

Patterns of access to public oral health care in Queensland by gender, indigenous status and rurality

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Abstract

Data were collected on courses of care from all attendances at public sector dental clinics between July 1994 and June 1996 and examined by gender, rurality and indigenous status. Males and indigenous people were more likely to attend dental clinics when a problem with pain existed, resulting in a high need for emergency services, more diagnoses of dental caries, and treatment more often involving oral surgery, including extractions. Similarly, remote area dwellers had more diagnoses of dental caries and oral surgery, although their attendance at clinics was complicated by access.

Key words: Rural health care, indigenous populations, remote access.

(Received for publication July 1999. Revised October 1999. Accepted October 1999.)

Introduction

When the Commonwealth Dental Health Program was introduced in 1994, its aim was to reduce the inequalities in both oral health and access to oral health services in the Australian adult population. In providing oral health care, it was hoped the services could promote the use of general services over emergency services, the provision of teeth restorations over extractions and prevention over treatment.¹ In the two years following its introduction in Australia, the program appeared to achieve some of these objectives, with an increased frequency of dental visits, fewer extractions and more restorations and reduced frequency of toothache.² However, there was only a small shift away from emergency to general treatment. This problem-oriented attendance at dental services led to a greater rate of extraction and lower rates of restoration for decayed teeth compared with the non-eligible population.

The delivery of oral health services in Queensland is unique, due to the large distances between rural and

remote centres and the large indigenous population, especially in far-north Queensland. From past research,³ these features, combined with the low socio-economic status of those eligible for services, would predispose this population to poor oral health and low attendance for dental care, especially preventive services. The current study investigates these factors and provides recommendations for service delivery and oral health promotion activities in Queensland.

Method

The scope of the data included the eligible population accessing Queensland public sector adult oral health services between July 1994 and June 1996. This did not include school students accessing school dental clinics. Data were collected on all completed treatments as part of the requirements for Commonwealth Dental Health Program funding, and included clinic, year of birth, gender, aboriginality, eligibility, residential postcode, concerns, waiting time, natural dentition, diagnosis, need, number of visits, concerns met, status, month, year and treatment items (Table 1). Treatment was considered complete if the treatment plan for diagnoses was completed, the patient was referred, transferred or placed on a waiting list for specialised service, or the patient failed to keep an appointment or make contact after one month. There were 236,485 completed treatments in 1994-95 and 284,531 in 1995-96, a total of 521,016 completed treatments for the two-year period. Due to initial difficulties entering treatment codes in some clinics, treatment items⁴ were only used from 1995-96

In the two-year period, there were two data dictionaries, as the definitions for diagnosis, concerns, status, aboriginality and eligibility were revised (Table 1). Most of these data items were able to be mapped between years. In 1994-95, the aboriginality dataset was Aboriginal, Torres Strait Islander, South Sea Islander and Other; in 1995-96, it was identical except Other was changed to Non-Aboriginal. For the purposes of this paper, Non-Aboriginal and Other were considered to be equivalent and data were added. Nil concerns, and concerns with appearance, bleeding, and pain occurred in both years' data dictionaries – these are

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Table 1. Data dictionaries for 1994-95 and 1995-96

Data item	1994-95 code	Description	1995-96 code	Description	Example
Clinic attended	aann	Region and clinic attended	aann	Region and clinic attended	BS23
Month	nn	Month of completed treatment	nn	Month of completed treatment	12
Year	yy	Year of completed treatment	yy	Year of completed treatment	95
Year of birth	yy		yy		33
Gender	F	Female	F	Female	F
	M	Male	M	Male	
	U	Unknown	U	Unknown	
Postcode	nnnn	Residential postcode	nnnn	Residential postcode	4123
Aboriginality	O	Other	N	Non-aboriginal	N
	A	Aboriginal	A	Aboriginal	
	T	Torres Strait Islander	T	Torres Strait Islander	
	S	South Sea Islander	S	South Sea Islander	
Eligibility	A	School Student	A	School Student	C
	B	Health Benefits Card	B	Health Benefits Card	
	C	Health Care Card	C	Health Care Card	
	P	Pensioner Concession Card	P	Pensioner Concession Card	
	Q	Queensland Seniors Card	Q	Queensland Seniors Card	
	S	Commonwealth Seniors Card	S	Commonwealth Seniors Card	
	N	Non-eligible	N	Non-eligible	
			O	Other	
Concerns	0	Nil	A	Appearance	P,S,T
	1	Pain – tooth	B	Bleeding	(max of 3)
	2	Pain – mouth	D	Denture problem	
	3	Function – chewing	F	Function – chewing/speaking	
	4	Function – speaking	H	Hole in tooth	
	5	Appearance	L	Loose teeth	
	6	Bleeding gums	M	Missing filling/broken tooth	
	7	Mobility, natural teeth	N	Nil concerns	
	8	Dry mouth	O	Other concern	
	9	Other	P	Pain – tooth/mouth	
			S	Swelling	
			T	Trauma	
			X	Dry mouth (xerostomia)	
Concerns met	as for concerns		as for concerns		P,S,T
					(max of 3)
Waiting time	nnn	Waiting time for services (weeks)	nnn	Waiting time for services (weeks)	23
Need	N	Nil	N	Nil	C,P,R
	E	Emergency/immediate	E	Emergency/immediate	(max of 3)
	P	Preventive	P	Preventive	
	C	Curative	C	Curative	
	R	Rehabilitative	R	Rehabilitative	
Natural dentition	nn	Number of permanent teeth	nn	Number of permanent teeth	24
Diagnosis	0	Nil diagnosis	A	Congenital abnormality	A,C
	1	Dental caries	C	Dental caries	(max of 9)
	2	Periodontal disease	I	Impacted teeth	
	3	Malocclusion	J	Temporomandibular joint dysfunction	
	4	Oral mucosa lesions	L	Oral mucosa lesions	
	5	Temporomandibular joint dysfunction	M	Malocclusion	
	6	Trauma	N	Nil diagnosis	
	7	Impacted teeth	O	Other disease/condition	
	8	Congenital abnormality	P	Periodontal disease	
	9	Other	T	Traumatic injury/event	
Visits	n	Number of visits to complete treatment	n	Number of visits to complete treatment	5
Status	W	Waiting list	Wn	Waiting for treatment (n=0-9)	C
	T	Transfer (to another region)	A	Authorised treatment – private provider	
	I	Incomplete	I	In treatment	
	C	Complete	C	Completion of planned treatment	
	F	Referred	F	Referred	
	R	Recall	Rn	Recall/review (n=0-9)	
	D	Discontinued	D	Discontinued	
Service items	nnn	Based on DVA/ADA codes	nnn	Based on DVA/ADA codes	011,764,742 (no limit)

shown in this study, with all remaining concerns grouped under Other.

