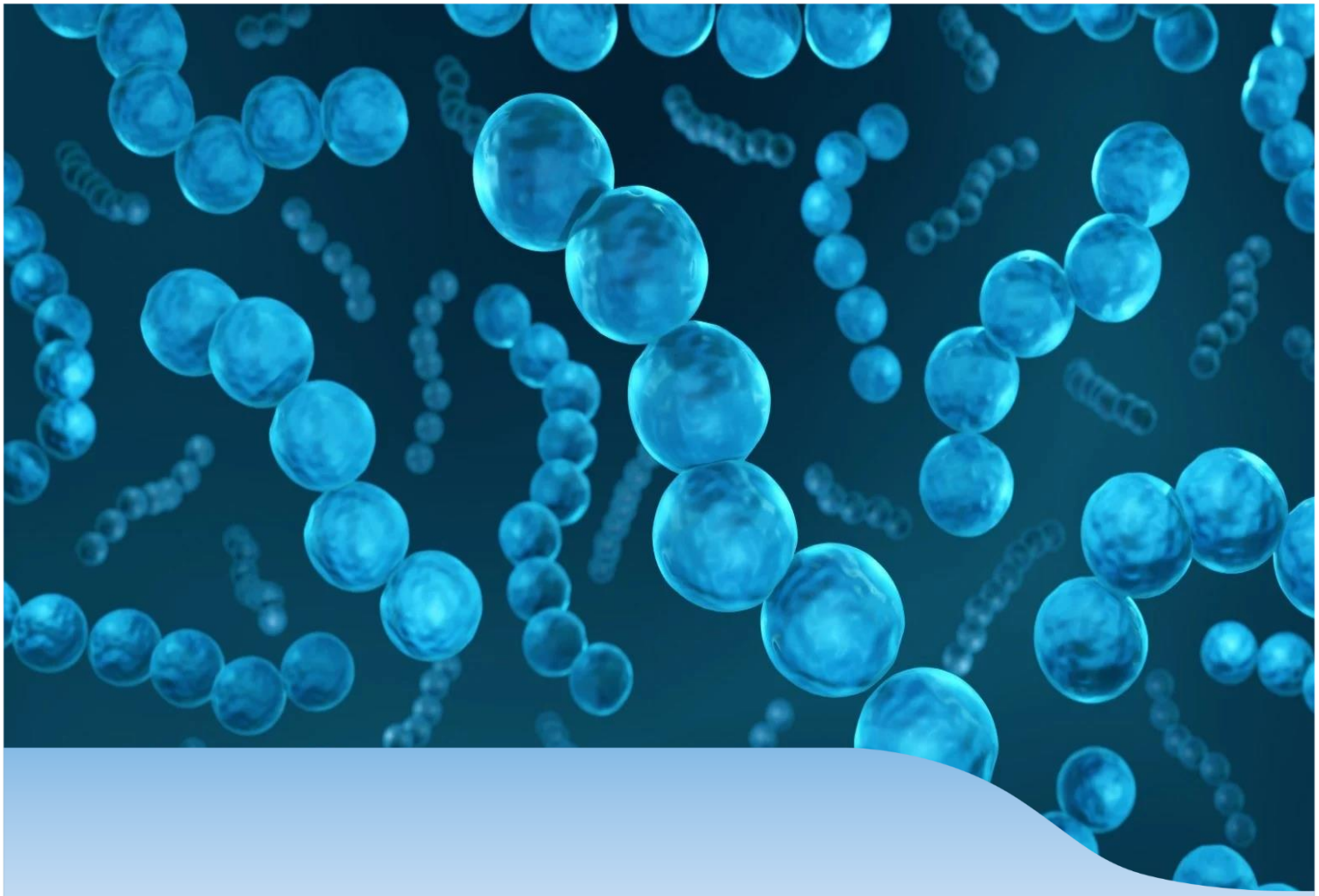


Communicable Diseases Prevention Unit,
Public Health Services

Invasive Group A Streptococcal (iGAS) Disease

Surveillance Report 2023

Department of **Health**

Tasmanian Government

Contents

Summary

Invasive group A streptococcal disease (iGAS) is a severe, invasive infection caused by *Streptococcus pyogenes*. iGAS was added to the nationally notifiable diseases list on 1 July 2021. In Tasmania, iGAS became notifiable to the Director of Public Health on 1 July 2022. From late 2022, iGAS was notifiable in all Australian jurisdictions. This report summarises cases of iGAS notified to the Director of Public Health in Tasmania from 1 January 2023 to 31 December 2023.

In 2023, a total of 44 iGAS cases were notified, an annual rate of 7.7 per 100 000 population. The highest notification rates of iGAS were in the youngest (0 to 4 year) and oldest (65 years and over) age groups, with rates of 10.4 and 9.8 per 100 000 population, respectively. Aboriginal and/or Torres Strait Islander people experienced higher rates of iGAS (9.9 per 100 000) compared to non-Aboriginal and/or Torres Strait Islander people (8.2 per 100 000). Notification rates were higher among residents of the North-West (8.4 per 100 000 population) compared to other regions.

The majority of iGAS cases were hospitalised (97.7%), which reflects the nature of invasive disease. Bacteraemia (71.4%), pneumonia (11.9%) and septic arthritis (7.1%) were the most common clinical syndromes. There were a number of different GAS genotypes (*emm* types) identified in 2023, with *emm*-1 (61.1%) and *emm*-12 (16.7%) the most dominant, consistent with 2022 data (unpublished).

In this first full calendar year of iGAS as a notifiable disease in Tasmania and Australia, the incidence of iGAS was notably higher than expectations based on historical rates described in other jurisdictions (where previously notifiable) and global trends. However, the rate of iGAS in 2023 in Tasmania was lower than that observed in most other Australian jurisdictions. Ongoing surveillance of iGAS will be important to further understand the epidemiology of iGAS in Tasmania.

1. Introduction

