

The UK Cochlear Implant Referral Criteria Audit (CIRCA): Socioeconomic and ethnic disparities associated with access to cochlear implantation for severe-to-profound hearing loss: a multicentre study of 6,236 UK adults

INTRODUCTION

- Approximately 1.2 million people in the UK suffer from severe or profound hearing loss (1). One option for management of this degree of hearing loss is a cochlear implant (CI).
- Following the change in UK National Institute for Health and Care Excellence (NICE) guidance in 2019, many more adults are now potentially within audiometric criteria(2).

PRIMARY OUTCOME MEASURE

To identify potential predictors of **referral** for assessment of cochlear implantation

SECONDARY OUTCOME MEASURE

To identify potential predictors of **discussion of the option of referral** for assessment of cochlear implantation

FUNDING

BSO grant. Funders had no role in the design, data collection, analysis or writing of this study.

METHODS

- National retrospective audit
 - INTEGRATE-delivered and supported by British Society of Otolaryngology (BSO) and British Cochlear Implant Group (BCIG).
- Inclusion criteria:** adults (18 years and older) who had audiometric testing (pure-tone audiometry, auditory brainstem response or comparable) between **1st July and 31st December 2021** that confirmed their eligibility for CI referral as per **NICE criteria (2)**.
- Only centres with **Auditbase** software (the most common Audiology software in the UK) were eligible to submit data. Duplicated patients were excluded.
- All UK general ENT, Audiology and Audiovestibular departments were invited to participate via social media and mailouts from supporting organisations.
- Eligible cases were identified retrospectively using an open-source electronic search tool (the **BCIG CI Referral crystal report**) in Auditbase, as designed by the BCIG.
- Site teams retrospectively analysed clinical notes, letters, audiology notes:
 - Were patients referred for a CI assessment?
 - Were patients informed that they were eligible for a CI assessment?
 - Patient and hospital factors

DATA ANALYSIS

Baseline characteristics – means or proportions (chi-squared test or ANOVA). Backward stepwise logistic regression model to explore predictors for both primary & secondary outcomes: Odds ratios + 95% confidence intervals.