Need was determined by the patient at the time of appointment and those in pain (teeth or dentures) were provided with emergency or immediate treatment. General services included preventive, rehabilitative, curative and nil treatment needs. Concerns were those problems expressed by the patient to the dentist on

initial contact. Diagnosis was clinically determined by the dentist.

Rural areas were defined on the basis of residential postcode converted to Statistical Local Area (SLA) and classified according to the Rural and Remote Area Classification (RRAC).⁵ RRAC has seven categories – capital city, other major urban, rural major, rural other, remote major, remote other and other offshore areas.

Table 2. Rate of service per 1,000 cardholders by age group, gender and need 1994-95

Card	Need	Gender	16-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+	Total
Pensioner	Emergency	Female	159	138	155	153	153	169	167	155	130	107	97	122
		Male	268	185	200	186	202	180	179	171	173	138	139	156
	General	Female	188	82	107	119	147	170	178	170	148	138	130	138
		Male	371	147	145	151	173	170	181	161	172	141	156	162
Cwlth Seniors	Emergency	Female										45	144	132
		Male											209	230
	General	Female										68	179	162
		Male											231	249
Health Benefit	Emergency	Female	319	345	581	770	581	389	279	324	424			508
		Male	204	196	293	188	197	200	187	152	148	389		233
	General	Female	279	226	399	518	435	316	223	260	462			425
		Male	144	123	145	148	170	161	141	152	141	368		192
Health Care	Emergency	Female	78	181	257	202	187	210	229	266	296	2433	1889	194
		Male	71	124	195	239	266	266	216	177	144	169	1369	179
	General	Female	82	125	184	173	181	196	210	254	330	2596	2137	172
		Male	66	72	113	171	219	228	198	155	129	190	1429	142

Bold face indicates a significantly higher figure ($p < 0.05$) when comparing rates between genders.

No postcodes in this study corresponded with other offshore areas.

The calculation of rates of service was based on the number of cardholders as of March 1995 (source: Department of Social Security) and the number of completed treatments in 1994-95 only, as at least annual attendance at clinics is recommended. As each card may also be used by the dependants of the cardholder, these rates are indices of service provision, not true or absolute rates. However, a comparison of rates using data on cardholders and all people attached to cards shows only a small difference in rates. Children covered by cards can be excluded as they usually have access to school dental services. There was an average 1.15 adults per Health Care Card, 1.02 adults per pensioner card and 1.07 adults per any eligible card (Department of Social Security: September 1997 data).

Although no calibration of the dental examiners occurred, all participants in the multicentre study were professional dentists. However, it must be acknowledged that some variation may have occurred in the definition of some items. For example, at what stage of decay is dental caries considered to be the diagnosis? The large size of the dataset involved in this analysis should reduce the effect of the variation in definitions used by individual examiners.

Statistical analysis was performed on the data items by gender, need (emergency and general), age group and aboriginality using chi-squared contingency table analysis. Mean natural dentition, waiting times and number of visits were compared by one-way analysis of variance with least squared difference post-hoc tests. Rates of service were compared with 95 per cent confidence intervals. Logistic regression analyses were performed on the occurrence of emergency service, a caries diagnosis, nil diagnosis, nil concerns, the presence of functional dentition (24 plus natural teeth) and no natural dentition versus age group, rurality, sex and aboriginality. All statements of significant associations or differences are based on a statistical significance level of 0.05.

Results

Gender

The two major eligibility groups (pensioners and Commonwealth Seniors Card holders, and Health Benefit and Health Care Card holders), distinct due to the age groups of the majority of cardholders within them, had quite different rates of service. Overall, there was a higher rate of access to general services for pensioners and Commonwealth Seniors Card holders, but a higher emergency service rate for Health Benefit and Health Care Card holders (Table 2). For pensioners and seniors, the rate of general and emergency service for males was higher than females. Focusing on this, there was a significantly higher rate of service for pensioner males than females in all age groups except the age groups between 40-49 in emergency completed treatments and 40-54 and 60-64 in general completed treatments, where rates were not significantly different by sex (Table 2). Male Commonwealth Senior Card holders aged 65 plus also had a significantly higher rate of emergency and general service delivery than females, but females were more predominant below this age due to their eligibility for this card at age 60.

Female Health Benefit and Health Care Card holders had a higher rate of both emergency and general service than males (Table 2). Female Health Benefit Card holders had higher rates than males for both emergency and general services in all age groups except emergency services for 16-19 year olds. Service rates for female Health Care Card holders were significantly higher than males for the five-year age groups between 20-29 for emergency services and 16-29 for general services, and above 50 for both service types. Male rates were significantly higher for age groups 35-44 for general services and 30-44 for emergency services. For these cardholders, females had a higher rate of service except in the 30-44 age group.

The following analyses regarding gender differences in the use of oral health services were performed separately on the two eligibility groups – Health Care and Health Benefit Card holders and pensioners and

Table 3. A comparison of male and female pensioners and Commonwealth Seniors Card holders with Health Care and Health Benefit Card holders 1994-96

