When is silence not silent?
the effect of cochlear implants on tinnitus

Kelly Assouly, PhD

COCHLEAR IMPLANT INTERNATIONAL
COMMUNITY OF ACTION.AISBL

Disclosure of conflict of interest

Tinnitus Research Project Manager

Cochlear®
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Invited Researcher

UMC Utrecht

Co-Director

TRI Academy
together in tinnitus education

TRI Academy — Linktree

https://linktr.ee/tri.academy


Do you have tinnitus?

Tinnitus in children

4.7% to 46%
in children with normal hearing

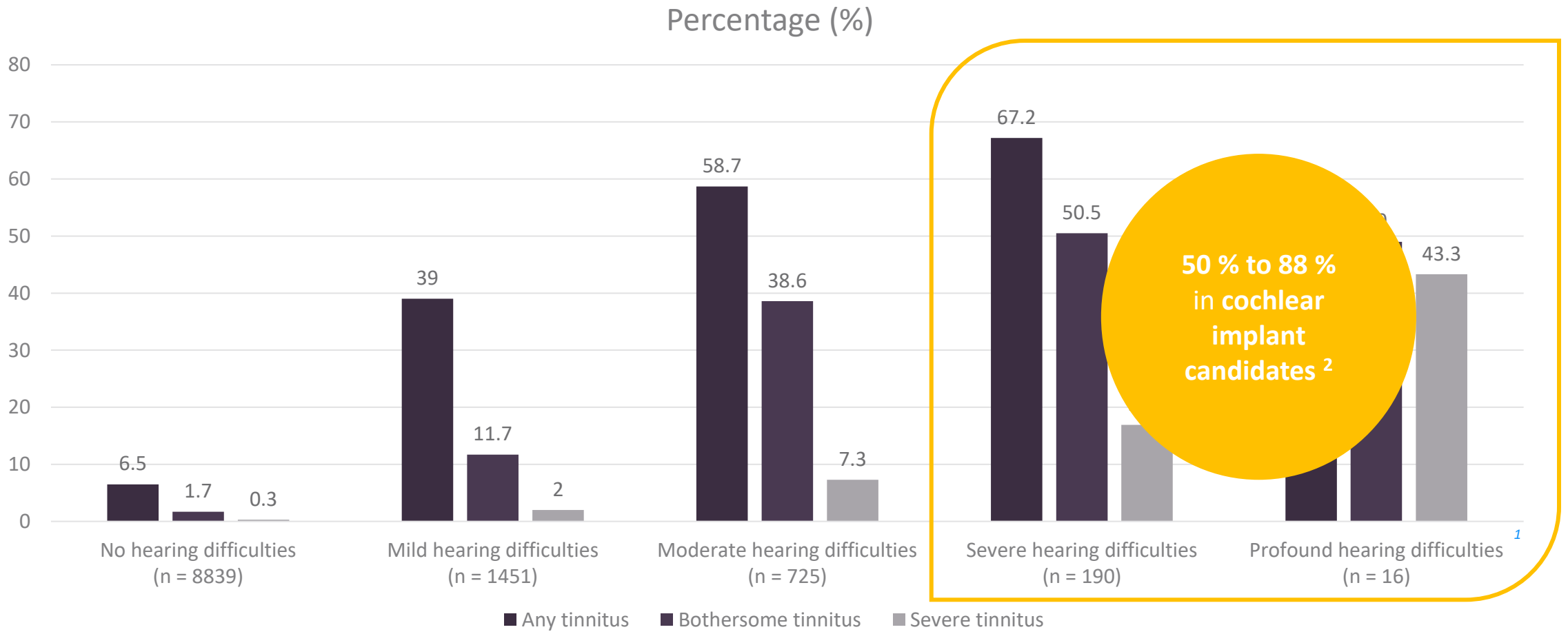


23.5% to 62.2%
in children with hearing loss

Many children do not spontaneously report tinnitus unless specifically asked, suggesting that tinnitus in childhood is likely under-recognized in clinical practice.