This surveillance report describes the epidemiology of invasive group A streptococcal infection (iGAS) in Tasmania from 1 January 2023 to 31 December 2023. Group A S*treptococcus* (GAS) bacteria, also known as *Streptococcus pyogenes*, commonly colonise the skin and upper pharynx, and typically spread through respiratory droplets, or through contact with secretions (such as discharge from wounds) from an infected person. A range of clinical presentations are related to GAS infections, including common illnesses such as tonsilitis or pharyngitis (strep throat), and skin or soft tissue infections (impetigo or cellulitis).[1]

iGAS is a serious infection caused when GAS infect a normally sterile body site, such as blood, bone marrow, joint fluid, or cerebrospinal fluid. GAS bacteria are genomically diverse and some are more likely to cause invasive disease.[2] Clinical presentations may include bacteraemia, meningitis, pneumonia, necrotising fasciitis, and streptococcal toxic shock syndrome. iGAS is more common in Aboriginal and Torres Strait Islander populations, the elderly, and people experiencing poverty.[3-8] Post-surgical and postpartum patients are at increased risk of infection as broken cutaneous or mucosal barriers may facilitate invasive GAS infection.

iGAS became notifiable in Tasmania under the *Public Health Act* (1997) from 1 July 2022, but did not become notifiable in all Australian states and territories until September 2022.[9] The annual notification rate of iGAS in Australia in 2023 was 10.5 per 100 000 population.[10]

Data considerations

- This is the first surveillance report on iGAS in Tasmania and presents data for 2023 extracted from the Tasmanian Notifiable Diseases Surveillance System (TNDSS) on 23 September 2024.
- Data from the TNDSS are analysed and reported based on calculated onset date, which is the true onset date of a case, if known, or the earliest of the specimen collection date or the notification date.
- Confirmed cases are reported as per the national surveillance case definition, available at the Australian Department of Health website.
- Reporting of mortality in association with iGAS reflects information known at the time of notification and may be incomplete. Mortality reported in association with iGAS does not consider or assess the relative contribution of the infection to the outcome.
- Data presented in this report are subject to revision and may differ from data in national reports due to differences in information management in respective databases.

