

Telephone triage does not improve attendance rates in a paediatric audiology outpatient service

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ABSTRACT

AIMS: To investigate the impact of clinician-led telephone consultation during the New Zealand COVID-19 lockdown on subsequent appointment attendance in a paediatric audiology service, particularly for Māori and Pacific families.

METHODS: A retrospective clinical audit at Counties Manukau Health of all children (>3 years old) on the audiology waiting list. Binary logistic regression analysis tested for association of appointment attendance following attempted audiologist-led telephone consultation, with ethnicity, waiting times, socio-economic deprivation levels and telephone consultation contact.

RESULTS: Of 349 eligible children, 208 families participated in telephone consultations (59%). Ten percent of those contacted were able to be discharged as no longer requiring care. There were no differences in attendance rates between those who had participated in telephone consultation and those who had not (77.5% versus 77.8%). Pacific and Māori children were 68% and 64% less likely to attend appointments after adjusting for socio-economic deprivation level, waiting time and telephone consultation compared to NZ European children. Longer waiting times were significantly associated with decreased attendance rates.

CONCLUSIONS: Attendance was found to be associated with ethnicity and waiting times. Telephone consultation did not improve attendance rates overall nor for ethnicity subgroups. It is therefore concluded that telephone consultation was found to be of only limited benefit in paediatric audiology services.

Paediatric audiology diagnostic services play an important role in ensuring that children who have a significant hearing loss are diagnosed in a timely manner and referred for habilitation (eg hearing aids) or surgical treatment (for middle ear disease). Despite the importance of paediatric services, attendance rates across many paediatric outpatient services (including audiology) are traditionally poor.¹⁻³ Non-attendance rates of up to 21–38% have been reported in audiology and otolaryngology (ORL) outpatient services.^{4,5} Suggested reasons for non-attendance have included socio-demographic and economic factors,^{2,6} long waiting times^{3,6} and parental forgetfulness.^{3,7} Strategies to improve attendance rates have included SMS reminders,^{6,8} telephone reminders⁹ and pre-delivered information packs.¹⁰

Māori and Pacific children have lower first appointment attendance rates in otolaryngology (ORL) outpatient departments compared to NZ European and Asian or Indian children.⁵ Māori and Pacific children are also known to have higher prevalence of middle ear disease compared to the overall population,¹¹ and Māori children are overrepresented in

the diagnoses of permanent hearing loss, comprising 32% of notifications compared to the population proportion of 26%.¹² Difficulties accessing health-care for Māori in particular have been found to include organisational, cost, health provider and cultural fit barriers, and are greatest for Māori with disabilities.¹³

The current study came about due to the COVID-19 lockdown in March–April 2020. At this time, there was a waiting list of over 400 children (3–19 years old) waiting for diagnostic audiology assessments at Counties Manukau Health. The waiting time for this group extended up to seven months at the time of the lockdown period. The Audiology Department implemented non-face-to-face telephone consultations using the departmental audiologists for all children on this waiting list. The initial purpose of this telephone consultation process was to allow improved triaging of referrals. The aim of this study was to investigate whether the lockdown telephone consultation with an audiologist improved the likelihood of children attending the outpatient appointment, particularly for Māori and Pacific families.

Methods

Design

A retrospective clinical audit was conducted within the Audiology Department at Manukau SuperClinic (Counties Manukau Health).

Participants

Participants were families with children (aged 3–19 years old) who were referred to the audiology outpatient waiting list for diagnostic audiology assessment and were eligible for services through Counties Manukau (CM) Health. A total of 349 participants were included in this study. Socio-economic deprivation levels were obtained using the registered home addresses of participants and generating a deprivation index score using the NZDep2013 Index of Deprivation.

