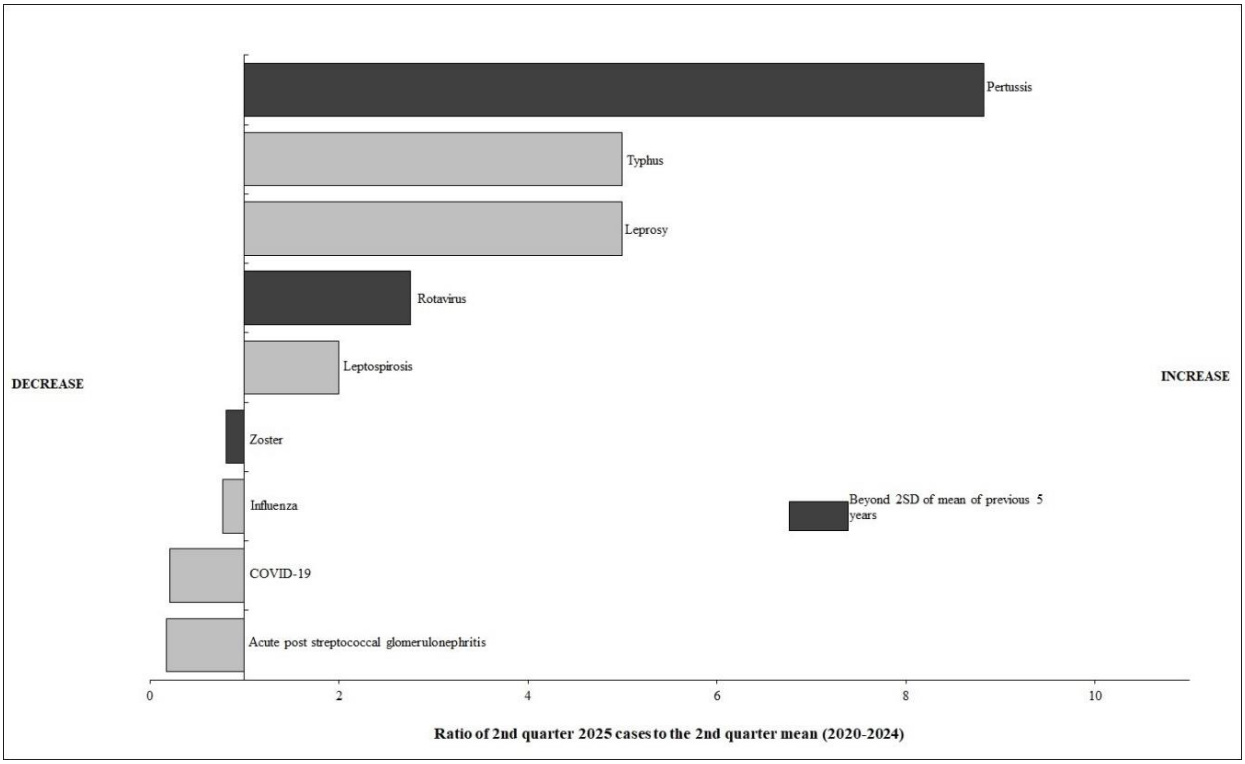
Malaria notifications for April to June 2025

Number of cases	Origin of infection	Agent	Chemoprophylaxis	NT Region
8	Uganda	*Plasmodium* species (PCR only)	Artemether/ lumefantrine	Darwin

