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No more capacity: the nature and appropriateness of attendances at a hospital dental service in New Zealand

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Abstract

Background and objectives: Cost is a barrier to accessing dental treatment for a substantial proportion of New Zealand (NZ) adults, and there is limited publicly-funded dental care. The Hospital Dental Service (HDS) can accept low-income adults, 'as capacity allows', although doing so places additional strain on their ability to deliver care for the priority patient group—people requiring complex health care management. Although most of the treatment provided by HDS to low-income adults could likely be delivered by community-based practitioners, the nature and appropriateness of presentations to HDSs have not been described or quantified. This study aimed to determine the nature of HDS attendances, patients' alignment with HDS eligibility criteria and appropriateness of the treatment setting.

Methods: Capital and Coast District Health Board HDS records for May and October 2021 appointments were reviewed. Patient and appointment characteristics were extracted and analysed for HDS priority and appropriateness of the treatment setting.

Results: About half of the 1795 appointments were for patients not high-priority for hospital-level dental care, of which a considerable proportion were adults on low incomes, Māori or Pasifika. Extractions or prosthodontic treatments were most commonly provided. Almost three-quarters were self-referrals or referred by general medical practitioners. Virtually all appointments for "as capacity allows" patients could have been delivered in the community.

Conclusions: People who could otherwise be appropriately treated in the community are being seen by the HDS. Unmet oral health care needs are high in NZ, especially among high needs groups. Affordable, community-based oral health care services, along with robust prevention strategies, are urgently required to address unmet need and oral health disparities.

Introduction

Publicly-funded oral health care for New Zealand adults is limited, accessible only to specific population groups.[1] The Ministry of Health's service specifications describe the minimum national service requirements and eligibility for publicly-funded health services—including oral health services—when contracting or providing services.[2] In accordance with the Tier 2 Hospital Dental Services (HDS) service specification,[3] HDS are mandated to provide treatment to, and prioritise, those people who, owing to their high and complex health needs, require their dental care to be delivered in a hospital setting (Table 1).

Table 1. Ministry of Health Hospital Dental Services service specification eligibility criteria for treatment by hospital dental services, and patient priority[3,6]

DHBs should provide oral health services for people in the following scenarios	
Core Services–high priority	Dental treatment is an essential part of hospital treatment for a current medical or surgical condition, or for dental pre-assessment for receiving another medical or surgical treatment.
	Orthodontic treatment is required for cleft palate or other craniofacial syndromes or severe congenital craniofacial abnormalities.
	A hospital admission is required because of the need for special management facilities in order to provide dental treatment, such as general anaesthetics.
	General and specialist dental services are required because a Service User's medical or congenital condition and/or physical, sensory, intellectual or psychological disability mean they are unable to access dental care in the community.
	People needing special dental care may include: residents of community residential disability services, residents of dementia and hospital-level residential care facilities, care recipients under the Intellectual Disability (Compulsory Care and Rehabilitation) Act 2003 and the Criminal Procedure (Mentally Impaired) Act 2003.
As capacity allows and as a provider of last resort–low priority	Where capacity and funding allows, the Service may provide basic dental services (routine dental care) for low income adults.

On turning 18, most New Zealanders must pay privately for their oral health care.[1] Owing to cost, a substantial proportion of the adult population only seek dental care when they have a problem, disproportionately so for Māori, Pasifika and those on low incomes.[4,5] Moreover, people with oral health problems likely present to general medical practitioners and hospital emergency departments rather than dental practitioners because those services are either free or are low cost.[6-8] The HDS service specifications also allow for HDS to provide urgent and basic dental care at low cost for adults who are on low incomes but who are otherwise well (that is, do not meet any of the priority criteria) on an "as capacity allows and as a provider of last resort" basis (Table 1). The 'as capacity allows' HDS service specification provision offers adults who cannot afford to pay for dental treatment from a private provider a means of accessing oral health care. Eligibility for acceptance into the hospital dental service on this basis, that is, 'low income', is typically determined by patients confirming they have a Community Services Card.[(1)]

Recently, HDS clinical directors and leaders raised concerns about the rising numbers of referrals (predominantly from general medical practitioners) and self-referral presentations to their service of adults on low incomes for urgent and basic dental treatment, that is, on an 'as capacity allows' basis,[6,7] and the HDSs' reducing capacity to accept patients on such a basis. Greater demands are being placed on HDS to care for priority patients, a consequence of the high—and rising—prevalence of chronic health conditions[9,10] and an ageing population with improved natural tooth retention.[5] In turn, there are more patients requiring complex management of their dental treatment in a hospital setting, generating considerable pressure on HDS resources to just meet the needs of their priority patients. As such, some HDS have ceased accepting people on an 'as capacity allows' basis; others are likely to follow. The loss of this dental 'safety net' likely means that unmet oral health need in the population will rise, and oral health disparities will not only persist but also widen.

There is an urgent need to find alternative ways of providing dental services for those on low incomes but who are not eligible for hospital-level care. Given appropriate resourcing, it is likely that the majority of people who are seen on an 'as capacity allows' basis, could be managed by oral health practitioners in the community.[6,11] The nature and appropriateness of presentations to HDS have yet to be described or quantified. Knowing more about the characteristics of the people who are referred or present to the HDS, their eligibility to receive care in the HDS, and if the treatment they receive could be provided in the community, would assist in informing strategies, including financial assistance for patients, to improve low-income adults' access to dental treatment in a primary dental care setting and reduce the burden on secondary dental care services.