Process

Eligible participants received at least two telephone call attempts (separated in time >24 hours) by a CM Health audiologist in April 2020. The telephone call attempts were made during the COVID-19 lockdown, which, at the time, required the population of New Zealand to remain at home, leaving their place of residence only to obtain essential services and brief exercise. If families were able to be contacted, the audiologist introduced themselves, explained that their child had been referred to the audiology department for hearing assessment, and gained consent to ask them a few questions regarding their child's current hearing and history. All participants who were contacted by telephone gave consent and provided information regarding their child's hearing, speech and language development, ear infections and risk factors for hearing loss (Appendix 1). Children whose parents/caregivers reported no further concerns, and who had prior normal hearing results on screening tests, were discharged at this point. Children whose parents reported symptoms suggestive of significant hearing loss were upgraded to higher priority on the waiting list. Children who were unable to be contacted by telephone remained on the waiting list in approximate date order. A small number of eligible participants had insufficient information in their medical charts to conduct a telephone consultation.

Business as usual clinics recommenced on 13 May 2020, and appointments were made according to the standard care. The process to book appointments is through the administrative officer contacting patients by telephone to make an appointment

offer. If families are unable to be contacted by telephone, a letter is sent inviting families to make contact to book an appointment. If no response is received from the letter invitation, contact details are checked with the general practitioner (GP). Families that are unable to be contacted or are no longer eligible for services through CM Health are removed from the waiting list at this point. In addition, SMS text reminders are sent to all patients on the day before the outpatient appointment.

All demographic and appointment details were recorded in the DHB electronic patient management system (iPM). Clinical results were recorded in paper medical charts with an electronic record of clinic letters and referrals generated stored in the electronic Clinical Portal.

Data analysis

All data were obtained from the available information stored in the electronic patient management systems (iPM and Clinical Portal). Nominal variables were described using descriptive statistics, and analysed for significance between groups using Chi-squared tests. Continuous variables were assessed for normality and analysed for significance between groups using non-parametric tests (Mann–Whitney U test). Binary logistic regression analysis was conducted to assess the association between telephone contact, attendance and multivariate variables, including ethnicity, waiting times from referral and socio-economic deprivation level. All statistical analysis were performed using Statistical Package for Social Sciences, version 27.0 (SPSS Inc, an IBM Company, Chicago, Illinois).

Ethical approval

HDEC ethical approval was not required for this clinical audit. AHREC approval (AH3097) and CM Health Locality approval (CM Health Research Registration Number 1366) were obtained.

Results

Overall cohort descriptive statistics

The overall process flow chart is shown in Figure 1.

The ages and ethnicities of all participants referred to Counties Manukau Health for hearing testing are shown in Table 1. Pacific children make up the largest proportion referred to CM Health for hearing testing, and were significantly older at point of referral compared to NZ European children (Mann–Whitney U test; $p=.003$).

In all, 248/349 (71.1%) of children referred were from household addresses within the highest

levels of socio-economic deprivation (Deprivation Index score 7–10), with 44.7% (156/349) from the highest level of deprivation (10).

The majority of referrals were made by GPs (159/349; 45.6%), followed by referrals from public health nurses (53/349; 15.2%) and paediatricians (51/349; 14.6%). The remaining referrers accounted for 5% or less for each group.

Telephone contact groups

Two hundred and eight participants underwent telephone consultations with an audiologist forming the contact group and 141 participants did not have contact with an audiologist by telephone, forming the non-contact group (Figure 1).

