

A tour of **THE 500 PROJECT**

What can we learn from 500 Norwegian CI users?



THE SAMPLE

CHANGES IN
CLINICAL
PRACTICE



PROBLEMS



HEARING &
LANGUAGE



QUALITY
OF LIFE

The Sample

Implanted 1988-2015
before age 18y

496

(82%) participated

Tested 2013-2016 at OUH

DIFFERENT
GENERATIONS
OF CI USERS!



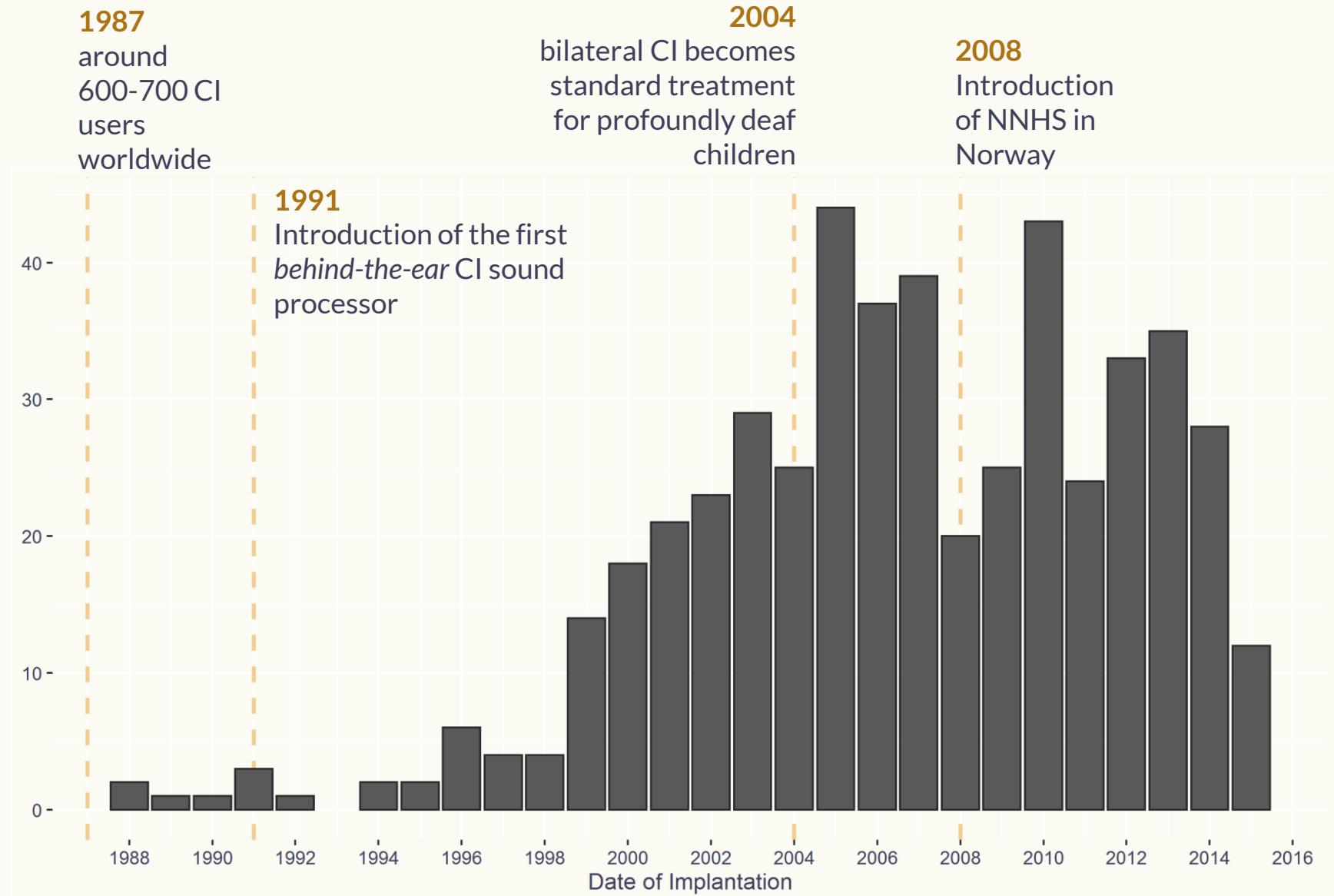