Capital & Coast DHB's (CCDHB) Dental and Oral Health Service (DOHS) provided (at the time of this study, hospital and health services were provided by individual District Health Boards) oral health services for just over 300,000 people in Wellington, Porirua and Kāpiti Coast. Relative to other HDS, DOHS had a high clinician to population ratio,[6] capacity to see low-income adults for relief of pain and high expenditure for their treatment; it was an exemplar of a HDS that serviced a sizeable proportion of the NZ population. It had clinics in two hospitals in the Capital and Coast region—Wellington Regional Hospital and Kenepuru Public Hospital. Six senior clinicians, two oral and maxillofacial surgeons, four house surgeons, three clinical dental technicians and an oral medicine specialist provided dental treatment, predominantly for the residents of CCDHB. Approximately 12,000 outpatient appointments were scheduled each year, with about 1,500 of those reserved for low-income adults with toothache. Outpatient clinics were open Monday to Friday between 8am and 4.30pm. An after-hours service was available for individuals with facial swelling, maxillofacial trauma or uncontrolled bleeding. Outpatients were predominantly referred to the service by other health care professionals, and triaged by senior clinicians on a roster basis. Patients with toothache could self-refer to the relief of pain clinic, if there was space on the day. Recently, the DOHS's capacity to provide care diminished. To ensure resources were directed toward high priority patients a decision was made for the DOHS to stop accepting patients on an 'as capacity allows' basis.

Using data from the period prior to the decision for the DOHS to only see priority patients to inform an understanding of attendances at HDS and address a gap in knowledge, this study aimed to determine (i) the nature of patients treated by CCDHB's DOHS; (ii) if those patients reflected the Ministry of Health's HDS service specifications; and (iii) the proportion of patients treated by the DOHS who could have been appropriately managed by oral health practitioners in the community.

Method

A retrospective review of dental records of all weekday appointments in the DOHS in the months of May and October 2021 was conducted. These months were chosen as they were considered to reflect the most 'usual' pattern of service use; they were not affected by the response to SARS-CoV-2 (all regions of NZ were at Alert Level 1 during the chosen months), school holidays or public holidays, and accounted for any seasonal differences in attendances at the DOHS.

Data on the characteristics of the patients attending the DOHS during the study period and the nature of those appointments were extracted (by a researcher with dental training (LS)) from the DOHS's electronic clinical records (Titanium New Zealand version 11.0 (Build 64.115)), and (manually) from the clinical and patient medical notes associated with the appointments. Categories of data extracted were: patient gender, age,

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(1) Identification card that confirm eligibility for subsidies and reductions in health care costs. https://www.workandincome.govt.nz/products/a-z-benefits/community-services-card.html

ethnicity, Community Services Card (CSC) status and payor category; location of appointment, appointment type, referral source, treatment provided, and clinician type (Table 2). Ethnicity was determined according to the CCDHB's classification for ethnicity. 'Payor category' is CCDHB's fee scale on which the patient has been accepted for care; 'Financial' or 'Relief of Pain' payor codes indicate 'low income'. They are those patients who have been referred for dental treatment but are otherwise well (that is, not a priority group) and required to demonstrate that they hold a CSC before being accepted into the service on an 'as capacity allows' basis.

Patients' clinical notes and medical histories were used to determine: (i) the patient's priority level (low or high) for hospital-level care and (ii) the appropriate setting for the treatment provided, that is, hospital or oral health care provider in the community. Priority decisions were guided by the Hospital Dental Services Minimum Eligibility and Level of Service Matrix 2nd Edition (Service Matrix).[6] The Service Matrix is based on the Ministry of Health's HDS service specifications and was developed by hospital dental clinicians for use by senior hospital colleagues to aid the identification and prioritisation of patient eligibility for hospital-level dental care. When the information in the clinical notes and/or medical histories was not sufficient or a second opinion was required to make a final decision, the study's senior clinical researcher and hospital dentist (EH) was consulted.

Data were recorded in an Excel spreadsheet. There were no missing data for any of the appointments. All records of patients treated in the (tertiary) Oral Medicine clinic and patients who were admitted into hospital for treatment under general anaesthetic were excluded from the data extraction; the nature of those appointments meant that eligibility for hospital-level care was uncontested. Prior to data collection, the first 20 data points were extracted and recorded by the main investigator (LS), and compared for coherence with the information extracted and recorded by the study's senior clinical researcher (EH). On the points where a judgement call was needed in the test set, there was disagreement on one entry (5%) indicating high coherence.

Data were analysed using descriptive statistics in R Software. Confidence intervals (CI) for the proportions

Table 2. Information extracted from Capital and Coast District Health Board Dental and Oral Health Service's records, May and October 2021

Category	Response options	Additional notes
Gender	Male, female, Unknown	
Age	Number	At time of appointment
Ethnicity	NZ European/European, NZ Māori, Pasifika, Asian, MELAA/Other	First recorded ethnicity, as collected by Capital and Coast District Health Board
Holder of Community Services Card	Yes, no	At time of commencement of treatment plan
Payor/financial category–patient*	Financial, Medical, Policy N/C, Relief of pain, Special Dental Benefit, other	Fee scale on which patient has been accepted for care
Location of appointment	Wellington, Kenepuru	
Appointment type	New course of treatment (referred), New course of treatment (recall), Second or subsequent appointment in course of care (referred or recall)	New course of treatment or part of ongoing care
Referral source	General Medical Practitioner (GP), Self-referred, Dental Practitioner, CCDHB, Community Oral Health Service (COHS), Recall, Other	For this course of treatment only
Treatment provided	Diagnostic, Extraction, Prosthodontics, Restorative, Preventative, Review, Other surgical, Other	Only main treatment provided recorded. If multiple treatments were done: the order of main treatment is prosthodontic, extraction, restorative, preventive, diagnostic.
Clinician type	Dental house surgeon, senior dental clinician, clinical dental technician, oral surgeon/oral maxillofacial surgeon, other	
Patient meets Ministry of Health Hospital Dental Service service specifications	Yes, no	Based on Hospital Dental Services Minimum Eligibility and Level of Service Matrix v.26
Could treatment be provided safely in the community by a competent practitioner?	Yes, no	Assessed by dental reviewer/study team