		Health care and benefit cards			Pensioners and seniors		
		Female	Male	Total	Female	Male	Total
Need	Emergency %	53.3	56.8	55.0	46.9	48.9	47.7
	General %	46.7	43.2	45.0	53.1	51.1	52.3
	Total n	103 146	97 861	201 007	175 512	117 504	293 016
Primary concern	Nil %	13.8	11.9	12.9	17.6	15.8	16.9
	Pain %	69.4	72.0	70.7	52.6	54.3	53.2
	Appearance %	4.3	3.9	4.1	5.0	4.3	4.7
	Bleeding %	1.5	1.3	1.4	1.4	1.2	1.3
	Other %	11.1	11.0	11.0	23.5	24.3	23.8
	Total n	82 884	78 228	161 112	122 091	80 659	202 750
Primary diagnosis	Nil %	4.7	3.7	4.2	5.3	4.8	5.1
	Caries %	59.2	62.8	61.0	41.0	42.5	41.6
	Periodontal %	6.8	6.3	6.6	7.8	8.1	7.9
	Malocclusion %	1.3	1.2	1.2	2.2	2.2	2.2
	Joint %	0.4	0.2	0.3	0.3	0.1	0.3
	Trauma %	3.8	4.4	4.1	4.6	4.6	4.6
	Impacted %	3.0	2.1	2.5	0.9	0.5	0.7
	Other %	20.8	19.3	20.1	37.9	37.1	37.6
	Total n	102 570	97 314	199 884	174 081	116 614	290 695
	Rurality	Capital city %	32.0	32.9	32.4	44.2	42.3
Other major urban %		25.6	26.3	25.9	28.0	28.2	28.1
Rural major %		14.3	14.4	14.3	11.7	11.7	11.7
Rural other %		23.5	22.7	23.1	14.7	16.1	15.2
Remote major %		0.6	0.5	0.6	0.3	0.4	0.3
Remote other %		4.0	3.3	3.6	1.1	1.3	1.2
Total n		102 218	96 922	199 140	174 125	116 462	290 587
Treatment items	Diagnostic %	0.1	0.1	0.1	0.1	0.1	0.1
	Preventive %	32.9	30.1	31.5	34.7	31.6	33.4
	Periodontics %	8.5	8.2	8.3	5.4	4.5	5.0
	Oral surgery %	12.0	15.3	13.7	8.5	11.4	9.7
	Endodontics %	3.9	3.9	3.9	2.2	1.7	2.0
	Restorative %	29.7	29.5	29.6	24.7	25.2	24.9
	Crown and bridge %	0.4	0.4	0.4	0.4	0.3	0.4
	Prosthodontics %	6.5	7.1	6.8	20.1	21.8	20.8
	Orthodontics %	0.2	0.1	0.2	0.1	0.1	0.1
	General/misc %	5.6	5.2	5.4	3.9	3.3	3.6
Total n	178 819	179 238	358 057	300 737	211 205	511 942	
Natural teeth	Less than 24%	28.9	32.0	30.5	66.9	74.8	70.1
	24+ %	71.1	68.0	69.5	33.1	25.2	29.9
Total n	100 167	94 569	194 736	170 555	114 106	284 661	
Zero dentition	Zero %	3.3	3.2	3.2	17.6	16.0	17.0
	Greater than zero %	96.7	96.8	96.8	82.4	84.0	83.0
Total n	100 167	94 569	194 736	170 555	114 106	284 661	
Natural dentition	Mean	24.2	24.0	24.1	16.3	15.3	15.9
	n	100 217	94 622	194 839	170 647	114 154	284 801
	SE	0.02	0.02	0.02	0.03	0.03	0.02

Commonwealth Senior Card holders. These two groups will be referred to in this section by the majority of cardholders represented in them, pensioners and Health Care Card holders. The results are summarised in Table 3.

There was a significant association between gender and concerns expressed by the patient for both eligibility groups. Completed treatments showed more than expected nil concerns for females and pain concerns for males for both pensioners and Health Care Card holders. Pensioner females also had more than expected concerns with appearance.

There was a significant association between gender and diagnosis in both groups. Female pensioners and Health Care Card holders had more than expected nil diagnoses, temporomandibular joint dysfunction and impacted teeth and males had more than expected dental caries diagnoses. Peculiar to Health Care Card

holders were more than expected diagnoses of trauma for males and more 'other' diagnoses for females.

The treatment items performed were also significantly related to gender, with females having more than expected preventive and general/miscellaneous treatment items and males having more oral surgery and prosthodontics in both pensioner and Health Care Card holder groups. Female Health Care Card holders also had more orthodontic treatment items than expected and female pensioners had more periodontics and endodontics items than expected. Comparing the total treatment items performed by age and gender, females had a greater percentage of preventive treatments in the age groups over 50 (compared with males) and males had a greater percentage of oral surgery (including extractions) in the age groups over 30.

Table 4. Percentage of completed treatments within rurality groups for all eligibility types

		Capital city	Other major urban	Rural major	Rural other	Remote major	Remote other	Total
Need	Emergency %	50.0	52.6	54.2	48.6	54.5	43.3	50.8
	General %	50.0	47.4	45.8	51.4	45.5	56.7	49.2
	Total n	199 413	139 145	64 567	94 772	2445	15 908	516 250
Gender	Female %	56.1	54.8	55.7	54.4	54.0	54.7	55.3
	Male %	43.9	45.2	44.3	45.6	46.0	45.3	44.7
	Total n	199 257	139 036	64 515	94 727	2445	15 901	515 881
Age group	Less than 16%	1.9	2.9	4.9	5.9	10.2	14.7	3.7
	16-19%	3.3	3.6	4.4	4.1	4.7	4.5	3.7
	20-29%	15.2	15.6	15.5	14.7	23.8	17.5	15.4
	30-39%	15.2	17.2	18.2	20.2	16.8	20.5	17.2
	40-49%	13.0	13.1	13.2	15.5	11.3	14.6	13.5
	50-59%	11.1	10.9	11.8	12.5	10.4	10.6	11.4
	60+%	40.4	36.6	31.9	27.0	22.8	17.5	35.0
	Total n	199 177	138 850	64 457	94 619	2389	15 871	515 363
Primary concerns	Nil %	15.7	7.8	8.1	9.4	5.1	13.4	11.3
	Pain %	42.8	45.5	48.2	46.4	60.2	44.4	45.0
	Appearance %	2.7	3.9	3.3	3.5	4.7	7.2	3.4
	Bleeding %	1.1	1.1	1.0	1.1	0.9	1.1	1.1
	Other %	37.7	41.6	39.6	39.6	29.1	34.0	39.2
	Total n	198 888	138 577	64 352	94 314	2413	15 831	514 375
	Nil %	3.7	5.5	5.5	6.1	3.0	7.3	4.9
Primary diagnosis	Caries %	49.1	49.7	47.4	50.7	56.6	56.5	49.6
	Periodontal %	8.2	6.6	6.9	6.5	9.8	10.0	7.4
	Malocclusion %	2.0	2.1	1.5	1.2	3.9	1.4	1.8
	Joint %	0.2	0.3	0.4	0.3	0.1	0.2	0.3
	Trauma %	3.5	5.4	4.6	5.3	8.8	6.3	4.6
	Impacted %	1.4	1.6	1.7	1.7	3.5	1.6	1.5
	Other %	32.1	28.9	31.9	28.3	14.3	16.8	29.9
	Total n	198 675	137 720	64 078	93 970	2403	15 806	512 652
Wait time (weeks)	Emergency mean	0.4	1.1	0.4	0.8	0.9	1.0	0.7
	Emergency SE	0.01	0.02	0.02	0.02	0.09	0.05	0.01
	Emergency n	99 410	72 254	34 700	44 716	1331	6811	259 222
	General mean	8.7	14.0	17.5	11.5	5.6	2.0	11.3
	General SE	0.07	0.09	0.16	0.09	0.33	0.05	0.05
	General n	99 310	62 728	28 974	47 369	1108	8902	248 391
Treatment items	Diagnostic %	0.0	0.0	0.5	0.2	0.1	0.0	0.1
	Preventive %	34.2	32.0	31.2	31.3	35.2	35.4	32.9
	Periodontics %	7.0	5.9	5.9	6.0	2.5	6.6	6.4
	Oral surgery %	9.8	12.4	12.6	12.6	27.1	14.7	11.4
	Endodontics %	3.2	2.0	2.9	2.6	2.0	3.6	2.8
	Restorative %	26.6	25.9	26.2	29.2	21.3	29.4	26.9
	Crown and bridges %	0.4	0.3	0.3	0.4	0.3	0.4	0.4
	Prosthodontics %	14.5	17.0	15.5	13.0	6.3	5.4	14.6
	Orthodontics %	0.0	0.3	0.1	0.1	0.1	0.4	0.1
	General/misc %	4.3	4.2	4.9	4.6	5.1	4.1	4.4
	Total n	419 425	195 820	117 019	150 683	4510	23 880	911 337
Females aged 65+	65-74%	47.1	28.2	11.0	12.1	0.2	1.3	100.0
	75-84%	50.1	28.7	9.2	10.7	0.1	1.2	100.0
	85-94%	49.7	25.6	11.6	11.2	0.2	1.8	100.0
	95+%	29.1	35.5	15.5	19.1	0.0	0.9	100.0
	Total %	48.2	28.2	10.5	11.6	0.2	1.3	100.0
	Total n	36 308	21 288	7918	8750	145	972	75 381
Males aged 65+	65-74%	42.1	28.2	12.0	15.6	0.4	1.7	100.0
	75-84%	45.1	29.8	10.6	12.9	0.2	1.3	100.0
	85-94%	43.0	29.7	11.2	14.9	0.1	1.0	100.0
	95+%	33.9	16.9	16.9	27.1	1.7	3.4	100.0
	Total %	43.0	28.8	11.6	14.8	0.3	1.6	100.0
	Total n	28 471	19 045	7662	9798	216	1036	66 228