1997





2013

Date of Surgery



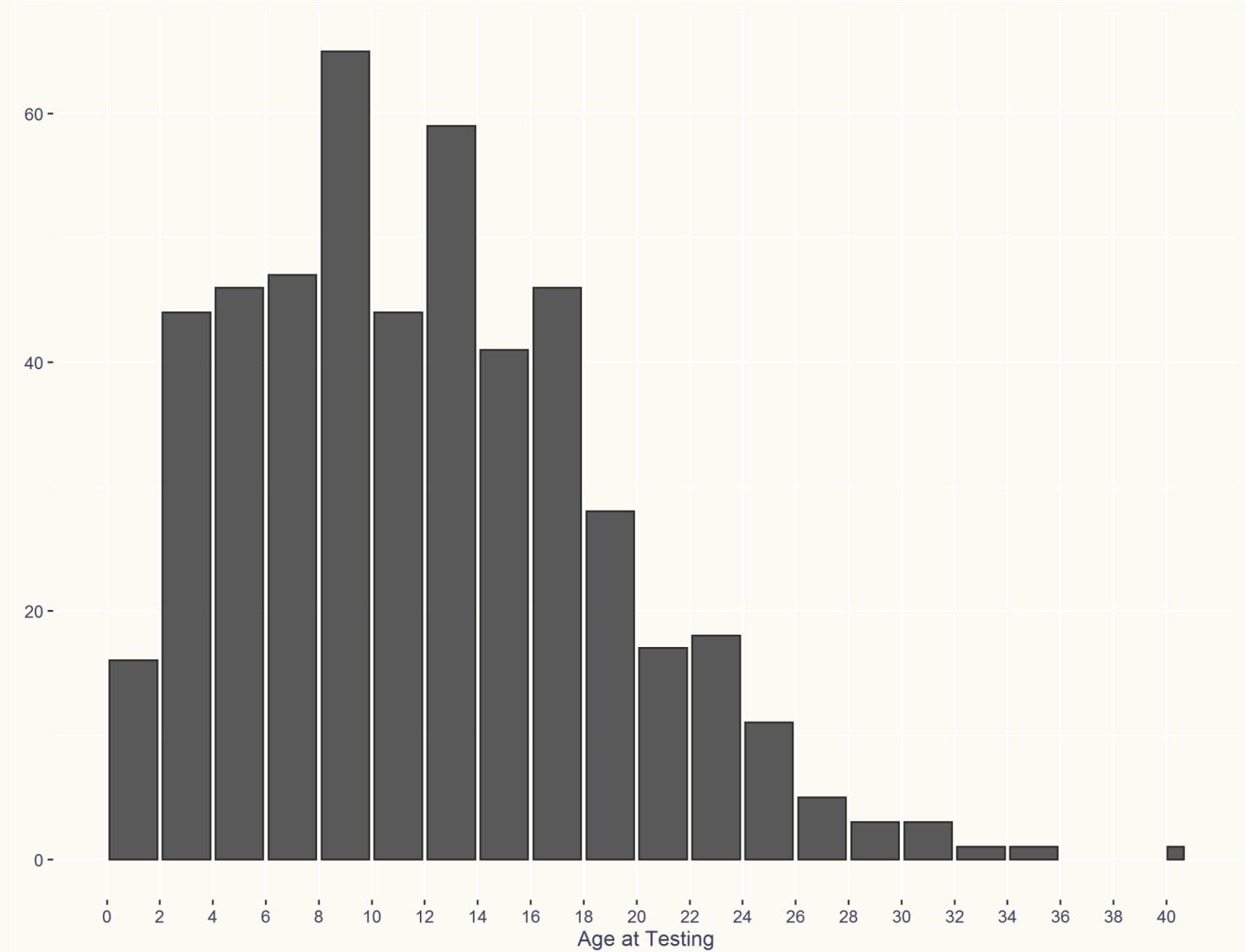
Age at Testing

408 / 496

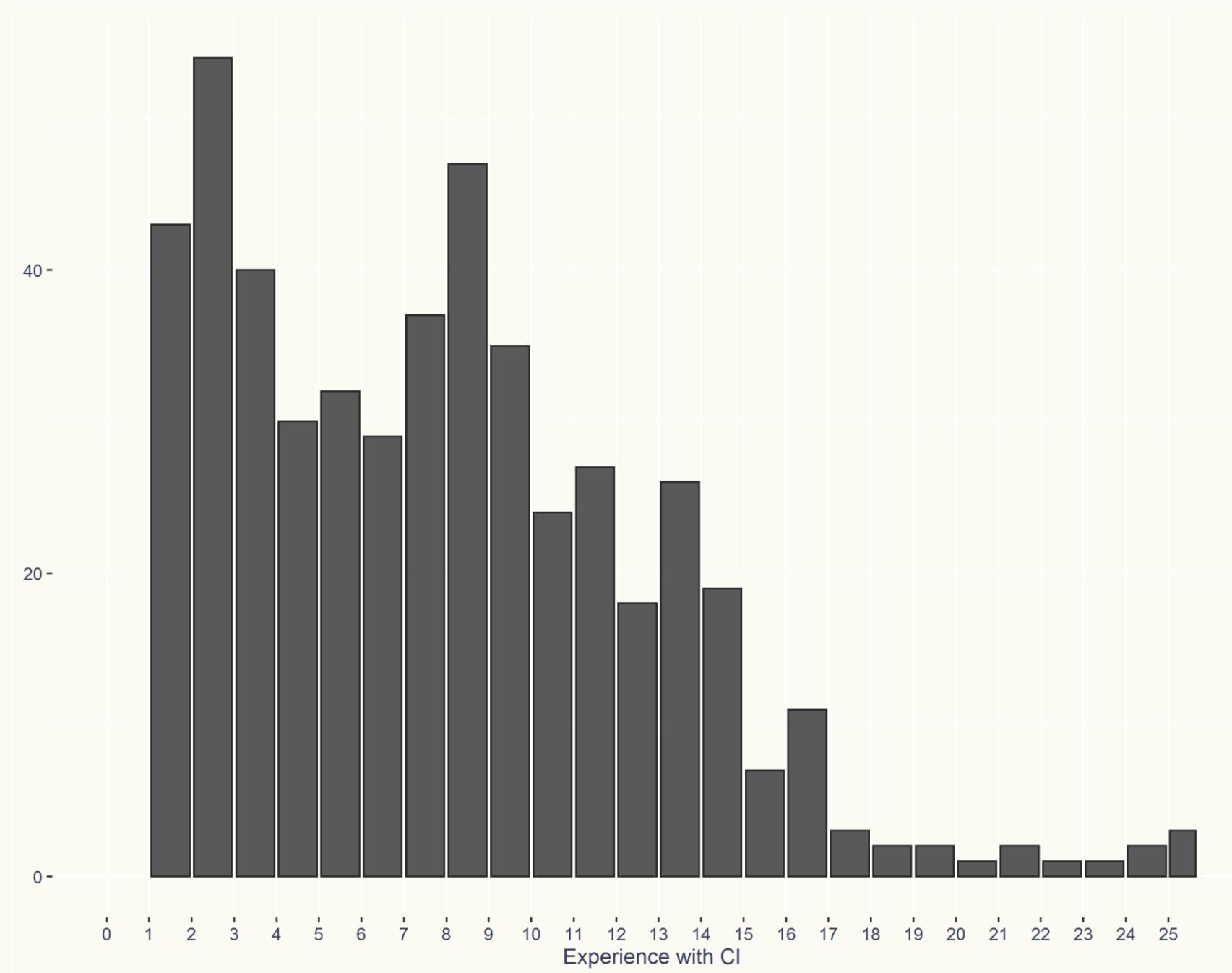
younger than 18y

106 / 496

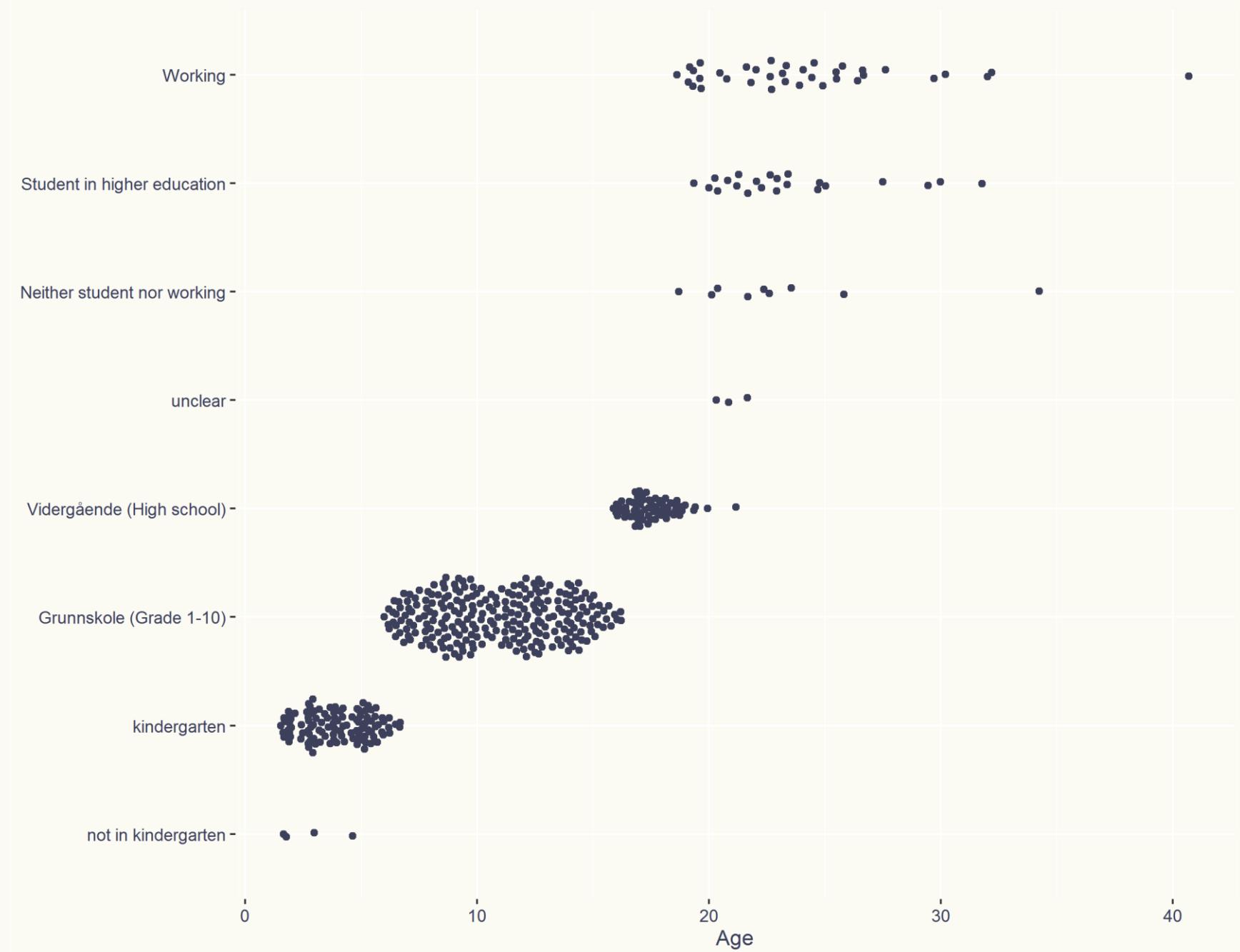
younger than 6y



Experience with CI



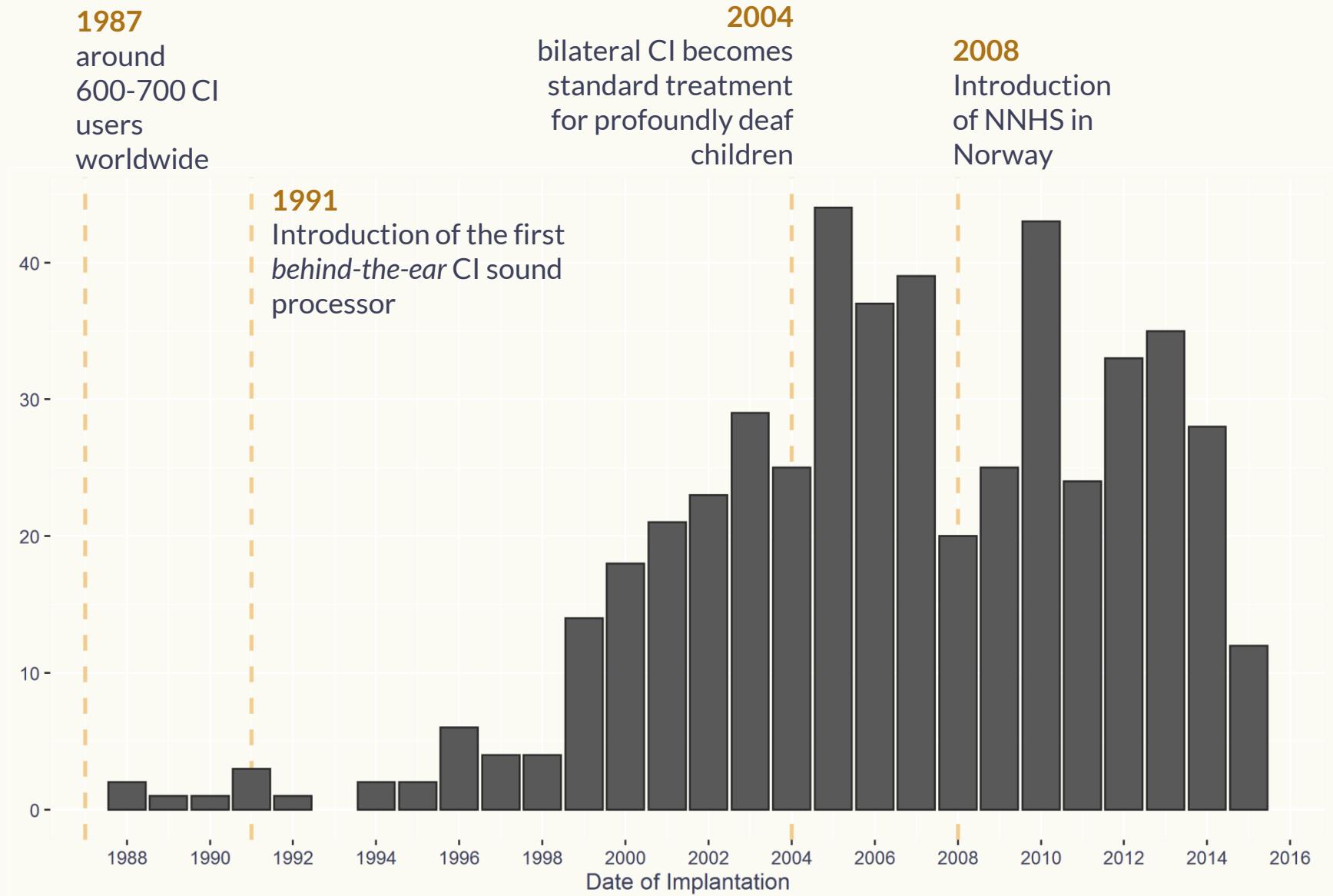
School / Work Situation



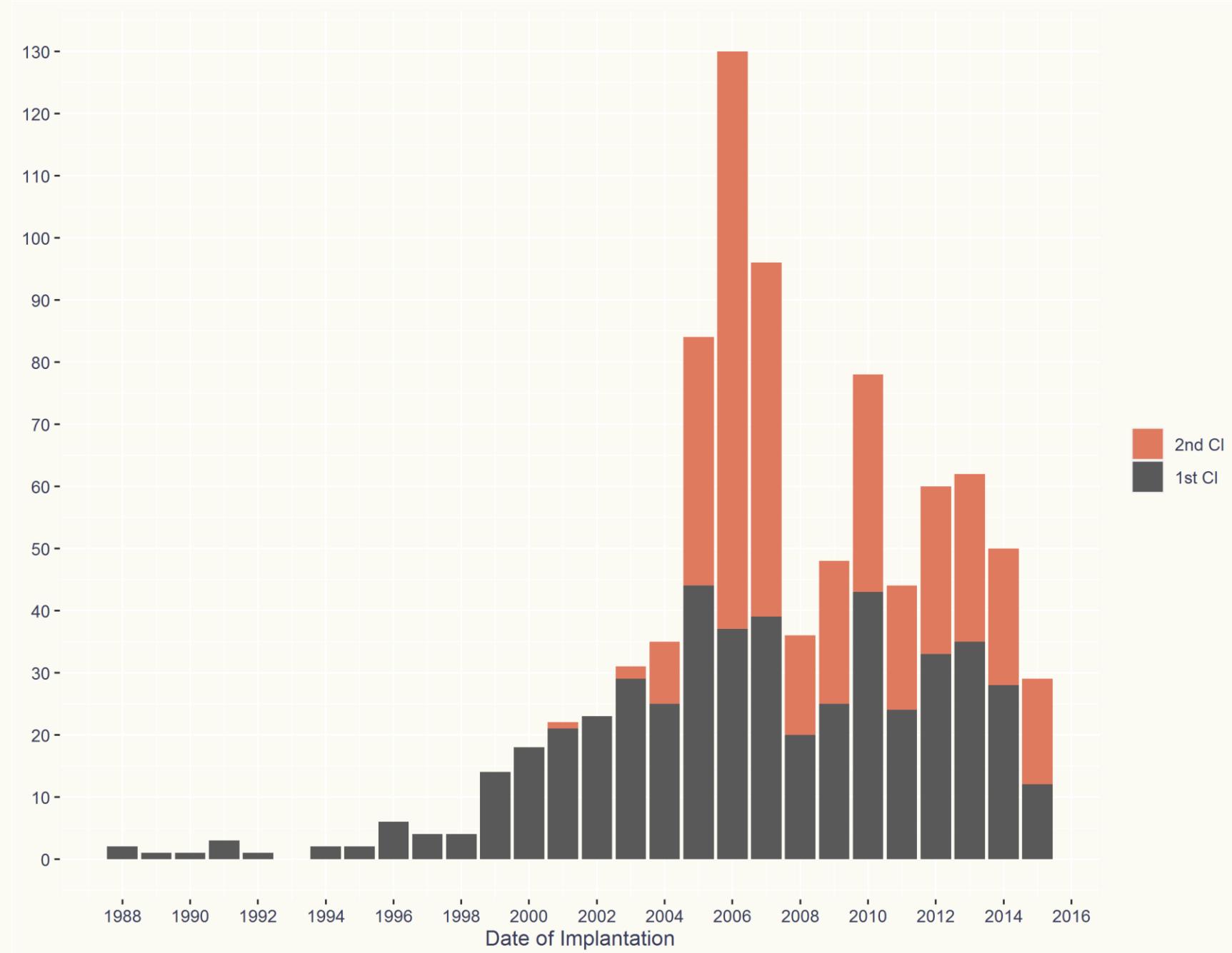
