

Newborn diagnostic auditory assessment from NHSP during COVID lockdowns in England

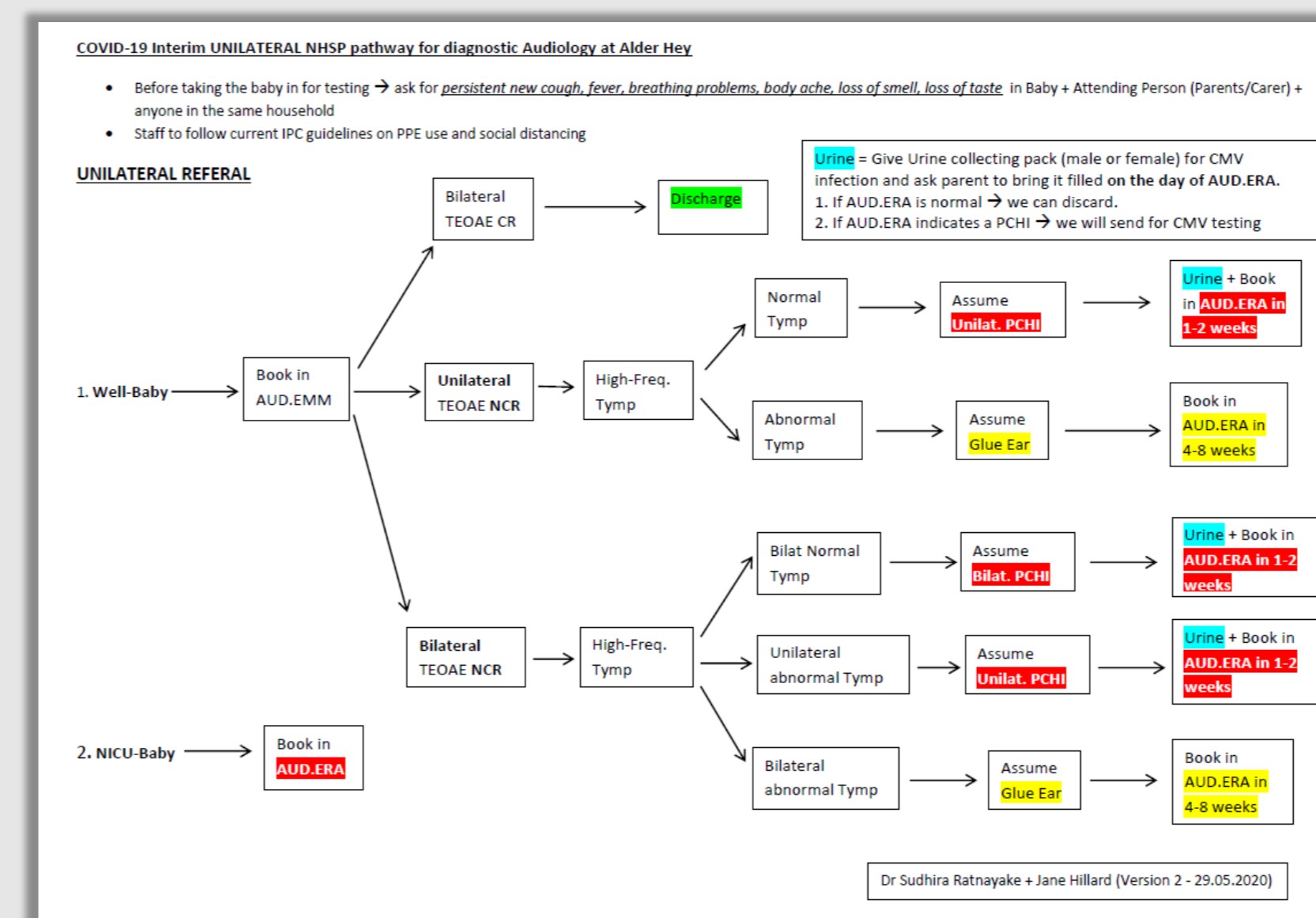
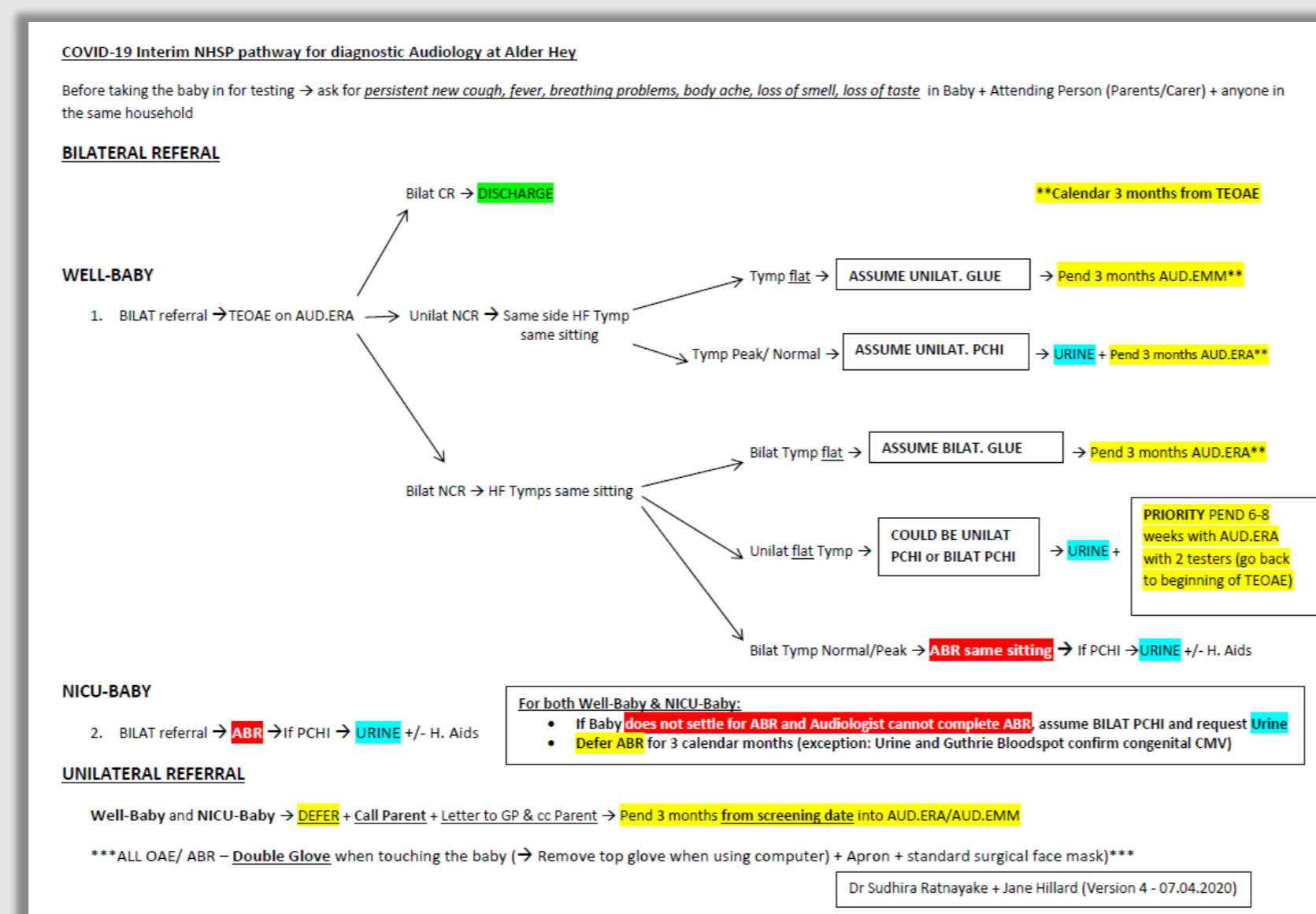
Mrs Auboney Dineen ¹, Chief Audiologist - Auboney.Dineen@alderhey.nhs.uk
 Dr Sudhira Ratnayake ^{1 & 2}, Consultant Audiovestibular Physician
 Mrs Jane Hilliard ¹, Chief Audiologist
 Mrs Neera Chopra ¹, Chief Audiologist
 Mrs Maureen O'Hare ¹, Chief Audiologist & Audiology Manager
 Prof Soumit Dasgupta ^{1 & 2}, Consultant Audiovestibular Physician