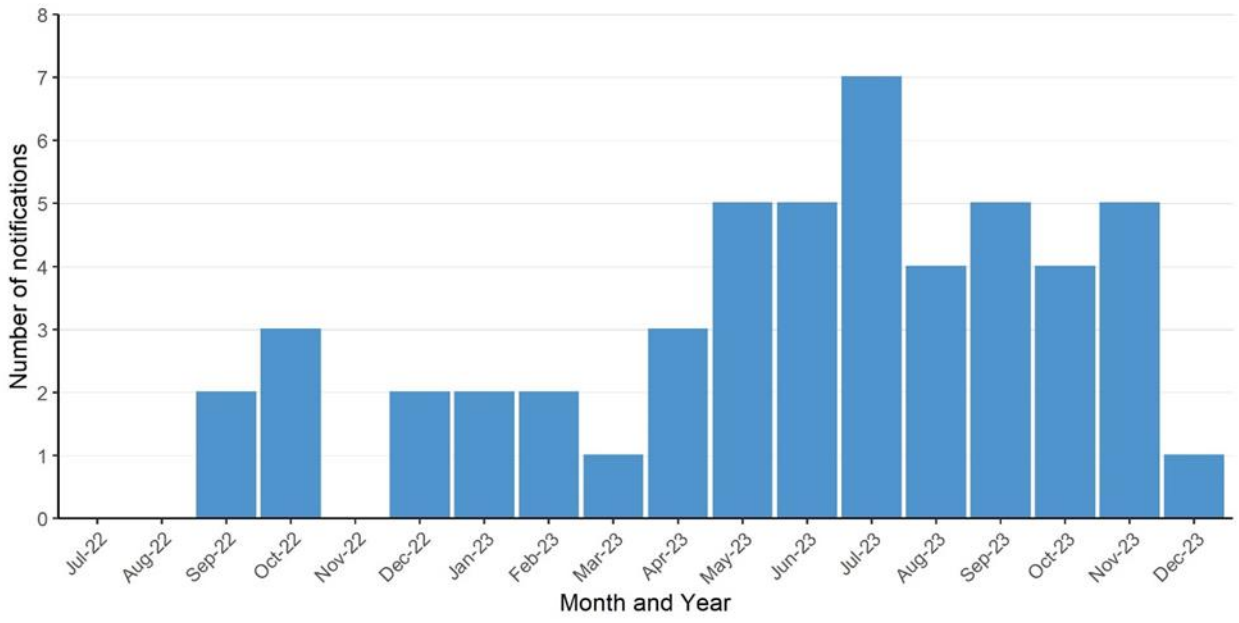
2. Epidemiology of cases

2.1 Trends in notifications

From 1 January 2023 to 31 December 2023, a total of 44 confirmed iGAS cases were notified in Tasmania. The annual notification rate was 7.7 cases per 100 000 population, which was lower than the national rate of 10.5 per 100 000.[10]

Since iGAS was recently made notifiable, historical comparisons within Tasmania are limited. Figure 1 presents notifications from July 2022 to December 2023, and shows there was no clear seasonal pattern for iGAS in 2023. However, the highest number of notifications (n=7) occurred in mid-winter (July), coinciding with increases in respiratory infections including influenza and respiratory syncytial virus (RSV). Increases in iGAS cases during periods of increased influenza circulation have been documented in Australia.[11-12] Internationally, iGAS trends demonstrate seasonal peaks in winter to early spring.[13-14] While notifications decreased slightly in August, the number of notifications remained stable at 4–5 notifications per month until December when there was a single case notified.

Figure 1. iGAS notifications by month, Tasmania, 1 July 2022 to 31 December 2023



Source: Tasmanian Notifiable Diseases Surveillance System (TNDSS).