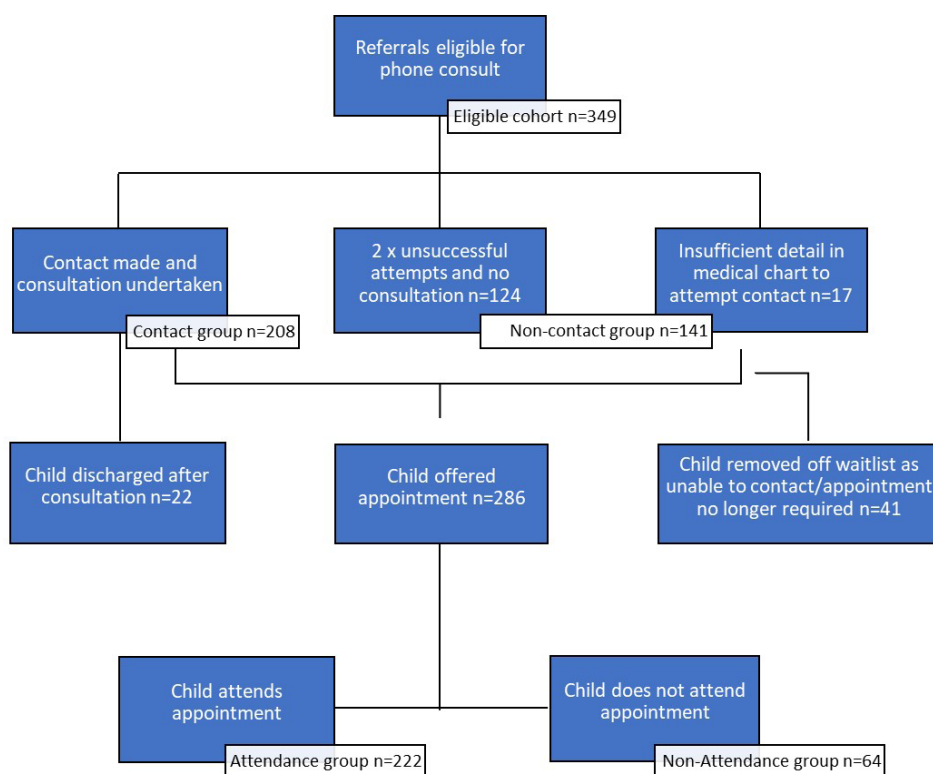
Table 2 shows the unadjusted models for binary logistic regression showing significant associations between ethnicity and socio-economic deprivation level and ability to establish telephone contact. After adjusting for socio-economic deprivation levels, Māori had 73% lower odds of being contacted compared to NZ European/Other, and Pacific had 59% lower odds of being contacted. There was no significant association between socio-economic deprivation level and ability to make phone contact after adjusting for ethnicity.

The outcomes recommended by the audiologist from these consultations are shown in increasing urgency in Table 3.

Table 1: Participant ages and ethnicities.

Ethnicity	Number (%)	Mean (SD)	Median (IQR)
NZ European/Other (95)	95 (27.2)	6.3 (2.7)	5.7 (4.1–8.2)
Māori (78)	78 (22.3)	7.2 (3.3)	6.5 (4.4–9.5)
Pacific (139)	139 (39.8)	7.8 (3.6)	7 (4.8–10.5)
Asian (37)	37 (10.6)	6.5 (3.1)	5.8 (4.5–6.9)
Total	349	7.1 (3.3)	6.3 (4.4–9.3)

Figure 1: Flow chart of process.



First appointment offer

A total of 286 children were offered appointments within the Audiology department from the original 349 eligible participants (81.9%) in date order of referral and according to priority (Figure 1).

The median waiting times from the date of telephone consultation to the offered appointment date generally increased with decreasing priority (Table 4).

Attendance rates

Of the 286 participants offered audiology appointments, 222 participants attended (77.6%). Attendance rates by ethnicity and telephone contact group are shown in Table 5. There were significant disparities between ethnicity groups in attendance rates (Chi-squared test $p=.032$). Overall, attendance rates did not significantly differ between the telephone contact and non-contact groups (138/178; 77.5% vs 84/108; 77.8%, respectively; Chi-square test $p>.05$) (Table 5); nor by deprivation level (low deprivation attendance rate 67/82; 81.7% versus high deprivation attendance rate 155/204; 76%; $p>.05$).

Pacific children were 56% less likely to attend appointments compared to NZ European children ($p=.032$, unadjusted model, Table 6). This finding increases to 68% less likely to attend after adjusting for socio-economic deprivation level, telephone contact, and wait time from referral (adjusted model Table 6, $p=.019$). Māori children were 64% less likely to attend (odds ratio 0.36) compared to NZ European children after adjusting for all variables in the model ($p=.038$).

