


ORIGINAL ARTICLE

Health status and health service use of urban Aboriginal children attending an Aboriginal community child health service in Sydney

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Aim: There is limited information on the health status of urban Australian Aboriginal children and young people attending community-based child health services. Such information is vital to plan appropriate services. The objective of the study is to describe the health status and service use of children and young people presenting to an urban Aboriginal Community Paediatric Service in Sydney, Australia.

Methods: Cross-sectional analysis of routinely collected data extracted from electronic medical records and the Australian Immunisation Register for urban Aboriginal children and young people aged 0–18 years who visited the service between January 2013 and December 2017.

Results: A total of 273 Aboriginal children and young people had 609 occasions of service. Almost all (97.35%) were fully immunised. Forty-six percent of occasions of service noted >3 diagnoses; 55% of the consultations were for mental health and behavioural disorders. The most frequent diagnoses were speech and language delay, attention deficit hyperactivity disorder and school difficulty. Psychosocial concerns were noted in 61.2% of occasions of service, and 19.4% of children had a history of prematurity. Eighty-five percent of consultations had an onward referral to additional services. The most common referrals were for audiology, ear-nose and throat specialists and speech therapy. There were low numbers of referrals to mental health services relative to the high number of mental health diagnoses.

Conclusion: It is essential that we address the mental, developmental and psychosocial needs of Aboriginal children and young people who attend urban Community Child Health services. Integrated service models should be developed in partnership with Aboriginal community to do this.

Key words: Aboriginal; Australia; child; health; urban.

What is already known on this topic

- 1 Aboriginal Australian children and adolescents have poorer health outcomes than their non-Aboriginal peers.
- 2 Urban Aboriginal children and youth (10–24 years) make up 5.0% ($n = 200\,512$) of the total child health population yet there is limited data on the health status of those attending community-based child health services.¹

What this paper adds

- 1 Urban Aboriginal children and young people attending community health centres have complex and chronic needs that increase with increasing age.
- 2 Urban Aboriginal children and young people presenting to a community child health service have a high burden of mental health and behavioural conditions complicated by exposure to perinatal and psychosocial risk.
- 3 Service provision for Aboriginal children and young people must be coordinated and family centred using strengths-based practices to support their chronic and complex needs. Fundamental to this is an integrated holistic approach that is trauma-informed and culturally competent developed in partnership with Aboriginal communities.

The health of Aboriginal children is a national priority. Discriminatory government policies, removal from land and culture, persisting racism and intergenerational trauma are compounded by low socio-economic status which result in reduced

opportunities and culminates in an unequal burden of ill health.² Urban Aboriginal children in New South Wales, while exhibiting resilience in the face of adversity, have higher rates of acute infections, obesity, ear disease, mental health problems and developmental risk than non-Aboriginal children.^{2–6} Aboriginal children experience 18% of the total burden of disease for Aboriginal Australians, with particular over-representation in avoidable hospitalisation across all age groups.^{5,7,8} They experience cumulative exposure to psychosocial risk factors, including

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housing instability, poor caregiver mental health and placement in out of home care (OOHC).^{6,9}

The majority (39%) of Aboriginal children and young people^{9–23} live in urban areas¹ and face different health difficulties to those in rural and remote areas.¹⁰ Urban Aboriginal people comprise 60% of the health gap between Aboriginal and non-Aboriginal people yet only 11% of all studies of Aboriginal health focus on urban Aboriginal people.¹⁰ There is a dearth of literature surrounding use of community-based Aboriginal-specific services, despite knowledge that such services increases use by Aboriginal people.¹¹ In order to provide equitable and appropriate paediatric health care in the community, an understanding of how and why urban Aboriginal children, young people and their families present to community child health services is needed. In this study, we aimed to address this gap by describing the health status and health utilisation of urban Aboriginal children and young people aged 0–18 years attending a community based Aboriginal child health service in South East Sydney from 2013 to 2017.