2.2 Demographics

Age and sex distribution

Females accounted for 25 (25/44, 56.9%) iGAS notifications, with the notification rate higher in females (8.6 per 100 000) than in males (6.7 per 100 000).

The median age of cases was 53 years (range 1–92 years). Over half (24/44, 54.5%) of notifications were in adults aged 18-64 years (Table 1). Notification rates were highest in children aged 0–4 years (10.4 per 100 000) followed by adults aged 65 years and over (9.8 per 100 00).

Table 1. iGAS notifications and rates by age group, Tasmania, 2023

Age group (years)	Number of notifications	Percentage of notifications	Rate*
0 - 4	3	6.8	10.4
5 - 17	5	11.4	5.8
18 - 64	24	54.5	7.1
65 and over	12	27.3	9.8
Total	**44**	**100.0**	**7.7**

* Notification rate per 100 000 population. Sources: Tasmanian Notifiable Diseases Surveillance System (TNDSS), Australian Bureau of Statistics estimated resident population (Jun 2023).

Aboriginal and/or Torres Strait Islander status

Of the 44 iGAS notifications, three notifications (3/44, 6.8%) were in Aboriginal and/or Torres Strait Islander people (Table 2). Aboriginal and/or Torres Strait Islander people experienced a higher rate of iGAS (9.9 per 100 000) compared to the non- Aboriginal and/or Torres Strait Islander people (8.2 per 100 000).

Table 2. iGAS notifications and rates by Aboriginal and/or Torres Strait Islander status, Tasmania, 2023

Aboriginal and/or Torres Strait Islander	Number of notifications	Percentage of notifications	Rate*
No	41	93.2	8.2
Yes	3	6.8	9.9
Total	**44**	**100.0**	**8.3^**

* Notification rate per 100 000 population. ^Total rate differs to elsewhere in the report due to use of Aboriginal and Torres Strait Islander population in the 2021 Australian Bureau of Statistics Census as the denominator. Sources: Tasmanian Notifiable Diseases Surveillance System (TNDSS), Australian Bureau of Statistics Census population (Jun 2021).

Regional distribution

The majority of iGAS notifications were from residents of the South (22/44, 50.0%), followed by the North (13/44, 29.5%), and North-West (9/44, 20.5%) (Table 3). Notification rates were highest in the North-West (8.4 per 100 000), followed by the North (7.7 per 100 000) and South (7.4 per 100 000).

Table 3. iGAS notifications and rates by region, Tasmania, 2023

Region	Number of notifications	Percentage of notifications	Rate*
South	22	50.0	7.4
North	13	29.5	7.7
North-West	9	20.5	8.4
Total	**44**	**100.0**	**7.7**

* Notification rate per 100 000 population. Sources: Tasmanian Notifiable Diseases Surveillance System (TNDSS), Australian Bureau of Statistics estimated resident population (Jun 2023).

3. Clinical presentation and outcomes

3.1 Clinical presentation

Among iGAS notifications where clinical presentation was known, bacteraemia (30/42, 71.4%), pneumonia (5/42, 11.9%), and septic arthritis (3/42, 7.1%) were the most common clinical syndromes reported by cases (Table 4).

Table 4. Number of iGAS notifications by clinical presentation (n=42), Tasmania, 2023

Clinical presentation*	Number of notifications	Percentage of notifications
Bacteraemia	30	71.4
Pneumonia	5	11.9
Septic arthritis	3	7.1
Streptococcal toxic shock syndrome	2	4.8
Peritonitis	1	2.4
Pleural empyema	1	2.4
Meningitis	1	2.4
Non-necrotising soft tissue infection	1	2.4
Osteomyelitis	1	2.4
Pleural effusion	1	2.4
Other – unspecified	4	9.5

*Excludes notifications with unknown clinical presentation (n=2). Source: Tasmanian Notifiable Diseases Surveillance System (TNDSS).