There was a small but significant difference (18.5 days) between the waiting time from referral for participants attending (median of 235.5 days) versus not attending (median of 254 days) (Mann-Whitney U test; $p=.012$). Binary logistic regression analysis (Table 6) shows that waiting times were significantly associated with decreased likelihood of attendance both in the univariate model and after adjusting for ethnicity, deprivation level and whether they received telephone contact.

Clinical outcomes for attendance group

Of the 222 participants attending appointments in the Audiology Department, results were obtained on 214 participants (96.4%). The majority with available results had normal hearing (65.4%) and/or were able to be discharged back to GP care (65%) (Tables 7 and 8). However, a substantial proportion of cases had moderate degrees of hearing impairment, active disease, or permanent hearing loss (20.6%). Twenty (56.8%) and eight (18.2%) of these children were of Pacific and Māori ethnicities, respectively. Thirteen of the children re-prioritised

as urgent following the telephone consultation were found to have significant permanent hearing loss or ear disease.

Discussion

The overall aims of this study were to investigate whether introducing a telephone-based consultation during the waiting time period would translate to improved attendance rates in the study's Audiology outpatient Department. Although the concept of telephone consultation was theoretically to encourage the engagement from parents of children with the Audiology Department, these results did not demonstrate any significant improvements in attendance rates for the populations most at risk, namely Māori and Pacific children. Overall, attendance rates were significantly associated with ethnicity and waiting times since referral. Some limited benefits were realised from the telephone consultations, including the ability to discharge children who no longer required appointments, and triage children with higher urgency based on reported symptoms. These findings will be discussed in turn.

Referral characteristics

As both Pacific and Māori children are known to experience higher levels of ear disease and hearing loss compared to NZ European and Asian children,¹⁴ it would be expected that referral rates would be proportionately higher. This appears to have occurred for Pacific children (referral proportion of close to 40% compared to a population proportion of 28%) but has not occurred for Māori children (referral proportion of 22% compared to a population proportion of 23%). These findings support the anecdotal evidence suggesting that Māori children are not being referred to hospital services at rates commensurate with the level of need in this population.¹⁵

The population sample in this study was defined as those children who were likely to developmentally be able to complete play audiometry testing (normally \geq three years old). Approximately half of the referrals were generated from GPs highlighting concerns raised during a primary healthcare visit, as opposed to referrals resulting from failed hearing screening tests (eg B4SC screening of 4-year-olds). This study found that Pacific children were significantly older than NZ European children at the point of referral, potentially reflecting delayed presentation to primary healthcare services with concerns or

Table 2: Binary logistic regression models of phone contact (unadjusted and adjusted).

	Unadjusted model (univariate)		Adjusted model	
	OR (95% CI)	p	OR (95% CI)	p
High level deprivation (248/349)	0.32 (0.19–0.55)	<.001	0.54 (0.28–1.00)	.053
Ethnicity		<.001		<.001
Māori (78/349)	0.21 (0.11–0.40)	<.001	0.27 (0.13–0.56)	<.001
Pacific (139/349)	0.29 (0.16–0.52)	<.001	0.41 (0.21–0.82)	.011
Asian (37/349)	1.47 (0.54–3.98)	.453	1.77 (0.64–4.94)	.273
NZ European/Other (95/349)	Reference		Reference	

Table 3: Audiologist recommended triage following phone consultation.

Clinical Outcome	N/208 (%)
Discharge to GP	22 (10.6)
Screening audiology assessment	64 (30.8)
Audiology assessment (routine priority)	5 (2.4)
Audiology assessment (semi-urgent priority)	63 (30.3)
Audiology assessment (urgent priority)	54 (26)

Table 4: Waiting times from telephone consultation to offered audiology appointment.

Clinical urgency	Median waiting time (days)	Range (days)
Audiology assessment urgent	76	39–255
Audiology assessment semi urgent	108	57–192
Audiology assessment routine	122	120–155
Screening audiology assessment	107.50	75–294

Table 5: Attendance rates by ethnicity and contact group.