Methods

Setting and participants

The community child health clinic is an outreach service of Sydney Children's Hospital Randwick held at the La Perouse Aboriginal Community Centre. The majority of patients are from Randwick City area, located in the Eastern Suburbs of Sydney NSW, where 1.5% ($n = 2144$) of people identify as Aboriginal or Torres Strait Islander.¹² The clinic is staffed by community paediatricians with support from allied health services including an Aboriginal social worker, Aboriginal health-workers, speech pathology and an early childhood nurse. The clinic has a 'soft entry' intake service to reduce barriers to care, meaning that families are seen without a referral so the majority of presentations are due to parental concern. Referrals are also accepted from a community-managed Aboriginal childcare centre, local schools and allied health. Ear, nose and throat/audiology are present onsite and likewise have a soft entry model that does not require a referral. A previous audit of this clinic (2007–2012) found that 20% of urban Aboriginal children and young people who attended had a chronic medical condition.²

Study design

A **cross-sectional analysis** was undertaken of prospectively collected routine data for children and young people (0–18 years) who had attended the service between January 2013 and December 2017. Data were retrieved from **electronic medical records (EMR)**, patient letters and the Australian Immunisation Register.

Measures

Demographic information

Demographic information on perinatal information, gender, age, carer status (parents, kinship care, OOHC) was extracted from the EMR. **ICD-10-AM** codes (Z55–Z65) were used to record psychosocial concerns such as schooling difficulty, housing problems, exposure to domestic violence and abuse/neglect. Medication use

was used to measure health status and categorised according to Anatomical Therapeutic Chemical Classification.

Outcomes

The outcomes of this study were health status and health service use. Health status was defined by the child's diagnoses categorised according to the International Classification of Disease (ICD-10-AM Australian Modification).¹³ The proportion of categories of diseases and specific conditions were examined.

Chronic conditions were defined as per the Healthcare Cost Utilization Project Chronic Condition Indicator for ICD-10-AM as conditions lasting longer than 1 year, having a considerable impact on the quality of life and requiring medical intervention.¹⁴ Conditions excluded from the chronic definition include injuries, infections and neonatal conditions (excluding congenital abnormalities) but include mental illness (e.g. attention-deficit hyperactivity disorder) and developmental disabilities.¹⁴

Medical complexity was defined as occasions of service (OOS) with >3 diagnosis including ICD-10 codes for psychosocial concerns and past-perinatal conditions. Health service use was measured by OOS, referrals to and from the service and immunisation status.

Data extraction

Data were extracted over the 5-year period. Children attending with scheduled appointments were identified with EMR. A secondary methodology to capture unscheduled, drop-in appointments involved hand-searching the service database of patient letters for relevant outcomes. The accuracy of the identification of Aboriginal status in EMR was assessed using the unique medical record number of each child sourced from patient letters. Immunisation records were sourced from the Australian Immunisation Record database. All data were de-identified and securely stored on Sydney Children's Hospital Network password-protected computers.

Data analysis

IBM Statistical Package for Social Sciences (**SPSS**, IBM Corp., Armonk, NY) software version 25 was used to perform descriptive analysis. Factors that may change over time (such as carer status) were listed as positive if children had ever experienced those factors and analysed with **SAS** (Enterprise Guide) statistical software version 7.1 (SAS Institute Inc., Cary, NC, USA). The postcode of the last OOS was used to determine children's neighbourhood socio-economic status using IRSR. We calculated the ratio of the number of OOS to the number of children *per annum* for each age group examined to measure health-care use. Health status and service were stratified by age categories, gender, year of service and carer characteristic. Age categories were infancy (<1 year), childhood (1–4 years), mid-childhood (5–9 years) and adolescence (10–18 years).

Descriptive analysis was undertaken (frequency, means and standard deviations), and associations between gender and carer status and outcomes were examined using appropriate statistical analyses (e.g. Fisher's exact test for binary variables, χ^2 test for categorical variables, *t*-test and Wilcoxon rank-sum test for continuous variables).

Ethics approval

The Sydney Children's Hospital Network HREC and the Aboriginal Health & Medical Research Council gave approval for this study (HREC Reference Number: 763/10). We consulted the local Aboriginal land council and worked with Aboriginal members of the health-care team and researchers who are authors on this study.