Patient predictors of interest

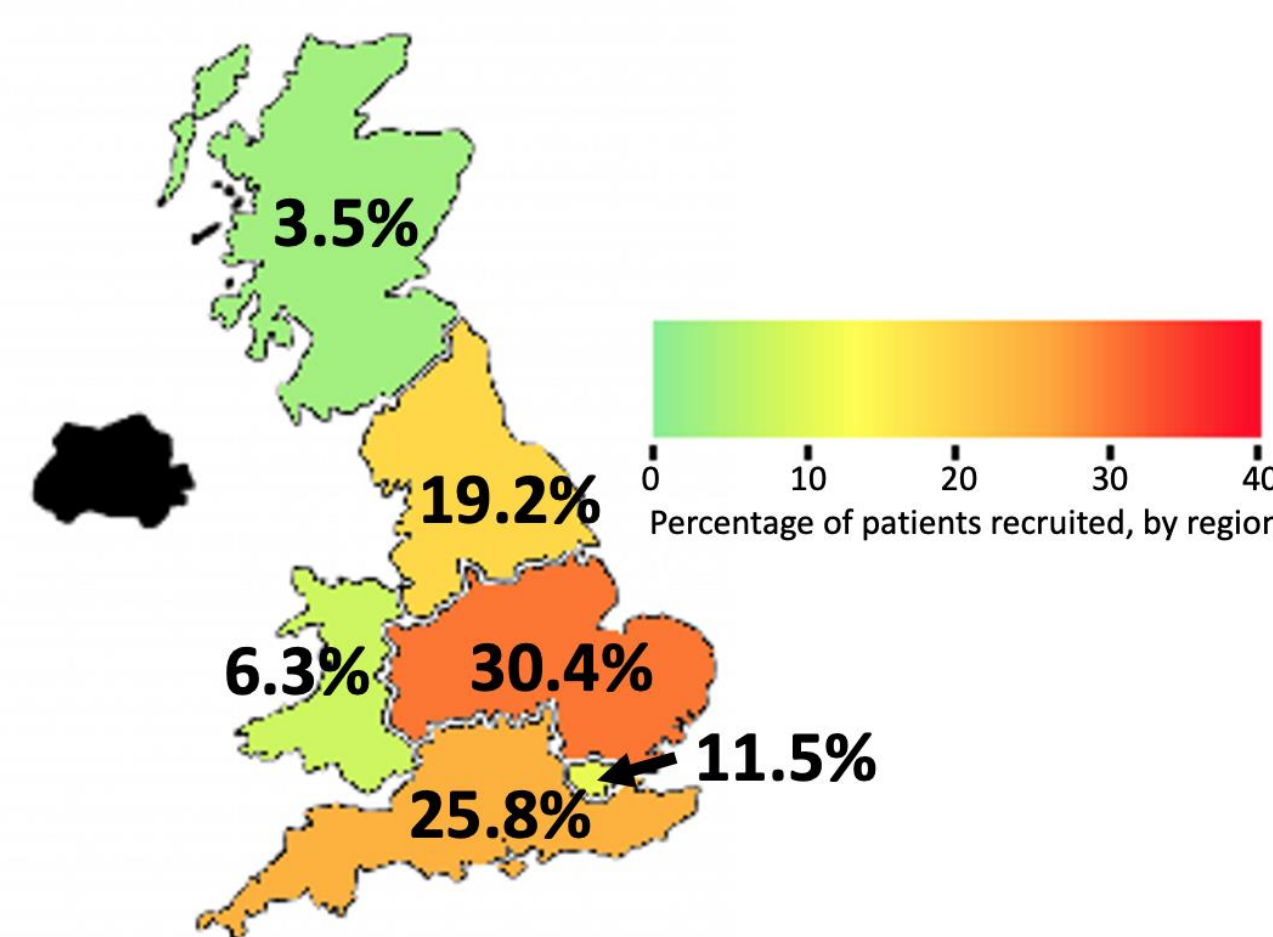
Age, gender, comorbidities, degree of hearing loss, socioeconomic and ethnicity measures. Socioeconomic measures were assessed according to the patient's home postcode, which provided information regarding the Indices of Multiple Deprivation (IMD) decile and geographic region that patients lived. Ethnicity is categorised as per the 2021 UK census (white, Asian, Black, Mixed, and Other which are further subcategorised into 19 subgroups).

Hospital predictors of interest

Presence of CI champion and co-location of the hospital with an implant centre.