1. Department of Audiovestibular Medicine & Audiology | Alder Hey Children's Hospital | Liverpool, UK
 2. School of Medicine | University of Liverpool | Liverpool, UK



Background

- During the COVID Pandemic, England had 3 national lockdowns from 23rd March 2020 to March 2021.¹
- The national Audiology organisations issued various interim guidelines at different stages of the pandemic.
- Alder Hey Children's Hospital provide diagnostic Auditory Brainstem Response (ABR) tests to 2x Newborn Hearing Screening Programme (NHSP) sites, namely Liverpool and West Lancashire, and babies referred from Isle of Man.
- In addition to the diagnostic services, we provide a full medical deafness aetiology assessment (as per national guidelines from the British Association of Audiological Physicians ²) and auditory rehabilitation service.
- During the COVID lockdowns, we adopted interim diagnostic pathways for bilateral and unilateral NHSP referrals, with approval from the Hospital's ethical and COVID taskforces.



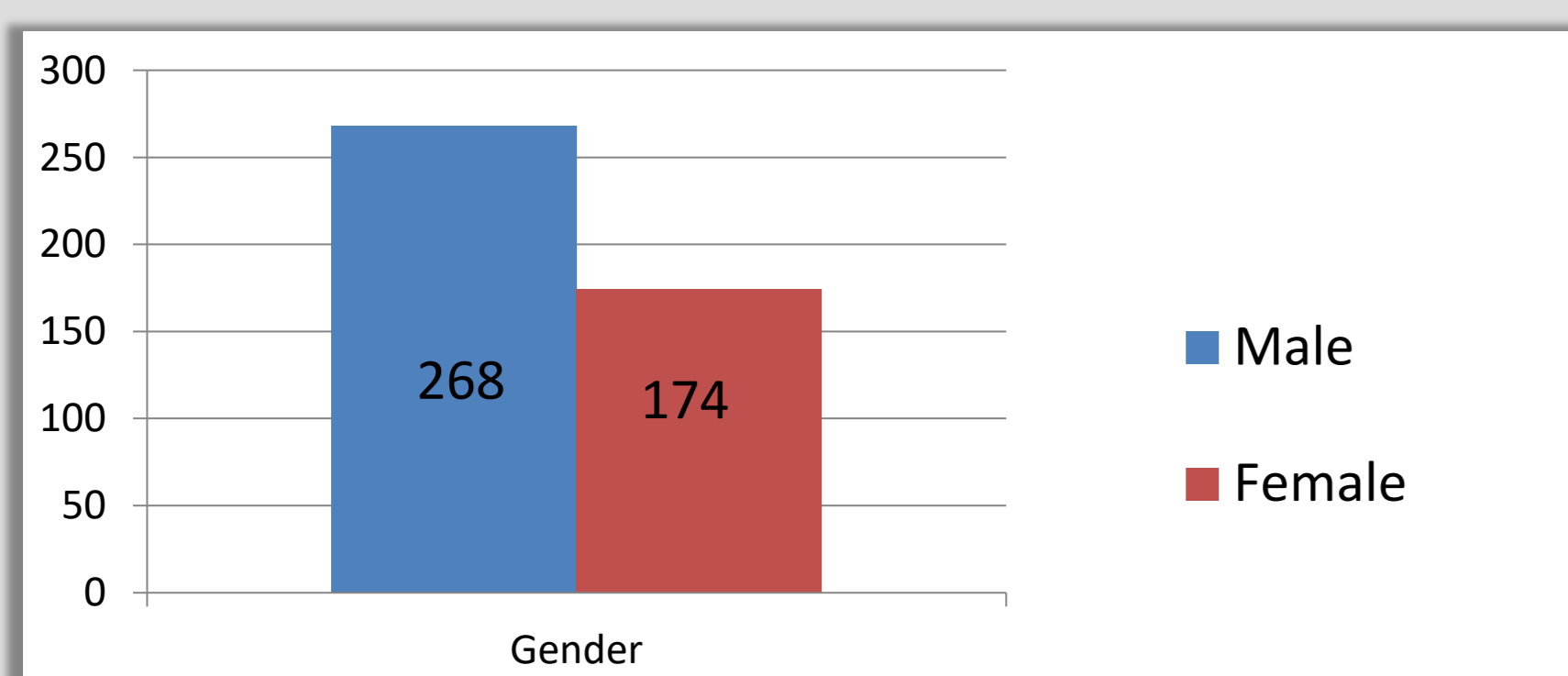
Methods

- A retrospective case note review, registered with the Governance and Quality Assurance Department, was undertaken of all newborns who had at least one post-NHSP auditory assessment (Transient-Evoked Oto-Acoustic Emissions, TEOAE and/or ABR) during the 12-month period of COVID lockdowns.
- All diagnostic equipment undergo regular calibration as per national and departmental guidelines.
- Data collected: NHSP referral details, diagnostic auditory test details, type and degree of hearing loss detected from auditory tests, deafness aetiology.