Results

Children and young people attending

The Community Child Health (CCH) service was accessed by 273 children. One hundred and seventy-nine (65.6%) children were identified from EMR and 94 (34.4%) from patient letters (Table 1). The majority of children were identified as Aboriginal on the EMR database ($n = 215$, 78.8%). Of the 273 children, 149 (54.6%) were male and 124 (45.4%) female; 201 (73.6%) lived with their parents, 17.2% were in kinship care and 9.2% were in OOH.

Occasions of service

There were 609 OOS identified from 2013 to 2017 with no changes in the number of OOS over time ($P = 0.84$). Of these, 112 (18.4%) had referrals to the service, including from general practitioners ($n = 38$, 33.9%), child and family health nurse ($n = 32$, 28.6%), other services in the CCH department ($n = 21$, 18.8%), child protection services ($n = 8$, 7.1%), the child's school ($n = 8$, 7.1%) and other ($n = 5$, 4.5%). Children presenting to the service were aged between 13 days and 17 years (mean 4.5, SD = 4.4). Children aged 1–4 years were the largest group ($n = 215$, 35.3%), followed by those aged 5–9 years ($n = 147$,

24.1%), below 1 year ($n = 144$, 23.6%) and 10–18 years ($n = 103$, 16.9%).

Diagnosed with a chronic condition

Of 273 children seen in the service during the study period, 200 (73%) had ever been diagnosed with a chronic condition; 85 (68.5%) for girls and 115 (77.2%) for boys.

Number of diagnoses

Regarding the complexity, 239 of OOS (39.24%) had one or two diagnoses, 194 (31.88%) three or four diagnoses, 96 (15.76%) five or six diagnoses and 38 (6.24%) more than six diagnoses. The number of diagnosis increased with age ($P < 0.01$) (Fig. 1). Males had a significantly higher number of diagnoses ($P < 0.05$) compared with females.

Top 5 diagnoses (ICD-10)

The studied population was separated by age group at the age of presentation. The frequency of ICD-10 codes for each OOS was ordered for each of these groups. Table 1 demonstrates the most frequent ICD-10 codes and therefore diagnoses for each age group. The most common diagnostic group for OOS was mental and behavioural disorders (55.0%). The most frequent specific diagnosis for all age groups was speech and language delay (23.2%), attention-deficit hyperactivity disorder (13.1%) and school difficulty (12.2%). In terms of risk factors, 16.3% of children and young people had psychosocial concerns and 12.0% had a history of prematurity (Table 1).

Table 1 Top 5 ICD codes by age group

Order of conditions	Age range, years				All
	<1	1–4	5–9	10–18	
1	Prematurity† (24.3%)	Speech and language delay (42.8%)	Speech and language delay (23.8%)	ADHD (51.5%)	Speech and language delay (23.2%)
2	Low birthweight‡ (14.6%)	Psychosocial concerns (16.3%)	Psychosocial concerns (19.1%)	School difficulty (49.5%)	Psychosocial concerns (16.3%)
3	URTI§ (13.9%)	Developmental Delay (14.9%) Asthma (14.9%)	ADHD (18.4%)	Anxiety (25.3%)	ADHD (13.1%)
4	Failure to Thrive¶ (13.2%)	Eczema (11.2%) Dermatitis (11.2%)	Asthma (17.7%)	Psychosocial concerns (21.4%)	School difficulty (12.2%)
5	GORD†† (11.8%)	Prematurity (10.7%) Otitis media (10.7%)	Overweight‡‡ and obese (17.0%)	Signs and symptoms without diagnosis (19.4%)	Prematurity (12.0%)

† Twenty-eight completed weeks or more, but less than 37 completed weeks.

‡ Birthweight 1000–2499 g.

§ Upper respiratory tract infection, unspecified.

¶ Other lack of expected normal development including failure to gain weight and failure to thrive.

†† Gastro-oesophageal reflux disease.