Prevalence estimates vary widely depending on study methods and tinnitus definitions. *(Rosing et al. 2016, Jacquemin et al. 2023, Baguley et al. 2024)*

Tinnitus in adults



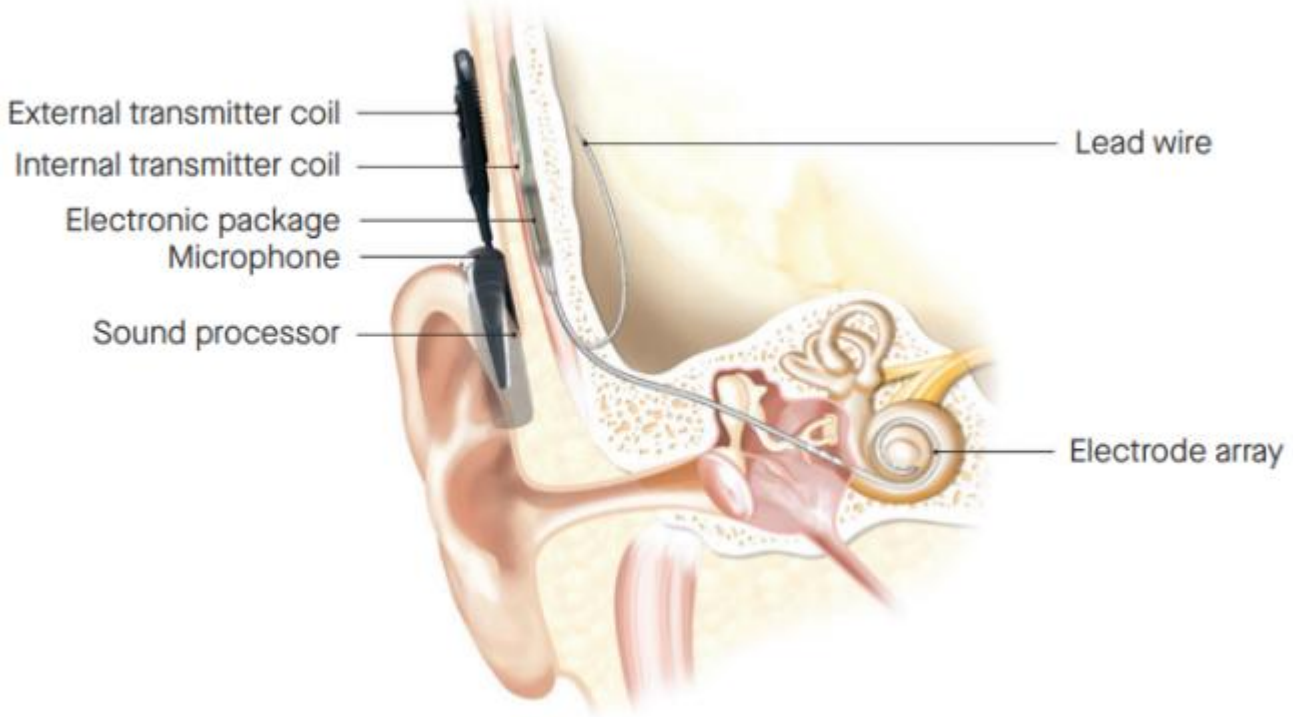
50 % to 88 % in **cochlear implant candidates** [2]