*Financial and Relief of Pain, accepted on the basis of low income; Policy N/C, inpatients and those receiving essential treatment prior to other medical/surgical interventions (e.g. chemotherapy/valve replacement); Medical, those who cannot see a community dentist due to a medical condition/intellectual or mental impairment; Special Dental Benefit, under 18 years old

Table 3. Characteristics of patients attending appointments and the nature of appointments (N; %), Capital and Coast district Health Board's Dental and Oral Health Services, May and October 2021

Patient or appointment characteristic	N	% (95% CI)	
Total	1795	100	
Gender			
Male	914	50.9	(48.6, 53.3)
Female	880	49.0	(46.7, 51.4)
Unknown	1	0.1	(0.0, 0.3)
Age			
0-4	48	2.7	(2.0, 3.5)
5-12	205	11.4	(10.0, 13.0)
13-17	43	2.4	(1.7, 3.2)
18-24	99	5.5	(4.5, 6.7)
25-34	183	10.2	(8.8, 11.7)
35-44	181	10.1	(8.7, 11.6)
45-54	219	12.2	(10.7, 13.8)
55-64	326	18.2	(16.4, 20.0)
65-74	244	13.6	(12.0, 15.3)
75+	248	13.8	(12.3, 15.5)
Ethnicity			
Māori	416	23.2	(21.2, 25.2)
Pasifika	250	13.9	(12.4, 15.6)
NZ European/Other European	853	47.5	(45.2, 49.9)
Asian	185	10.3	(8.9, 11.8)
MELAA/Other	85	4.7	(3.8, 5.8)
Unknown	6	0.3	(0.1, 0.7)
Community Services Card			
Yes	836	46.6	(44.2, 48.9)
No	959	53.4	(51.1, 55.8)

Patient or appointment characteristic	N	% (95% CI)	
Payor			
Financial	482	26.9	(24.8, 29.0)
Medical	189	10.5	(9.1, 12.0)
Policy N/C	295	16.4	(14.7, 18.2)
Relief of Pain (ROP)	227	12.6	(11.1, 14.3)
Special Dental Benefit	286	15.9	(14.3, 17.7)
Other	316	17.6	(15.9, 19.4)
Location			
Kenepuru	850	47.4	(45.0, 49.7)
Wellington	945	52.6	(50.3, 55.0)
Referral source			
General Medical Practitioner	468	26.1	(24.1, 28.2)
Self-referred	373	20.8	(18.9, 22.7)
Dental Practitioner	180	10.0	(8.7, 11.5)
CCDHB	284	15.8	(14.2, 17.6)
Community Oral Health Service	167	9.3	(8.0, 10.7)
Recall	299	16.7	(15.0, 18.5)
Other	24	1.3	(0.9, 2.0)
Treatment provided			
Diagnostic	474	26.4	(24.4, 28.5)
Prosthodontics	336	18.7	(16.9, 20.6)
Extraction	319	17.8	(16.0, 19.6)
Restorative	283	15.8	(14.1, 17.5)
Preventative	190	10.6	(9.2, 12.1)
Review	158	8.8	(7.5, 10.2)
Other surgical	13	0.7	(0.4, 1.2)
Other	22	1.2	(0.8, 1.8)

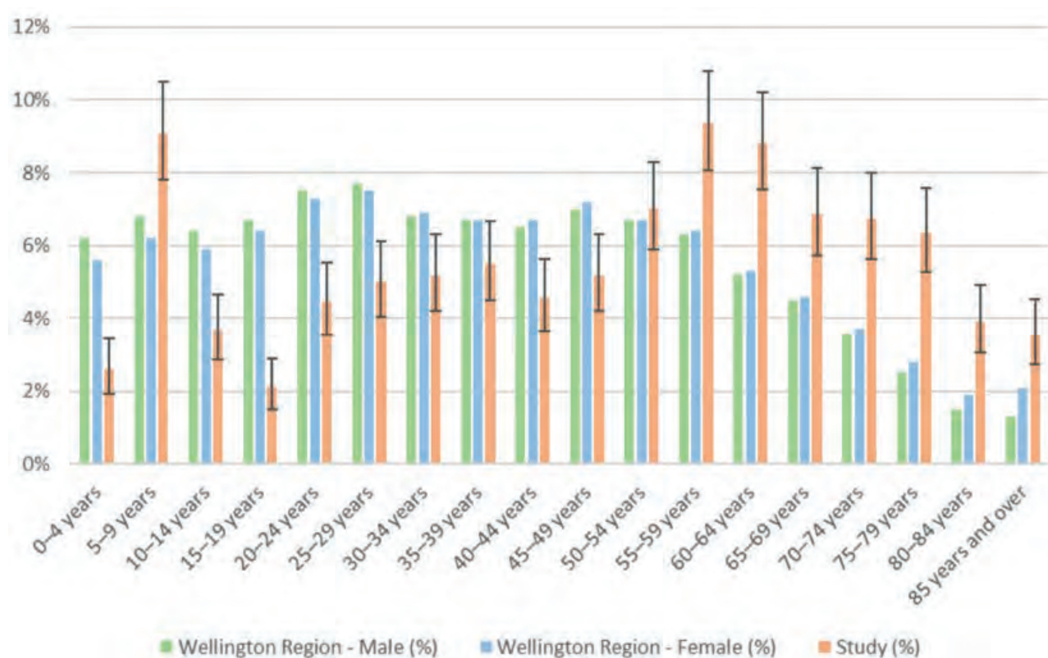

Figure 1. Distribution of the Wellington Region population^ and study participants, by age.
^ Source: Stats NZ

were calculated using Fisher's exact method, and results have been validated against OpenEpi (https://www.openepi.com/Menu/OE_Menu.htm). Age standardisation was performed for ethnicity data, standardising to the overall study age structure. Sub-analysis was conducted for adults (18 years and above). Age standardisation was conducted for the sub-group. Additionally, a sub-analysis was conducted to describe the nature of patients who were not eligible for hospital-level care. In total, 1973 appointment records were identified during the study period, excluding patients admitted for dental treatment under general anaesthetic. Following further exclusion of oral medicine appointments (n=178), 1795 appointment records were included in the analysis.