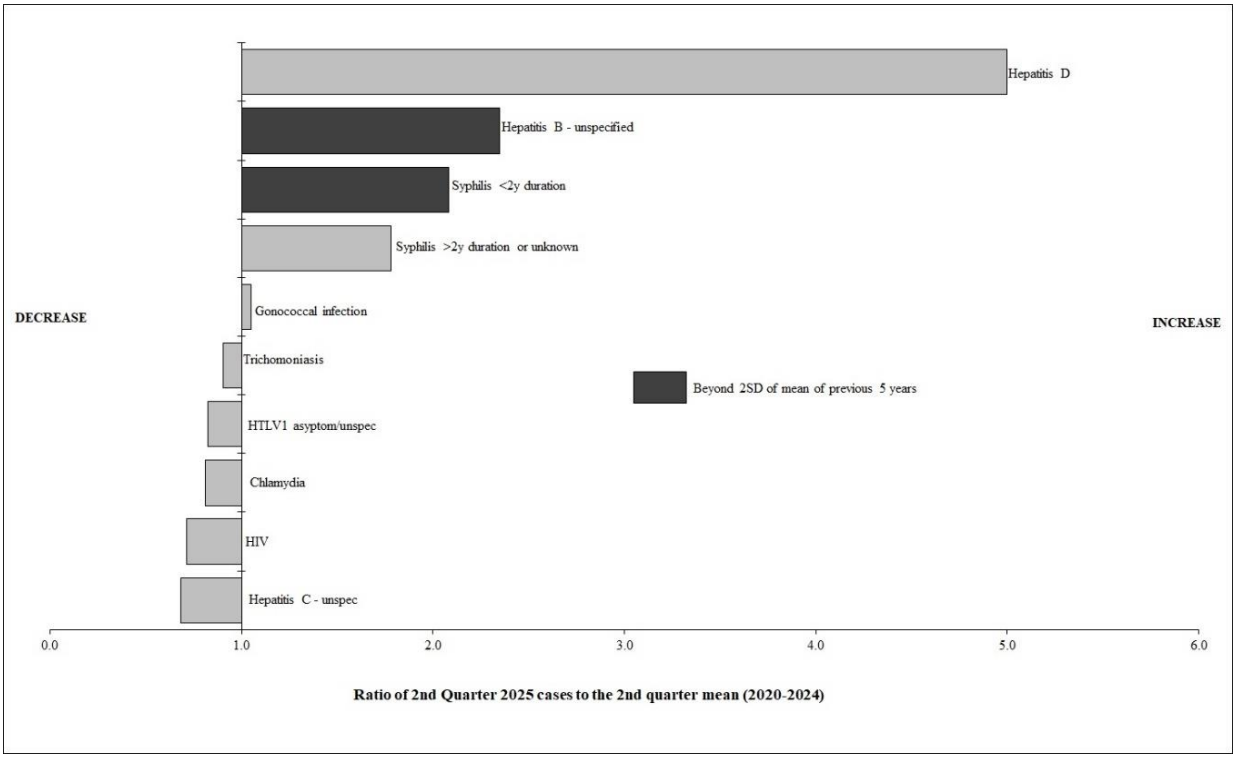
More information about Malaria.

Graphs of selected diseases and STIs – Q2 2025

Ratio of the number of notifications in 2nd quarter of 2025 to the 2nd quarter mean (2020– 2024): Selected diseases



Ratio of the number of notifications in 2nd quarter of 2025 to the 2nd quarter mean (2024 – 2025): Sexually transmitted infections



Comments on selected disease notifications

Pertussis

There were 30 notifications of pertussis in the 2nd quarter of 2025 compared to a 5-year 2nd quarter mean of 3.4 notifications. This follows on from the 34 cases notified in the 1st quarter of 2025, and from 2024, where Australia experienced its highest ever annual incidence of pertussis with over 57,000 notifications.

Rotavirus

There were 37 notifications of rotavirus in the 2nd quarter of 2025 compared to a 5-year 2nd quarter mean of 13.4 notifications; 25/37 (68%) were aged <5 years; 10/37 (27%) total were hospitalised with 6 of those 10 hospitalised<5 years.

Diphtheria (does not appear on graph)

There was 1 cutaneous diphtheria notification in the 2nd quarter of 2025; this was a locally acquired infection. This is only the second notification since 2011. This last notification was also a cutaneous infection acquired in Solomon Islands.

Hepatitis B unspecified

There were 46 notifications of hepatitis B (unspecified) in the 2nd quarter of 2025 compared to a 5-year 2nd quarter mean of 19.6 notifications. This increase may also reflect ongoing enhanced testing and case finding across the NT.

Zoster

There were 75 notifications of zoster in the 2nd quarter of 2025 compared to a 5-year 2nd quarter mean of 92.6 notifications.