[1] *Biswas et al. 2021*

[2] *Quaranta et al. 2004, Pierzycki et al. 2016*

Cochlear implant: treatment for severe-to-profound hearing





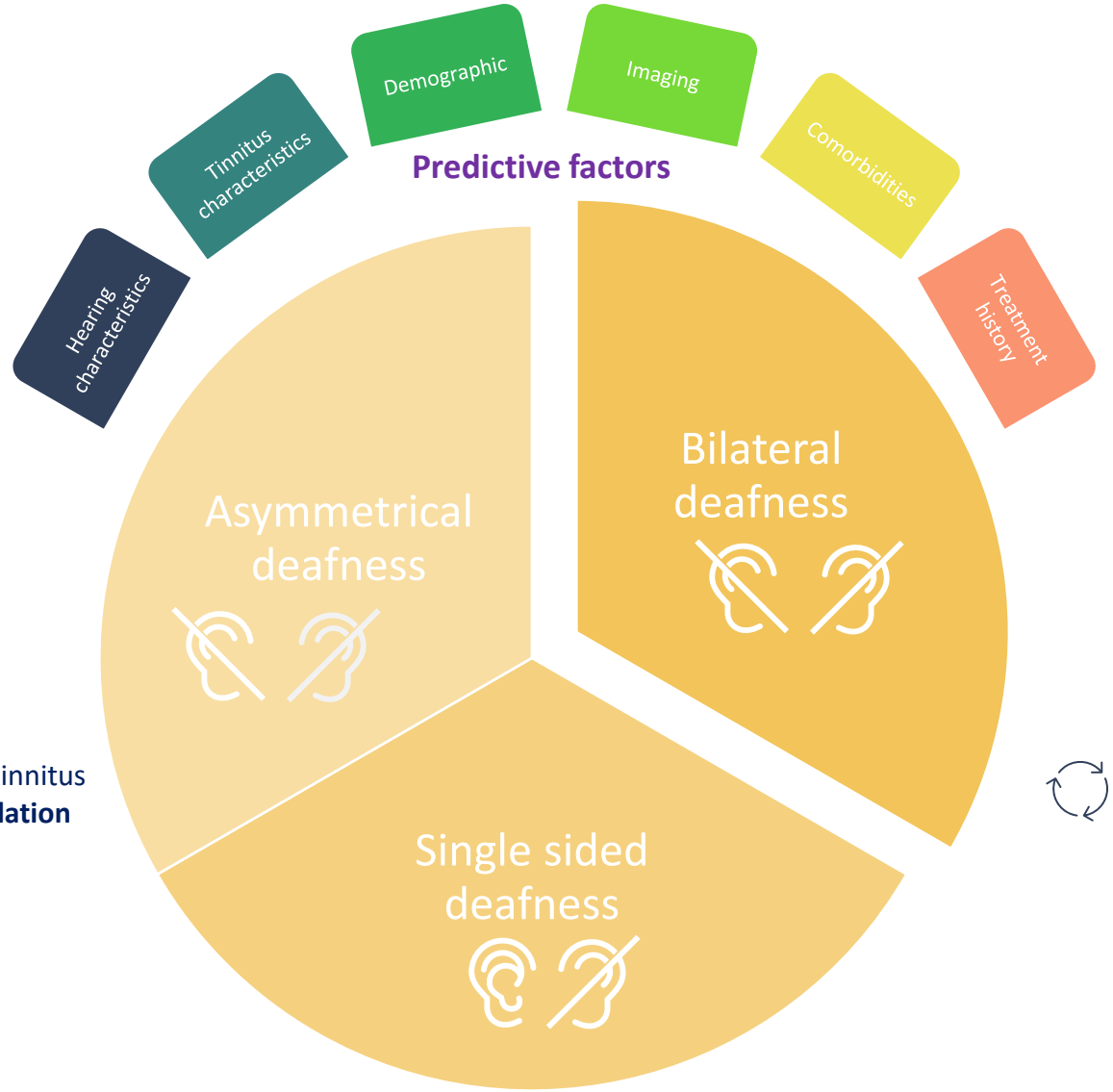
Cochlear implant (CI) primarily aims to improve hearing functions.

Clinical observations that CI can reduce tinnitus loudness & distress.

