

Burden of Skin Disease in two Remote Primary Health Care Centres in Northern Australia

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ABSTRACT

The burden of skin infections across all age groups in remote Australian Indigenous communities is currently unknown. In a retrospective audit of 439 residents from two remote communities presenting to health clinics, skin conditions were the most common reason for presentation (1603/7392, 22%) and 330/439 (75%) residents presented at least once with a skin infection. Skin infections are an under-appreciated and dominant reason for presentation to primary health care centres in these Indigenous communities and public health campaigns to address this should incorporate all age groups.

Keywords: dermatology, skin infections, indigenous health, primary care.

INTRODUCTION

Skin disease is a common presentation reason to rural and remote primary health care (PHC) in Australia¹, with Indigenous Australians having the highest burden². Skin diseases are predominately infectious including impetigo, scabies and fungal infections – all linked to household crowding, poverty and limited access to functional health hardware (e.g. washing facilities)³. Current documentation on incidence of skin infections in Indigenous communities focuses on children⁴⁻⁶. There is a considerable knowledge gap regarding the incidence of skin infections across all ages.

METHODS

Patient Population and study methodology

Two remote Indigenous communities from the Northern Territory (NT) were involved: one tropical and one arid location. Population lists were obtained from the Patient Care Information System (PCIS).

All visits to NT Remote Health PCIS clinics by the resident population of the two communities were included for the 2014 calendar year. All medical or nursing consultations, recorded as electronic records in PCIS were manually reviewed, collected on case report forms, and entered into an electronic database (Microsoft Access, 2013). Age, gender and presentation reason were collected, with presentation reasons separated into organ categories by patient symptoms report or health care provider summarised presentation reason. Categories included skin infection (including wounds), skin non-infectious, respiratory, diabetes, gastrointestinal, renal, cardiac, optometry, ear, and other (antenatal visits, vaccinations, collecting prescription medication). Multiple categories could be recorded per visit.

Ethics Approval

Ethics approval was granted by The Human Research Ethics Committee of the Northern Territory Department of Health and Community Services and Menzies School of Health Research (2015-2378). Following ethics approval, the Remote Leadership Group (RELG) of the Top End Health Service approved the study and facilitated engagement with NT community health clinics for expressions of interest in the study. The RELG suggested two NT community health clinics to the researchers for inclusion. Consent to access the de-identified medical records was provided by the clinic practice manager, with individual waiver of consent. This is the recognised practice in the NT for research to access remote clinic files. A report of the study findings was fed back to the clinics involved.

Statistical Analysis

Data was analysed using STATA14 (Statacorp, Texas, USA)

RESULTS

A total population list of 471 people for the two communities was obtained from PCIS. 439 (93%) presented to a clinic at least once during 2014, with analysis restricted to this population. 241/439 (55%) were female and median age of the combined population was 20 years of age. Over 12 months, 6445 visits and 7392 presentation reasons were recorded, with median number of presentations/patient/year of 11 (IQR 6-18). There was no seasonality to the presentations (figure 1).

Skin conditions (1603/7392, 22%) predominantly infectious (1514/7392, 21%) were the most common reason for PHC visits (Table 1). Skin infection was mostly the sole reason for presentation (956/1514, 83%). Diabetic complaints were the most common concurrent diagnoses for presentations with a skin infection (42/1514, 3%). On average, 126 appointments per month were for a skin infection. Respiratory presentation (536/7392, 7%) was the next most common category.

Of people presenting to the clinic, 330/439 (75%) presented with a skin infection at least once during 2014, with this rate peaking in patients aged 0-12 years at 92% (Table 2). Children aged 0-4 and 5-12 years had the highest absolute number of presentations/age group, and the highest yearly prevalence of skin infections. A high skin infection prevalence was present across all age categories. Using a conservative assumption that the baseline population was 471, the incidence of skin infections was 70 per 100 population per year.

Throughout the year, 108 incision and drainage procedures were performed, 670 dressings applied and 470 antibacterial washes performed.