Syphilis <2 years duration

There were 123 notifications of syphilis (<2 years duration) in the 2nd quarter of 2025 compared to a 5-year 2nd quarter mean of 59 notifications. In late 2024 an incident management team (IMT) was established in response to further increases in syphilis cases in the Top End, East Arnhem and Big Rivers regions. Enhanced testing efforts and active case finding are currently underway across the NT, which is likely contributing to the observed increase in notifications.

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Immunisation coverage in the Northern Territory

Northern Territory (NT) immunisation data is accessible from the Australian Government website. The following link provides tables of the latest annualised quarterly report on childhood immunisation coverage from the Australian Government Department of Health and Aged Care, which combines the December, March, June and September quarters for NT and Australia.

The data show the proportion of children fully immunised at 1, 2 and 5 years of age according to the National Immunisation Program Schedule.

Launch of the NT Immunisation Schedule, 1 September 2025

The NT officially launched its updated Immunisation Schedule, on 1 September 2025 with the introduction of Prevenar 20® to the National Immunisation Program funded for all children (aged up to 18 years). Prevenar 20® it replaced both Prevenar13® and Penumovax 23® on the NT Childhood Immunisation Schedule.

Prevenar 20® is a 20 valent pneumococcal conjugated vaccine (20vPCV) inducing a long-term memory response providing long term immunity. It protects against 20 strains of *Streptococcus pneumoniae*.

The Immunisation Team at Centre for Disease Control, Darwin, showcasing the September NT Immunisation Schedules.

NT Health Fact sheet

Irukandji Syndrome

What is Irukandji syndrome?

Irukandji syndrome consists of a diverse range of symptoms that can occur following a sting from one of a variety of types of box jellyfish. The syndrome can be mild for some and severe and life-threatening in others.

What type of jellyfish causes Irukandji syndrome?

There are at least 14 different 4-tentacled box jellyfish that can cause Irukandji syndrome. The bell of the box jellyfish is a 'box shape', with in those causing Irukandji syndrome a single tentacle arising from each of the 4 corners. The tentacles range in length from a few cm to 35 cm. These box jellyfish are difficult to see in water as they are colourless with a bell commonly of 2.5cm diameter or smaller.

Where are these jellyfish found?

The jellyfish that cause Irukandji syndrome have been found along Australia's northern coastline from Fraser Island in Queensland across the Northern Territory to Broome in north Western Australia. Irukandji syndrome has also been reported in parts of Asia, the Caribbean and Hawaii.

What time of the year does Irukandji syndrome occur?

Irukandji syndrome has been recorded in the Northern Territory all year round. Stings occur less frequently during the dry season.

Around 40 people present to Top End hospitals or health clinics each year with a condition attributed to a jellyfish sting some of which will be Irukandji syndrome.

How does envenomation occur?

The bell and tentacles contain millions of 'nematocysts' which store and can inject venom. Contact with skin causes the nematocysts to rapidly fire - injecting highly toxic venom into the tissue through a harpoon-like thread structure.

What are the signs and symptoms?

The person may or may not feel a mild pain at the sting site and develop a goose bump-like skin reaction. After about 30 minutes symptoms worsen to include severe limb, abdominal and back pain, anxiety, headache, vomiting, profuse sweating and sometimes difficulty breathing. Their heart rate may become very rapid and their blood pressure may become very high. In extreme cases, heart failure, swelling of the brain and very rarely death may result.

In some cases the symptoms resolve in a matter of hours, however many patients require hospital admission with full resolution of symptoms taking up to several days. Complications from envenomation may continue for several days to weeks.

What is the treatment for Irukandji syndrome?

- Pour vinegar if available on the area of the sting to stop further discharge from nematocysts – do not wash with fresh water
- Seek urgent medical assistance and transport to hospital for assessment
- Watch closely for difficulty breathing and loss of consciousness.

How do I prevent Irukandji syndrome?

Wear protective clothing at all times if entering the water. Small children especially need protective clothing. Long sleeved tops or rash-shirts and long pants will provide a good level of protection but a full-body lycra suit is better.

What is the difference between the jellyfish causing Irukandji syndrome and the major box jellyfish Chironex fleckeri?