Changes in Clinical Practice



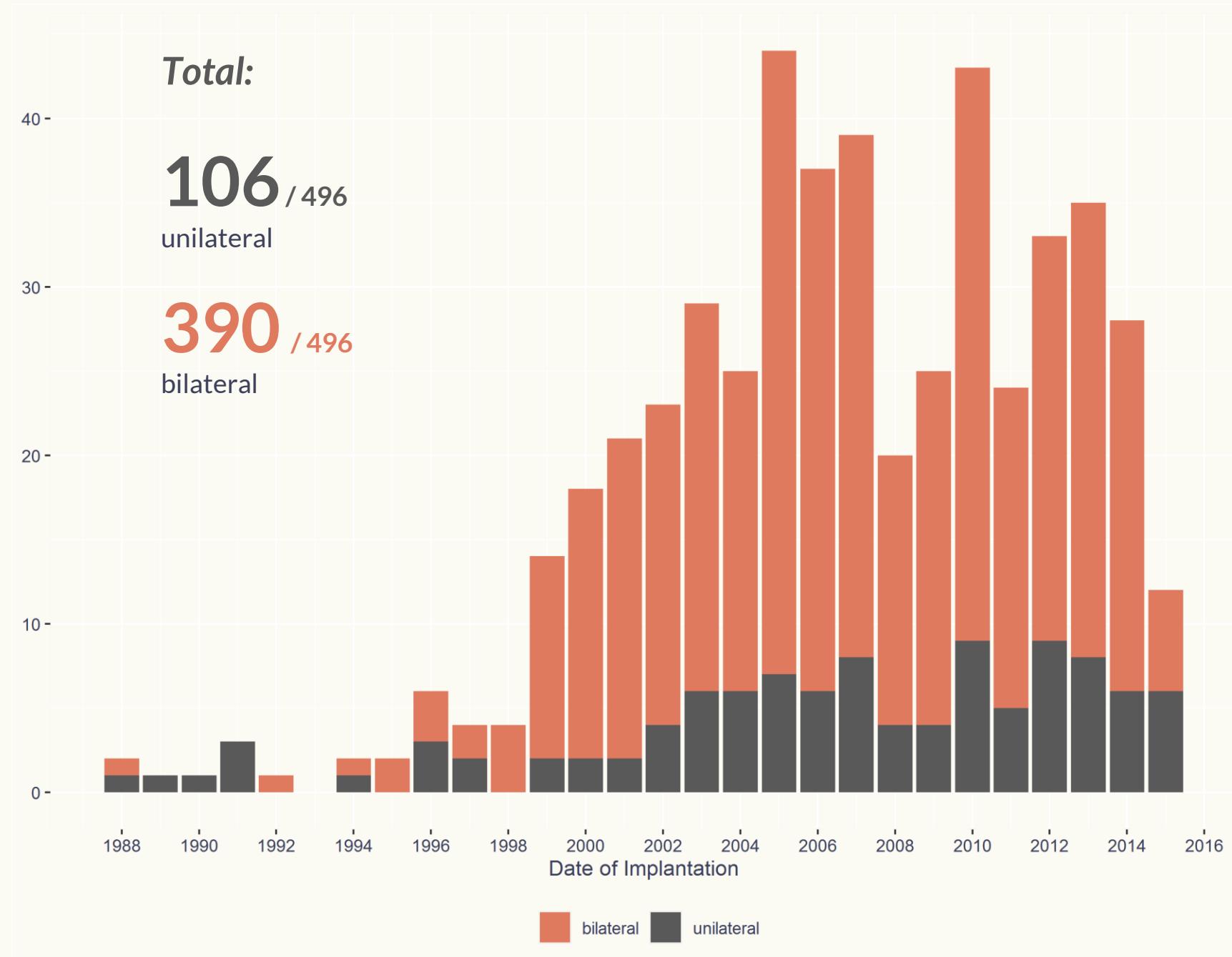
Number of 1st Implants per year



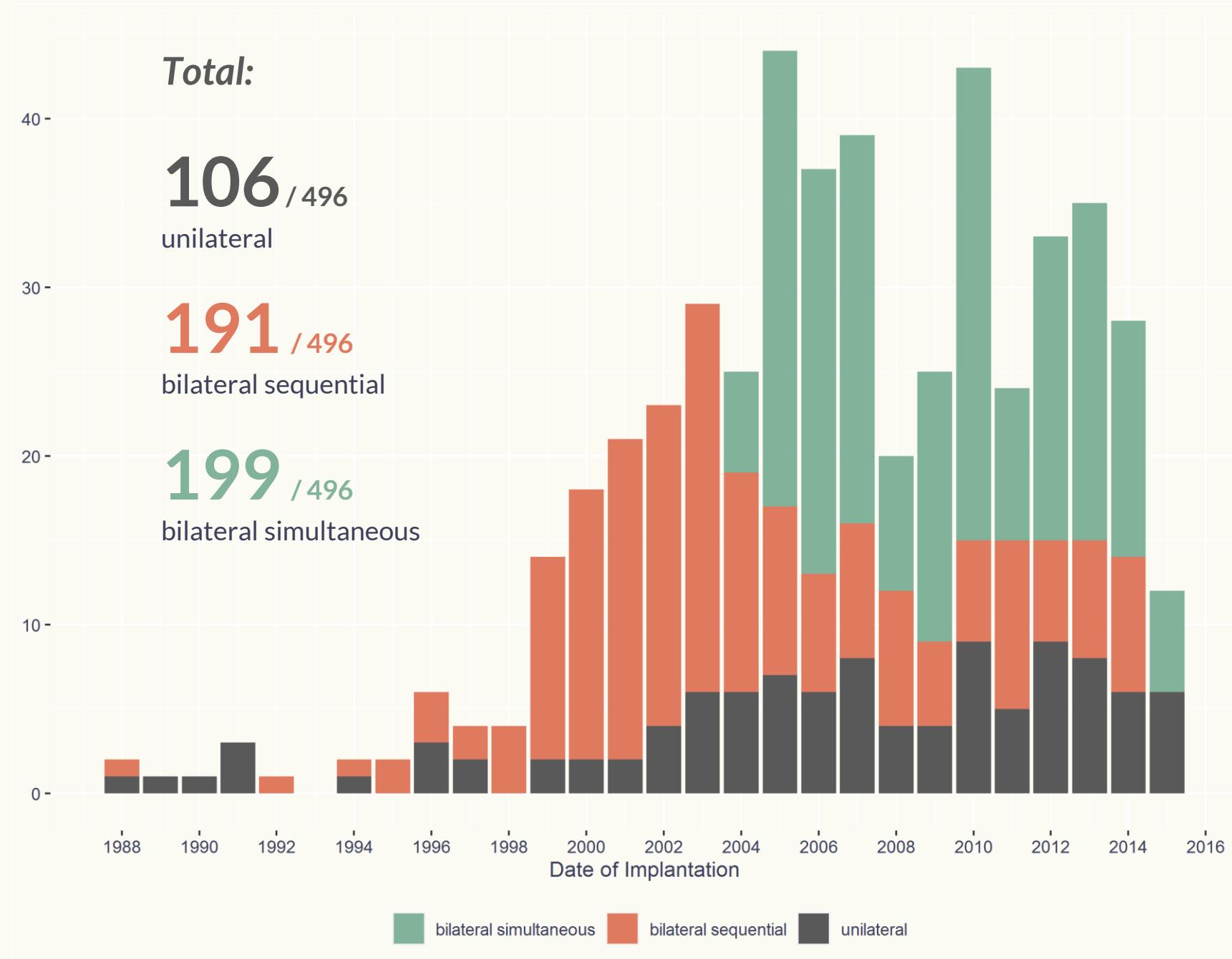
Total Number of Implants per year



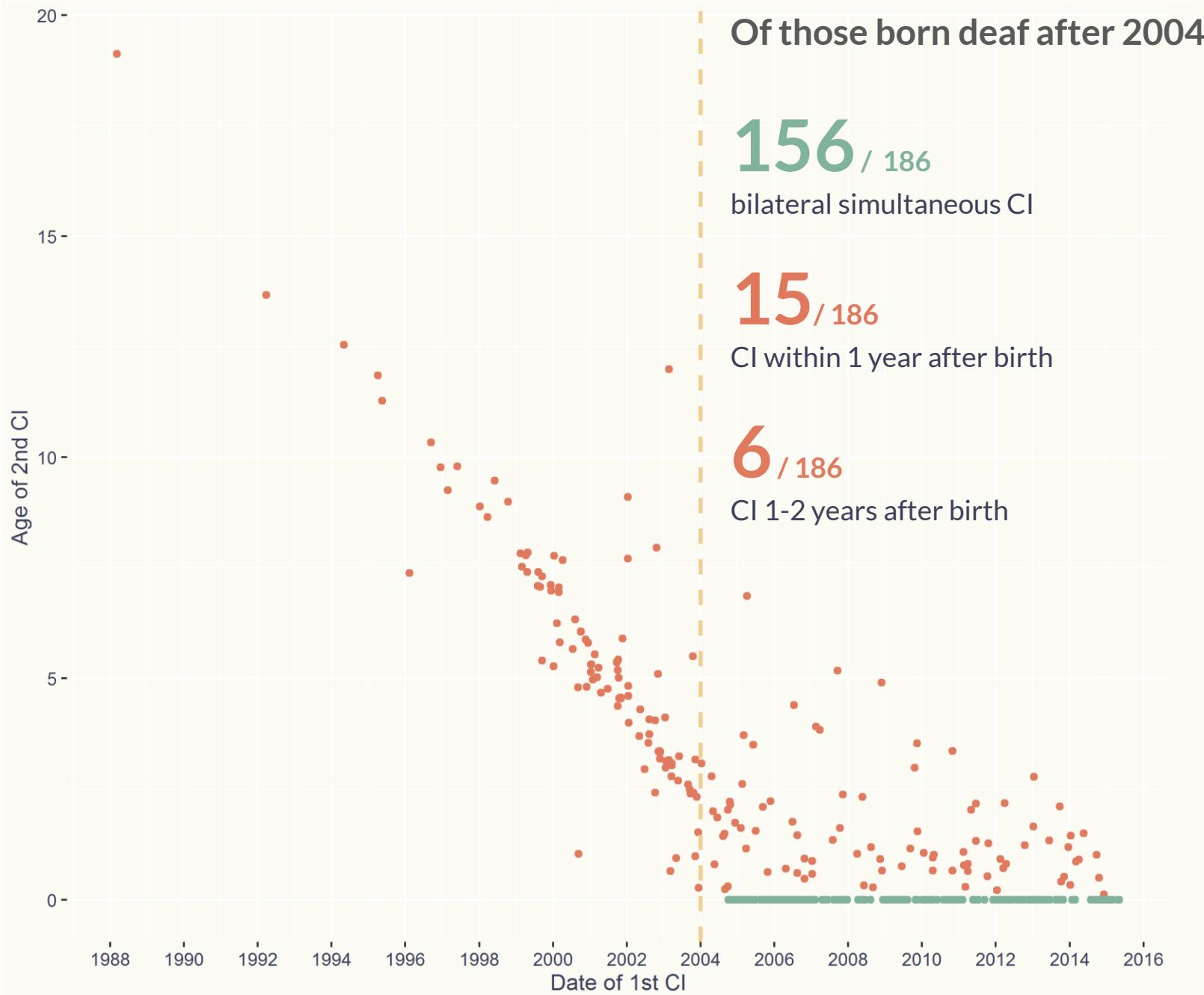
Number of Bilateral CI by year of 1st CI



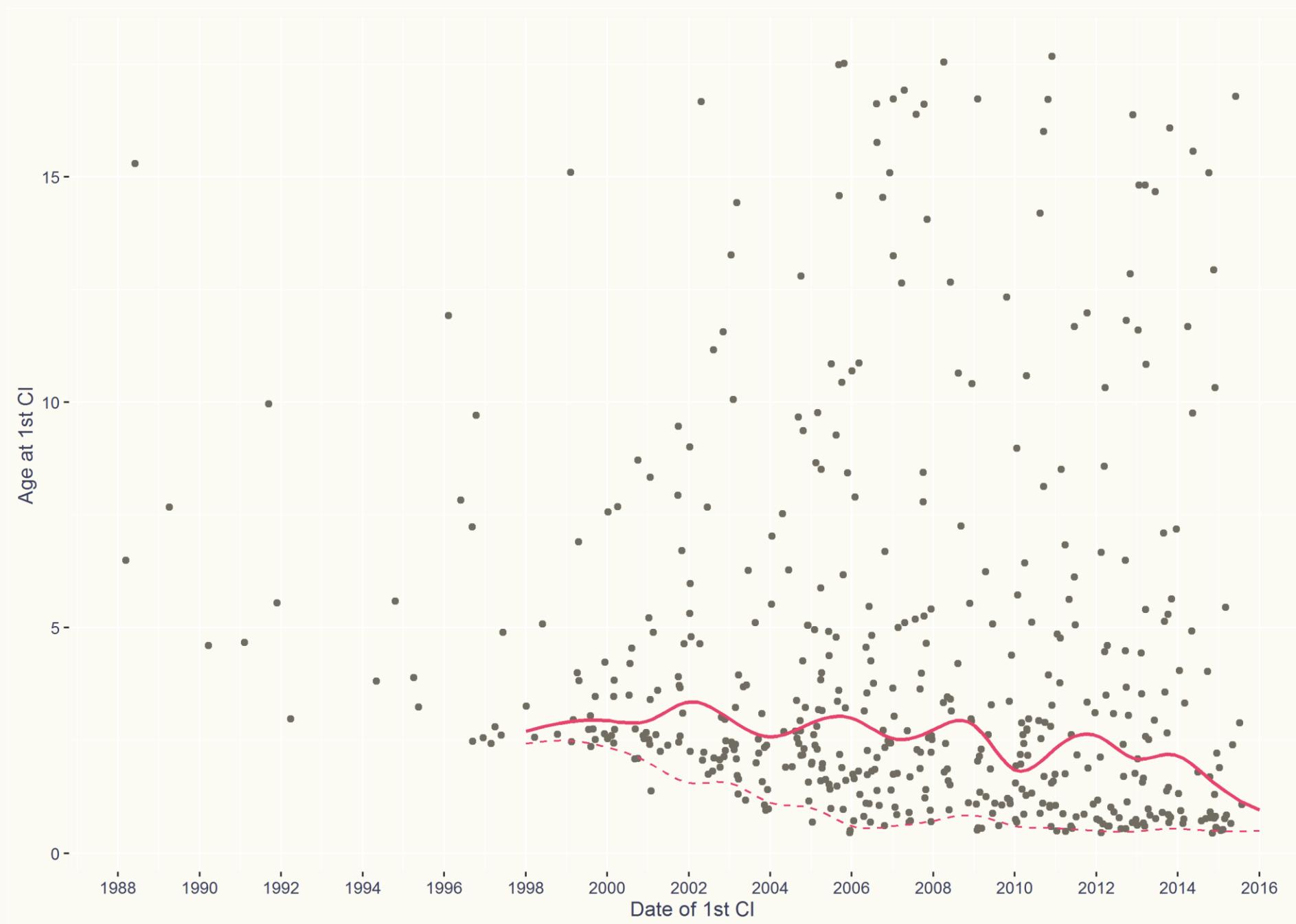
Number of Bilateral CI by year of 1st CI