DISCUSSION

Our study is the first to document the community wide burden of skin infections in remote Indigenous Australians. We found that every year, three out of every four residents presented at least once with a skin infection. Skin infections accounted for over one in five

clinic visits each day of the year and were the dominant reason for seeking care at the clinic. Even so, the actual community burden may be both under-represented (with individuals not presenting for care) and under-reported (with skin infections either not recognised or recorded) due to the normalisation of skin infections by both patients and healthcare providers⁷. The serious sequelae of this non-benign condition includes sepsis⁸, skeletal infection⁹, soft tissue infection¹⁰ and post-streptococcal glomerulonephritis (PSGN)¹¹. Indigenous Australians have a higher incidence of PSGN, rate ratio of 53.6 for Indigenous to Non-Indigenous Australians¹¹, and of hospitalisations related to *Staphylococcal* skin infections^{10, 12}.

An incidence of skin infections of 70 per 100 person-years is remarkably high. Studies in other populations have noted a rate approximately 10x lower. For example, estimates for the incidence of clinic visits per 100 person-years have been 6.5–7.3 in Canada¹³ and 2.3–4.8 in the United States^{14 15}. Such data is lacking from elsewhere in Australia but the incidence is likely to be similar to these in other industrialised nations.

One in four clinic visits due to skin infections is considerably higher than in urban Australian primary health care. Both a small report¹ and the most recent BEACH (Bettering the Evaluation and Care of Health) data indicate that while skin conditions comprised 15% of presenting problems to general practitioners, skin infections were a small proportion of these¹⁶ with 2.7% of all encounters due to a skin infection¹. In BEACH, dermatitis was the most common skin presentation (ranked #18 overall),¹⁷ while skin infections did not make the top 30 presentation reasons¹⁷. Thus, the incidence estimations and proportion of clinic visits for skin infections are 7-10x higher in the studied Indigenous communities (21%) compared to mainly urban primary health care practices (2.7%). This supports the hypothesis that skin infections are normalised for Indigenous patients, given the increased frequency in comparison to non-Indigenous peers⁷.

Skin infections are problematic for all age groups of these communities, with rates of 92/100 person years for 0-12 years and 58-75/100 person-years calculated for the elderly. Children may drive the high, community-wide burden of skin infections, but it would be remiss to ignore the significant impact across all age groups in a population with higher morbidity and mortality than the general Australian population¹⁸. Over 12 months, the procedures including dressings and cleaning wounds with topical antiseptics recorded represent a considerable drain upon clinic resources, through staffing time requirements and expenditure.

Limitations to this study include the use of two smaller remote community clinics in the NT, hence our findings may not be generalizable to all Indigenous Australians resident in remote communities. As this is the first study to provide a detailed report on the burden of presentations to community clinics across all age groups, we do not have other similar data to compare to. However, the prevalence of skin infections in childhood is similar to that described in several studies^{4, 19}. Anecdotally, our combined experience as clinicians, researchers and leaders of remote health services more broadly, accords with the findings presented here. Population mobility may also result in failing to capture some episodes that presented to non-PCIS remote health clinics in the NT.

Our findings lead to several recommendations. Public health messages such as prompt seeking of treatment for skin infections, practising of appropriate skin hygiene (e.g., hand washing, covering up sores or abscesses), and the need for functioning health hardware like washing machines and showers in houses, needs to be targeted across all age groups and not just children. Such messages should be delivered in a culturally appropriate manner. The skin should be routinely examined in all age groups. Training of staff in clinics should include specific modules on skin infections and their diagnosis and management using the recently released National Healthy Skin Guideline and resources²⁰. Important messages include that abscesses need incision and drainage and that rates of antibiotic resistance in *Staphylococcus aureus* are particularly high in some regions of remote Australia. Finally, the establishment of automated surveillance systems for the incidence of skin infection would provide critical infrastructure to assess the impact of interventions to reduce this incidence.

CONCLUSION

Skin infections dominate the activities of PHC in two remote Indigenous communities. This high burden affects all age groups. We finish with recommendations of targeting healthy skin public health messages to all ages, specific skin training for clinic staff, increased routine skin examinations, and automated skin infection surveillance systems to address this burden to improve the health of Indigenous Australians.