The adult major box jellyfish, *Chironex fleckeri*, has a larger bell of 25-30 cm in diameter and has 10-12 tentacles from each of the 4 corners of the bell, each up to 2 metres or more in length.

It is extremely venomous causing immediate severe pain and the appearance of white welts within minutes followed by red whip-like lines which may later blister.

In some cases cardiac arrest and death occurs within 5 minutes of being stung by a *Chironex fleckeri* jellyfish.

Contact

For more information contact the Centre for Disease Control in your region.

Location	Phone
Darwin (Top End Region)	(08) 8922 8044 1800 008 002
Katherine (Big Rivers Region)	(08) 8973 9049
Tennant Creek (Central Australia Region)	(08) 8962 4259
Alice Springs (Central Australia Region)	(08) 8951 7540
Nhulunbuy (East Arnhem Region)	(08) 8987 0357

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Version: Version: 4.0 DO NOT EDIT THIS	**Approved Date: 5/12/2023**	**Review Date: 5/12/2028**

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Abstracts from peer reviewed published articles related to the Northern Territory

Acute Rheumatic Fever and Rheumatic Heart Disease in Children Aged Less Than 5 Years in the Northern Territory Between 2010 and 2020

Stephenson Z, Jones B, Remenyi,B, de Dassel, Jessica, Dunn S, Francis J R and Yan J

Journal of paediatrics and child health. 2025;0: 1-7

https://doi.org/10.1111/jpc.70194

Aim: Acute rheumatic fever (ARF) and rheumatic heart disease (RHD) are preventable diseases affecting socioeconomically disadvantaged populations globally, including Australian children. This study aims to describe the clinical presentation and outcomes of ARF and RHD in children aged less than 5 years, to improve recognition and management.

Method: A retrospective audit was undertaken of children aged less than 5 years with ARF and RHD in the Northern Territory (NT) of Australia between 2010 and 2020. Patients were identified from the NT RHD register. Descriptive data analyses were performed to summarise patient demographics, clinical presentation, diagnosis, disease severity, management, and outcomes.

Results: During the study period, 82 children (51% female) aged less than 5 years presented with definite, probable, or possible ARF (78/82), and/or RHD (20/82). Aboriginal and Torres Strait Islander children were disproportionately affected, with average annual incidences (2010-2020) of ARF and RHD of 127 (95% confidence interval [CI]: 99-155) and 33 (95% CI: 18-47) per 100,000 population, respectively. ARF recurrence was common (23%). At diagnosis, RHD was moderate to severe in 55% of cases, and 20% of children with RHD required one or more cardiac surgeries.

Conclusion: Children aged less than 5 years living in remote NT are at risk of ARF and RHD. Aboriginal and Torres Strait Islander children are disproportionately affected. Presentations with sore joints, chorea, new cardiac murmurs or other symptoms suggestive of ARF should be fully investigated. Echocardiographic screening for RHD should be considered for children living in remote NT from the age of 3 years.

Keywords: *Aboriginal and Torres Strait Islander people; acute rheumatic fever; paediatrics | rheumatic heart disease*

Sudden cardiac death in young First Nations Australians in the Northern Territory, Australia: Potential implications for pre-participation screening

Pande S, DeSilva V, Paratz E, Tiemensma M and Kangaharan N

Journal Sports Medicine Australia.2025;5:100-101

https://doi.org/10.1016/j.jsampl.2025.100100

Objective: To present data from coronial records on sudden cardiac death (SCD) cases seen in young, First Nations Australians in the Northern Territory of Australia, estimate its incidence, and propose potential pre-participation screening strategies.

Design: Retrospective observational study.

Methods: Coronial records of sudden cardiac death cases in First Nations Australians in the Northern Territory under 40 years of age occurring between 2019 and 2023 were reviewed

to study the incidence, demographics, medical history, circumstances of death and causes of death with autopsy and toxicology analysis.