Ethical approval was obtained from the University of Otago Ethics Committee (HD21/089), locality ethical approval was obtained from the CCDHB (approval ID 1.1933), Māori consultation with Ngāi Tahu was undertaken (in accordance with University of Otago policy) and Regional Advisory Group-Māori approval was obtained (RAG-M #906).

Results

Characteristics of patients and nature of appointments

Table 3 presents the characteristics of the people who attended appointments at CCDHB and the nature of those appointments during the study period. Equal numbers of men and women attended. Over one-third of the patients were aged 55+ and one in seven were aged 0-12 years, both being considerably higher than the same age groups in the CCDHB population (Figure 1). Almost half of the attendees were NZ European; almost one in five were Māori and one in seven Pasifika, proportions greater than the respective proportions in the CCDHB population (Figure 2). Nearly half the attendees were Community Services Card holders; two in five were either 'Financial' or 'Relief of Pain' payors, that is, 'low income'.

General medical practitioners were the most common referral source, with more than one-quarter of patients being referred by their doctor; self-referrals were the next most common. Over half of the patients were part way through of a course of treatment. More than one-third (36.5%) of the treatments delivered during the study period were for extractions or prosthodontic treatment; just over one-quarter were diagnostic in nature.

Priority

Fewer than half of the appointments during the study period were attended by people who were high-priority HDS patients (Table 4). After adjusting for age, proportionally more appointments were attended by patients eligible for hospital-level care who were of NZ European and Asian ethnicities than of Pacific, Māori and MELAA/other ethnicities (Table 5). This difference is more pronounced when considering only those patients aged 18 or over (when free universal oral health care is no longer available). For instance, over twice as many adult patients of NZ European ethnicity as those of Pacific ethnicity met the HDS service specifications high-priority criteria (Table 5).

Almost all appointments for people referred from other departments within the CCHDB, the Community Oral Health Service (<18y) or who attended for a routine recall were for patients who met the HDS high-priority criteria; of those appointments for people referred by a general medical practitioner or self-referred, one-fifth were for patients eligible for hospital-level care (Table 4). The majority of appointments for surgical, preventive and diagnostic treatments were for people who are high-priority for hospital-level care; of those appointments for extractions or prosthodontic treatments, approximately one in four of the patients met the HDS high-priority criteria. Of those appointments attended by 'Financial' or 'Relief of Pain' payors, just over one in ten (11.9%) were for patients high-priority for hospital-level care.

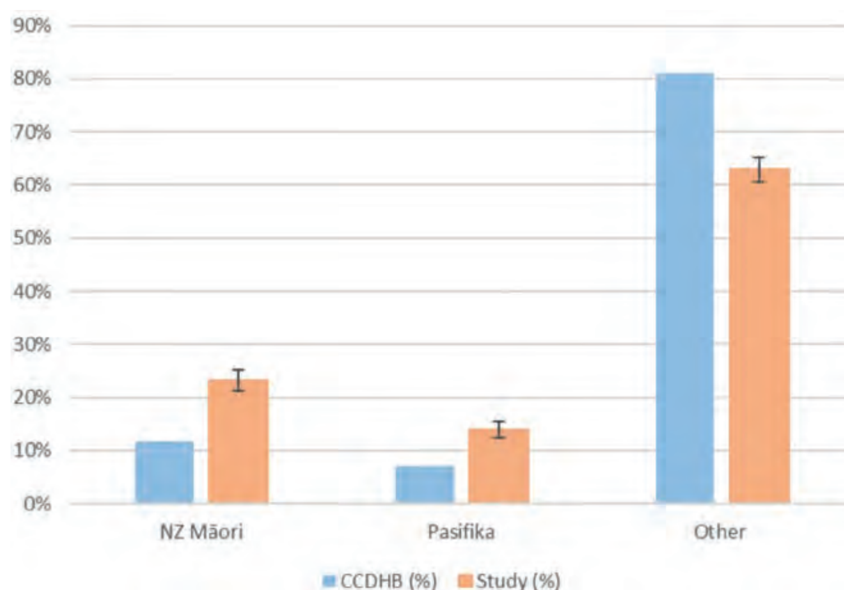

Figure 2. Distribution of Capital and Coast District Health Board region's population^ and study participants, by ethnicity.
^ Source: Stats NZ

Table 4. Characteristics of patients attending appointments and the nature of appointments that met the Ministry of Health Hospital Dental Service service specifications high priority criteria, by demographic and appointment characteristics