Inter Implant Interval



Age at CI



Age at CI of children who are born deaf

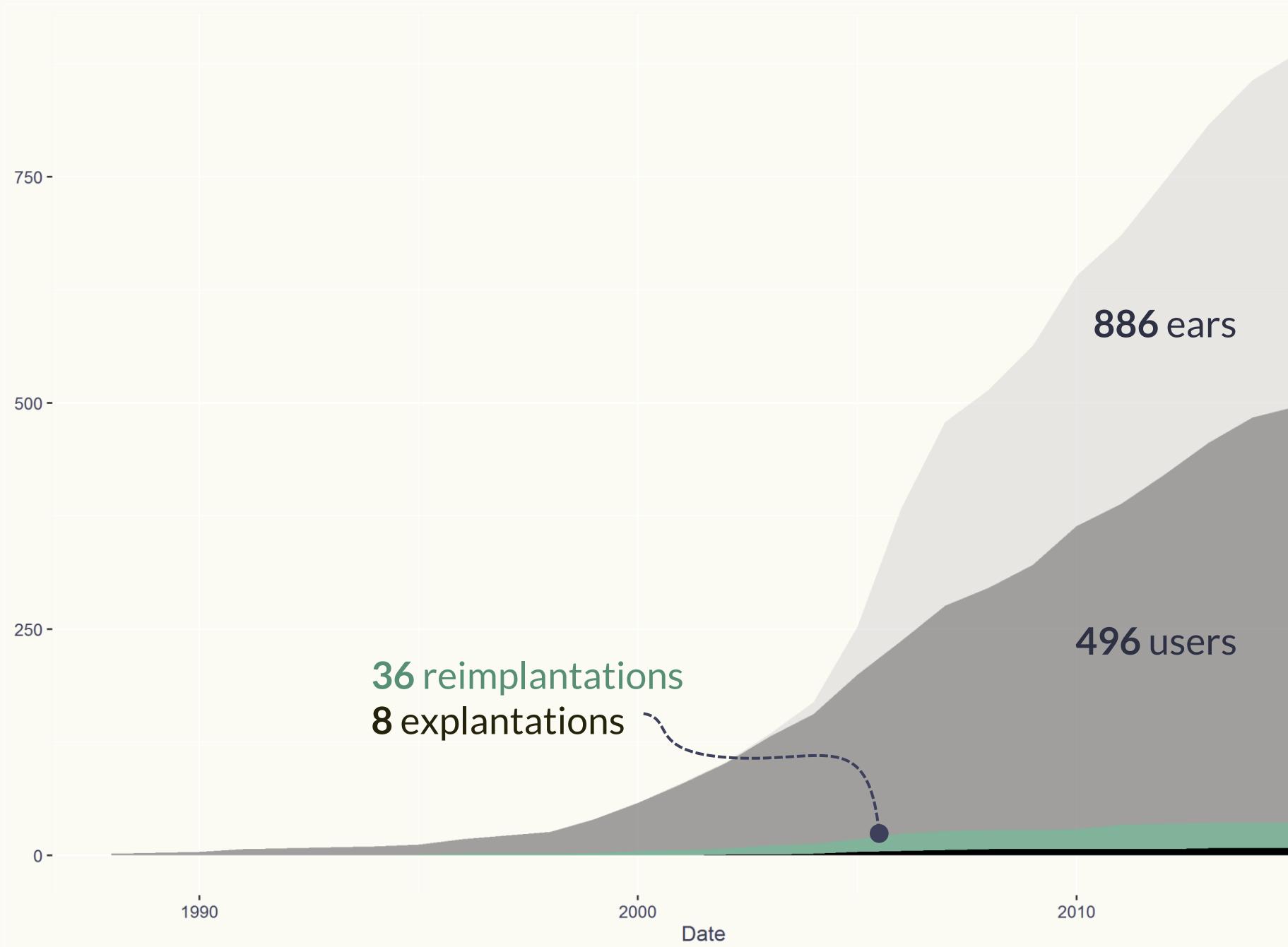


Problems

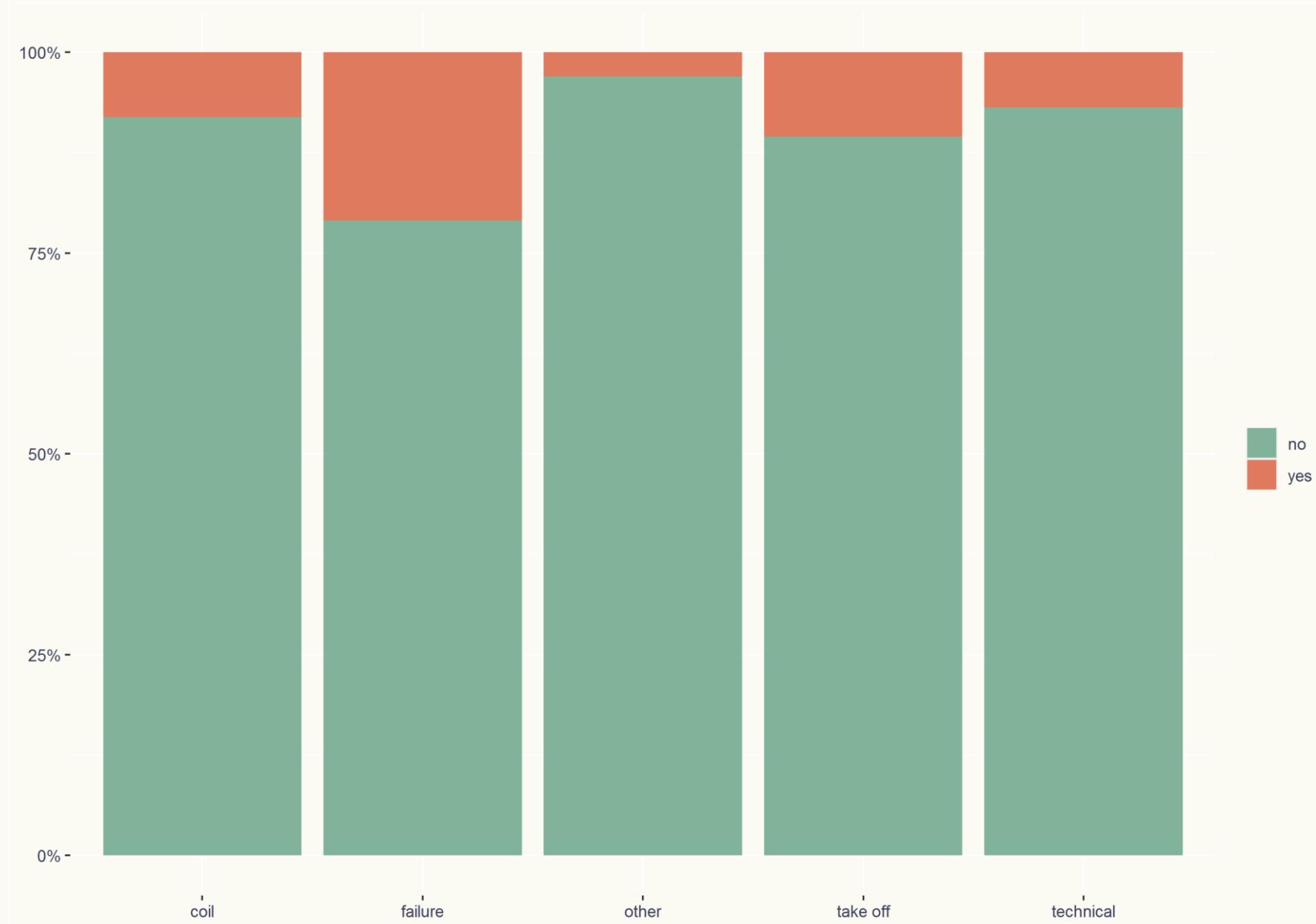


Reim-/Ex-plantation

1988-2015



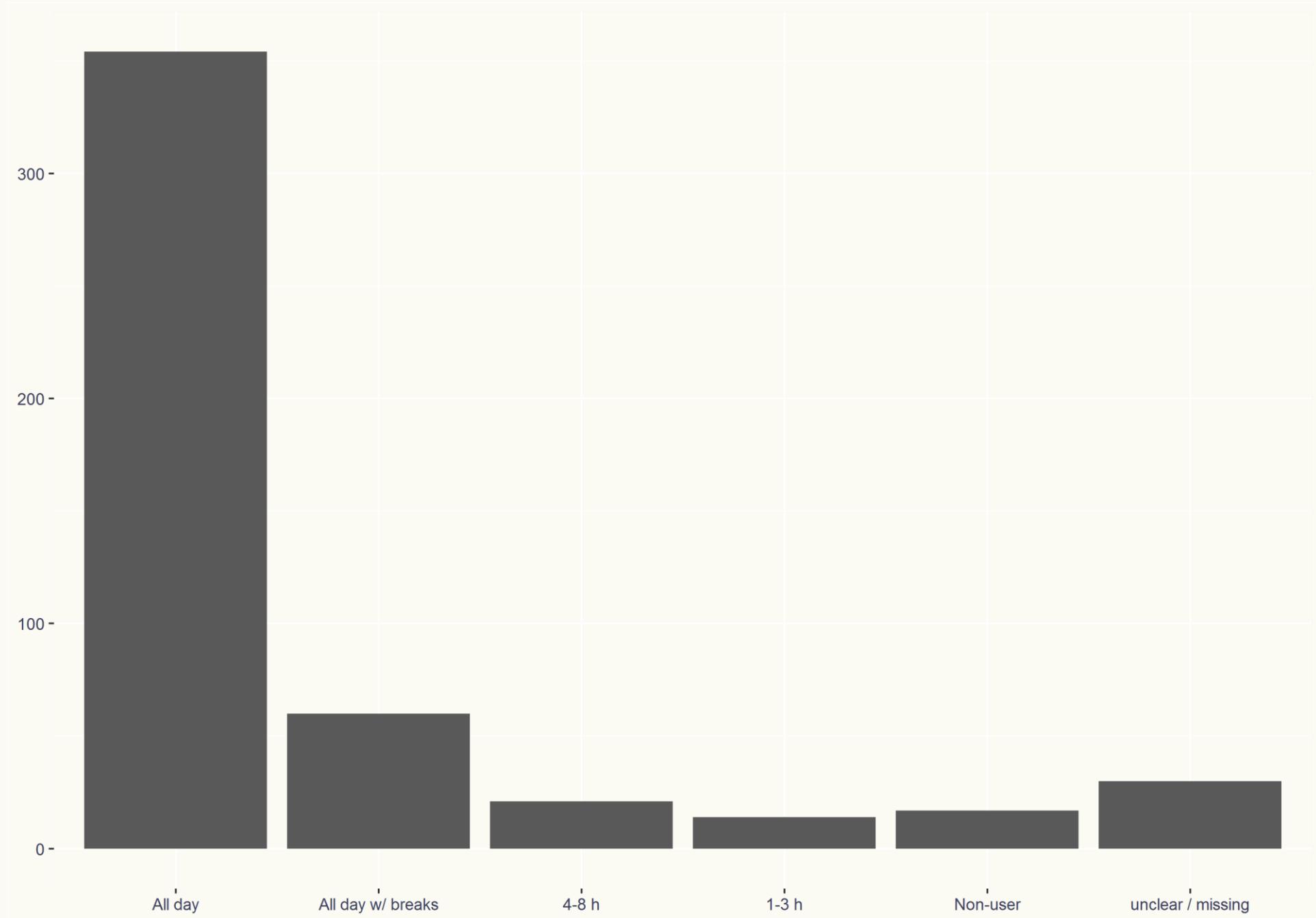
Self-reported Problems with the CI



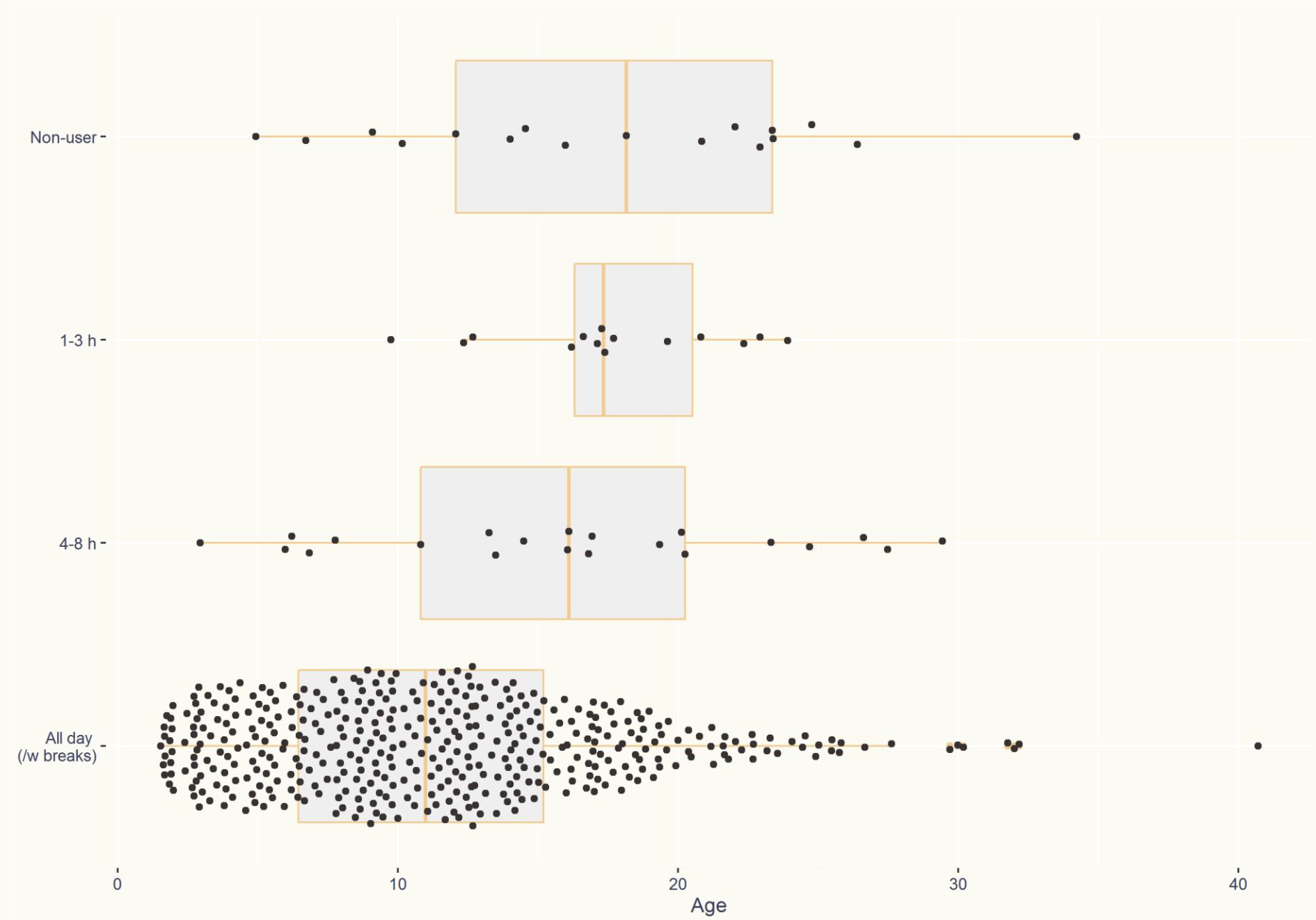


**Image of CI user quotes,
blurred in published version to
conceal potentially sensitive
personal information**

CI Use



CI Use





Hearing & Language

Test Battery

Language CELF, PPVT, BPVS, MSEL, CCC-2, CAP