‡‡ Overweight and obesity, unspecified.

Medication use

Across all age groups, the most common medications prescribed were salbutamol (13.1%), methylphenidate (9.5%), nasal steroids (4.3%) and fluticasone (4.3%). The most common medications were omeprazole (5.6%) in the <1 year age group, salbutamol (15.9%) in 1–9 year age group and methylphenidate (43.69%) in the 10–18 year age group.

Immunisation

National Immunisation records were accessed for 567 OOS (93%); children and young people were fully immunised in 552 OOS (97.35%) and were not fully immunised in 15 (2.65%) OOS.

Referrals resulting from the consultation

Of the 609 OOS, 518 (85.1%) required onwards referral; 381 (62.56%) required two or more and 112 (18.39%) five or more referrals. The most frequent referrals were to audiology and ear, nose and throat specialists (210, 34.5%), speech pathology (195, 32%), investigations such as blood/urine analysis and diagnostic imaging (146, 23.9%), non-government organisations (145, 23.8%) and mental health services (112, 18.4%).

Discussion

This is the largest descriptive cross-sectional study of urban Aboriginal children attending a community child health service in Australia to date. It fills an important knowledge gap on the

health status and health service use of this population which is needed for evidence-based future service development. This study has encouraging findings: the majority of children and young people were with their parents and the proportion of children fully immunised exceeds National and Local Health District Indicators for both Aboriginal and non-Aboriginal 5-year-olds.¹⁵ However, this study illustrates that children presenting to an Aboriginal CCH service have a high burden of chronic and complex disease. These diseases were dominated by mental health conditions and developmental delay, with high levels of underlying psychosocial and perinatal risk.

The presentation pattern shown in this study was similar to those found in a study of outpatient paediatric clinics across Australia with a male preponderance and a high prevalence of mental health and developmental problems.¹⁶ However, our study demonstrated a higher level of complexity in terms of children with greater than three diagnosis (53.9 vs. 22.8%) though our study included psychosocial concerns in this measure.¹⁶ The complexity demonstrated in our study is significant as multi-morbidity increases the rate of all-cause mortality compared to patients with fewer conditions.¹⁷ We found that complexity was also compounded by chronicity. Chronic disease accounts for the largest disparity (80%) in mortality in Aboriginal and non-Aboriginal people aged 35–74 years.¹⁸ The potential life course trajectories of the complex and chronic conditions experienced by this group of urban Aboriginal children justifies the need for a culturally appropriate integrated community paediatric team to intervene early and work in partnership with Aboriginal children and their families.

Of note, there were fewer presentations for ear disease and obesity in our study compared to profile of Australian paediatric