Acknowledgements

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Conflict of interest

None declared

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TABLES

Table One: Reasons for clinic presentations

Presentation Reason	Number of presentations			Proportion of total reasons for presentation (%)
	Community One	Community Two	Total	
Skin infection	641	873	1514	36
Skin non-infectious	30	59	89	2
Respiratory	170	366	536	13
Diabetes	244	201	445	11
Gastrointestinal	80	107	187	4
Renal	150	84	234	6
Cardiac	94	312	406	10
Ophthalmology	291	98	389	9
ENT	151	212	363	9
TOTAL	1125	3038	4163	100

The above table lists the reasons for an appointment relating to a certain organ or body system. Multiple presentations reasons were recorded per appointment if applicable. This data is excluding the “other category” which accounted for 3962 presentation reasons, this category included immunisations and routine antenatal checks.

Table Two: Age stratified numbers of skin infection related presentations and total clinic presentations

Age Category (years)	Number of Patients presenting due to a skin infection		Number of Patients presenting for Any Appointment		Combined Percentage of those presenting due to a skin infection (%)
	Community One	Community Two	Community One	Community Two	
0-4	27	33	31	34	92
5-12	31	34	34	37	92
13-18	16	32	21	43	75
19-25	19	23	32	27	71
26-35	21	20	30	32	66
36-45	9	24	18	33	65
46-55	15	9	25	9	71
56-65	10	4	17	7	58
66-75	2	1	3	2	60
75+	0	0	3	1	0
Total	150	180	214	225	

The above table shows the data of individuals presenting for any appointment, and the number presenting for an appointment related to a skin infection.

