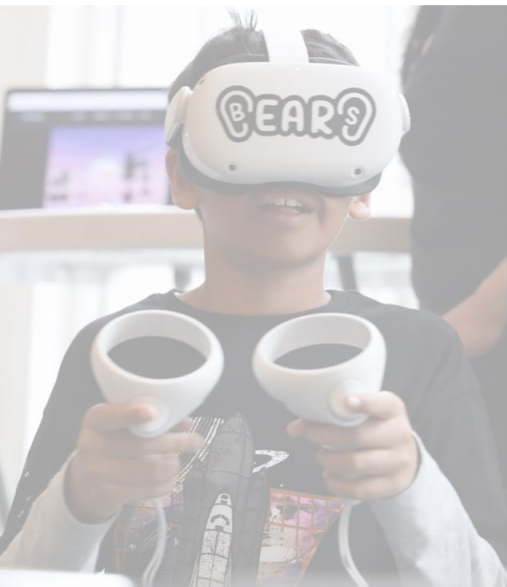


BEARS virtual reality training: Rehabilitation co-created with cochlear-implant users



Dr Marina Salorio-Corbetto
Postdoctoral researcher,
University of Cambridge

NCIUA Conference, 2024



What is BEARS (Both Ears)?

- 🐷 BEARS (Both Ears) is a virtual-reality intervention for 8-16 year olds
- 🐷 It includes games to train speech in noise, localisation and spatial music listening
- 🐷 It is being evaluated in a UK nationwide clinical trial, comparing BEARS intervention (+usual care) with usual care alone
- 🐷 £2.5million funded by National Institute of Health Research (NIHR) across 5 years
- 🐷 First NIHR Programme grant for a behavioural intervention for deaf children and young people with bilateral CIs



BEARS team



Debi Vickers



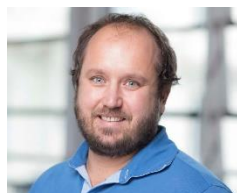
Bhavisha Parmar



Marina Salorio



Fleur Corbett



Lorenzo Picinali



Nerja Van Zalk

Imperial College London



Dan Jiang



Chris Rocca



Sandra Driver



Andrew Soulby



Merle Mahon



Andrew Steptoe



Stuart Rosen



Nick Freemantle



Caroline Clarke



Ruth Nightingale

Liz Arram



Pdraig Kitterick



Helen Cullington

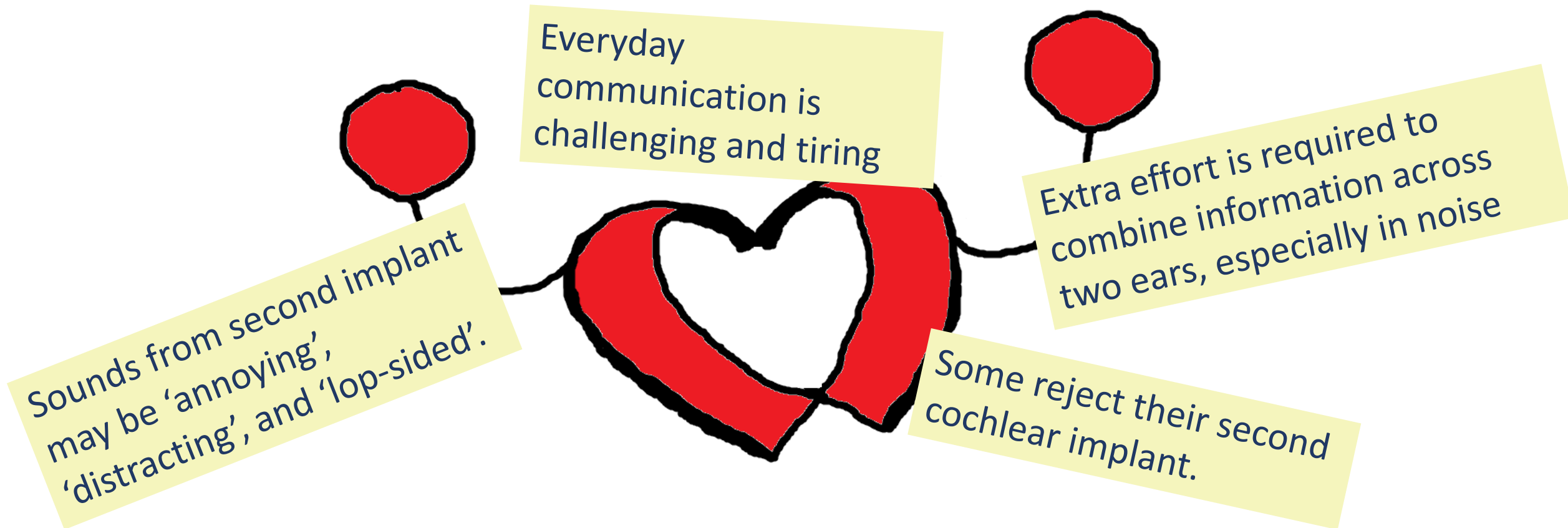


Frances Early

Why is a programme like BEARS needed?