There were more than expected females with zero and 24 plus natural dentition in both pensioners and Health Care Card holders. The mean natural dentition of females, excluding those with zero natural dentition, was significantly higher than males for both card groups. Thus, although more females had zero natural dentition, those who retained some natural dentition had kept more teeth than their male counterparts.

Rurality

All types of eligibility were examined, as one group, in this section. Contingency table analysis showed an

association between rurality and need ($p < 0.001$, $df = 5$) (Table 4). Capital city clinics provided an equivalent number of emergency and general completed treatments while other major urban and both rural major and remote major categories had more emergencies than general treatments. However, the rural other and remote other areas had more general treatments than emergencies.

Females consistently made up a greater proportion of the clients of all rurality classifications, the difference being around 45 per cent males to 55 per cent females. Contingency table analysis found a greater than

Table 5. Rates of service per 1,000 eligible population by eligibility for the two years of the study

		Capital city	Other major urban	Rural major	Rural other	Remote major	Remote other	Total
1994/95								
Health Benefit Card	Female	317	1135	2449	1040	7278	2741	902
	Male	201	478	967	398	3405	1276	412
	Total	241	700	1440	568	4673	1741	572
Health Care Card	Female	279	380	405	468	185	651	362
	Male	282	307	320	390	75	519	318
	Total	280	341	359	428	125	589	340
Pensioner	Female	266	275	230	243	203	187	259
	Male	333	349	261	275	274	258	315
	Total	288	301	241	255	229	214	278
Cwlth Senior Card	Female	308	272	404	181	71	1318	290
	Male	456	480	581	416	0	1105	473
	Total	370	360	482	287	53	1220	368
Total cards		286	320	296	327	258	395	305
1995/96								
Health Benefit Card	Female	268	487	609	660	2556	3296	453
	Male	219	330	351	311	1189	1103	291
	Total	236	384	433	403	1636	1800	344
Health Care Card	Female	328	456	504	496	593	820	424
	Male	341	400	404	424	359	759	389
	Total	334	426	450	459	465	791	406
Pensioner	Female	317	380	300	306	220	306	328
	Male	399	484	363	354	343	352	405
	Total	344	416	323	325	265	323	355
Cwlth Senior Card	Female	350	463	324	280	71	1091	369
	Male	640	727	376	482	0	1842	607
	Total	472	575	347	371	53	1439	471
Total cards		340	420	369	379	364	546	374

expected number of females attending capital city clinics and more than expected males attending rural other clinics ($p < 0.001$, $df = 5$).

Rates of service per 1,000 cardholders showed consistent gender trends in all rurality groups (Table 5). Health Benefit Card holders had between 37-62 per cent higher rates of service for females in all rurality groups, the highest being rural major and remote areas. Health Care Card holders had between 12-60 per cent higher rates for females in all rurality areas, except in capital cities (where there was no significant difference). The greatest rate difference was in remote major areas. Within both genders there was an increased rate of service with increasing rurality, with the exception of remote major areas which had the lowest rates of service for both male and female Health Care Card holders.

Pensioners had a significantly higher rate of service for both genders in capital city areas than in rural and remote areas. Male pensioner service rates were significantly higher than female rates in all rurality groups. There was also a higher rate of service to male Commonwealth Senior Card holders than female, except in remote major areas, where there were no such treatments recorded for males, and remote other areas where there was no significant difference to the female rate. For both genders, pensioner rates were equivalent across all rurality groups, but significantly higher in remote other areas.

The percentage of clients aged under 16 and 16-19 increased with rurality and remoteness (Table 4). The percentage of completed treatments for elderly people (aged 65 plus) was greatest in capital cities and decreased with rurality. There were proportionately more elderly

females attending capital city clinics than elderly males, but more elderly males attending rural other and remote areas clinics. Contingency table analysis revealed capital cities had fewer people than expected attending in the age group 25-39, but rural other clinics had more people than expected attending in the age group 30-54. Remote areas also had more clients in the age group 20-29.