Figure 1: Skin Appointments by month for both communities

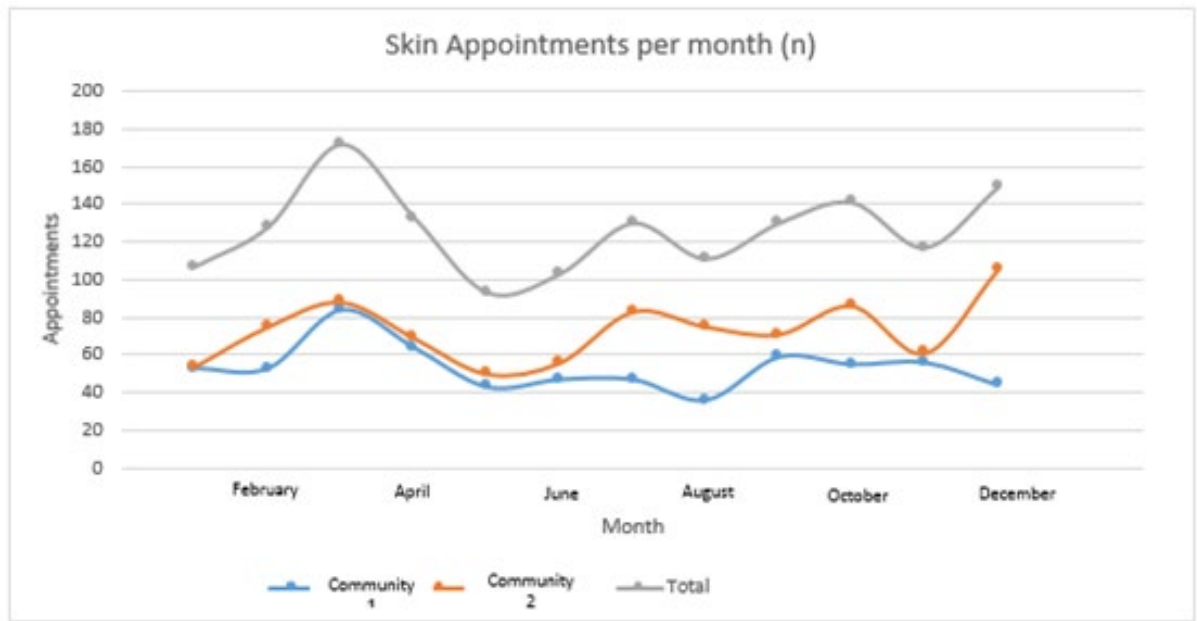
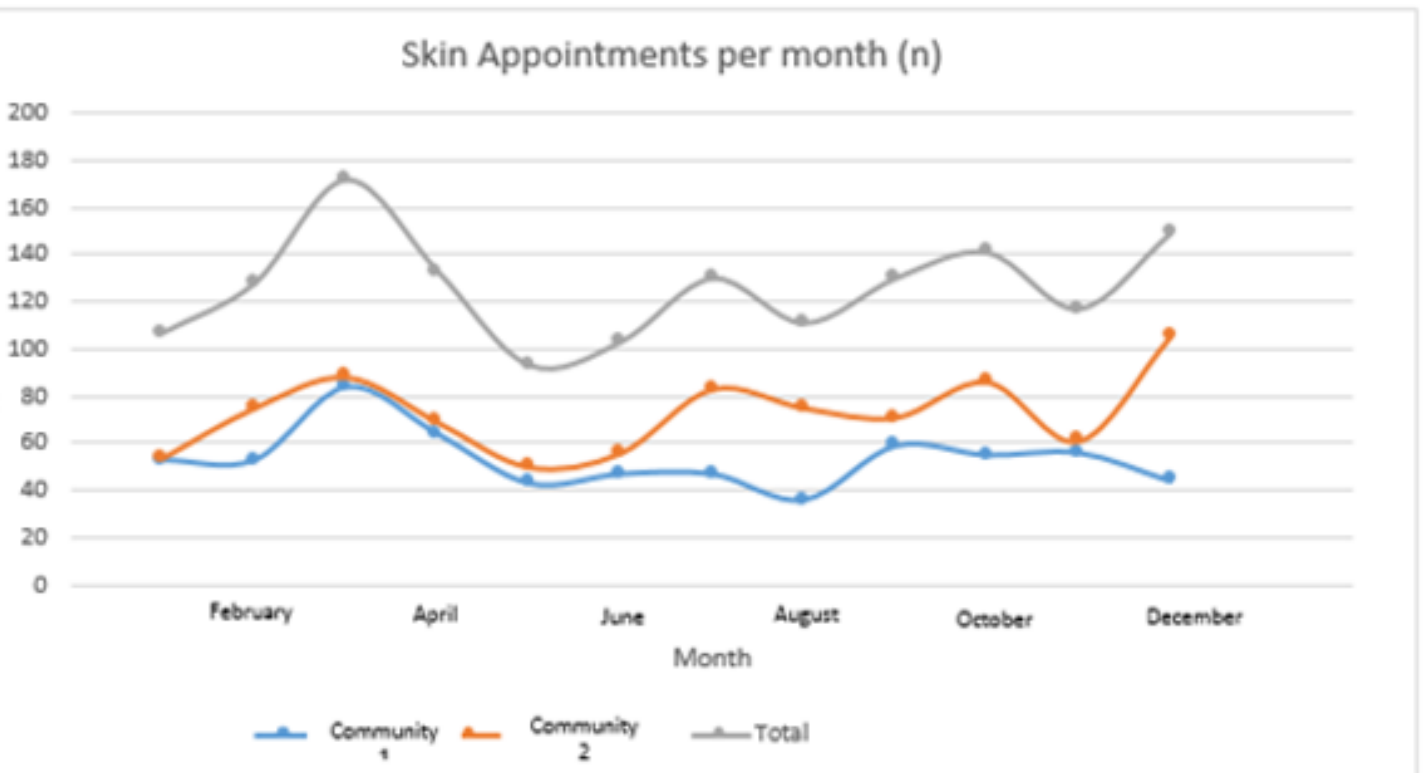


Figure 1 – Appointments relating to skin presentations per month



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IMJ_14222_table_1.PNG

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56-65	10	4	17	7	58
66-75	2	1	3	2	60
75+	0	0	3	1	0
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Burden of Skin Disease in two Remote Primary Health Care Centres in Northern Australia

Running title: skin infections in remote communities

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