	Attendance rates n/n (%)		
	Overall	Contact group	Non-contact group
NZ European/ Other	62/73 (84.9)	50/58 (86.2)	12/15 (80)
Māori	46/62 (74.2)	23/31 (74.2)	23/31 (74.2)
Pacific	84/118 (71.2)	41/62 (66.1)	43/56 (76.8)
Asian	30/33 (90.9)	24/27 (88.9)	6/6 (100)
Total	222/286 (77.6)	138/178 (77.5)	84/108 (77.8)

Table 6: Logistic regression models for attendance at appointment by ethnicity, deprivation level, telephone contact and waiting times.

	Unadjusted model (univariate)		Adjusted model	
	OR (95%CI)	p	OR (95%CI)	p
High deprivation (low deprivation=reference)	0.71 (0.37–1.35)	.30	1.154 (0.512-60)	.73
Ethnicity		.041		.036
Māori	0.51(0.22–1.20)	.124	0.36* (0.13–0.94)	.038
Pacific	0.44* (0.21–0.93)	.032	0.32* (0.12–0.83)	.019
Asian	1.774 (0.46–6.84)	.405	1.32 (0.33–5.30)	.698
NZ European/Other	Reference			
Telephone contact (non-contact=reference)	0.99 (0.55–1.75)	.96	0.72 (0.39–1.33)	.299
Waiting time from referral (days)	0.99* (0.99–1.0)	.006	0.99* (0.99–1.0)	.004

Table 7: Clinical outcomes at first attended appointment in audiology (n=214).

Clinical outcome	N/214 (%)
Normal hearing	140 (65.4)
Mild conductive hearing loss	30 (14)
Moderate conductive hearing loss	27 (12.6)
Significant active disease/perforation	4 (1.9)
Permanent hearing loss	13 (6.1)

Table 8: Management pathways from first attended appointment in Audiology (n=214).

Management option	N/214 (%)
Discharge to GP care	139 (65)
Review in Audiology	30 (14)
Refer to ORL	36 (16.8)
Refer to ear nurse for wax suction	5 (2.3)
Refer to paediatrician	1 (.5)
Hearing aid fitting	3 (1.4)

ORL= Otolaryngology

delayed referral from GP practices. Similar findings in ORL services have found that Pacific children receive grommets at significantly older ages compared to NZ European children.¹⁶ The reasons for this delayed access are not explored in the current study, but there are significant implications of delayed diagnosis of permanent or chronic hearing loss secondary to middle ear disease for the long term educational and social outcomes for these children.

Attendance rates

The study's hypothesis that telephone consultation would increase the likelihood of subsequent clinic attendance was based on informal feedback from Māori and Pacific families included in the study: that the consultations were well received and appreciated during a difficult time in New Zealand. However, the results demonstrated that there was no difference in attendance rates between those families that participated in the telephone consultation (77.5%) and those that did not (77.8%). There were, however, some significant associations with Pacific families overall being 68% less likely and Māori families 64% less likely to attend appointments after adjusting for socio-economic deprivation level, waiting times and telephone contact, compared to NZ European children. With Māori and Pacific children making up substantially greater proportions of the sample not attending appointments it is essential that research is focussed on understanding why this may be, and to develop culturally responsive solutions. Linguistic and transport barriers, along with lack of community-based services, have been identified as influencing access to hearing care services in older Pacific peoples in New Zealand.¹⁷

Waiting times from referral were also significantly correlated with the likelihood of attendance, as has been found with previous studies in outpatient services.^{3,6,18} Although families who engaged in telephone consultation generally had a shorter residual waiting time to the first appointment compared to those families that did not participate in telephone consultation, this variable had no significant association with attendance. Waiting times are often used as key indicators of how well a service is meeting demand within the available resources. It is evident that children waiting the longest time are less likely to attend audiology appointments, and there is no reason to assume that this is because they no longer require services.