- Listening with two ears helps us to locate sounds in space, and to understand speech in noise
- Currently 6770 (1543 of which adults) people using bilateral CIs and approximately 450 new children implanted annually in the UK
- Children and teenagers are the largest groups of bilateral CI users.
- Children and young people spend much time in sound-rich or noisy places (for example the classroom)

We've asked children and young people with bilateral cochlear implants about areas that needed improvement



They also reported that current rehabilitation techniques are not engaging, and that computer-based approaches better fit their lifestyles.

There is a need to support the listening skills of children and young people with bilateral cochlear implants

- Evidence suggests that:
 - language development
 - spatial listening skills
 - speech-in-noise understandingare better than for children and young people who wear only one cochlear implant, however, these areas remain challenging and often below the ranges for typical hearing: children and young people could benefit from support
- There are no clearly defined ways of programming bilateral cochlear implants or offering rehabilitation to ensure users maximise their potential



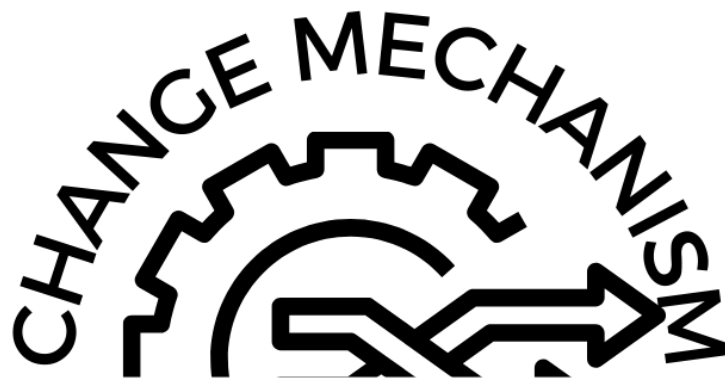
TARGET POPULATION

- Young People aged 8-16 years
- Bilateral cochlear implants
- Stable listening experience



INTERVENTION PLAN

- Training of spatial listening
- Music, speech in noise, localisation games
- Over 3 months
- Minimum 1 hour per week over two sessions



Plasticity driven cue reweighting and remapping

Enhancement via multisensory integration

Generalisation via multimodal stimuli and cognitive engagement



DIRECT OUTCOMES

- Improved speech perception in noise
- Better sound localisation
- Reduced listening effort