Hearing HIST, HINT, SSQ

Speech SIR

Quality of Life SWLS, KINDL, PedSQL,

Reading Ordkjede, TOWRE

Cognition Raven CPM, WPPSI, WISC, WAIS, Leiter, VMI

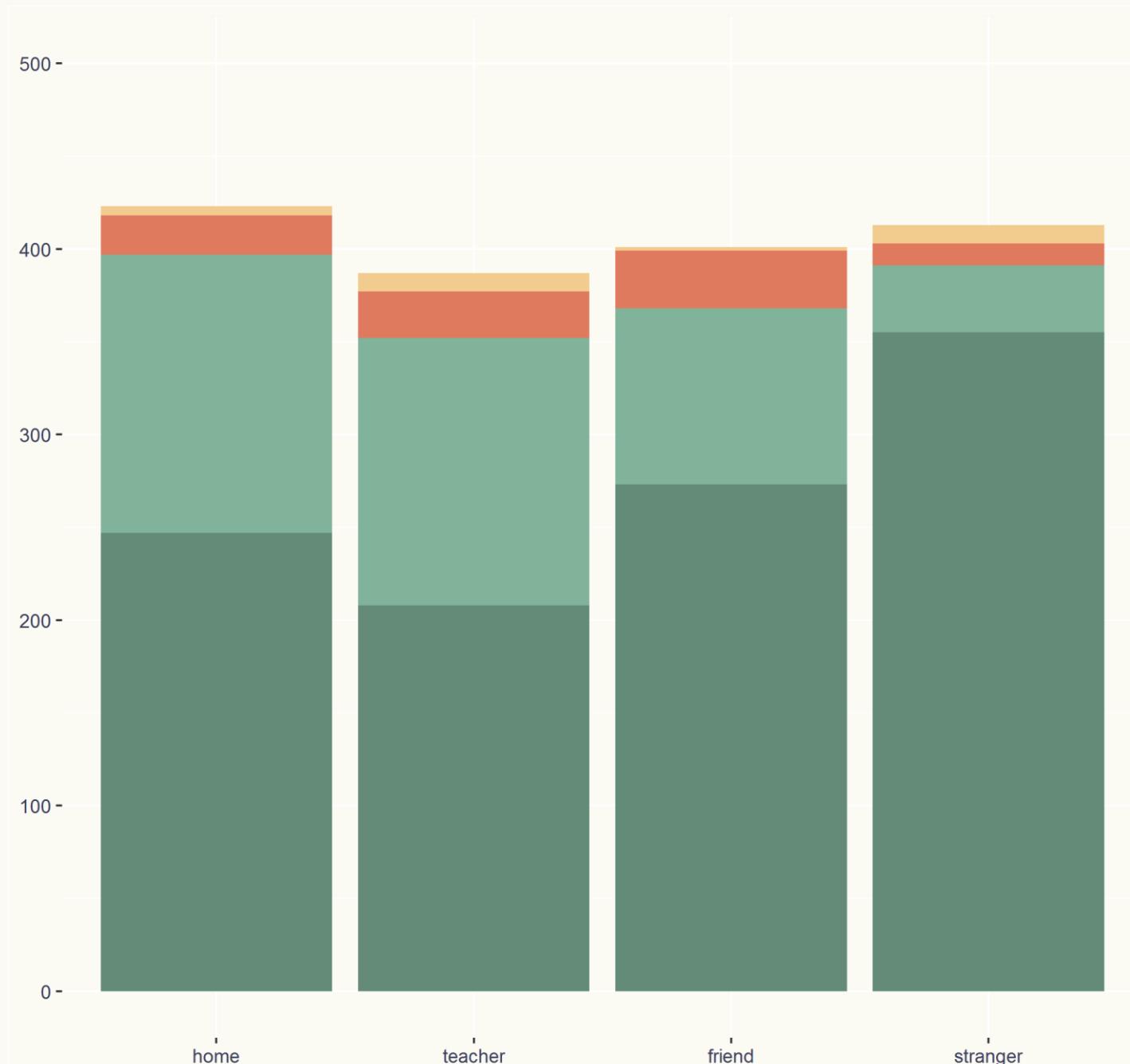
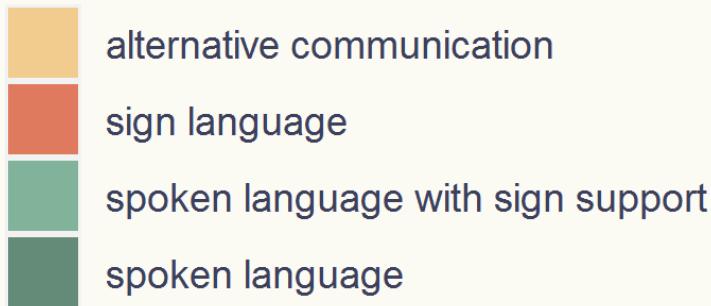
Processing Rapid Naming, Statistical Learning

Other Unstandardized Questionnaires

Language Environment

› 83% from Norwegian speaking home

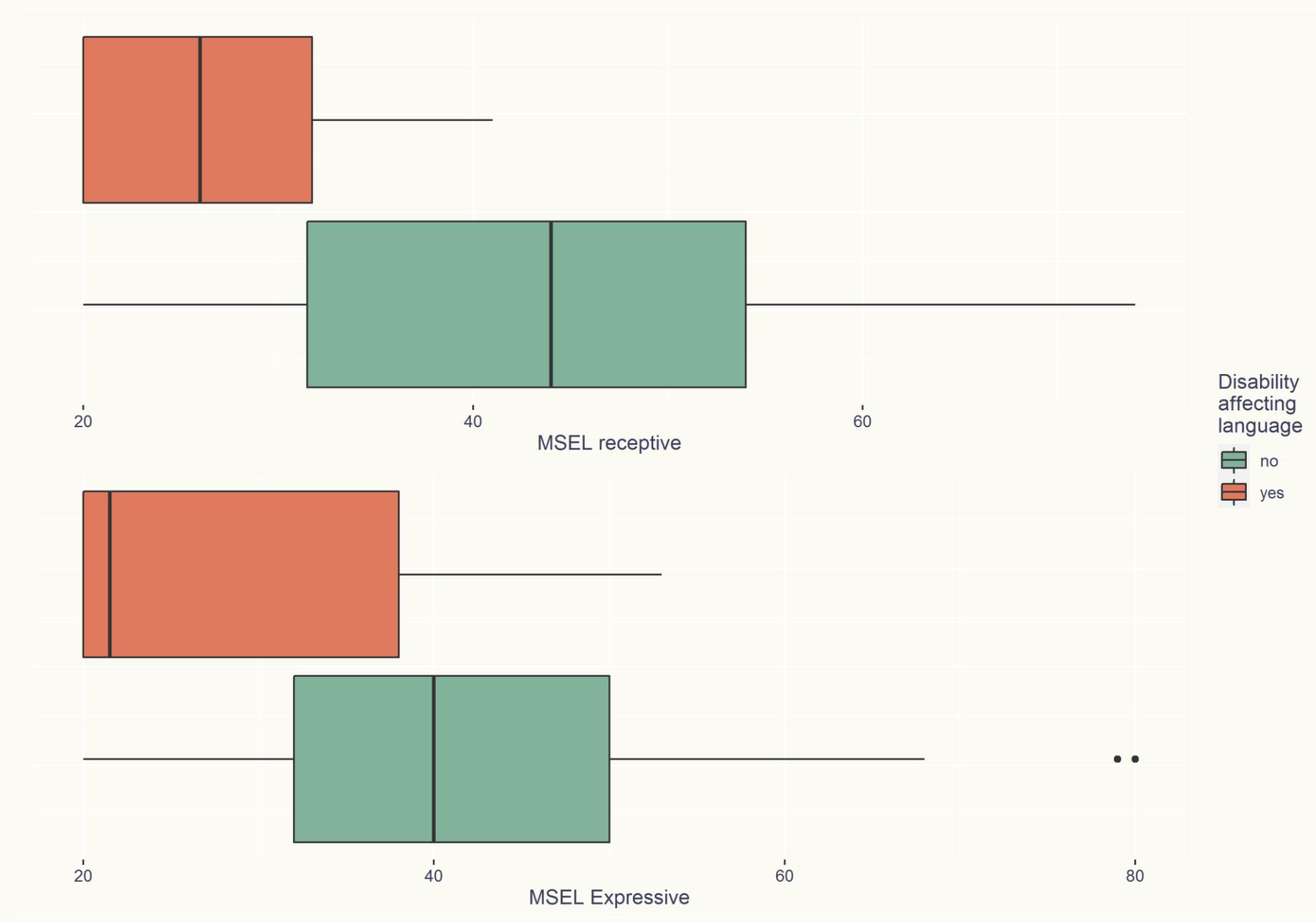
Communication Mode



HiST



MSEL (1-5y)



Taletest 1

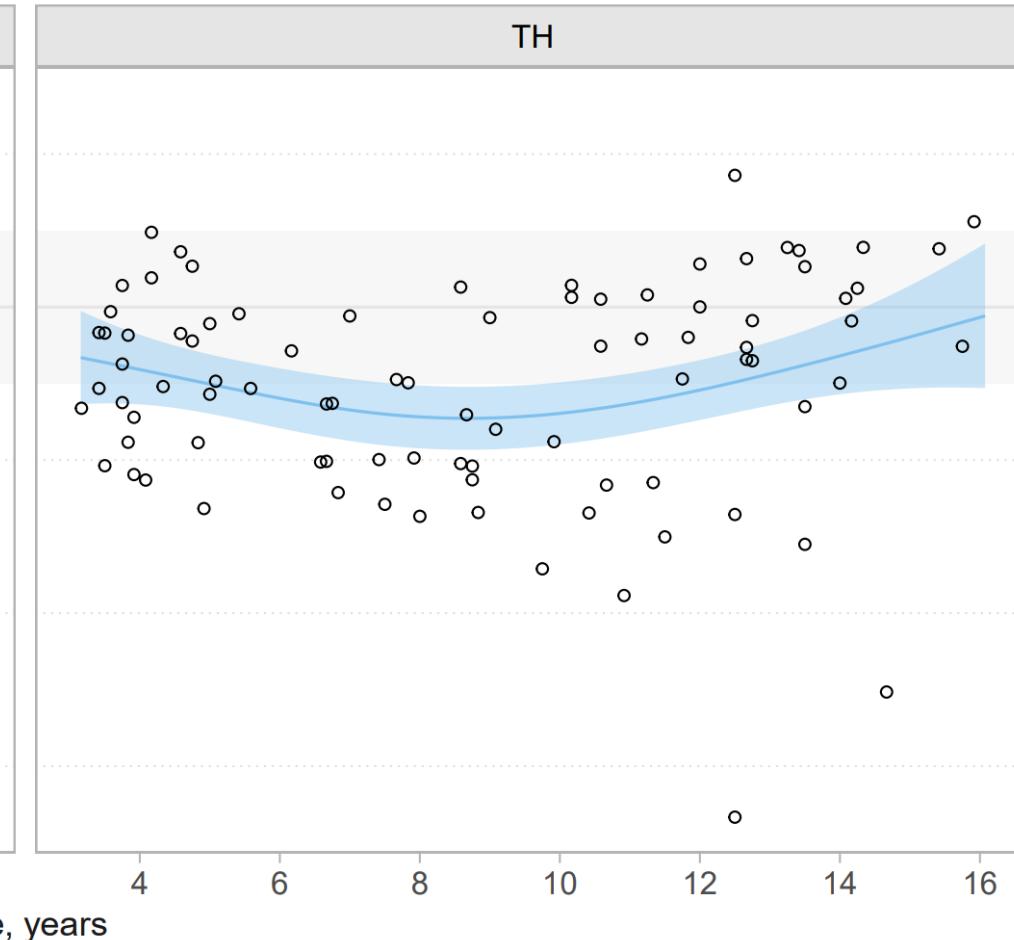
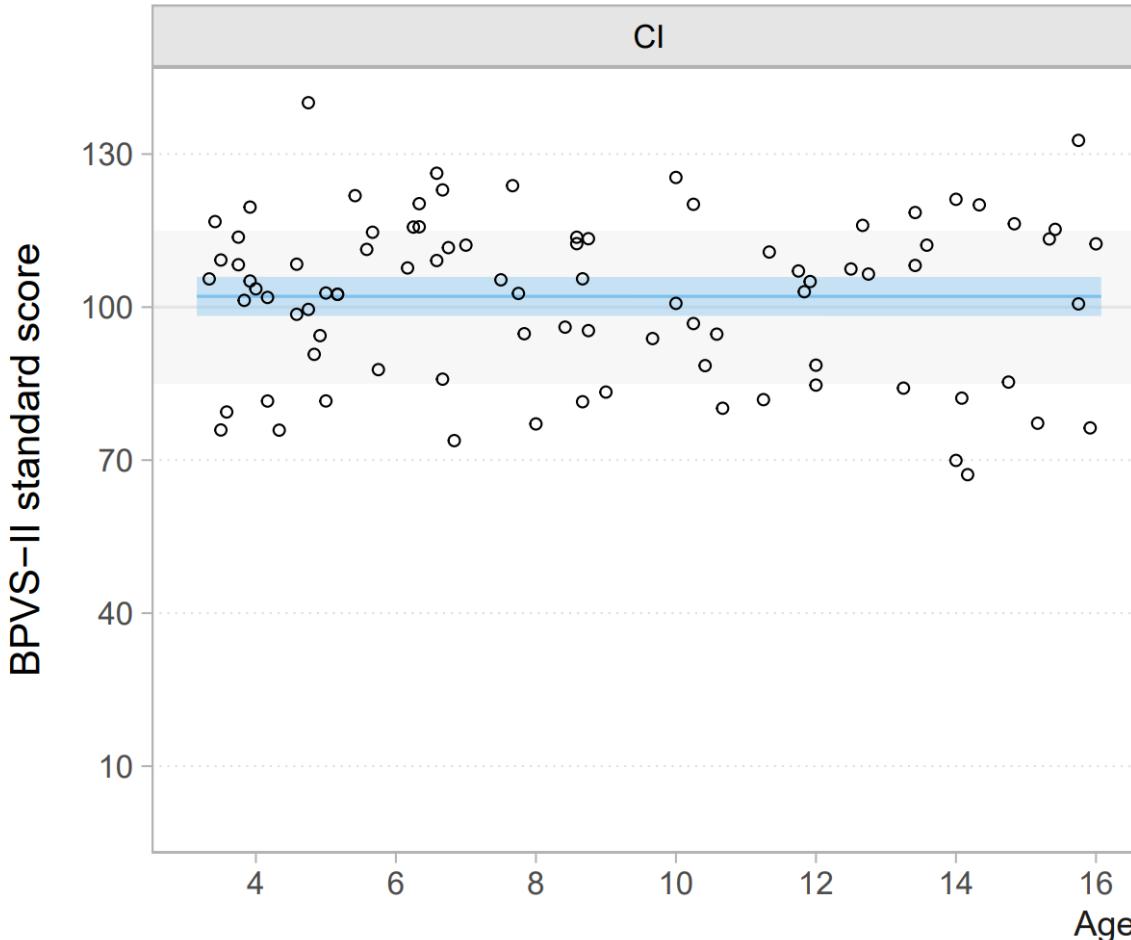