Patient or appointment characteristic	Total (N)	N	% (95% CI)
Total	1795	864	48.1
Gender			
Female	880	387	44.0 (40.7, 47.3)
Male	914	477	52.2 (48.9, 55.5)
Age			
0-4	47	37	78.7 (64.3, 89.3)
5-12	205	166	81.0 (74.9, 86.1)
13-17	43	36	83.7 (69.3, 93.2)
18-24	99	42	42.4 (32.5, 52.8)
25-34	183	77	42.1 (34.8, 49.6)
35-44	181	60	33.1 (26.3, 40.5)
45-54	219	79	36.1 (29.7, 42.8)
55-64	326	136	41.7 (36.3, 47.3)
65-74	244	103	42.2 (35.9, 48.7)
75+	248	128	51.6 (45.2, 58.0)
Ethnicity			
Māori	416	182	43.8 (38.9, 48.7)
Pasifika	250	90	36.0 (30.0, 42.3)
NZ/Other European	853	458	53.7 (50.3, 57.1)
Asian	185	100	54.1 (46.6, 61.4)
MELAA/Other	85	32	37.6 (27.4, 48.8)
Unknown	6	2	33.3 (4.3, 77.7)
Community Services Card			
Yes	836	129	15.4 (13.0, 18.1)
No	959	735	76.6 (73.8, 79.3)

Patient or appointment characteristic	Total (N)	N	% (95% CI)
Payor			
Financial	482	34	7.1 (4.9, 9.7)
Medical	189	152	80.4 (74.0, 85.8)
Other	316	168	53.2 (47.5, 58.8)
Policy N/C	295	267	90.5 (86.6, 93.6)
Relief of pain	227	11	4.8 (2.4, 8.5)
Special Dental Benefit	286	232	81.1 (76.1, 85.5)
Referral source			
GP	468	94	20.1 (16.5, 24.0)
Self-referred	373	61	16.4 (12.7, 20.5)
CCDHB	284	253	89.1 (84.9, 92.5)
Recall	299	228	76.3 (71.0, 81.0)
Dental Practitioner	180	76	42.2 (34.9, 49.8)
Other	24	16	66.7 (44.7, 84.4)
Community Oral Health Service	167	136	81.4 (74.7, 87.0)
Treatment provided			
Diagnostic	474	315	66.5 (62.0, 70.7)
Extraction	319	89	27.9 (23.0, 33.2)
Prosthodontics	336	78	23.2 (18.8, 28.1)
Restorative	283	135	47.7 (41.8, 53.7)
Preventative	190	130	68.4 (61.3, 75.0)
Review	158	98	62.0 (54.0, 69.6)
Other	22	10	45.5 (24.4, 67.8)
Other surgical	13	9	69.2 (38.6, 90.9)

Table 5. Age-adjusted proportions of study participants who met the Ministry of Health Hospital Dental Service service specifications high priority criteria, by ethnicity

Ethnicity	All study participants	Adults (18y and over)
Māori	48.1 (39.4, 59.3)	38.7 (29.0, 51.8)
Pasifika	32.1 (25.7, 39.9)	23.8 (16.6, 34.9)
NZ European/Other European	54.1 (49.1, 59.6)	52.3 (46.4, 59.0)
Asian	53.0 (41.9, 66.7)	45.7 (32.0, 66.6)
MELAA/Other	49.8 (33.4, 72.7)	31.5 (17.7, 53.5)

Table 6 presents data on those patients who were low-priority for hospital-level care. Almost all patients were aged 18 or more, equally distributed across age groups. Over two in five were either Māori or Pasifika, and another two in five were NZ European. Three-quarters were either referred by their general medical practitioner or self-referred, with few having been referred from other sources. Appointments were predominantly for extractions and prosthodontic treatments, and approximately three-quarters were CSC-holders, and ‘Financial’ or ‘Relief of Pain’ payors.

Appropriateness of care delivery setting

Virtually all patients seen in the DOHS who were on the low-priority criteria for hospital dental care could have had the treatment they received delivered by an oral health care practitioner in the community. Over three-quarters of those patients who were high-priority had their dental treatment appropriately delivered in a hospital setting (Table 7).

Table 6. Characteristics of patients attending appointments and the nature of appointments that did **not** meet Ministry of Health Hospital Dental Service service specifications high priority criteria

Patient or appointment characteristic	N	% (95% CI)
Total	931	100%
Gender		
Male	437	46.9 (43.7, 50.2)
Female	493	53.0 (49.7, 56.2)
Unknown	1	0.1 (0.0, 0.6)
Age		
0-4	10	1.1 (0.5, 2.0)
5-12	39	4.2 (3.0, 5.7)
13-17	7	0.8 (0.3, 1.5)
18-24	57	6.1 (4.7, 7.9)
25-34	106	11.4 (9.4, 13.6)
35-44	121	13.0 (10.9, 15.3)
45-54	140	15.0 (12.8, 17.5)
55-64	190	20.4 (17.9, 23.1)
65-74	141	15.1 (12.9, 17.6)
75+	120	12.9 (10.8, 15.2)
Ethnicity		
Māori	234	25.1 (22.4, 28.1)
Pasifika	160	17.2 (14.8, 19.8)
NZ European/Other European	395	42.4 (39.2, 45.7)
Asian	85	9.1 (7.4, 11.2)
MELAA/Other	53	5.7 (4.3, 7.4)
Unknown	4	0.4 (0.1, 1.1)
Community Services Card		
Yes	707	75.9 (73.1, 78.7)
No	224	24.1 (21.3, 26.9)
Payor		
Financial	448	48.1 (44.9, 51.4)
Medical	37	4.0 (2.8, 5.4)
Policy N/C	28	3.0 (2.0, 4.3)
Relief of pain	216	23.2 (20.5, 26.0)
Special Dental Benefit	54	5.8 (4.4, 7.5)
Other	148	15.9 (13.6, 18.4)
Referral source		
GP	374	40.2 (37.0, 43.4)
Self-referred	312	33.5 (30.5, 36.6)
Dental Practitioner	104	11.2 (9.2, 13.4)
CCDHB	31	3.3 (2.3, 4.7)
Community Oral Health Service (COHS)	31	3.3 (2.3, 4.7)
Recall	71	7.6 (6.0, 9.5)
Other	8	0.9 (0.4, 1.7)
Treatment provided		
Diagnostic	159	17.1 (14.7, 19.7)
Extraction	230	24.7 (22.0, 27.6)
Prosthodontics	258	27.7 (24.9, 30.7)
Restorative	148	16.0 (13.6, 18.4)
Preventative	60	6.4 (5.0, 8.2)
Review	60	6.4 (5.0, 8.2)
Other surgical	4	0.4 (0.1, 1.1)
Other	12	1.3 (0.7, 2.2)