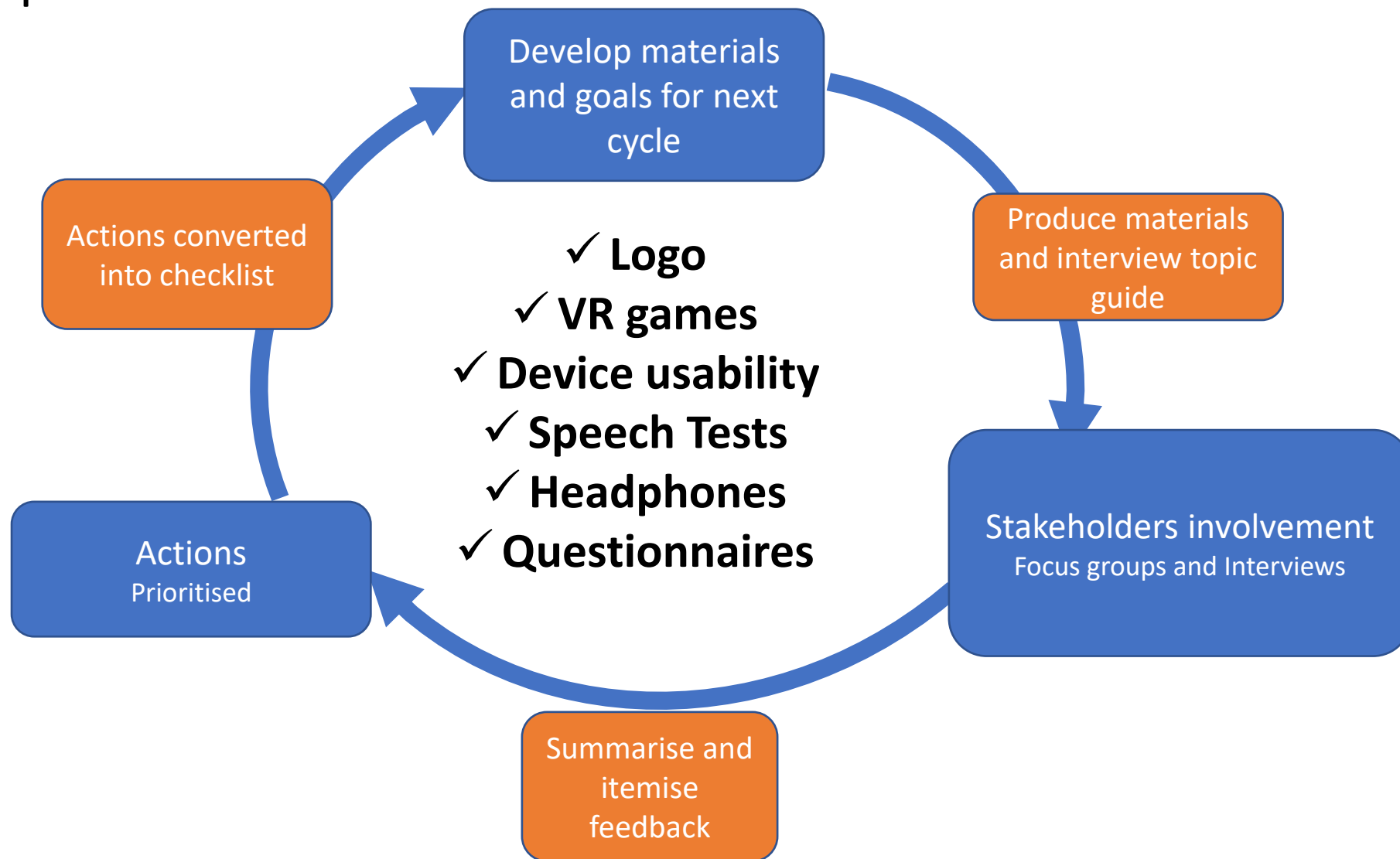
CHANGES TO HEALTH PROVISION

- Young people self-administer, encouraging responsibility for own health and progress
- Available to all, supporting equality in health care access