Receptive Vocabulary (3-16y)

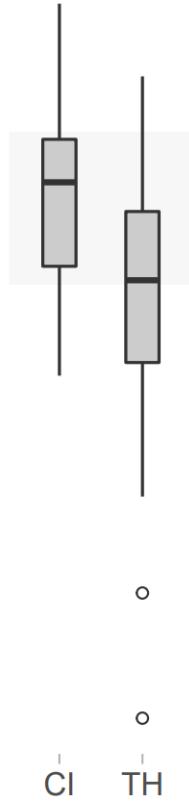
Busch et al. (in press) *Ear and Hearing*

a)

CI vs. TH, matched for sex, maternal education, and chronological age



b)

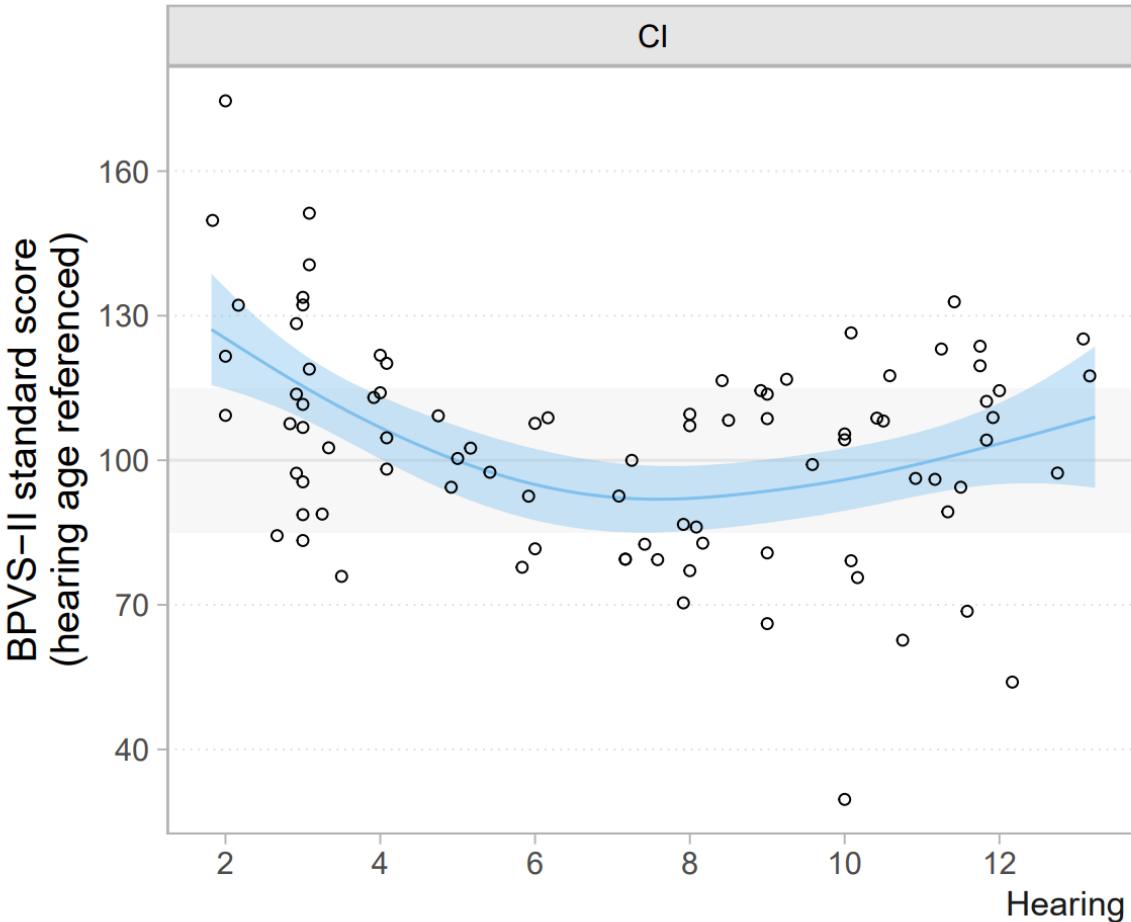


Receptive Vocabulary (3-16y)

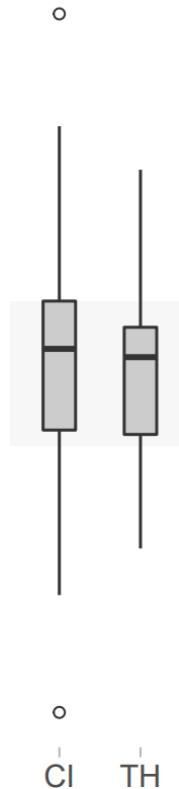
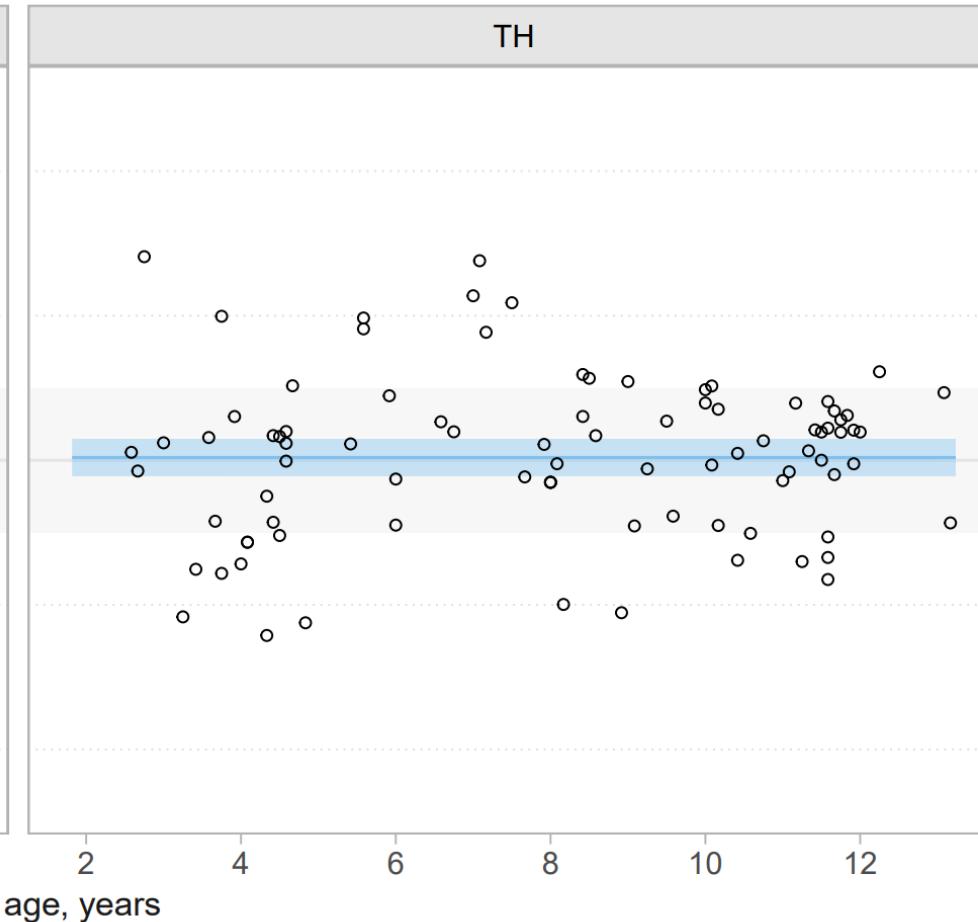
Busch et al. (in press) *Ear and Hearing*

c)

CI vs. TH, matched for sex, maternal education, and hearing age

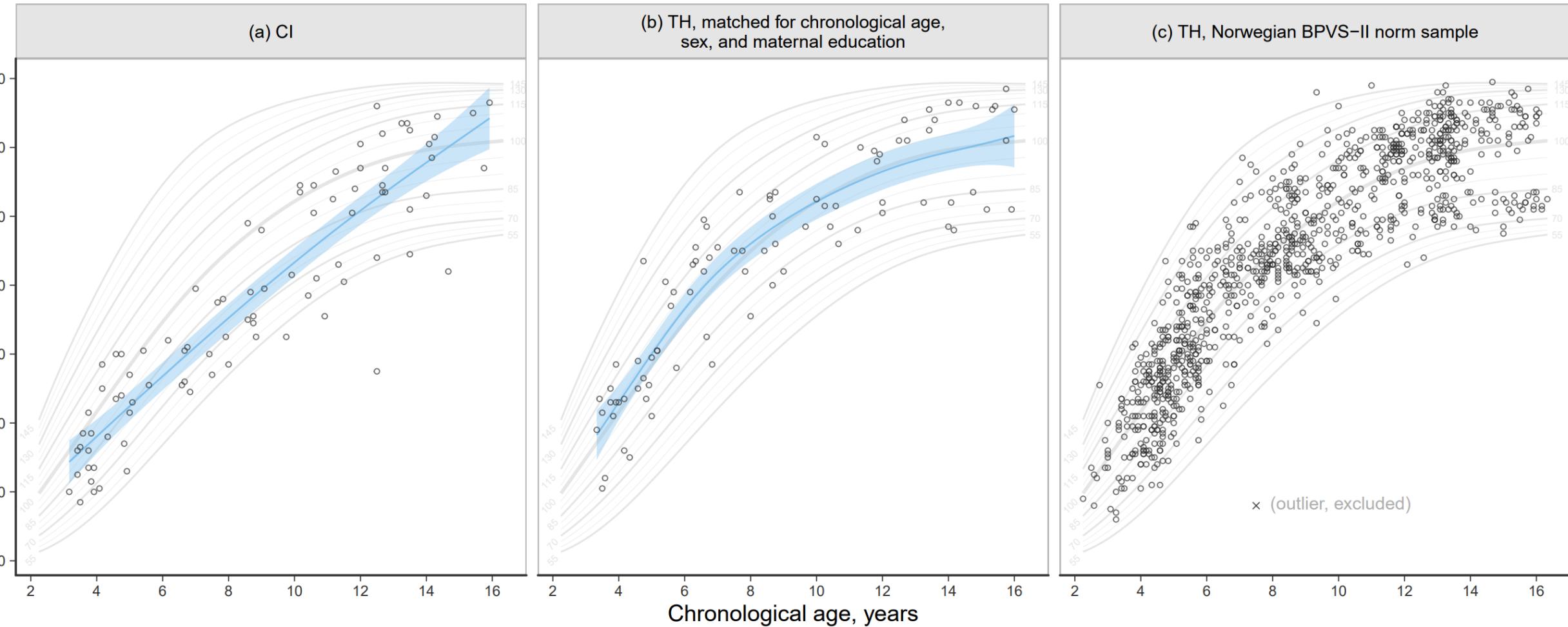


d)



Receptive Vocabulary (3-16y)