RESULTS

Distribution of recruited patients, by region

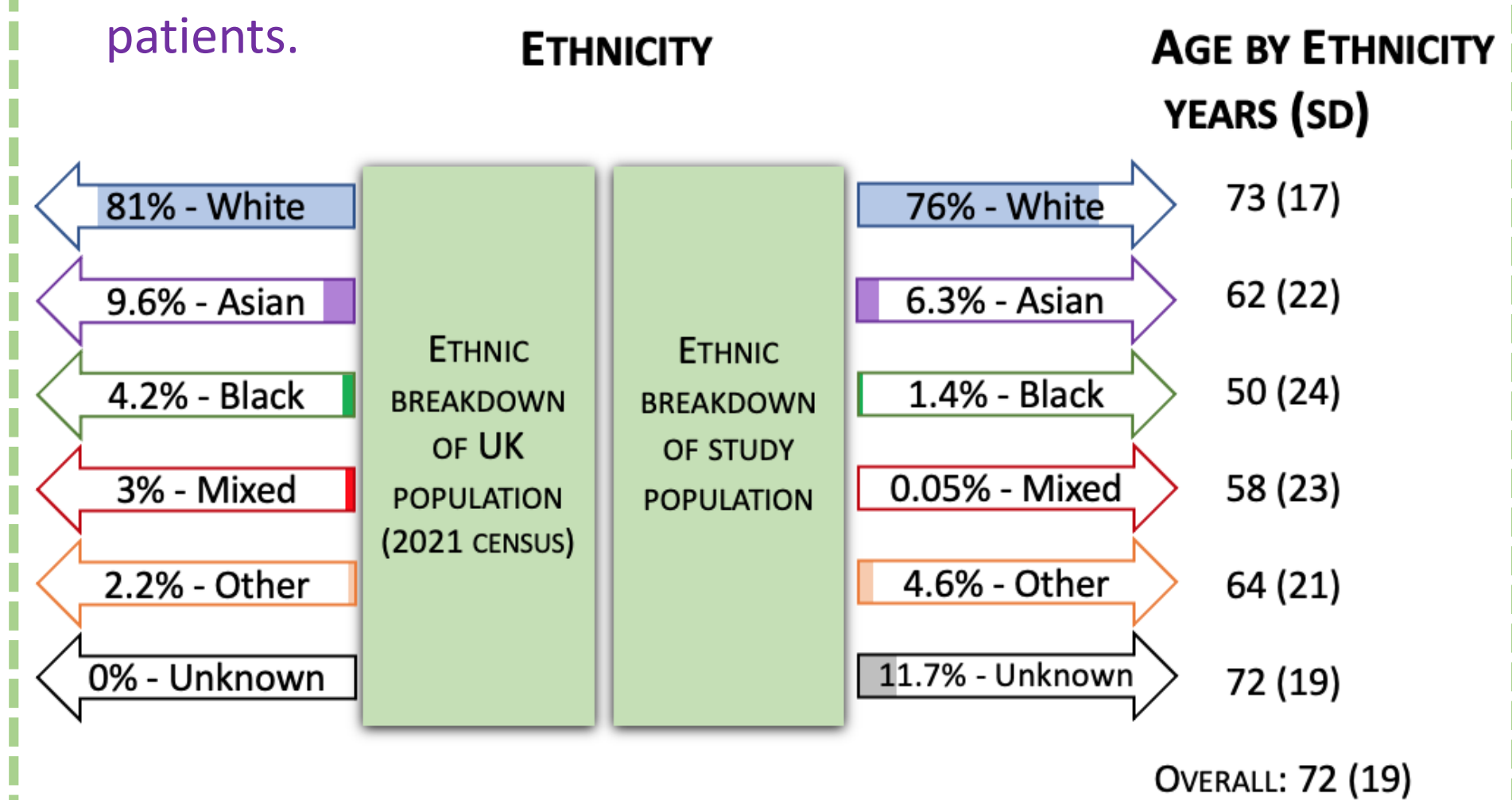


- Only **9%** of eligible patients were **referred** for assessment
- Only **36%** of eligible patients had a documented **discussion** about their eligibility of being considered for CI assessment.

- 36 hospitals across England, Wales and Scotland contributed data
- 6760 patients**
 - 6587 after duplicate patients excluded
 - 6276 after patients already implanted excluded
- 9 (25%) sites were co-located with CI centres
- 27 (74%) had CI Champions on site
 - 11 sites (41%) 0 hours dedicated non-clinical time per month for the role
 - 5 sites (19%) 0-2 hours
 - 7 sites (26%) 2+ hours