Rurality affected the primary concern expressed by the patient ($p < 0.001$, $df = 20$). Capital cities had more nil concerns than expected and remote major areas had a greater occurrence of concerns about pain.

Rurality also affected the diagnosis ($p < 0.001$, $df = 35$). In remote areas, there were more diagnoses of dental caries and periodontal disease and less 'other' diagnoses than expected. In remote major areas, malocclusion and trauma diagnoses were more common.

Mean waiting time for emergency treatment was significantly lower in capital city and rural major areas (0.4 week), but up to one week in other major urban and remote other areas. For general treatment, mean waiting time was lowest in remote other areas, followed by capital city areas. Mean waiting time in rural and other major urban areas was up to 17.5 weeks.

When examined by rurality, the remote areas had less prosthodontic treatments and more oral surgery than expected and remote major areas had less periodontic treatment ($p < 0.001$, $df = 45$).

Indigenous status

There were 11,886 completed treatments for Aboriginal people (2.3 per cent of total completed

Table 6. Details of completed treatments by indigenous status for all eligibility types

		Aboriginal	Torres Strait	South Sea	Other	Total
Need	Emergency %	65.7	51.9	59.0	50.3	50.7
	General %	34.3	48.1	41.0	49.7	49.3
	Total n	11 886	3546	765	499 542	515 739
Gender	Female %	52.8	56.7	43.1	55.3	55.3
	Male %	47.2	43.3	56.9	44.7	44.7
	Total n	11 876	3545	763	499 195	515 379
Eligibility	School %	3.8	2.6	14.3	0.7	0.9
	Health Benefit %	2.5	1.2	7.2	1.6	1.7
	Health Care %	50.0	42.5	57.2	36.8	37.3
	Not eligible %	4.7	1.7	6.0	1.5	1.6
	Other %	10.7	28.2	2.7	1.7	2.0
	Pensioner %	28.2	23.6	11.6	56.6	55.6
	Qld Senior %	0.0	0.0	0.0	0.2	0.2
	Cwlth Senior %	0.2	0.3	1.0	0.9	0.8
	Total n	11 671	3538	763	495 983	511 955
	Need	Emergency %	64.3	58.5	50.9	47.8
Curative %		20.3	27.0	27.6	24.8	24.7
Preventive %		6.6	6.0	14.6	12.3	12.2
Rehabilitative %		6.9	6.2	5.3	13.7	13.5
Nil %		1.9	2.3	1.6	1.4	1.4
Primary concerns	Total n	13 042	4622	853	572 323	590 840
	Nil %	5.6	11.1	10.6	11.4	11.3
	Pain %	63.4	61.1	56.1	44.5	45.0
	Appearance %	4.8	7.0	4.6	3.3	3.4
	Bleeding %	1.5	2.2	4.1	1.1	1.1
	Other %	24.6	18.6	24.7	39.7	39.2
	Total n	11 728	3531	765	497 822	513 846
Total diagnosis	Nil %	4.5	5.2	4.1	4.6	4.6
	Caries %	63.3	53.3	57.2	46.1	46.6
	Periodontal %	11.7	12.8	12.2	7.0	7.2
	Malocclusion %	0.9	1.3	0.4	1.8	1.7
	Joint %	0.1	0.2	0.1	0.4	0.4
	Trauma %	4.4	4.8	4.9	4.3	4.3
	Impacted %	2.4	3.9	3.1	3.4	3.4
	Other %	12.7	18.5	18.0	32.4	31.8
	Total n	12 336	4059	815	536 296	553 506
Rurality	Capital city %	15.8	7.8	32.2	39.3	38.6
	Other major urban %	14.8	7.9	30.3	27.3	26.9
	Rural major %	8.5	3.0	10.9	12.7	12.5
	Rural other %	42.6	4.7	18.4	18.0	18.4
	Remote major %	5.9	0.2	1.5	0.4	0.5
	Remote other %	12.5	76.4	6.8	2.4	3.1
	Total n	11 600	3288	752	495 397	511 037
	Treatment items	Diagnostic %	0.2	0.0	0.7	0.1
Preventive %		34.1	35.6	37.9	32.9	32.9
Periodontics %		5.6	6.5	7.2	6.4	6.4
Oral surgery %		23.6	19.7	16.7	11.1	11.4
Endodontics %		2.3	5.0	2.9	2.8	2.8
Restorative %		22.9	23.4	22.8	27.0	26.8
Crown and bridges %		0.2	0.6	0.6	0.4	0.4
Prostodontics %		6.4	3.6	6.6	14.9	14.6
Orthodontics %		0.0	0.1	0.1	0.1	0.1
General/misc %		4.7	5.5	4.5	4.4	4.4
Total n	18 509	6501	1132	885 475	911 617	

treatments), 3,546 for Torres Strait Islanders (0.7 per cent) and 765 for South Sea Islanders (0.1 per cent) who accessed services in the two-year period. There was a gender difference in the access of services ($p < 0.001$, $df=3$) with a greater percentage of female Aboriginals, Torres Strait Islanders and 'other' (non-indigenous) groups but a greater proportion of South Sea Islander males (Table 6). Contingency table analysis showed fewer than expected Aboriginal and South Sea Islander females attending clinics.

Eligibility varied with indigenous status ($p < 0.001$, $df=21$). There were more than expected school students, Health Care Card holders and those not eligible in the Torres Strait Islander and Aboriginal

groups, but less pensioners. There were more than expected 'other' eligibilities in the Aboriginal and South Sea Islander groups.

Indigenous status affected the type of need ($p < 0.001$, $df=12$), especially with Aboriginal people receiving more than expected emergency services and fewer preventive and rehabilitative services and Torres Strait Islanders receiving fewer than expected rehabilitative services.