HEALTH AND WELLBEING OUTCOMES

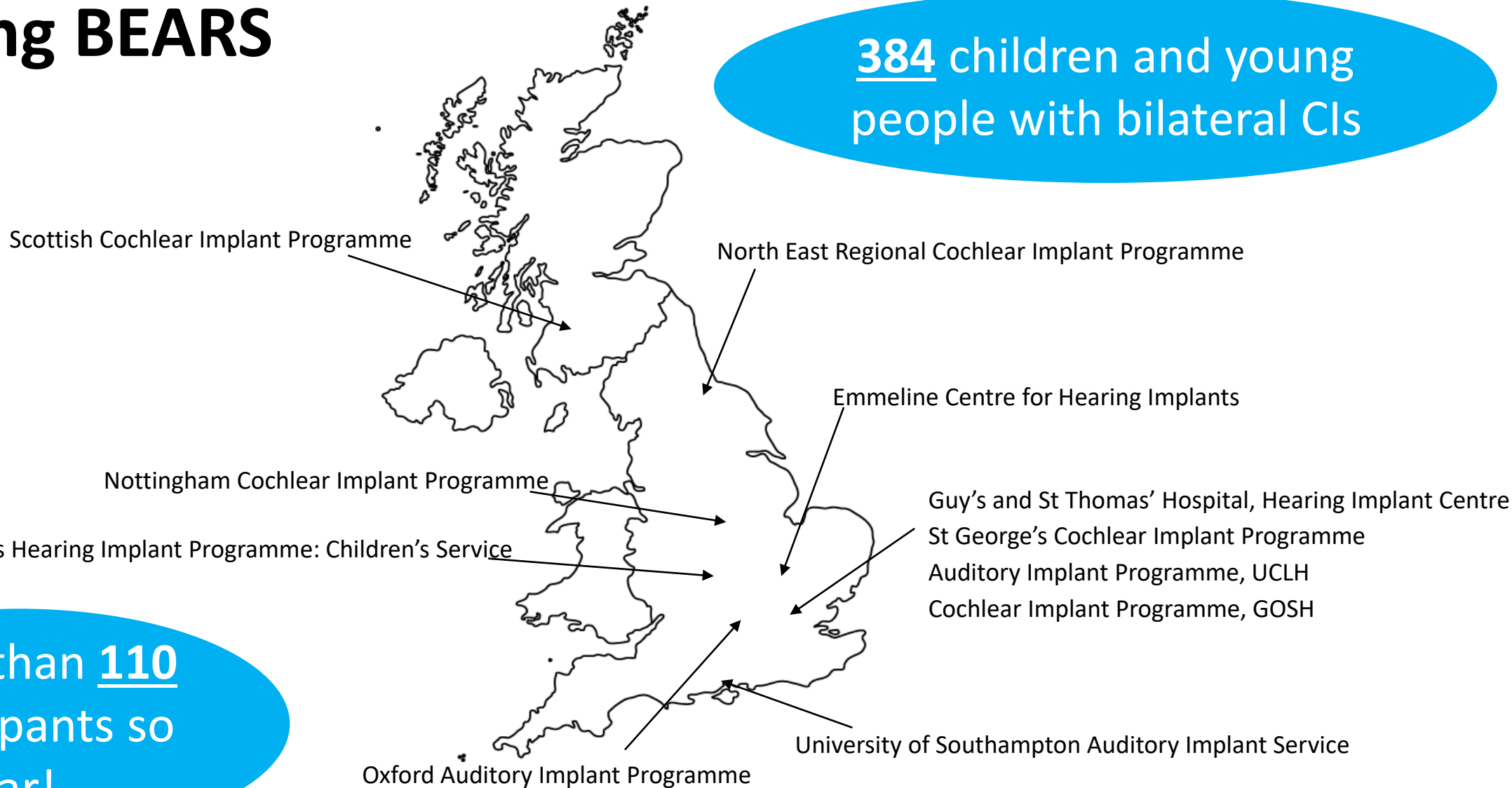
- Improved vocabulary
- Improved concentration and attention
- Improved communication
- Reduced anxiety and stress
- Improved quality of life

- Young people with CI, clinicians & teachers of the deaf have contributed to the development of BEARS.



Assessing BEARS

384 children and young people with bilateral CIs



More than **110** participants so far!

What we want to know

Does the use of BEARS:

- (i) improve spatial speech-in-noise perception in relative to Usual Care;
- (ii) improve quality of life relative to Usual Care;
- (iii) improves perceived benefits for everyday listening