Impact of Ethnicity

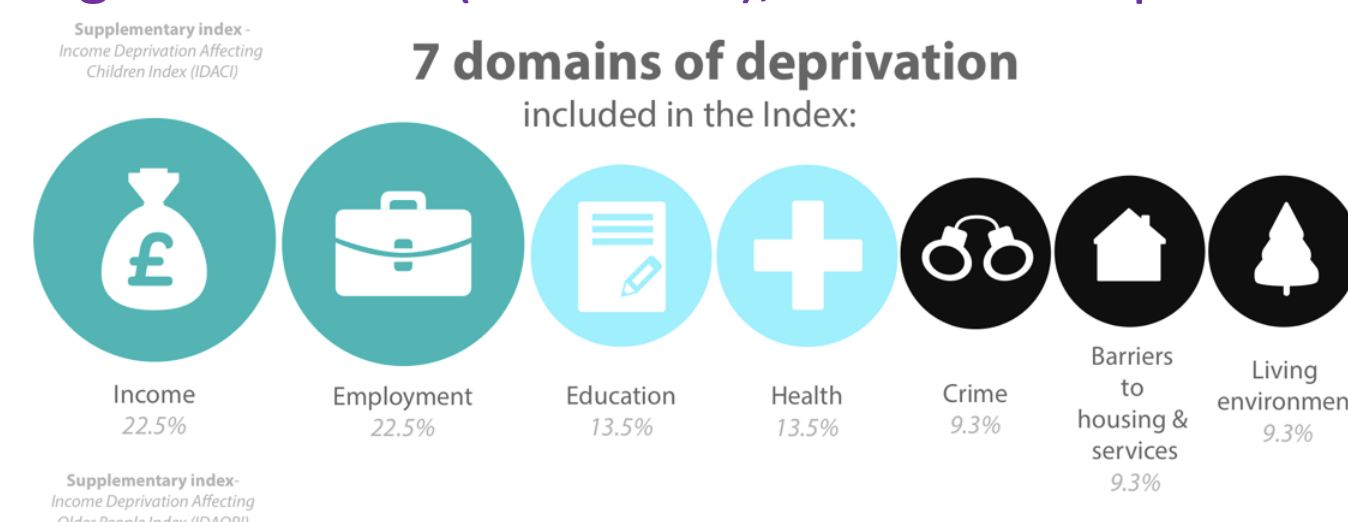
- Ethnicity and English language** did not confer a significant association with likelihood for referral.
- Ethnicity conferred a significant association with likelihood for **discussion** of a CI ($p < 0.001$), whereby Asian patients (OR 0.57, 95% CI 0.42-0.76) and Black patients (OR 0.55, 95% CI 0.33-0.89) were less likely to have a discussion compared to white patients.



Impact of Socioeconomic Status and Geography

Patients from LEAST deprived locations (IMD)

- MORE** likely to be referred ($P < 0.001$) (Least deprived region OR 2.12 (1.28-3.5), ref: most deprived location)
- MORE** likely to have a discussion ($P < 0.001$) (Least deprived region OR 1.45 (1.09-1.92), ref: most deprived location)