Indigenous status influenced the distribution of primary concerns ($p < 0.001$, $df=12$). Aboriginal people and Torres Strait and South Sea Islanders had a greater percentage of pain concerns. Aboriginal people had less attendances with nil concerns. South Sea and Torres

Table 7. Percentage of primary diagnoses for different indigenous groups by rurality

		Aboriginal	South Sea	Torres Strait	Other	Total
Capital city	Nil %	10.2	3.3	2.0	3.6	3.7
	Caries %	59.3	63.1	77.6	48.9	49.1
	Periodontal %	8.0	11.2	7.1	8.1	8.1
	Malocclusion %	0.7	0.0	0.4	2.0	2.0
	Joint %	0.1	0.0	0.0	0.2	0.2
	Trauma %	4.9	4.6	2.4	3.5	3.6
	Impacted %	3.9	2.9	2.8	1.3	1.4
	Other %	12.8	14.9	7.9	32.3	32.1
	Total n	1827	241	254	193 973	196 295
Other major urban	Nil %	4.8	5.7	2.7	5.6	5.5
	Caries %	66.3	48.9	65.0	49.4	49.6
	Periodontal %	6.8	16.3	12.8	6.6	6.6
	Malocclusion %	1.5	2.2	0.0	2.1	2.1
	Joint %	0.4	0.4	0.0	0.3	0.3
	Trauma %	5.1	4.8	4.3	5.4	5.4
	Impacted %	3.3	4.4	3.5	1.6	1.6
	Other %	12.0	17.2	11.7	29.1	28.8
	Total n	1698	227	257	133 905	136 087
Rural major	Nil %	4.1	3.7	5.1	5.5	5.5
	Caries %	65.1	62.2	69.4	47.0	47.4
	Periodontal %	5.3	8.5	7.1	7.0	7.0
	Malocclusion %	0.8	1.2	1.0	1.5	1.4
	Joint %	0.0	0.0	0.0	0.5	0.5
	Trauma %	4.3	7.3	1.0	4.6	4.6
	Impacted %	1.0	2.4	1.0	1.7	1.7
	Other %	19.4	14.6	15.3	32.2	31.9
	Total n	980	82	98	62 413	63 573
Rural other	Nil %	3.1	8.0	2.6	6.2	6.1
	Caries %	67.2	53.3	68.6	49.7	50.7
	Periodontal %	9.1	13.1	6.5	6.3	6.5
	Malocclusion %	0.4	1.5	1.3	1.3	1.2
	Joint %	0.0	0.0	0.0	0.3	0.3
	Trauma %	4.2	4.4	2.6	5.4	5.3
	Impacted %	1.9	1.5	4.6	1.7	1.7
	Other %	14.2	18.2	13.7	29.1	28.3
	Total n	4850	137	153	88 218	93 358
Remote major	Nil %	1.9	0.0	0.0	3.5	3.0
	Caries %	66.7	18.2	80.0	52.8	56.6
	Periodontal %	10.6	54.5	0.0	9.2	9.8
	Malocclusion %	1.6	0.0	0.0	4.9	3.9
	Joint %	0.1	0.0	0.0	0.1	0.1
	Trauma %	8.4	18.2	0.0	9.0	8.8
	Impacted %	3.2	0.0	20.0	3.6	3.5
	Other %	7.4	9.1	0.0	17.1	14.3
	Total n	679	11	5	1708	2403
Remote other	Nil %	3.6	13.7	5.6	8.1	7.3
	Caries %	65.4	56.9	60.1	54.6	56.5
	Periodontal %	10.8	7.8	15.1	8.8	9.9
	Malocclusion %	0.5	2.0	0.4	1.7	1.4
	Joint %	0.2	0.0	0.1	0.2	0.2
	Trauma %	4.6	5.9	6.9	6.3	6.3
	Impacted %	2.5	2.0	2.5	1.3	1.6
	Other %	12.4	11.8	9.3	19.0	16.8
	Total n	1435	51	2502	11 762	15 750

Strait Islanders had more concerns with bleeding gums. Non-indigenous people had comparatively more 'other' concerns than expected.

Indigenous status was associated with diagnosis ($p < 0.001$, $df = 21$). Aboriginal people, Torres Strait and South Sea Islanders had more than expected diagnoses of dental caries and periodontal disease. Non-indigenous people had more 'other' diagnoses than expected. When cross-tabulated with rurality, primary diagnosis showed some variation with indigenous status (Table 7). Dental caries occurred more frequently for Aboriginal people and Torres Strait Islanders across all ruralities (capital city to remote other). Non-indigenous people had a higher caries occurrence in

remote areas than rural or urban areas. Periodontal disease was slightly higher in Aboriginal people in remote areas compared with other ruralities. The 'other' diagnosis (although lower in proportion in remote areas) was consistently greater for non-indigenous people across all ruralities.

Within indigenous groups, Aboriginal people had more nil diagnoses in capital cities but fewer nil diagnoses in rural other and remote other areas (Table 7). Aborigines in rural other areas had a higher percentage of periodontal disease. Torres Strait Islanders had a greater percentage of caries diagnoses in capital cities, fewer 'other' diagnoses in capital cities, other major urban and remote other areas and more

Table 8. Indigenous status split by mean natural dentition, per cent with zero and 24+ natural dentition, waiting time for general services and rate of service by need per 1,000 total population

		Capital city	Other major urban	Rural major	Rural other	Remote major	Remote other	Total
Mean natural dentition*	A 18-29	27.5	27.5	27.5	27.2	28.3	28.2	27.5
	A 30-54	22.7	22.7	22.3	22.2	22.6	24.3	22.6
	A 55+	16.4	17.8	14.2	14.4	16.3	16.6	15.5
	TSI 18-29	26.9	29.2	28.0	29.3	30.3	28.4	28.3
	TSI 30-54	24.1	23.7	19.8	23.9	32.0	23.9	23.8
	TSI 55+	21.2	16.4	13.2	17.3	-	16.3	16.5
	Other 18-29	27.7	27.4	27.6	27.7	28.1	28.5	27.6
	Other 30-54	23.5	23.1	23.0	23.6	23.2	25.6	23.4
Other 55+	16.9	16.2	15.8	16.5	16.4	18.7	16.5	
Zero natural dentition %	ATSI 18-29	2.3	2.0	4.3	0.0	0.0	3.2	2.0
	ATSI 30-54	37.2	39.2	25.5	32.5	10.0	29.5	33.5
	ATSI 55+	60.6	58.8	70.2	67.5	90.0	67.4	64.5
	Other 18-29	0.9	1.4	0.7	0.8	0.0	0.8	1.0
	Other 30-54	13.9	14.1	14.8	17.6	5.5	18.3	14.6
Other 55+	85.2	84.5	84.5	81.7	94.5	80.9	84.3	
24+ natural dentition %	ATSI 18-29	14.5	15.0	10.5	12.2	7.7	6.4	11.3
	ATSI 30-54	57.1	60.3	59.5	61.5	57.5	53.4	58.5
	ATSI 55+	28.3	24.6	30.0	26.3	34.8	40.2	30.2
	Other 18-29	3.0	3.3	2.9	2.5	3.8	2.5	3.0
	Other 30-54	26.0	28.2	31.1	35.0	28.9	35.6	28.8
Other 55+	71.0	68.4	66.0	62.5	67.3	61.8	68.1	
Wait time (general)	ATSSI mean	4.3	5.2	13.9	4.7	4.3	0.9	4
	ATSSI SE	0.44	0.49	1.23	0.28	0.54	0.1	0.2
	ATSSI n	771	779	344	1688	191	1891	5664
	Other mean	8.7	14.1	17.6	11.7	5.9	2.3	11.5
	Other SE	0.07	0.1	0.16	0.1	0.38	0.12	0.04
Other n	97 459	61 610	28 381	45 447	917	6986	240 800	
General	ATSI	50	52	45	102	70	111	78
	Non-ATSI	75	104	83	91	42	101	85
Emergency	ATSI	105	93	107	209	187	123	135
	Non-ATSI	74	113	98	82	38	68	86