Socio-economic deprivation level factors

Paediatric audiology referrals (as shown in this study and previously) are disproportionately from households with high levels of deprivation.¹⁴ Although socio-economic status may be linked to poorer health outcomes,¹⁹ there were no significant associations found between deprivation level and attendance rates. This is an interesting finding, as traditional thinking has linked non-attendance rates to difficulties accessing transport, paying for parking and other financially related factors. The lack of association with deprivation levels suggests that there may be broader reasons impacting on attendance rates not necessarily associated with deprivation. Potential factors for Pacific peoples have been discussed in detail in the recent publication *Bula Sautu*.²⁰

Impact of telephone consultation on clinical outcomes

Audiology is an allied health specialty that is heavily reliant on technology to conduct assessments, and as yet, effective tele-audiology service models are not yet readily available. Approximately 10% of those contacted by telephone were able to be discharged following the telephone consultation, however, this equated to only 6.2% of the whole cohort. Yet, over 65% of children seen in face-to-face consultation were considered asymptomatic and discharged back to primary care. It may, therefore, be worthwhile to reconsider community-based, targeted approaches in addition to the two screening programs currently available. Given that hearing loss is difficult to assess without formal testing, and doesn't correlate well with the level of parental concern,¹⁴ it is unlikely that telephone triage will provide an effective means of screening for asymptomatic cases.

However, for a small subset of the referral population, the telephone consultation process showed the ability to improve triaging based on the information provided by the caregiver/parent. There were over 20% of children who were diagnosed with hearing loss or ear disease requiring treatment or management. Pacific children were disproportionately affected, making up 56.8% of this group. The telephone consultation triage process effectively allowed 13 of these children with serious disease/hearing loss to be re-categorised as urgent referrals, thus allowing expedited access to treatment.

Limitations and future directions

This study has been limited by its retrospective design, and therefore potential confounding vari-

ables may not have been captured. The telephone consultation process was developed within the Audiology Department at very short notice due to the suddenness of the lockdown. These results represent the outcomes from an intervention that was initially designed as a means to better triage children waiting on a long audiology waiting list. Furthermore, although associations have been found, no conclusions can be drawn as to causative factors. Multiple statistical tests have been performed and positive results may reflect Type 1 errors. In addition, there may be lack of statistical power to detect associations due to the sample size limitations.

There is a possibility that part of the failure of the telephone consultation to improve attendance rates is partly due to cultural discordance. Despite the high levels of Māori and Pacific children in the catchment population, there is very low representation of Māori and Pacific peoples within the audiology workforce. Although long-term commitment is required by the hearing and ear healthcare professions to increase representation within the workforce at all levels of service, in the interim, solutions utilising alternate workforces could be implemented, as well as strategies

to improve cultural safety of existing non-Māori and non-Pacific clinicians.

A second observation regarding the telephone contact process was that mobile phones were used with caller ID disabled. Māori families were significantly less likely (73% lower odds) to answer the telephone call compared to NZ European families. Alternate means of contacting patients should be employed for Māori and Pacific families, allowing a mechanism to provide the opportunity to introduce the clinician when making cold calls or unexpected calls.

Conclusion

This study did not demonstrate any effective reduction in inequities experienced by Māori and Pacific children in accessing audiology services by using a telephone consultation model. Significant associations with attendance were found for ethnicity and long waiting times, but the level of socio-economic deprivation was not found to be a significant factor. More research is required to further develop an understanding of how to improve engagement and responsiveness for at-risk populations.

COMPETING INTERESTS

Nil.