Effect of cochlear implants on tinnitus

Open access Protocol
BMJ Open Effect of electrical stimulation with a cochlear implant on tinnitus impact: protocol of an individual patient data meta-analysis

Kelly Assouly [1,2,3] Adriana L Smit [1,2] Inge Stegeman [1,2]

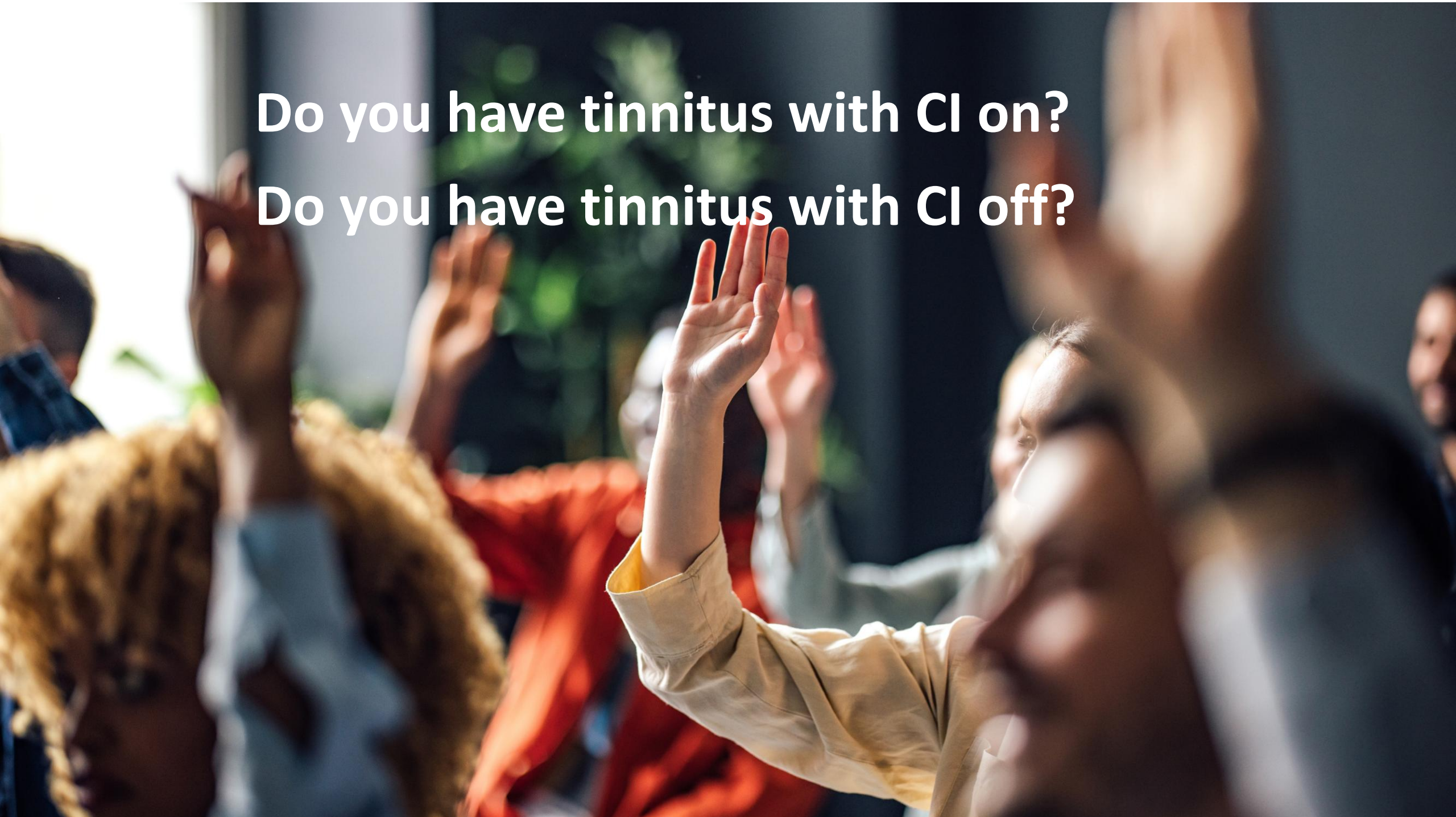


Existing clinical evidence for severe tinnitus
Lack of evidence for broader population

Partial or complete resolution of tinnitus in **65%** [1]
No meaningful change in tinnitus in **27%** [1]
Worsening of tinnitus in **10%** [1]
Heterogeneity in tinnitus outcomes

Clinical evidence
FDA approved CI for SSD (2019)
France approved CI for SSD and unilateral incapacitating tinnitus (2021)

[1] Assouly et al. 2022


Do you have tinnitus with CI on?
Do you have tinnitus with CI off?