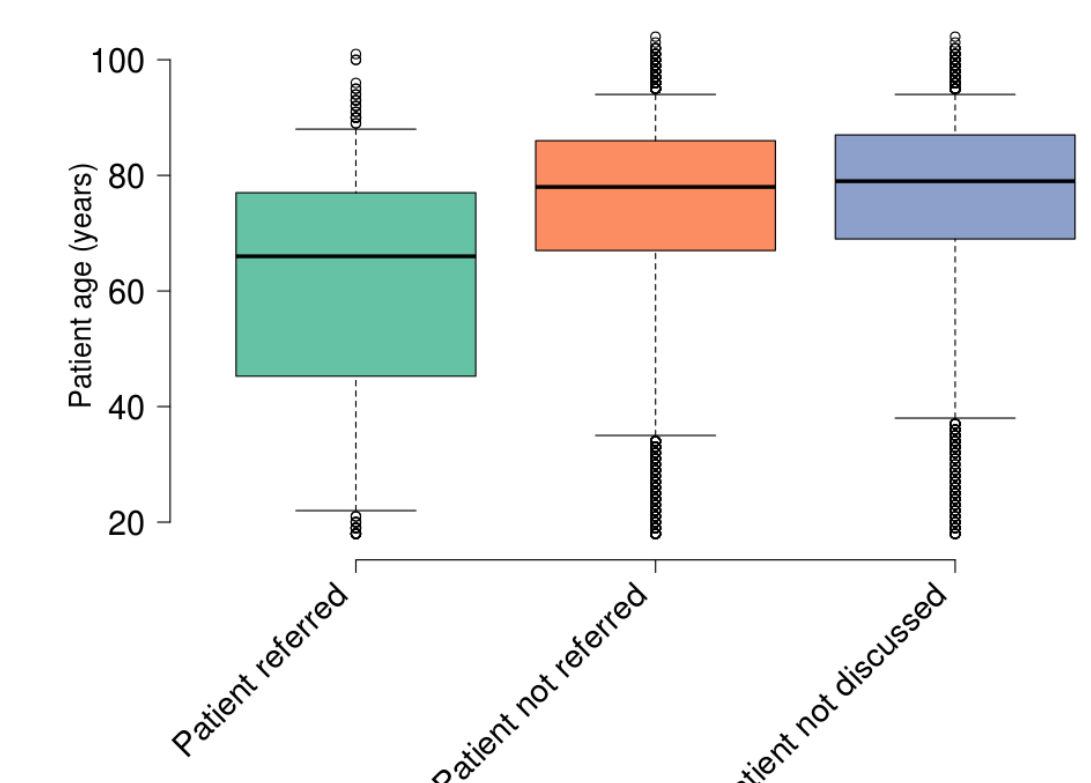


Geography

- From London LEAST likely to be referred (OR 0.41 (0.29-0.59), ref: Midlands)
- From the North & London LEAST likely to be discussion (OR 0.73 (0.61-0.87) & OR 0.43 (0.34-0.54), ref: Midlands)

Impact of Age & Gender

- Older patients** were less likely to be referred (OR 0.97, 95% CI 0.97-0.98).
- Older patients** were less likely to be informed of their eligibility (OR 0.98, 95% CI 0.98-0.98).



Sex: Male patients were less likely to be referred than female (OR 0.64, 95% CI 0.52-0.78) and less likely to have a discussion of their eligibility compared to female (OR 0.71, 95% CI 0.63-0.80).

Impact of Past Medical History

- Patients with **multimorbidity** were less likely to be referred than those without (OR 0.72, 95% CI 0.57-0.91).
- Patients with **cognitive impairment** ($p < 0.001$) and **physical disabilities** ($p < 0.001$) were more likely to have a discussion about their eligibility than those without (cognitive: OR 1.41, 95% CI 1.11-1.80; physical: OR 1.35, 95% CI 1.01-1.82).

Impact of Hospital Factors

- Patients seen at a centre **specialising in CI**, were more likely to be referred (OR 5.96, 95% CI 4.72-7.53).
- Patients at centres **specialising in CI**, were more likely to have a discussion about referral (OR 3.01, 95% CI 2.58-3.50).
- Discussion about referral was more likely if there was a **CI champion** at that hospital (OR 3.86, 95% CI 3.16-4.71).

Impact of Severity of Hearing Loss

- The **degree of hearing loss** was significantly associated with likelihood for referral ($p < 0.001$), whereby patients with more severe hearing loss were more likely to be referred than those with less severe hearing loss, despite these patients still being eligible for referral (OR 3.11, 95% CI 1.61-6.03).