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REFERENCES

1. Andrews R, Morgan JD, Addy DP, McNeish AS. Understanding non-attendance in outpatient paediatric clinics. *Archives of disease in childhood*. 1990;65(2):192-5.
2. French LR, Turner KM, Morley H, Goldsworthy L et al. Characteristics of children who do not attend their hospital appointments, and GPs' response: a mixed methods study in primary and secondary care. *The British journal of general practice : the journal of the Royal College of General Practitioners*. 2017;67(660):e483-e9.
3. Hon KL, Leung TF, Wong Y et al. Reasons for new referral non-attendance at a pediatric dermatology center: a telephone survey. *The Journal of dermatological treatment*. 2005;16(2):113-6.
4. Pokorny MA, Thorne PR, Whitfield BC et al. Can an advanced audiology-led service reduce waiting times for paediatric ear nose and throat outpatient services? *Journal of paediatrics and child health*. 2021;57(2):268-72.
5. McCallum J, Craig L, Whittaker I, Baxter J. Ethnic differences in acute hospitalisations for otitis media and elective hospitalisations for ventilation tubes in New Zealand children aged 0-14 years. *The New Zealand medical journal*. 2015;128(1416):10-20.
6. Downer SR, Sethuraman K, Tirupati D. Factors affecting outpatient non-attendance in an Australian children's hospital. *The Medical journal of Australia*. 2011;195(7):383.
7. Jamil MT, Ismail NZ, Zulkifli AB et al. Non-attendance to the paediatric clinics in a Malaysian tertiary hospital: a sizeable problem and identification of an efficacious intervention. *Journal of paediatrics and child health*. 2011;47(6):346-9.
8. Kannisto KA, Koivunen MH, Välimäki MA. Use of mobile phone text message reminders in health care services: a narrative literature review. *Journal of medical Internet research*. 2014;16(10):e222.
9. Jeppesen MH, Ainsworth MA. Telephone reminders reduced the non-attendance rate in a gastroenterology outpatient clinic. *Danish medical journal*. 2015;62(6).
10. Hardy KJ, O'Brien SV, Furlong NJ. Information given to patients before appointments and its effect on non-attendance rate. *Bmj*. 2001;323(7324):1298-300.
11. Paterson JE, Carter S, Wallace J et al. Pacific Islands families study: the prevalence of chronic middle ear disease in 2-year-old Pacific children living in New Zealand. *International journal of pediatric otorhinolaryngology*. 2006;70(10):1771-8.
12. Digby JE PS, Kelly AS. Deafness Notification Report (2019) Hearing loss (not remediable by grommets) in New Zealanders under the age of 19. Auckland, New Zealand.: Enable New Zealand; 2020.
13. Jansen P, Bacal K, Crengle S. He Ritenga Whakaaro: Māori experiences of health services. Auckland,: Mauri Ora Associates 2008.
14. Dickinson LJ, Nimmo M, Morton RP, Purdy SC. 'Asymptomatic' South Auckland preschool children have significant hearing loss and middle ear disease. *International journal of pediatric otorhinolaryngology*. 2018;114:106-10.
15. Robson B HR. Hauora: Māori Standards of Health IV. A study of the years 2000-2005. Wellington: Te Rōpū Rangahau Hauora a Eru Pōmare.; 2007.
16. Craig E, Adams J, Oben G et al. The Health Status of Children and Young People in the Northern District Health Boards. In: Service NCaYE, editor. Department of Women and Children's Health, University of Otago: University of Otago; 2011.
17. Reddy R, Welch D, Lima I et al. Identifying hearing care access barriers among older Pacific Island people in New Zealand: a qualitative study. *BMJ*

- open. 2019;9(8):e029007.
18. Stephens MR, Murthy AS, McMahon PJ. Wait times, health care touchpoints, and nonattendance in an academic pediatric dermatology clinic. *Pediatric dermatology*. 2019;36(6):893-7.
 19. Spencer N, Thanh TM, Louise S. Low income/socio-economic status in early childhood and physical health in later childhood/adolescence: a systematic review. *Matern Child Health J*. 2013;17(3):424-31.
 20. Health Quality & Safety Commission. *Bula Sautu – A window on quality 2021: Pacific health in the year of COVID-19*. Health Quality & Safety Commission. Wellington 2021.

Appendix 1: Structured history questions asked during telephone consultations.

- Level of parental concern
- Academic progress at school/teacher concerns/ level of extra support required/teacher concerns
- Number of recent ear infections (last 12 months)/treatment required/symptoms associated with them/last known ear infection
- Snoring/frequency/loudness/sleep apnoea/daytime sleepiness or difficulty waking in morning
- Speech development/prior Speech Language Therapy input/clarity/comprehension
- Family history of congenital or early onset Sensorineural Hearing Loss
- Pregnancy/birth complications
- Overall development
- Overall health/medical conditions/major illnesses