*Mean natural dentition excludes those with zero dentition.

A=Aborigines; TSI=Torres Strait Islanders; ATSI = Aborigines and Torres Strait Islanders; ATSSI=Aborigines, Torres Strait and South Sea Islanders.

periodontal disease in remote other areas. South Sea Islanders showed a greater percentage of periodontal diagnoses in other major urban and remote major areas.

Torres Strait Islanders had significantly higher mean natural dentition for 18-29 and 30-54 year olds than non-indigenous people and Aboriginal people had the lowest. In the 55 plus age group, Torres Strait Islanders and non-indigenous people had significantly higher mean natural dentition than Aboriginal people (Table 8). A common trend across indigenous and age groups (except Torres Strait Islanders 18-29 and 55 plus and Aboriginal people 55 plus) was a significantly higher natural dentition in remote areas.

Comparing indigenous groups by age, the mean amount of natural dentition showed no consistent trend across ruralities. In capital cities, non-indigenous people had significantly higher natural dentition in the age group 18-29, but Torres Strait Islanders had higher dentition in older age groups (with Aboriginal people having the lowest natural dentition). The largest difference within age groups was the significantly higher natural dentition of Torres Strait Islanders aged 55 plus. In other major urban areas, Torres Strait Islanders had higher natural dentition than Aboriginal people and the non-indigenous group, and higher than Aboriginal people in the age groups 18-29 and 30-54.

In rural major areas, none was significantly different, but in older age groups the natural dentition of non-indigenous people was significantly greater than Aboriginal people. In rural other areas, Aboriginal people had the lowest natural dentition in all age groups. In remote major areas, Torres Strait Islanders had a significantly higher natural dentition in the age groups 18-29 and 30-54. In remote other areas, all indigenous groups were equivalent in natural dentition but the non-indigenous group was significantly higher in the older age group.

The percentage of indigenous and non-indigenous people with zero natural dentition in remote major areas was much reduced for the 30-54 age group but much greater for the 55 plus age group (Table 8). Indigenous people in remote areas had a greater percentage of 24 plus natural dentition than other rurality groups. Non-indigenous people in rural other and remote other areas had a reduced percentage of 24 plus natural dentition.

The overall mean waiting time for general services varied significantly with indigenous status (ANOVA $p < 0.001$), with non-indigenous people having a much greater wait for general services within rurality groups (Table 8). For non-indigenous people, waiting time for general treatments increased from almost nine weeks in capital cities to almost 18 weeks in rural major areas.

Table 9. Logistic regression results: odds, ratios and probability levels

		Functional dentition		Emergency		Dental caries	
		Odds	p	Odds	p	Odds	p
Age group	<10	2.26	0.00	1.41	0.00	3.73	0.00
	10-19	147.05	0.00	1.06	0.00	2.59	0.00
	20-29	126.12	0.00	2.05	0.00	5.51	0.00
	30-39	37.58	0.00	1.59	0.00	4.97	0.00
	40-49	14.99	0.00	1.41	0.00	3.30	0.00
	50-59	6.17	0.00	1.27	0.00	2.14	0.00
	60-69	3.22	0.00	1.09	0.00	1.57	0.00
	70-79	1.88	0.00	1.02	0.20	1.28	0.00
	80+	1		1		1	
Indigenous status	Aborigines	0.66	0.00	1.78	0.00	1.34	0.00
	Torres Strait Islanders	0.76	0.00	1.53	0.00	1.22	0.00
	South Sea Islanders	1.03	0.78	1.35	0.00	0.89	0.16
	Other	1		1		1	
Gender	Male	-	-	1.16	0.00	1.22	0.00
	Female	-	-	1		1	
Rurality	Capital city	0.64	0.00	1.58	0.00	0.95	0.02
	Other major urban	0.54	0.00	1.73	0.00	0.90	0.00
	Rural major	0.53	0.00	1.84	0.00	0.80	0.00
	Rural other	0.65	0.00	1.41	0.00	0.86	0.00
	Remote major	0.72	0.00	1.49	0.00	0.96	0.40
	Remote other	1		1		1	

In rural other and remote areas, waiting time for this group varied between two and 12 weeks. This contrasted with Aboriginal people and Torres Strait and South Sea Islanders, who had a mean waiting time for general services of between four-five weeks for all rurality groups, but one week for remote other areas and 14 weeks for rural major areas.

Rates of service per 1,000 population by indigenous status were used as an indicator of service delivery only as they are influenced by the number of Aboriginals and Torres Strait Islanders and non-indigenous in the population that were eligible for services. The rates of emergency and general treatment rate for Aboriginals and Torres Strait Islanders were significantly higher in rural other and remote areas than the three more urban areas (Table 8). The Aboriginals and Torres Strait Islanders emergency rate was especially high in rural other and remote major areas. Non-indigenous rates of general and emergency service were lower in remote major areas.

Comparing emergency and general rates within aboriginality groups, the emergency rate of treatment of Aboriginals and Torres Strait Islanders clients was double the general rate in all rurality groups except for remote other, where the emergency rate was still higher than the general rate. The emergency service rate for non-Aboriginals and Torres Strait Islanders was not significantly different to the general rate in capital city and remote major areas, however it was higher in other major urban and rural major areas and lower in rural other and remote other areas.

Aboriginal people and Torres Strait Islanders had more than expected oral surgery (including extractions) performed (17 per cent for South Sea Islanders, 20 per cent for Torres Strait Islanders, 24 per cent for Aboriginal people and 11 per cent for non-indigenous

people), with an accompanying decrease in the number of restorations and prosthodontics ($p < 0.001$, $df = 27$).