Busch et al. (in press) *Ear and Hearing*



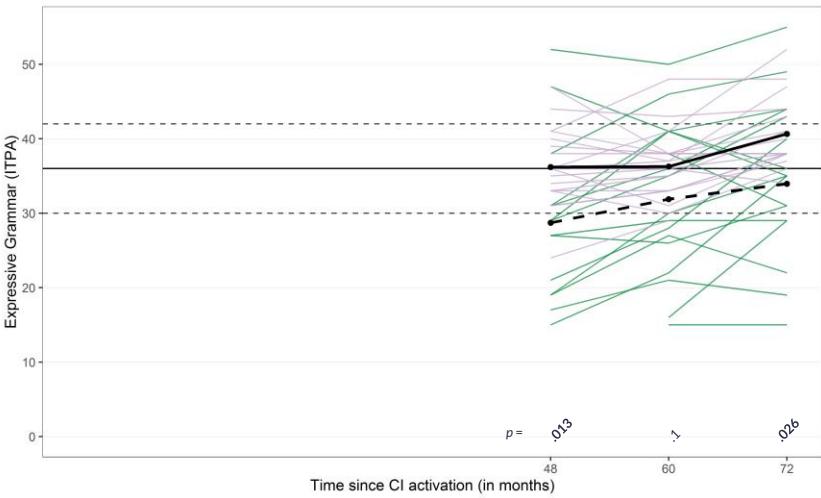
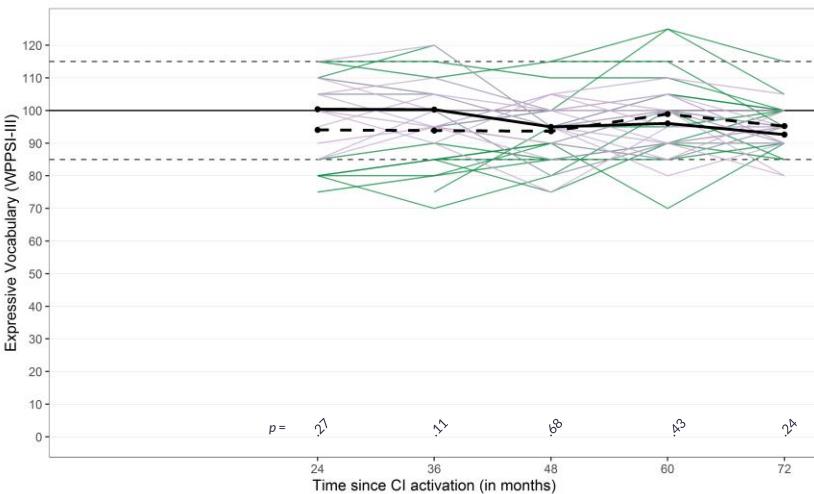
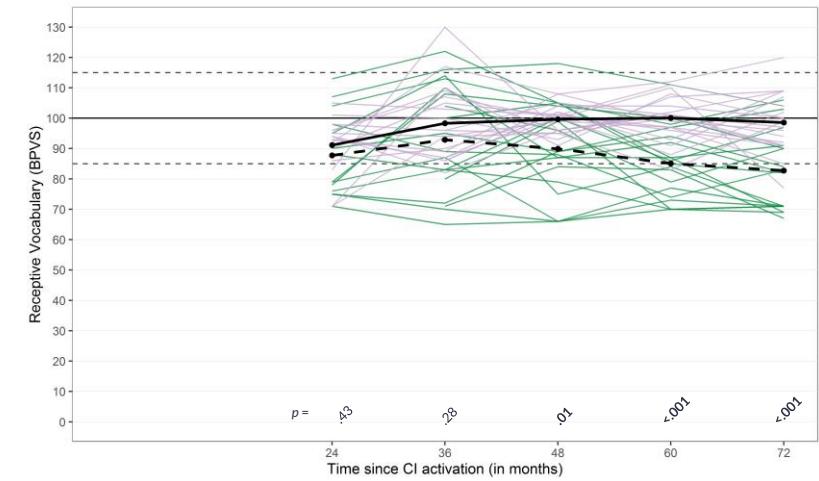
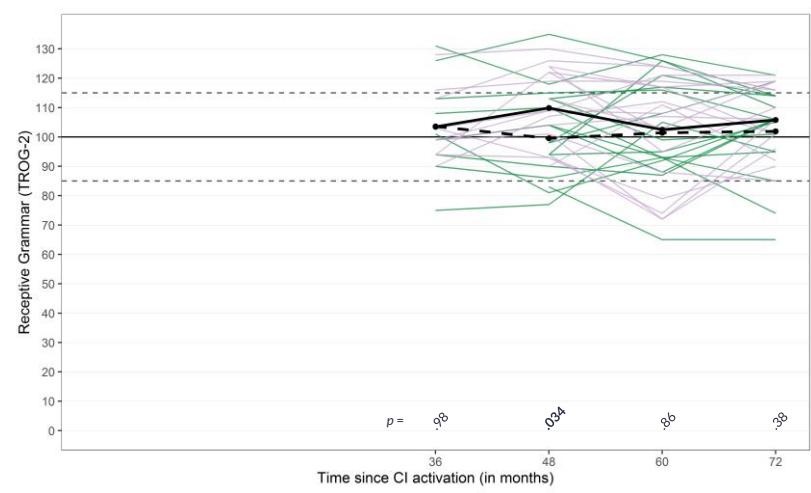
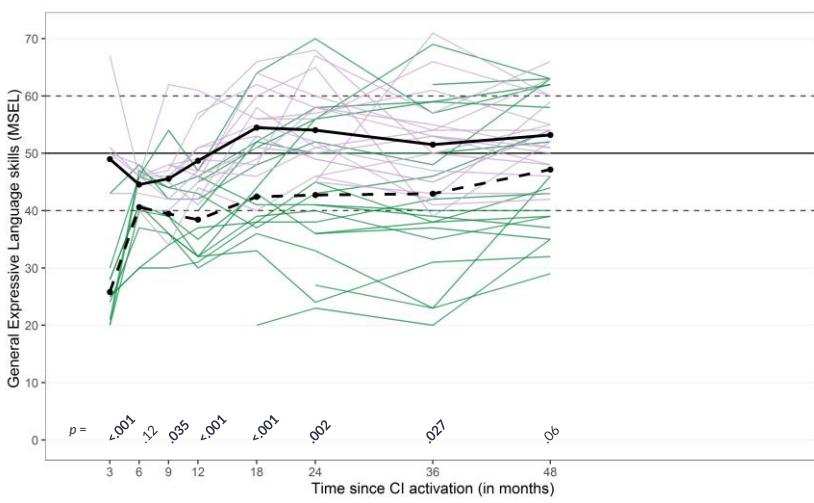
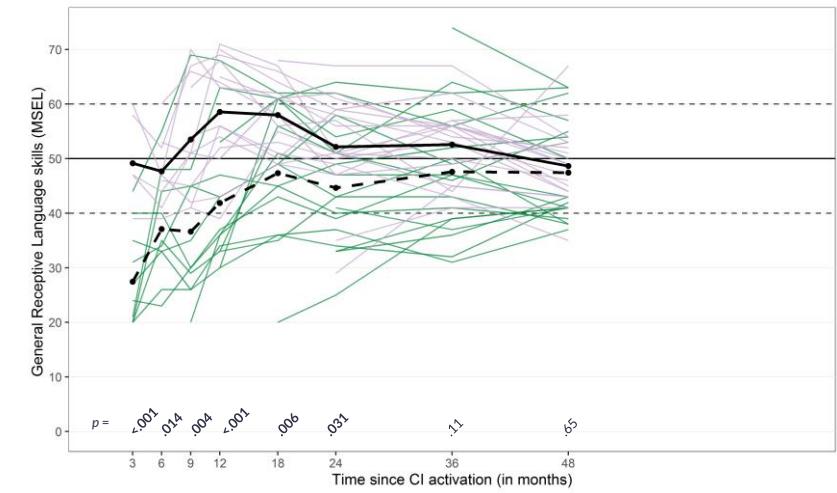
The 6 year-follow up study

Wie et al. (2019) *Ear and Hearing*

Is the “falling-behind” just an artifact
of the cross-sectional data?



- › Smaller sample
- › all early bilateral CI users
- › Multiple language measures
and measurement moments



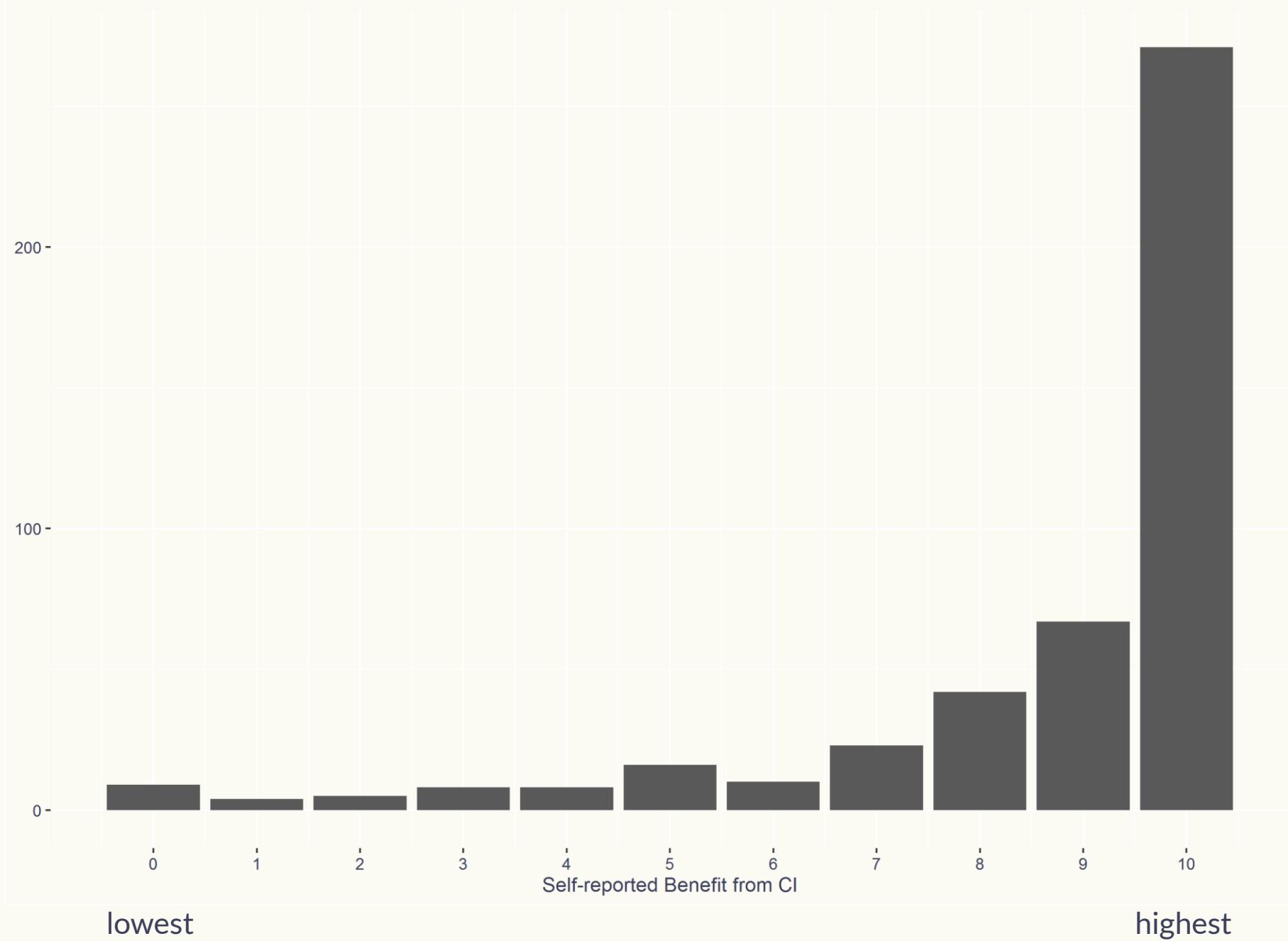
Normal Hearing
(Group Average) CI User
(Group Average)

The 6 year-follow up study

Wie et al. (2019) *Ear and Hearing*

- › 4-6y after CI: challenges with receptive vocabulary, expressive grammar
 - › language outcomes at 6y after CI related to speech recognition, age at CI activation, maternal education
 - › Is the “gap” temporary?
- Now conducting 13 year follow-up study

Self-reported Benefit from CI





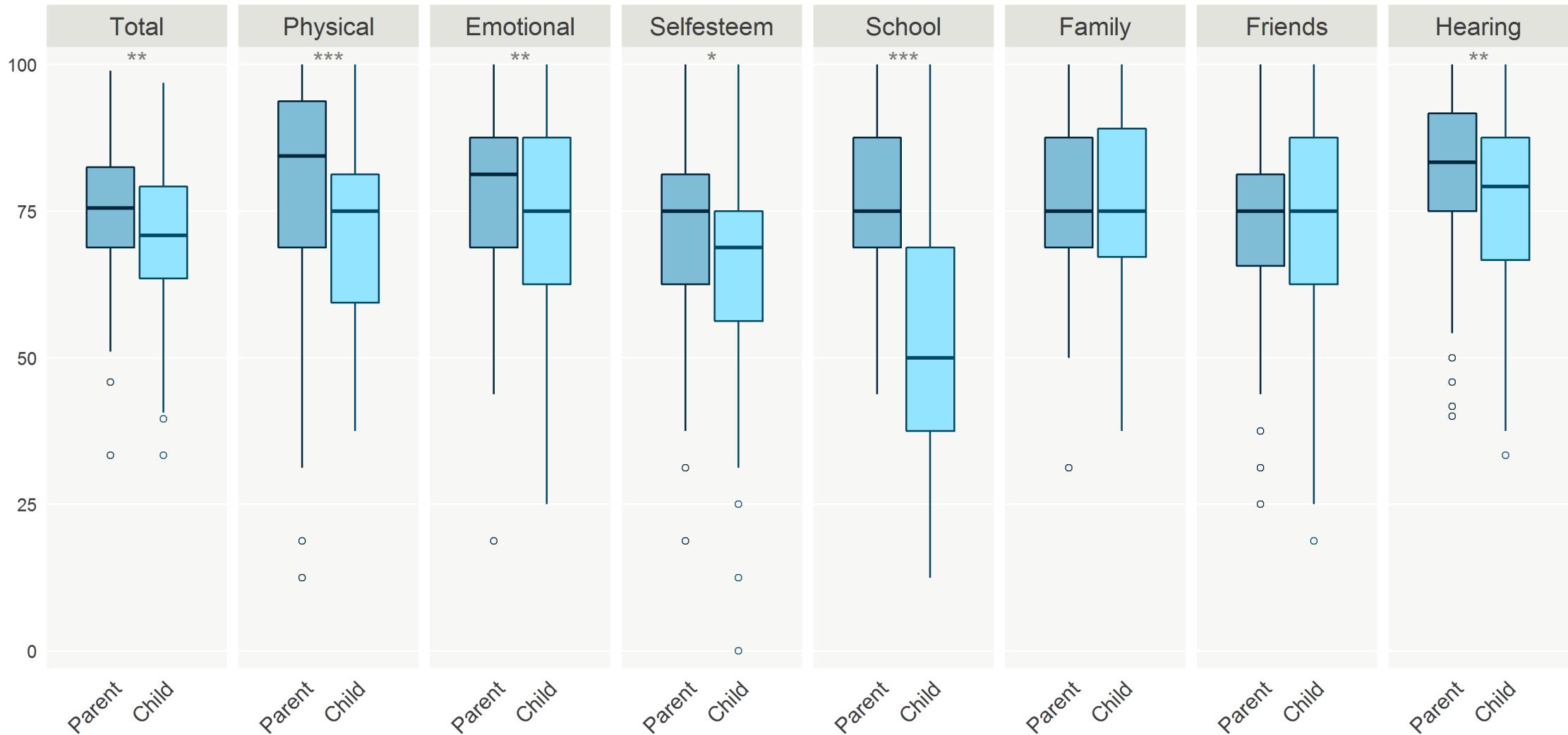
Quality of Life

Master student projects by
Kjersti Moen & Mina Bakken
Eirin Krog & Bettina Astrup