Results: A total of 59 SCD cases in First Nations Australians under 40 years of age were recorded in the Northern Territory with an annual incidence of 19.8 cases per 100,000 persons. The mean ± SD of age was 32.8 ± 6.14 years. There were 61% male and 2/3 of SCD cases occurred in remote location. Coronary heart disease (n = 36; 61%) was the most common cause of death. In 3 cases, SCD was related to sports or exercise activity. Most common medical co-morbidities were cardiac (38.9%), Diabetes mellitus (35.6%), and rheumatic heart disease (20.3%). Smoking (37.3%) and alcohol abuse (32.2 %) were the most common risk factors.

Conclusions: SCD is more common and coronary heart disease and rheumatic heart disease are the most common causes in First Nations Australians in the Northern Territory under the age of 40 years. Medical co-morbidities and risk factors are prevalent in this population. There is a need for First Nation Australians specific local guidelines for a comprehensive pre-participation Heart-Health assessment

Keywords: *Sudden cardiac death; cardiovascular disease; First Nations Australians; Screening*

Japanese Encephalitis Virus: The Emergence of Genotype IV in Australia and Its Potential Endemicity

Mackenzie JS, Williams DT, van den Hurk AF, Smith DW and Currie B

Viruses.2022;14:11

https://doi.org/10.3390/v14112480

A fatal case of Japanese encephalitis (JE) occurred in northern Australia in early 2021. Sequence studies showed that the virus belonged to genotype IV (GIV), a genotype previously believed to be restricted to the Indonesian archipelago. This was the first locally acquired case of Japanese encephalitis virus (JEV) GIV to occur outside Indonesia, and the second confirmed fatal human case caused by a GIV virus.

A closely related GIV JEV strain subsequently caused a widespread outbreak in eastern Australia in 2022 that was first detected by foetal death and abnormalities in commercial piggeries. Forty-two human cases also occurred with seven fatalities. This has been the first major outbreak of JEV in mainland Australia, and geographically the largest virgin soil outbreak recorded for JEV. This outbreak provides an opportunity to discuss and document the factors involved in the virus' spread and its ecology in a novel ecological milieu in which other flaviviruses, including members of the JE serological complex, also occur.

The probable vertebrate hosts and mosquito vectors are discussed with respect to virus spread and its possible endemicity in Australia, and the need to develop a One Health approach to develop improved surveillance methods to rapidly detect future outbreak activity across a large geographical area containing a sparse human population. Understanding the spread of JEV in a novel ecological environment is relevant to the possible threat that JEV may pose in the future to other receptive geographic areas, such as the west coast of the United States, southern Europe or Africa.

Keywords: *Japanese encephalitis virus; flavivirus; JEV genotype IV; Culex sp. mosquitoes; ardeid birds; feral pigs; Murray Valley encephalitis virus*

Diagnostic and phylogenetic features of the 2023 Murray Valley encephalitis virus outbreak in Australia

Howard-Jones AR et al.

Pathology.2024;56(SI):S36-S37

http://dx.doi.org.www.ezpdhcs.nt.gov.au/10.1016/j.pathol.2023.12.136

Objectives: This study aims to characterise the 2023 outbreak of Murray Valley encephalitis (MVE) in Australia, focusing on utility of diagnostic platforms, testing algorithms and genomic characteristics.

Methods: A nationwide case series of MVE cases from 1January to 31 July 2023 was collated across all state-based arbovirus reference laboratories.

Results: Our case series identified 26 MVE cases in 2023 spanning all age groups (6 weeks to 83 years) with a male preponderance (3.3:1). A multimodal diagnostic framework facilitated MVE diagnosis at a median of 6 days from symptoms to diagnostic specimen collection (IQR 4 to 9 days). MVEV-specific IgM was detectable in serum in 76% of patients by day 7 and MVEV IgG or total antibody in 100% by day 30. MVEV-specific IgM and molecular testing of CSF was confirmatory in 36% and 30% patients, respectively. Co-circulation of two MVEV genotypes, G1A and G2, was demonstrated, with only G1A present in Southeast Australia.

Discussion: This study provides a comprehensive overview of the 2023 MVE outbreak in Australia, emphasising the importance of a multimodal diagnostic approach for accurate and timely case confirmation. MVEV emergence underscores the need for ongoing One Health arbovirus surveillance, particularly in the context of episodic climatic events.