Table 7. Proportion of appointments meeting the Ministry of Health Hospital Dental Service service specifications high priority criteria, by whether the treatment provided could be appropriately delivered in the community

Service Specifications high priority?	Can treatment be appropriately delivered in the community?		
	Yes	No	Total
Yes	196 (22.7%)	668 (77.3%)	864
No	929 (99.8%)	2 (0.2%)	931
Total	1125	670	1795

Discussion

This study investigated the nature of attendances at a HDS in a large DHB in New Zealand, the alignment of those attendances with the priority criteria for hospital-level care and the appropriateness of the setting of those appointments. To the best of our knowledge, this is the first investigation to quantify the nature and appropriateness—according to the Ministry of Health's HDS service specifications—of the patients being seen in any of New Zealand's HDS. Given data from only one DHB were analysed, the findings cannot be generalised to other HDS in New Zealand or provide a regional view. Nevertheless, our findings are consistent with those from previous investigations of HDS[6] across the country. They also provide further insight into CCDHB's HDS role, and likely that in others in New Zealand, as a 'dental safety net' for those who cannot afford dental care in the community, and the implications for them if the service is no longer available. The findings also illustrate the stress that providing such a service has on HDS resources and the likely effect on priority patients. Analysing a

full year's data from CCDHB's DOHS and from other HDS across the country would improve the validity and generalisability of the findings. Further studies examining HDSs in other DHBs would provide a baseline to monitor and evaluate changes in strategy, policy and intervention on a national level. The retrospective nature of the study and (in turn) reliance on data extraction from clinical notes, which typically vary in detail between individual clinicians, is another limitation. The interpersonal clinician-patient nature of dentistry may mean some patient information may not have been recorded in patients' notes, or that its recording differed by clinician. However, data reliability was high when tested prior to data extraction and analysis.

A substantial proportion of the appointments were attended by older adults, Māori and Pasifika, and adults on low incomes, and proportionally more so than in the population CCDHB serves. This finding is not unexpected given the greater prevalence of comorbidity among these groups than others in the population,[9,12,13] and (in turn) their high health needs and the complexity of their health care management, and the substantial—and long-standing—inequities they face in accessing oral health care.[4,14] The high attendance by young children is also not surprising given that dental caries is one of leading causes of avoidable hospital admissions for children aged 0-14, especially those under 8 years of age.[11,15]

Over half the patients who attended the DOHS did not meet the service specification's high priority criteria for hospital-level care; rather they were being accepted into the service on an 'as capacity allows' basis. This finding is concerning. Given that the prevalence of chronic conditions in the population is expected to (continue to) rise, so too will the need for those for whom hospital-level health care—including dental care—is essential.[16] To ensure priority patients receive the oral health care they need, services for those seeking affordable dental care at the HDS will have to reduce. This scenario is already a reality; to accommodate priority patients, some HDSs have already ceased their relief of pain service and providing urgent dental care to low income adults.[6] The loss of the HDS as a 'dental safety net' almost certainly means the prevalence of unmet oral health need—and its consequences—will rise and moreover, existing oral health disparities will widen. An additional worry is the (likely growing) group of people who are working but both lack sufficient disposable income to pay privately for dental treatment and are not eligible for any form of public funding or subsidies.[7]

Extractions and prosthodontic treatments were the most common types of treatments provided for those who were low-priority for hospital-level care. This finding indicates not only the presence of advanced, and likely painful, oral disease, but also poor access to routine and preventive care in the community. Over half of New Zealand adults, and a significantly greater proportion of Māori, Pasifika and those living in deprivation than NZ European and less deprived adults, either wait until they have a dental problem to visit a dentist or do not go at all, the predominant driving factor being cost.[4,17] Most of the low-priority group were almost always referred by their doctor or self-referred. This finding is consistent with previous research that shows that general medical practitioners report seeing patients with oral health problems, particularly pain and infection as a result of advanced oral disease. General medical practitioners are typically more accessible and affordable than a dentist, and most people—particularly those with high health needs—will likely be enrolled in a medical practice, more so than with a dentist. As such, medical practices are often the first-port-of-call for people with dental problems, particularly those on low incomes who require urgent attention.[18-20] However, most general medical practitioners lack sufficient knowledge, training and confidence to appropriately address such presentations.[21,22] Consequently, they refer patients to the HDS, possibly without realising the high priority acceptance criteria or perhaps perceiving there is a relaxed acceptance policy. Informing general medical practitioners about the acceptance criteria to the HDS, along with a robust and standardised referral process, would address this issue. The high proportion of people who presented to the DOHS during the study period on their own accord, that is self-referred, again suggests a lack of a regular dental practitioner or an inability to pay privately, or both.