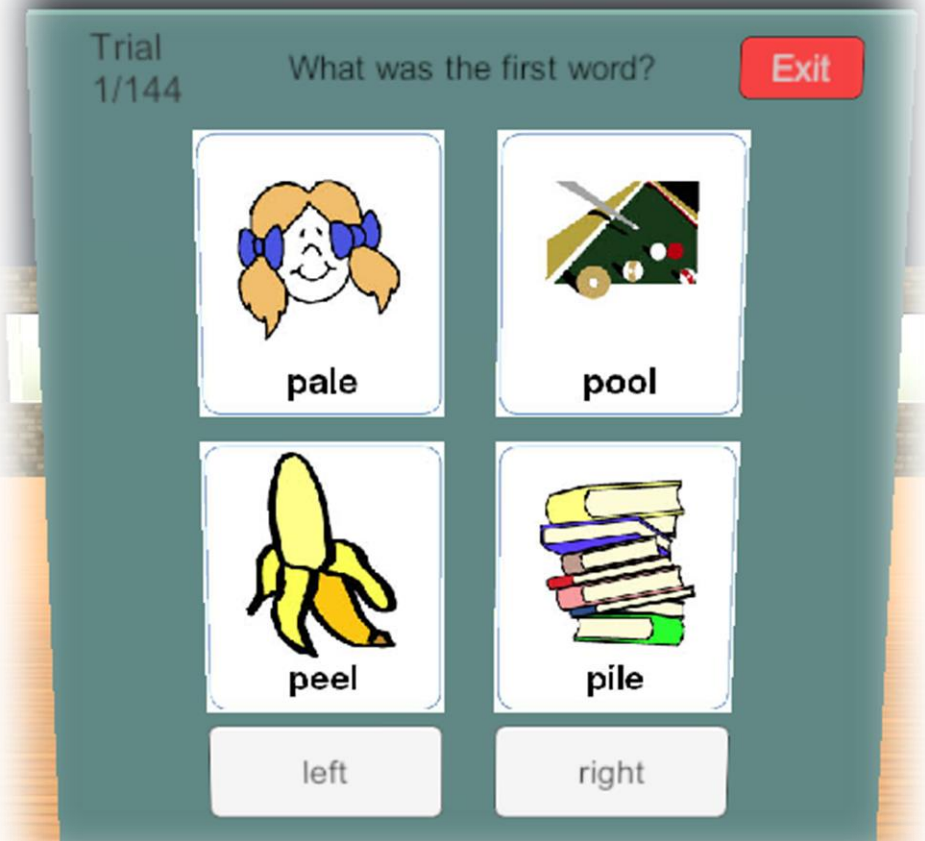
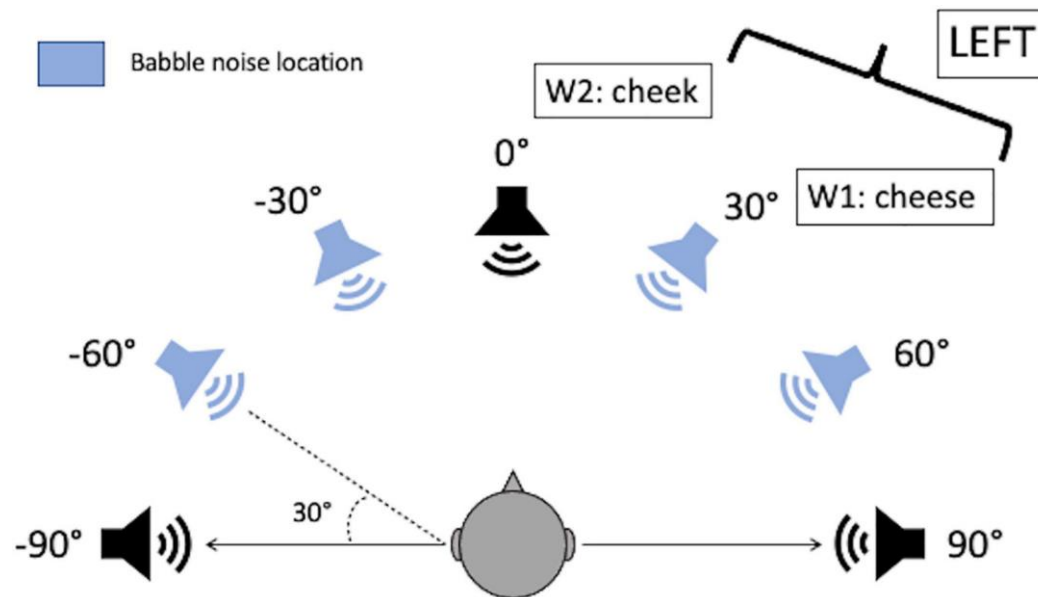
Additionally

- (i) Is BEARS cost effective compared with Usual care?

Complementary, independent process evaluation to understand how the trial was implemented and how BEARS could be better offered as a health intervention for people once the study is finished.

Main outcome measure: spatial speech in noise

Immersing listeners in complex acoustic environments with just a pair of headphones



Introducing the Spatial Speech in Noise test (Bizley et al., 2015) and its virtual audio version SSiN-VA (Salorio-Corbetto et al., 2022)

Qualitative interviews: aim and methods

Exploring deaf children's listening experiences in daily life

Semi-structured interviews on Zoom at the start of the BEARS trial

Experiences when talking 1:1/groups; at home/school; listening to music

Interviewed 33 children, aged 8-16, 10 CI centres

Data analysed thematically, using framework approach



Merle Mahon



Ruth Nightingale

Concluding remarks

- 🐘 First NIHR Programme grant for a behavioural intervention for deaf children and young people with bilateral CIs
- 🐘 So far, over 110 participants across 11 CI centres in the UK
- 🐘 Over 70 participants have completed the 3-month period and the primary outcome assessment at this point.
- 🐘 We are learning about listening experiences directly from children to better understand what contributes to better listening conditions
- 🐘 We are working with the clinics to use our virtual platform to deliver meaningful and complex clinical assessments with simple space and equipment requirements

Acknowledgements

Special thanks to:

- BEARS team members
- Clinical site teams
- Our participants and their families!
- Patient and public involvement contributors (PPI)
- BATOD
- Cochlear implanted children's support group (CICs)
- NCIUA



Thank you for listening. Any questions?