Melioidosis in Asia Pacific Nations: Expanding Boundaries but Unknowns Remain

Currie BJ and Meumann EM

Respirology.2025;0:1-3

https://doi.org/10.1111/resp.70098

Summary

- Melioidosis is endemic in many regions of the Asia-Pacific.
- The endemic boundaries of melioidosis remain unclear but are likely expanding.
- With increasing diabetes, an ageing population and global climate change, rates of melioidosis are predicted to increase.

Keywords: *Burkholderia pseudomallei; diabetes; melioidosis; pneumonia; sepsis*

Laboratory-based syphilis lateral flow immunoassay testing for maternity care at Alice Springs Hospital: a pilot study

Moore N, Freeman K, Mcleod J, Singh D, Crispe S, Campbell S, Yan J, Gunathilake M, Meumann EM and Baird R.

Communicable Diseases Intelligence.2025;49:3-9

https://doi.org/10.33321/cdi.2025.49.051

Congenital syphilis is a preventable yet severe condition resulting from untreated maternal syphilis. Since 2016, Australia has recorded over 95 congenital syphilis cases, with 31/95 (33%) associated with perinatal death. Syphilis serology is complex and therefore performed in designated central laboratories. In the Northern Territory, specimen transport times associated with vast geographic distances lead to delayed results in remote regions. This study evaluates the

introduction of the Abbott Determine™ Syphilis TP lateral flow immunoassay (LFI) at Alice Springs Hospital (ASH) to reduce turnaround times for maternal syphilis screening.

During the period 2 September – 1 December 2024, eighty-eight LFIs were performed on serum from 74 pregnant women at the ASH laboratory. LFI results were available within 24 hours for 99% of cases, with a median turnaround time of six hours compared to 61 hours for the screen done in Darwin ($p < 0.001$). No new syphilis cases were detected; all positive LFI results reflected past treated infections. LFI demonstrated 100% sensitivity and specificity compared to standard serology.

Although syphilis LFI cannot distinguish active from past infections, it significantly improves the timeliness of screening results, reducing risks of delayed treatment and of loss to follow-up. Implementing a syphilis LFI in remote laboratory settings offers a strategy to enhance syphilis diagnosis and prevention, with broader applicability in high-burden remote regions.

Keywords: *syphilis; congenital syphilis; syphilis diagnostics*

The association between sexually transmitted infections and pregnancy outcomes in the Northern Territory, Australia: a population-based cohort study

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Background: Often asymptomatic in nature, sexually transmitted infections (STIs) are highly prevalent in women of reproductive ages, leading to adverse perinatal outcomes. This study investigated the association between STIs during pregnancy and the risk of adverse perinatal outcomes using comprehensive population-linked data from the Northern Territory (NT), Australia.

Methods: This population-based retrospective cohort study examined births (live births and stillbirths) from the NT Perinatal Data Collection and the NT Notifiable Diseases register from 2005 to 2020. All singleton births (N = 59,465) were included, along with infectious disease notifications of four STIs that occurred during pregnancy: chlamydia, gonorrhoea, trichomoniasis, and syphilis. Relative risks (RR) for associations between STIs during pregnancy with adverse perinatal outcomes (pre-labour rupture of membranes, preterm birth, small for-gestational age, stillbirth) were estimated using robust Poisson regression models. -

Findings: For babies born with congenital syphilis (n = 23), there was an association with preterm birth (RR 3.34, 95% confidence interval (CI) 1.80–6.17) and small-for-gestational age (RR 2.22, 95% CI 1.34–3.67). Small-for-gestational age was associated with maternal chlamydia (RR 1.86, 95% CI 1.54–2.24), maternal gonorrhoea (RR 1.76, 95% CI 1.46–2.12), and maternal trichomoniasis (RR 1.10, 95% CI 1.01–1.20). Associations were also observed between gonorrhoea and stillbirth (RR 1.97, 95% CI 1.19–3.27), and trichomoniasis with preterm birth (RR 1.23, 95% CI 1.09–1.39).