All iGAS cases (44/44, 100%) were symptomatic, with fever (20/44, 45.5%), nausea and/or vomiting (13/44, 29.5%) and generalised pain and/or myalgia (13/44, 29.5%) the most frequently reported symptoms by cases (Table 5).

Table 5. Number of iGAS cases by most frequently reported symptoms (n=44), Tasmania 2023

Most frequently reported symptoms*	Number of notifications	Percentage of notifications
Fever	20	45.5
Nausea and/or vomiting	13	29.5
Generalised pain and/or myalgia	13	29.5
Skin rash or redness around a wound site	9	20.5
Dizziness	7	15.9
Headache	6	13.6
Shortness of breath	6	13.6
Abdominal pain	5	11.4
Sore throat	5	11.4

Sources: Tasmanian Notifiable Diseases Surveillance System (TNDSS).

3.2 Hospitalisations and outcomes

The majority of iGAS cases had hospitalisation information available (43/44, 97.7%). Of these cases, 97.7% (42/43) were hospitalised, of which 38.1% (16/42) were admitted to ICU. The median age of hospitalised cases, and cases admitted to ICU, was 52 years (range 1–92 years).

The age-specific-rates of hospitalisation were highest among children aged 0–4 years (10.4 per 100 000) and adults aged 65 years and over (9.0 per 100 000) (Table 6). The age-specific-rates of ICU admission were highest among children aged 0–4 years (6.9 per 100 000), and similar for other age groups.

In 2023, there were four reported deaths associated with iGAS in adults aged 65 years and over.

Table 6. Number and rate of iGAS cases hospitalised by age group, Tasmania, 2023

Age group (years)	Number hospitalised	Percentage	Rate*	Number admitted to ICU	Percentage	Rate*
0 – 4	3	7.1	10.4	2	12.5	6.9
5 – 17	5	11.9	5.8	2	12.5	2.3
18 – 64	23	54.8	6.8	9	56.2	2.7
65 and over	11	26.2	9.0	3	18.8	2.5
Total	**42^**	**100.0**	**7.3**	**16**	**100.0**	**2.8**

* Notification rate per 100 000 population. ^Excludes cases not hospitalisation and hospitalisation status missing (n=2). Sources: Tasmanian Notifiable Diseases Surveillance System (TNDSS), Australian Bureau of Statistics estimated resident population (Jun 2023).

4. *Emm* typing and antimicrobial susceptibility

Molecular genotyping (*emm* typing) is a method used to characterise GAS strains. *emm* typing provides insight into the diversity of strains causing invasive infection. Table 7 presents the nine different *emm*-types identified in 2023 (Table 7). Among iGAS isolates with known *emm* typing (36/44, 81.8%), *emm*-1 (22/36, 61.1%) and *emm*-12 (6/36, 16.7%) were the most common, accounting for 77.8% of isolates combined. Similarly, *emm*-1 and *emm*-12 comprised 71.4% of isolates in 2022 (from 1 July 2022 to 31 December 2022; unpublished data).

All 44 iGAS isolates had antimicrobial susceptibility data available, with multiple agents tested on the one sample. While GAS remains universally penicillin sensitive, mutations in GAS penicillin binding protein genes have been detected in some countries but have not yet caused penicillin resistance. These mutations however may reduce susceptibility to other beta lactam antibiotics.[15-16] All isolates (44/44, 100.0%) were sensitive to penicillin. Erythromycin and clindamycin sensitivity were tested on a subset of isolates, with two isolates resistant to both erythromycin (2/5) and clindamycin (2/25) (Table 7).

Table 7. iGAS notifications by genotype and antimicrobial resistance, Tasmania, 2023

emm* type	**Number of notifications**	**Number of isolates resistant**
emm-1	22	0
emm-12	6	0
emm-75	2	0
emm-2	1	-
emm-11	1	1
emm-36	1	-
emm-77	1	1
emm-89	1	0
emm-122.2	1	0
Unknown	8	0
Total	**44**	**2**

Source: Tasmanian Notifiable Diseases Surveillance System (TNDSS)

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