KINDL

Quality of Life, Parent-report vs. Self-report

n = 153 children with CI, age 5.5 - 17 years; 117 Child Reports, 151 Parent Reports



Wilcoxon rank sum test for independent samples

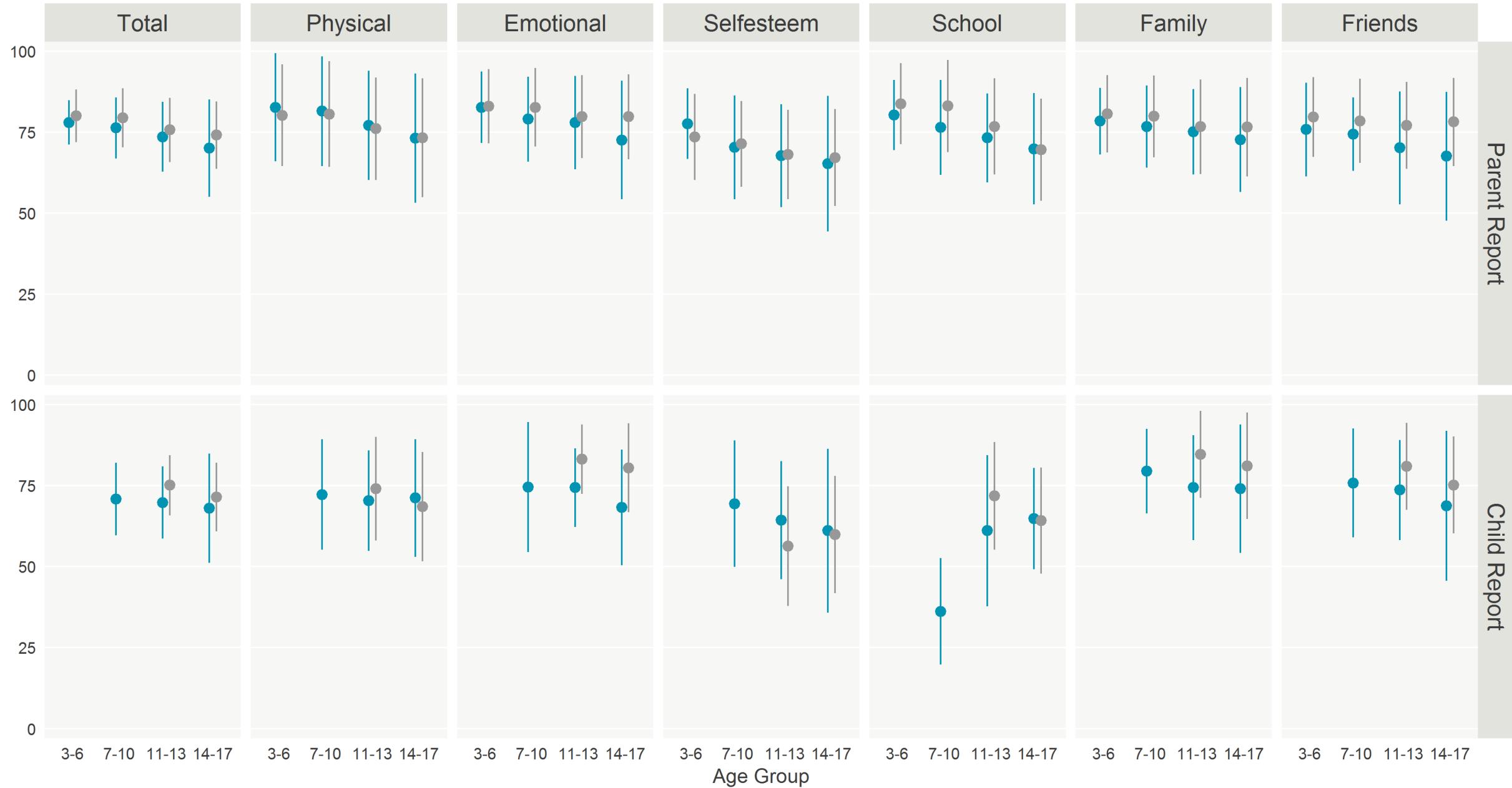
Using Holm's correction for multiple comparison

* p < .05, ** p < .01, *** p < .001

QoL CI group vs. KINDL Norm sample by Age Group, Mean and SD

n = CI: 117 Child, 151 Parent; Norm: 1,895 Child, 6,464 Parent

group CI Norm

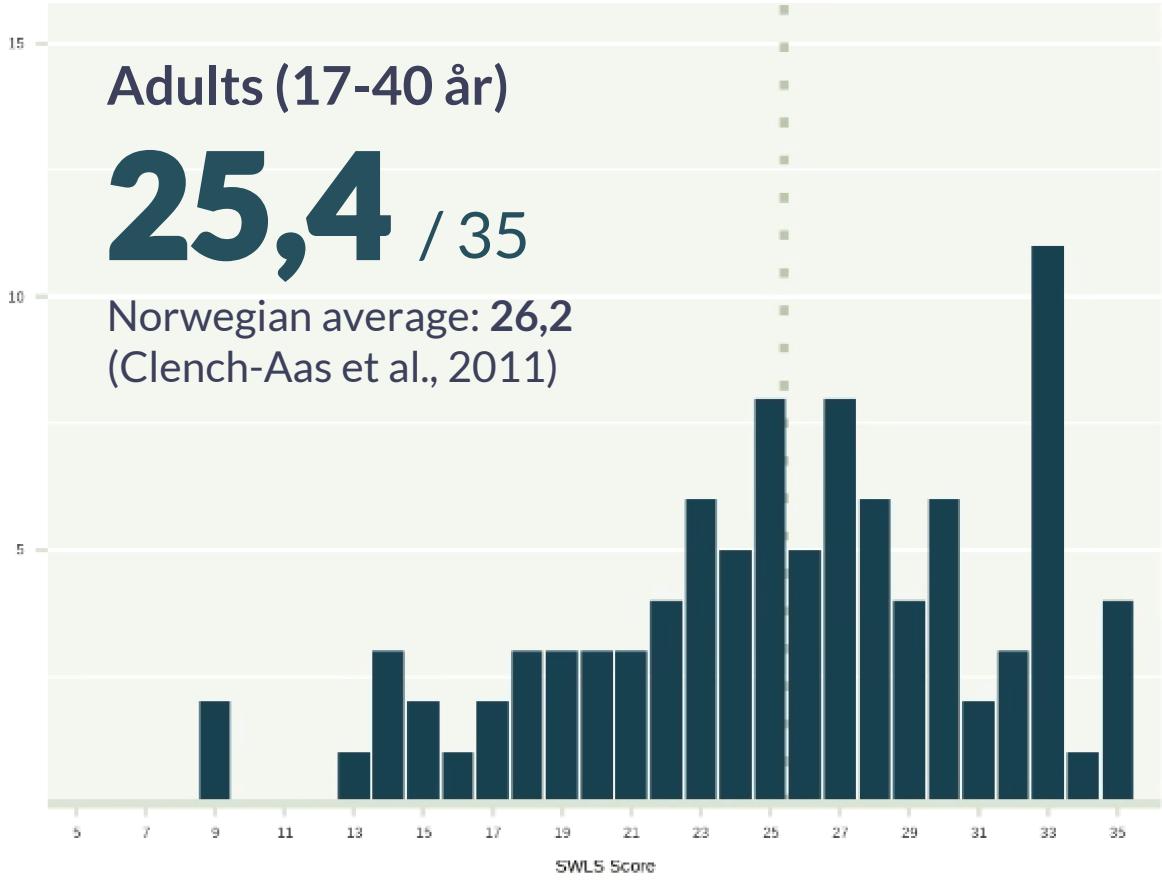
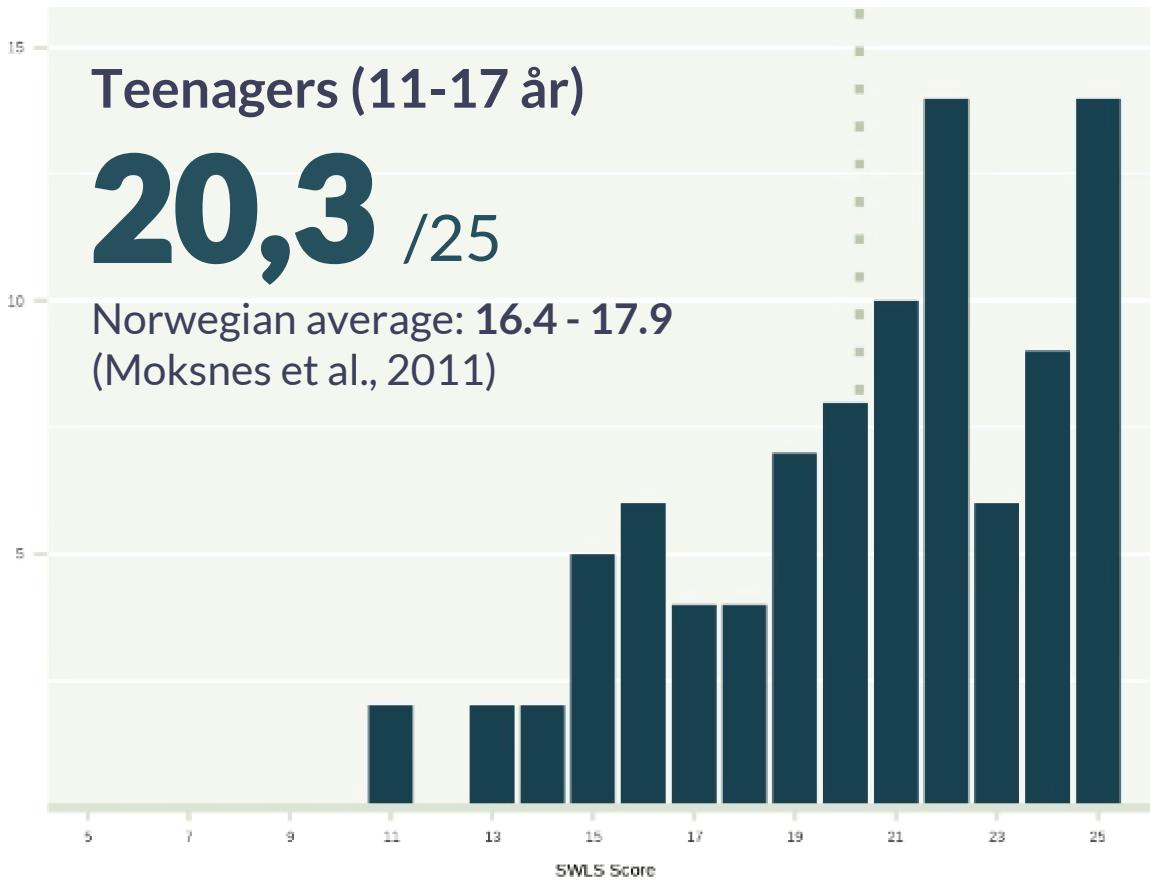


Satisfaction with Life (SWLS)

1. På de fleste måter er livet mitt nær idealtet mitt
2. Mine livsforhold er utmerkede
3. Jeg er tilfreds med livet mitt
4. Så langt har jeg fått de viktige tingene jeg ønsker i livet
5. Hvis jeg kunne leve livet på nytt, ville jeg nesten ikke forandret noe

→ Subjective perspective

Satisfaction with Life Scale



- Positive correlation with participation in organized activities, self-reported benefit from CI
- Negative correlation with avoidance / exclusion from social situations, misunderstandings in social situations,

That's it!

- › Children who receive a early bilateral CI today...
 - ❖ benefit from 30+ years of experience at OUH
 - ❖ get some of the best standard of care worldwide
 - ❖ have excellent chances of becoming competent spoken language users and happy individuals
- › Challenges around school entry
- › Social integration could be a protective factor

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