Interpretation: STIs during pregnancy showed notable associations with adverse birth outcomes. Congenital syphilis most severely affected outcomes, tripling preterm birth risk and doubling small-for-gestational age risk. These findings underscore the importance of addressing barriers to STI screening and treatment prior to and during pregnancy.

Keywords: Sexually transmitted; infections; Pregnancy; Adverse pregnancy outcomes

Disease progression & treatment need in sub-genotype C4 hepatitis B infection: a retrospective cohort study in the Northern Territory, Australia

Martin G E, Hosking K, Banz K, Gargan C, Stewart G, Greenwood-Smith B, Ramsay P, Tate-Baker J, Connors C, Binks P, McKinnon M, Manchikanti P, Garambaka Gurruwiwi G, Allard N, Qama A, Michaels J, Vintour-Cesar E, Batey R, Marshall C, Nihill P, Fernandes TA, Fuller K, Tong S YC, Boettiger D, Cowie B, Davis JS, Mariyalawuy Bukulatjpi S, Davies J on behalf of the Hep B PAST Partnership

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Background

In the Northern Territory (NT) of Australia, First Nations people with chronic hepatitis B (CHB) are infected with a unique sub-genotype, C4, which contains mutations linked to progressive fibrosis and hepatocellular carcinoma. This cohort study aimed to investigate disease progression in C4 sub-genotype infection and estimate how many untreated individuals may benefit from antiviral therapy with broadening treatment indications.

Methods

Included individuals were part of Hep B PAST, a co-designed program to improve the cascade of care for people living with CHB in the NT. Disease phase and cirrhotic status were determined algorithmically using clinical and laboratory data at two time points. Loss of HBV antigens was assessed longitudinally. Treatment need was assessed cross-sectionally in the cohort at study completion. Key outcomes were estimated rates of HBsAg/HBeAg loss in sub-genotype C4 infection and quantification of how many untreated individuals qualify for therapy under current Australian and expanded global treatment guidelines.

Results

HBsAg and HBeAg loss occurred at a rate of 1·04 and 8·06 events/100 person-years respectively (7342·6 and 545·6 years follow up). 783 people living with CHB were included (40% female, median age 48 years). Of these, 16% had cirrhosis (an additional 6% having FibroScan > 7 kPa, meaning 22% had cirrhosis or significant fibrosis) and 25% were prescribed antivirals. Only 6·7% of untreated individuals were treatment eligible under current guidelines. Using the 2024 World Health Organisation guidelines, this increased to 50% due mostly to fibrosis and population prevalence of diabetes.

Conclusions

Despite advanced liver disease in people living with CHB in the NT, rates of antigen loss in sub-genotype C4 hepatitis B infection are similar to other genotypes. Further work is needed to understand drivers of cirrhosis and significant fibrosis in this population.

Acute post-streptococcal glomerulonephritis (APSGN) in the Torres Strait and Cape York: surveillance insights pre- and post-mandatory notification

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Acute post-streptococcal glomerulonephritis (APSGN) is an immune-mediated kidney condition, typically affecting children. While the incidence has declined in urban Australia, APSGN remains a

major concern in rural and remote communities, particularly among First Nations children. This study describes the epidemiology of APSGN in the Torres Strait and Cape York region of Far North Queensland (FNQ) over a three-year period, from January 2022 to December 2024, which spanned pre- and post-mandatory public health notification of APSGN in Queensland.

Cases were initially identified through electronic medical record alerts and later augmented by clinical notification when APSGN became notifiable in Queensland in October 2023. Over the three years of our study period, there were 75 confirmed, probable and possible cases identified, including outbreaks on Waiben (Thursday Island) and New Mapoon. The median age of cases was six years (interquartile range: 4–9 years), with 92% of cases occurring in children under 15, all from First Nations backgrounds. The 63 confirmed and probable cases in children under 15 represent an incidence within this population of 390 cases per 100,000 person-years (95% confidence interval: 294–486 per 100,000 person-years), ostensibly the highest documented rate globally.

In the modern era, the burden of this preventable disease for FNQ First Nations children is the highest in the world. Progress will only be made by addressing the underlying social determinants of health, including childhood disadvantage and household crowding.

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