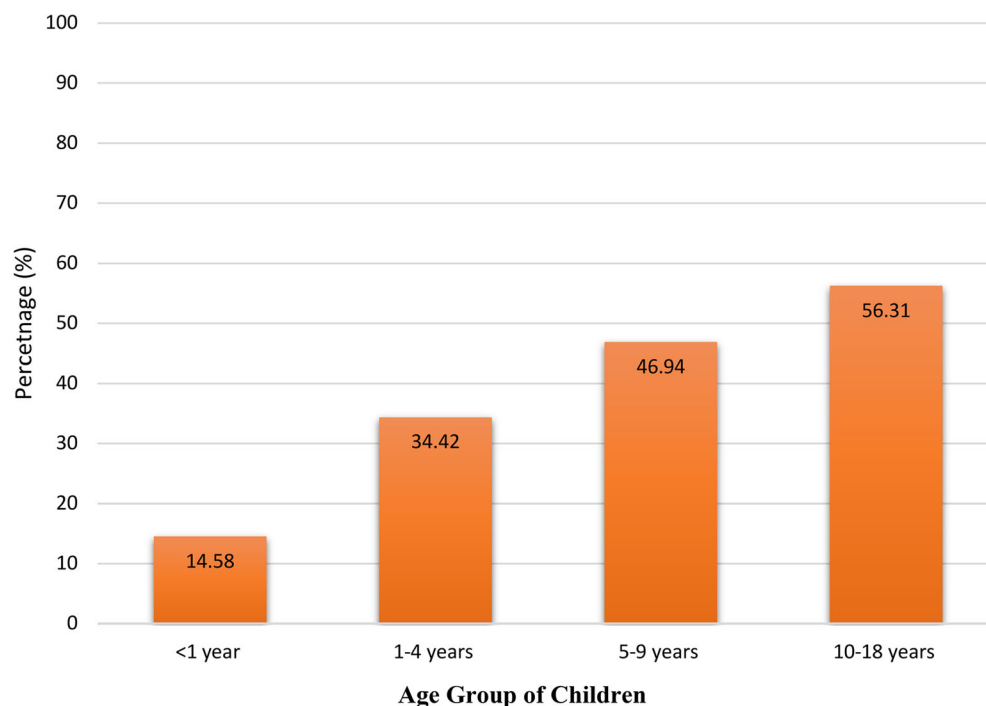


Fig 1 Measure of complexity; percentage of OOS with >3 diagnoses per age group.

outpatients previously documented.¹⁶ The proportion of children with ear disease was lower than the previous audit of the service (from 21 to 11%), possibly reflecting the 'soft entry' model of that service.^{2,19} Identification of overweight and obese children was low, which may represent under-reporting as diagnoses rather than growth charts were reviewed.²⁰ Contrary to previous studies we found no statistically significant difference in the complexity or OOS between children in OOHc compared to those not in care; however, this may be due to the small sample size.²¹ Further research is needed for this particular sub-group.

What is the service response?

This study highlights the importance of Aboriginal CCH services to meet the multiple needs of urban Aboriginal children, young people and their families. There was a high burden of underlying psychosocial concerns for the families attending the service. Psychosocial factors such as neglect, poor housing and domestic violence are associated with a range of physical and mental health problems throughout childhood and beyond.²² In addition, 40% percent of children had a single parent, and a quarter were in kinship or foster care. This compounds the medical complexity experienced by the children and young people and highlights the need for holistic, culturally safe, equitable and coordinated family-centred services. This study also found that the number of diagnoses increased with age and highlights the need to provide culturally appropriate transition services to adult care. A third of children were identified through patient letters due to 'drop in appointments' demonstrating the importance of a 'soft entry service' to reduce barriers to care.

Most OSS resulted in onward referrals to a wide range of service providers, demonstrating the inter-disciplinary management required. An exception to this was mental health referrals, which was low and out of proportion to the number of children experiencing mental health difficulties. This may reflect a 'pressure point' in the Australian health-care system as described in the NSW Henry review.²³ Anecdotally, barriers such as the inadequate Aboriginal workforce within mental health services has resulted in patient reluctance for mental health referrals and has been reported in other services.^{24,25} This indicates the need to create sustainable, culturally appropriate mental health pathways for urban Aboriginal children as early management of mental health presentations has the potential to decrease mental health morbidity and presentations to the emergency department.⁴

Limitations

This is a clinic-based study in one geographic area limiting the generalizability of findings to the wider urban Aboriginal population. The study cannot accurately determine the proportion of children from the catchment area seen by the service, compromising the study's capacity to estimate the true health burden of disease in this population.¹² Coding for overweight/obesity only occurred if mentioned in the patient diagnosis, and not from growth chart analysis meaning rates may have been underestimated. Management of these children after outward referral was not able to be analysed and should be addressed in future studies.

While the proportion of children fully immunised is high, immunisations do not take place at the Aboriginal Community Health Centre due to inability to meet NSW Health cold-chain

and staffing requirements. This indicates that the majority of families attending the Aboriginal CCH service are likely to have a general practitioner. This provides an opportunity for greater links to be created between our service and general practice for effective care coordination.

Conclusion

Children attending an urban Aboriginal CCH service have complex and chronic health needs and require culturally safe integrated models of care with an interdisciplinary service provision. This includes clear linkages with mental health services and general practice with holistic care coordination. Working in partnership with Aboriginal children, young people, their families and the community are essential to this process.

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