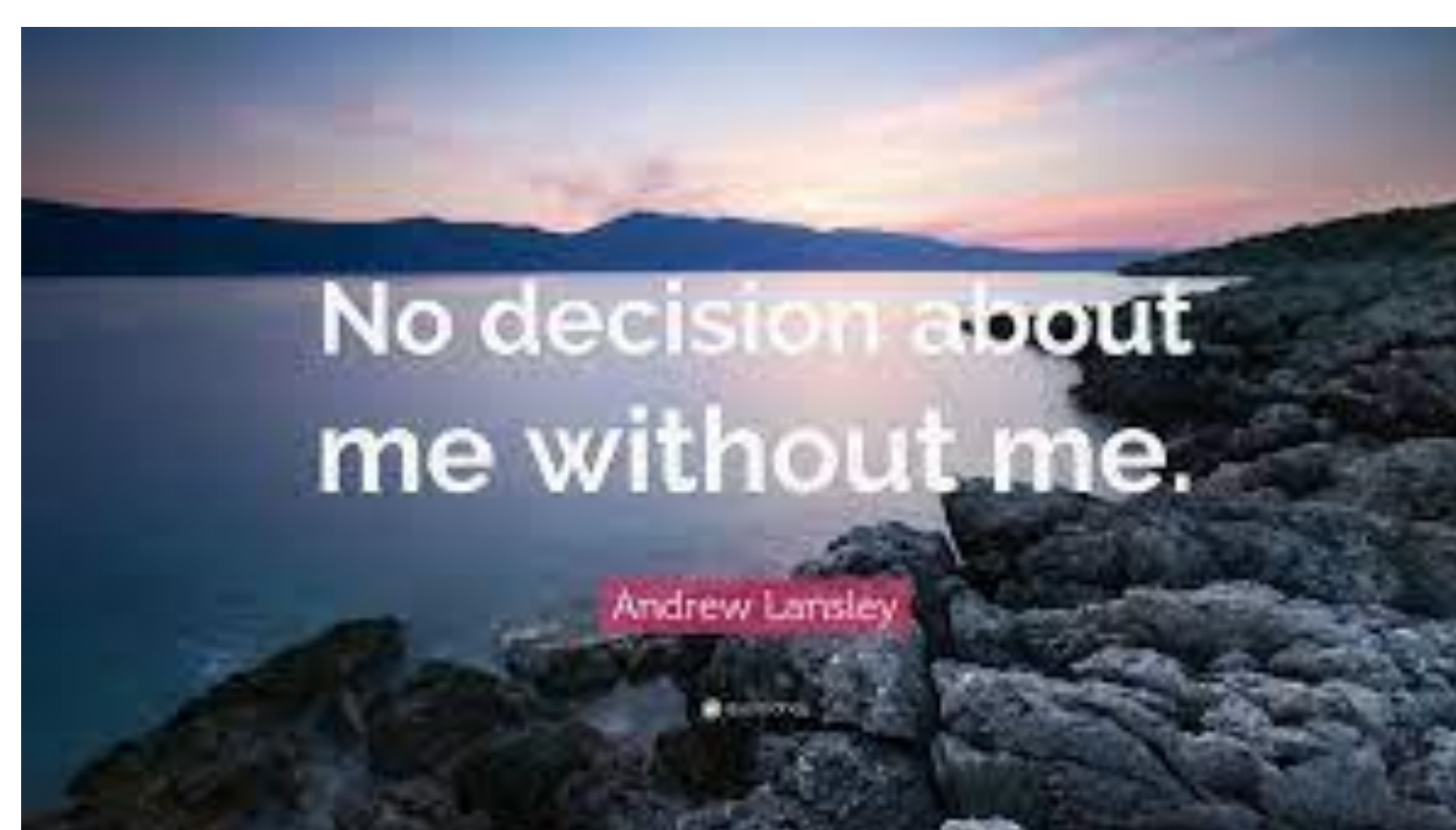
DISCUSSION

WHAT NEXT?

- Ensure all sites have a CI champion (25% did not) (3)
- Longer term
 - Encourage regular re-audit using Auditbase BCIG CI referral crystal report
 - Automatic alerts on Auditbase
 - Increase capability and capacity in departments

STUDY LIMITATIONS

- Retrospective note analysis over 6 months
- Lower representation from Scotland & Wales; no NI sites
- Were patients representative of UK population?



CONCLUSION

- Eligible patients inadequately referred and discussed for cochlear implant assessments
- Disparities in care across the UK
- Further research required:
 - To understand disparities
 - Increase equitable access to treatment and assessment across the UK
 - Focus on education of secondary healthcare providers
 - Identify how best to facilitate discussions about referral for CI assessment for eligible patients

REFERENCES

- RNID facts and figures. <https://rnid.org.uk/about-us/research-and-policy/facts-and-figures/>
- NICE guidance TA566. <https://www.nice.org.uk/guidance/ta566>
- CI champion scheme: <https://www.baaudiology.org/professional-information/cochlear-implant-champions/>