PLOS ONE

Real life impact of tinnitus on CI recipients

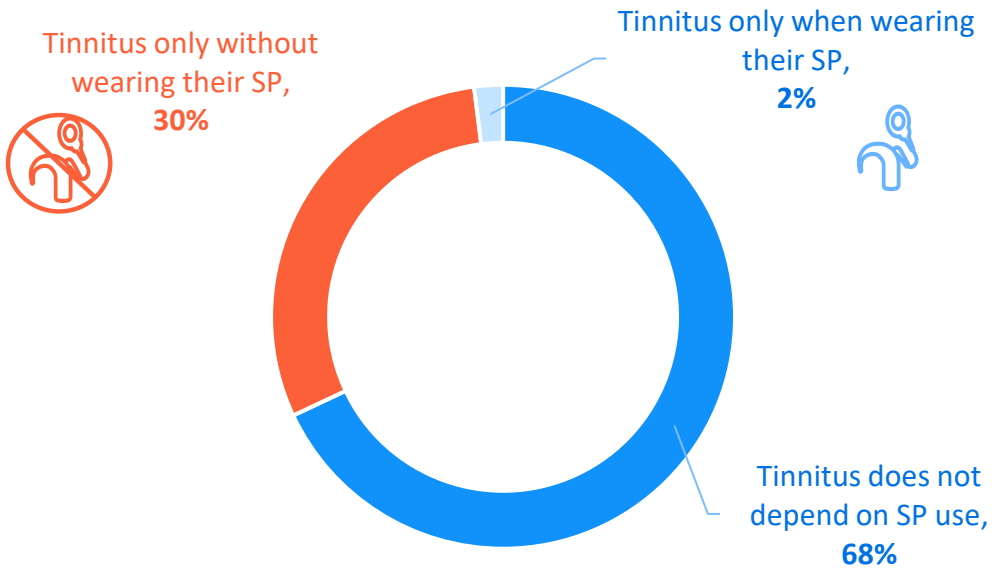
RESEARCH ARTICLE
The impact of tinnitus on adult cochlear implant recipients: A mixed-method approach

Kelly K. S. Assouly[1,2,3]*, Maryam Shabbir[4], Bas van Dijk[3], Derek J. Hoare[4,5], Michael A. Akeroyd[4,5], Robert J. Stokroos[1,2], Inge Stegeman[1,2], Adriana L. Smit[1,2]

Survey participation

414 recipients replied to the survey.

Tinnitus presence



SP: sound processor

Tinnitus impact

63% rated tinnitus as a **small problem to not a problem** with SP.

70% rated tinnitus as a **moderate to very big problem** without SP.

Tinnitus seemed to increase when **performing a hearing test or CI programming session**, when being tired, stressed or sick.

→ **Tinnitus presence and impact can depend on the sound processor usage**

The effect of cochlear implants on tinnitus



Tinnitus prevalence is higher in hearing-impaired and CI candidates.

Future research aims to predict and understand heterogeneity in tinnitus outcomes.



Tinnitus impact and presence can depend on the sound processor use.

Thanks

Research partners

UMC Utrecht

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UMC Utrecht
Brain Center Rudolf Magnus

MARIE CURIE ACTIONS

TINACT
Tinnitus
Assessment
Causes
Treatments

Collaborations

EAR SCIENCE
Institute Australia

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

kassouly@cochlear.com

Join the next CIICA conversation: CI and tinnitus



What would you like to discuss next time?

Previous topic:

- CI and tinnitus: what do we know and what do we want to know
- Cochlear implants & tinnitus: why every journey sounds different
- Tinnitus and CI users: one person's hiss is another person's sizzle
- Tinnitus trajectories with CI
- Experiences of Tinnitus and CI