Epidemiology of childhood ear surgery in an Australian population.

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Suburbs with lower SES and located further from hospitals have higher rates of surgical intervention for otitis media treatment.

Background

Grommet insertion is in Top 10 most common surgeries. South Australia has some of the highest incidence. Among First Nations children had myringotomy hospitalizations increased by 30% between 2012-13 to 2017-18 and had longer waiting times for surgery. Little is known about the spatial epidemiology of surgical intervention (grommet insertion) for otitis media.

Aim

To evaluate the spatial epidemiology of surgical intervention for the treatment of otitis media, and to assess the influence of socioeconomic status and access to healthcare facilities on surgical interventions for the treatment of otitis media in Greater Adelaide.

Methods

Hospital admission dataset
Adelaide, South Australia
Jan 2007 to Dec 2022

Data Variables

ICD-10-AM Procedure codes

- unilateral myringotomy (41626-00)
- bilateral myringotomy (41626-01)
- unilateral myringotomy with insertion of tympanostomy tube (41632-02)
- bilateral myringotomy with insertion of tympanostomy tube (41632-03)

Socioeconomic status

Distance (km) from hospitals with otolaryngology services

Statistical Area Level 2 (SA2) are medium-sized regions, similar population sizes

Statistical Analysis

Age and sex-specific incidence

Geospatial analysis

Negative binomial regression model

Results

A total of 19,113 ear surgery procedures in South Australia were conducted during the study period. Annual myringotomy incidence ranged from 2.7 to 4.0 per 1000 child-years for boys and 2.0 to 2.6 per 1000 child-years for girls. A one-unit increase in socioeconomic status resulted in a reduction of myringotomy cases by 17% (RR 0.83, 95%CI 0.76, 0.92). Distance to tertiary health care services was not found to be a strong predictor of surgical intervention for First Nations communities in Adelaide.

Table 1: Study Population (n = 19,113)

Age category	n	%
Toddlers (0-6 years)	15,609	81.7
Young Children (7-13 years)	2,378	12.4
Teens (14-18 years)	238	1.2
Young Adults (19-25 years)	136	0.7
Middle Age (26-45 years)	238	1.2
Older (46 and above)	514	2.7
First Nations Identity		
First Nations (Aboriginal or Torres Strait Islander)	749	3.9
Non-Indigenous	17,546	91.8
Not stated/inadequately described	818	4.3
Admission Type		
Public	6,894	36.1
Private	12,219	63.9
Funding source		
Medicare (Universal healthcare)	6,749	35.3
Private Health Insurance	9,708	50.8
Self-Funded	2,457	12.9
Miscellaneous	199	1.0

Figure 1: Age & sex specific incidence (per 1000 child years)

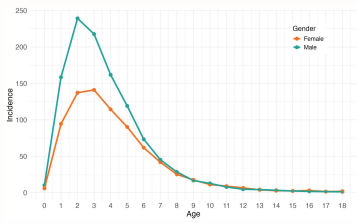


Figure 2: Mean annual incidence (per 1000 child years)

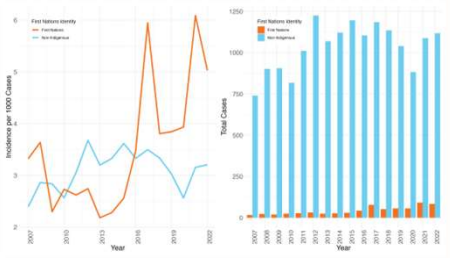
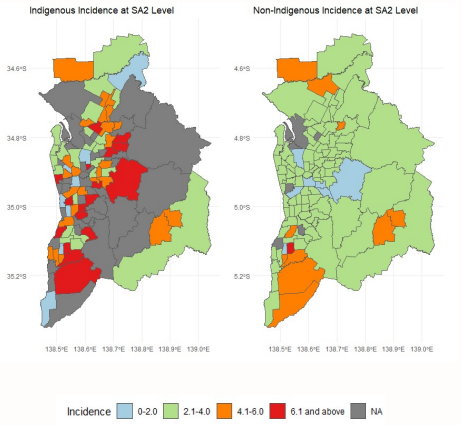


Figure 3: Spatial patterns of myringotomy incidence

The risk of surgical intervention with myringotomy with/without tympanometry tube insertion increases by 3% (RR 1.03, 95%CI 1.01-1.05), as distance from health care facilities (km) increases. The number of cases of myringotomy is generally higher in peri-urban and periphery SA2 regions in northern, southern and eastern parts of the cities, areas characterized by lower IRSAD and greater distance from health care facilities.



Conclusion

The strong association between ear health and socioeconomic status may be influenced by factors such as inadequate nutrition, and poor housing conditions. This is underpinned by the ongoing impacts of colonisation, land dispossession, systemic racism, and marginalisation. Structural reforms are crucial for improving healthcare of socioeconomically vulnerable communities. Targeted efforts should focus on providing culturally safe, holistic, and affordable services to ensure early intervention across the life course.

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