Logistic regression

Forward stepwise logistic regression was performed on age group, indigenous status, rurality and gender on the basis of the following oral health indicators: the presence of dental caries, functional dentition (24 plus natural teeth) and emergency course of treatment. The odds ratios of the models which fitted the data are shown in Table 9.

The results support those already reported. As expected, the presence of functional dentition by age group was significantly less likely for Aboriginal people and Torres Strait Islanders and more likely for those in remote areas. Emergency services were more likely to be accessed by middle-aged people and this effect decreased with age. Aboriginal people, Torres Strait and South Sea Islanders were more likely to use emergency services; Aboriginal people 1.78 times more likely than non-indigenous people. Males were more likely to use emergency services, as were people living in rural major and other major urban areas. The diagnosis of dental caries occurred around five times more in the 20-39 age group than the 80 plus age group. After 29, caries diagnosis became less likely with age. Caries was 1.34 times more likely to occur in Aboriginal people and 1.22 times more likely to occur in Torres Strait Islanders than non-indigenous people. Caries was also 1.22 times more likely in males than females and more likely in remote areas.

Discussion

Gender

Pensioner and Health Care Card groups had a greater proportion of males attending clinics with

concerns of pain. Overall, males were 1.22 times more likely to have diagnosis of dental caries than females. Treatment for males involved a greater proportion of oral surgery, including extractions. For those patients with some natural dentition, male Health Care Card holders and pensioners had less natural teeth than females. The area of greatest concern is young male Health Care Card holders, who had a low attendance rate at clinics. Brennan et al⁶ identified an Australia-wide trend for greater extractions in males. This result is not surprising as males were more likely to present when a problem with pain existed and dental caries was present.

In 1996, the National Men's Health Conference produced several reports that gave a profile of the typical attitude of men to health services. A review of the health differentials by gender in Australia⁷ concluded environmental and lifestyle factors meant men were less conscious of their health and less likely to seek help for health problems. UK men were also less likely to attend for dental visits and generally made less use of primary health care services.⁸ The image of 'real men' who took risks and ignored symptoms, feelings and pain had a great impact on men's health, especially in the younger age groups.

Oral health promotion needs to target males, especially young men, with messages of prevention, including regular general visits to clinics they are eligible to attend and more attention to oral health long before pain occurs. Men need to heed messages regarding the value of retaining natural dentition with associated encouragement from oral health staff not to extract a tooth just because it is causing a problem. However, echoing the conclusions reached at the 1996 Men's Health Conference, a change in the underlying male cultural attitude is required, especially in the vulnerable low socio-economic groups.

Rurality

This study found a greater use of general services in rural other and remote other areas, but a greater use of emergency services in other major urban, rural major and remote major areas (cities and towns other than the capital city). There was a greater than expected proportion of elderly females in capital cities and more elderly males in rural other and remote areas. Males and females had higher rates of service with increasing rurality, except for remote major areas, which had the lowest rates. Except for capital cities, the rate of service for pensioner males was higher than females.

Remote major areas had more concerns of pain and trauma and remote areas had more caries diagnoses. Remote areas had more oral surgery and rural and remote areas had less prosthodontics. The presence of functional dentition was more likely in remote areas.

Waiting time for general services was highest in rural and other major urban areas, this probably being the result of factors such as location, service availability and population density. The factors affecting service

delivery to rural and remote communities in Queensland are complex. In some rural areas, people accessing services may have lesser waiting time than their urban counterparts. The client load may also influence the likelihood that teeth are restored rather than extracted, due to the time the patient has access to a dentist, the waiting times experienced in the past by the patient or difficulty in obtaining a preferred appointment time. Conversely, in other remote areas, waiting time may be longer and treatment decisions may be based on the sporadic nature of visits by dentists to the area or the difficulty for the patient accessing services across great distances. There is also a lack of specialist services (such as orthodontics) in rural and remote areas.

A study of the access to dental care of rural and remote dwellers found rural cardholders had higher rates of edentulism than urban or remote dwellers.¹¹ However, a greater percentage of remote dwellers had not attended a dentist for more than two years, had a dental visit for a specific problem and had received more extractions and fewer fillings. The same report found patients living in remote areas were more likely to have oral surgery and less likely to have preventive services. Urban patients had a higher percentage of emergency care.

Indigenous status

There were more courses of care for female Aborigines and Torres Strait Islanders than males. There was a greater proportion of school students, Health Care Card holders, those not eligible and other eligibility classifications in indigenous people receiving courses of care from community dental services and fewer pensioners. Rates of service for indigenous people were highest in the rural other and remote areas. The rates of emergency service were around double that of general service in all rurality areas and even higher in remote other areas. Aboriginal people were treated for more emergency needs, but less preventive and rehabilitative needs. Indigenous people attended with more concerns of pain and bleeding gums and had more diagnoses of dental caries (across all rurality areas) and periodontal disease (especially in remote areas) than non-indigenous people. Indigenous people had more oral surgery and fewer restorations and prosthodontic treatment items.

There was a smaller mean waiting time for general services for indigenous people in all rurality areas. Staff report indigenous people were less likely to place themselves on long waiting lists. The waiting time would also depend on which clinic the person was registered in, as there would be higher waiting times in areas of dense population, or waiting times would vary, reflecting the frequency of visits by the clinic personnel.

By rurality, the majority of treatment given to Aborigines occurred in rural other areas whereas the majority of Torres Strait Islander treatments occurred in remote other areas. An examination by region

showed most of these treatments occurred in northern Queensland. Discussions with oral health staff in these regions revealed indigenous people tended to present to a dental clinic when a problem existed and they wanted the problem fixed immediately. If, for example, a sedative dressing was applied for further treatment at a later date, the person is not likely to attend the second appointment. The clinics reported that, even if these people are placed on the waiting list, they were likely not to attend and would not be contactable. Due to all of these factors, clinicians attempted to complete as much treatment as possible when indigenous people present for treatment at a dental clinic. This conclusion is supported by reports of a greater percentage of indigenous patients receiving extractions for both emergency and general services.^{3,6}

Acknowledgements

The author would like to thank Val King and Steve Shackcloth for helpful comments on the manuscript and Val King for getting feedback on some of the issues from north Queensland oral health staff. The data were collected by Queensland Health as part of the requirements of the Commonwealth Dental Health Program.

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