Almost all of the people who attended the DOHS on an 'as capacity allows', or low-priority basis during the study period had treatment that could have been adequately provided by general dental practitioners in the community. Removing the financial barrier to accessing oral health care in the community would not only would address patient's oral health issues, but also reduce the burden on hospital services (and general medical practices) that are already struggling to meet the needs of the services' priority patient groups. The implementation of strategies and policies allowing access to routine, community-based treatment and preventive measures for those least able to afford dental care is urgently needed. In the community, current or potential providers include, for the most part, Māori oral health providers, general dental practitioners and community oral health services. Anecdotally, Māori oral health providers are currently over-subscribed, and lack the capacity and resourcing to expand services. Community oral health providers predominantly treat children, and adult care is currently not in-scope. And while general dental practitioners agree that cost is a barrier for care, many believe that adult dental care should be mostly funded by private household expenditure, suggesting that dentists are content with the current model.[23] Ultimately, the current model for treating patients in the community is largely dependent on who is prepared to treat these patients, and having the necessary resourcing and processes to do so.

Current solutions to improving financial access to adult oral health care in New Zealand are typically short-term and reactive. Some low-income adults may be eligible for an annual publicly-funded grant for emergency dental care.[24] The rise in the emergency

dental grant[24] in late 2022 from NZ$300 to NZ$1000 was welcomed by a considerable proportion of New Zealand adults who have dental pain and poor oral health-related quality of life. The Ministry of Social Development has also recently expanded the scope of treatment that can be provided to include "immediate and essential"[24] treatment, however this is open to interpretation and does not include preventive care. Given that most oral diseases are preventable, prioritising and funding preventive oral health care would likely contribute to reductions in oral health inequities, and improvements in health and wellbeing. It is important to note that there is significant variation of preventive care, and that preventive care is difficult to audit and evaluate. Nevertheless, there continues to be a lack of consideration and funding for preventive care or earlier treatment interventions, actions which are likely to have longer-term benefits.

Of the appointments that were low-priority in the HDS service specifications in this study, only a small proportion was for those aged under 18, for whom dental care is free. In addition, there was little difference among those who are in the low-priority group for hospital-level care across the adult age groups, however considerably more of those aged 25-34 years than aged 18-24 attended. On turning 18, dental treatment ceases to be free in New Zealand. Also, few people aged under 18 attended the DOHS during the study period who were in the low-priority group for hospital-level care. This finding provides some evidence of the benefits of providing publicly-funded oral health care and supports calls by health professionals and academics[6,7,25-27] on the need to change the way adult oral health care is organised and funded in NZ, especially for adults on lower incomes.

Precedents for oral health services for adults on low incomes exist elsewhere. In the United Kingdom, low-income adults are able to receive free dental treatment if on income support,[28] and Canada is soon to implement a national oral health care funding programme for adults on low incomes.[29] In NZ, the prevalence and severity of untreated dental caries is highest among young NZ adults.[4] Extending the current Combined Dental Agreement (CDA) arrangements for adolescent oral health care[30] so that it includes young adults up to the age of 25 or 30 years would support people at a time in their life when they are at high risk of oral disease; typically, they are on low incomes and have health behaviours that increase their risk of oral problems. However, fewer than half of adolescents eligible for oral health care under the CDA attend a dentist, (R.Clarke, personal communication, 1 November 2022), and Māori and Pasifika adolescents are significantly less likely to do so[31] suggesting that the arrangement is not meeting the needs of those who likely need it most. Prior to extending the CDA to include older age groups, the current model should be evaluated and amended to ensure it appropriately meets the range of needs in the population. To achieve long-term and meaningful change in health, the NZ Health and Disability System Review acknowledged the need to prioritise prevention and to address inequities.[32] Nevertheless, despite the well-known, substantial oral health inequities and burden of oral disease in the population, the Review failed to acknowledge the importance of preventive oral health care and to address the oral health disparities among New Zealand adults.

A positive finding was that most patients who were in the high-priority group for receiving hospital-level care had—appropriately—received their dental treatment in one of CCDHB's two hospitals. This finding is reassuring and demonstrates the Service Matrix's effectiveness at identifying patients who require hospital-level care for their dental treatment.

Conclusion

Hospital dental services appear to serve as a safety net for low-income adult New Zealanders, providing dental treatment for advanced oral disease that could be delivered in the community. Doing so is not only inappropriate, it also places a substantial burden on hospital services and potentially delays treatment for those whose oral health care needs can only be addressed in a hospital setting. There is an urgent need to find ways to ensure equitable access to oral health care for all adult New Zealanders, especially those on low incomes.

References

1. Ministry of Health. Publicly funded dental care. https://www.health.govt.nz/your-health/services-and-support/health-care-services/visiting-dentist/publicly-funded-dental-care. Published 2019. Accessed 30 June 2022.
2. Ministry of Health. Contracts and service specifications. https://www.health.govt.nz/our-work/disability-services/contracting-and-working-disability-support-services/contracts-and-service-specifications. Published 2020. Accessed.
3. Ministry of Health. Oral Healh Service Specifications. *National Service Framework Library.* 2022.
4. Ministry of Health. *Our Oral Health: Key findings of the 2009 New Zeland Oral Health Survey.* Wellington: Ministry of Health; 2010 2010.
5. CBG Health Research Ltd. *Our Older People's Oral Health: Key Findings of the 2012 New Zealand Older People's Oral Health Survey.* Auckland: CBG Health Research Ltd; 2015 2015.
6. Smith M, Ferguson C, Thomson W. *Public sector oral health service provision for high needs and vulnerable New Zealanders.*: Health Promotion and Policy Research Unit, University of Otago, Wellington and Sir John Walsh Research Institute, Faculty of Dentistry, University of Otago, Dunedin;2019.
7. Smith M, Stroud C, Low M, Gibson C, Ferguson CA, Broadbent J. Non-traumatic dental presentations at emergency departments in New Zealand. *N Z Med J.* 2021;134(1544):99-112.

8. Mckenzie J, Yap M, Phemister R, Singh T. A five-year retrospective observational study of dental presentations to Waikato Hospital's emergency department. *N Z Med J.* 2022;135(1551).
9. Stanley J, Semper K, Millar E, Sarfati D. Epidemiology of multimorbidity in New Zealand: a cross-sectional study using national-level hospital and pharmaceutical data. *BMJ Open.* 2018;8(5):e021689.
10. Global, regional, and national burden of diseases and injuries for adults 70 years and older: systematic analysis for the Global Burden of Disease 2019 Study. *BMJ.* 2022;376:e068208.
11. Whyman R, Mahoney E, Stanley J, Morrison D. *Admissions to New Zealand Public Hospitals for Dental Care. A 20 Year Review.* Wellington: Ministry of Health; 2012 2012.
12. Gurney J, Stanley J, Sarfati D. The inequity of morbidity: Disparities in the prevalence of morbidity between ethnic groups in New Zealand. *Journal of Comorbidity.* 2020;10:2235042X20971168.
13. Prince MJ, Wu F, Guo Y, et al. The burden of disease in older people and implications for health policy and practice. *Lancet.* 2015;385(9967):549-562.
14. Robson B, Koopu P, Gilmour J, et al. *Oranga- Waha–Oral Health Research Prioirities for Māori low-income adults, kaumātua, and Māori with disabilities, special needs and chronic health conditions.* Wellington: Te Rōpū Rangahau Hauora a Eru Pōmare; 2011 2011.
15. Hobbs M, Tomintz M, Kingham S. Investigating the rates and spatial distribution of childhood ambulatory sensitive hospitalisations in New Zealand. University of Canterbury. https://ir.canterbury.ac.nz/handle/10092/16898. Published 2019. Accessed 30 June 2022.
16. van Oostrom SH, Gijsen R, Stirbu I, et al. Time Trends in Prevalence of Chronic Diseases and Multimorbidity Not Only due to Aging: Data from General Practices and Health Surveys. *PLoS One.* 2016;11(8):e0160264.
17. Ministry of Health. *Annual Update of Key Results 2020/21: New Zealand Health Survey.* Wellington: Ministry of Health; 2017 2021.
18. Cope AL, Wood F, Francis NA, Chestnutt IG. General practitioners' attitudes towards the management of dental conditions and use of antibiotics in these consultations: a qualitative study. *BMJ Open.* 2015;5(10):e008551.
19. Nikolarakos D. Oral and facial presentations to general practice. *Australian Journal for General Practitioners.* 2020;49:543-543.
20. Cope AL, Butt KG, Chestnutt IG. Why might patients in the UK consult a general medical practitioner when experiencing dental problems? A literature review of patients' perspectives. *Community Dent Health.* 2018;35(4):235-240.
21. Poudel P, Griffiths R, Wong VW, et al. Perceptions and practices of general practitioners on providing oral health care to people with diabetes–a qualitative study. *BMC Family Practice.* 2020;21(1):34.
22. Samaei H, Weiland TJ, Dilley S, Jelinek GA. Knowledge and confidence of a convenience sample of australasian emergency doctors in managing dental emergencies: results of a survey. *Emerg Med Int.* 2015;2015:148384.
23. Cheng M, Hsu K-H, Ekambaram M, Thomson W. General dental practitioners' opinions on universal publicly-funded dental care in New Zealand. *New Zealand Dental Journal.* 2021;117:35-39.
24. Ministry of Social Development. Dental treatment. https://www.workandincome.govt.nz/eligibility/health-and-disability/dental-treatment.html#null9. Published 2022. Accessed.
25. Williams K. From grin to grimace: The pain of paying for adult dental care. Stuff. https://www.stuff.co.nz/national/health/110145152/from-grin-to-grimace-the-pain-of-paying-for-adult-dental-care. Published 2019. Accessed 26 June 2022.
26. Jones N. Give all Kiwis 'comprehensive and affordable' dental care: New Zealand Medical Association. NZ Herald. https://www.nzherald.co.nz/nz/give-all-kiwis-comprehensive-and-affordable-dental-care-new-zealand-medical-association/7WK4ZKXTMWXOIUXXBXRZ2JFREQ/. Published 2019. Accessed 23 June 2022.
27. Gibb J. Call for affordable dental care hailed. Otago Daily Times. https://www.odt.co.nz/news/dunedin/call-affordable-dental-care-hailed. Published 2019. Accessed 23 June 2022.
28. National Health Service. Who is entitled to free NHS dental treatment in England. https://www.nhs.uk/nhs-services/dentists/who-is-entitled-to-free-nhs-dental-treatment-in-england/#:~:text=You%20can%20receive%20free%20NHS,a%20valid%20maternity%20exemption%20certificate. Published 2021. Accessed March 18, 2022. .
29. Canada. Delivering for Canadians Now. Prime Minister of Canada Justin Trudeau. https://pm.gc.ca/en/news/news-releases/2022/03/22/delivering-canadians-now. Published 2022. Accessed 30 June 2022.
30. TAS. Combined Dental Agreement. https://tas.health.nz/dhb-programmes-and-contracts/oral-health-programme/combined-dental-agreement/. Published 2022. Accessed 30 June 2022.
31. Børsting T, Stanley J, Smith M. Factors influencing the use of oral health services among adolescents in New Zealand. *The New Zealand dental journal.* 2015;111(2):49-57.
32. Health and Disability System Review. *Health and Disability System Review – Final Report – Pūrongo Whakamutunga.* Wellington: HDSR;2020.

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All authors conceived and designed the research, and contributed to interpretation of the data; LS drafted the manuscript, with EH, LMcB and MS providing critical revision. All authors have read and approved the submitted manuscript.

Conflicts of interest

Dr Elizabeth Hitchings is a member of the Executive Committee of the Wellington Branch of the NZ Dental Association.

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