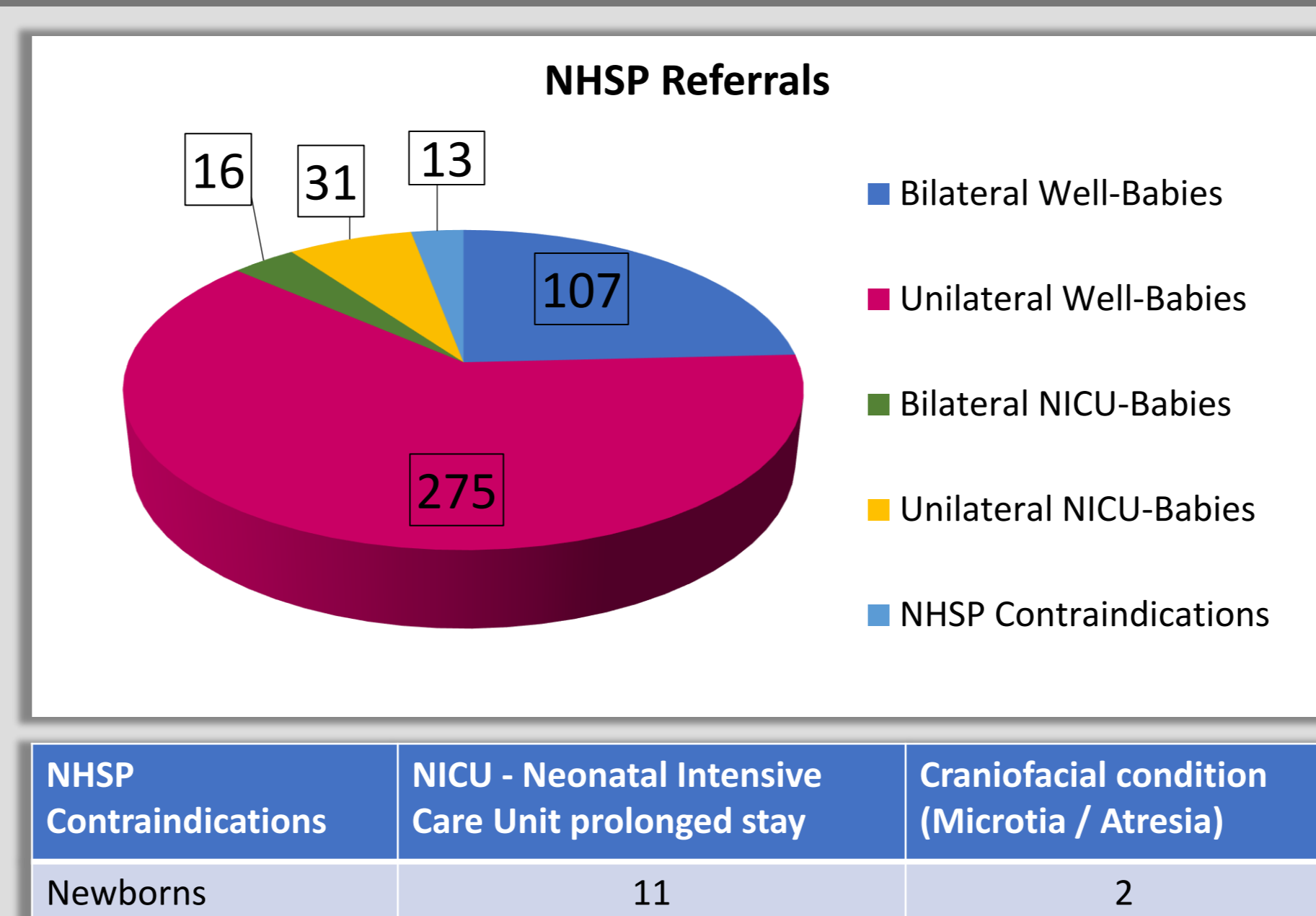
Results

Demographics

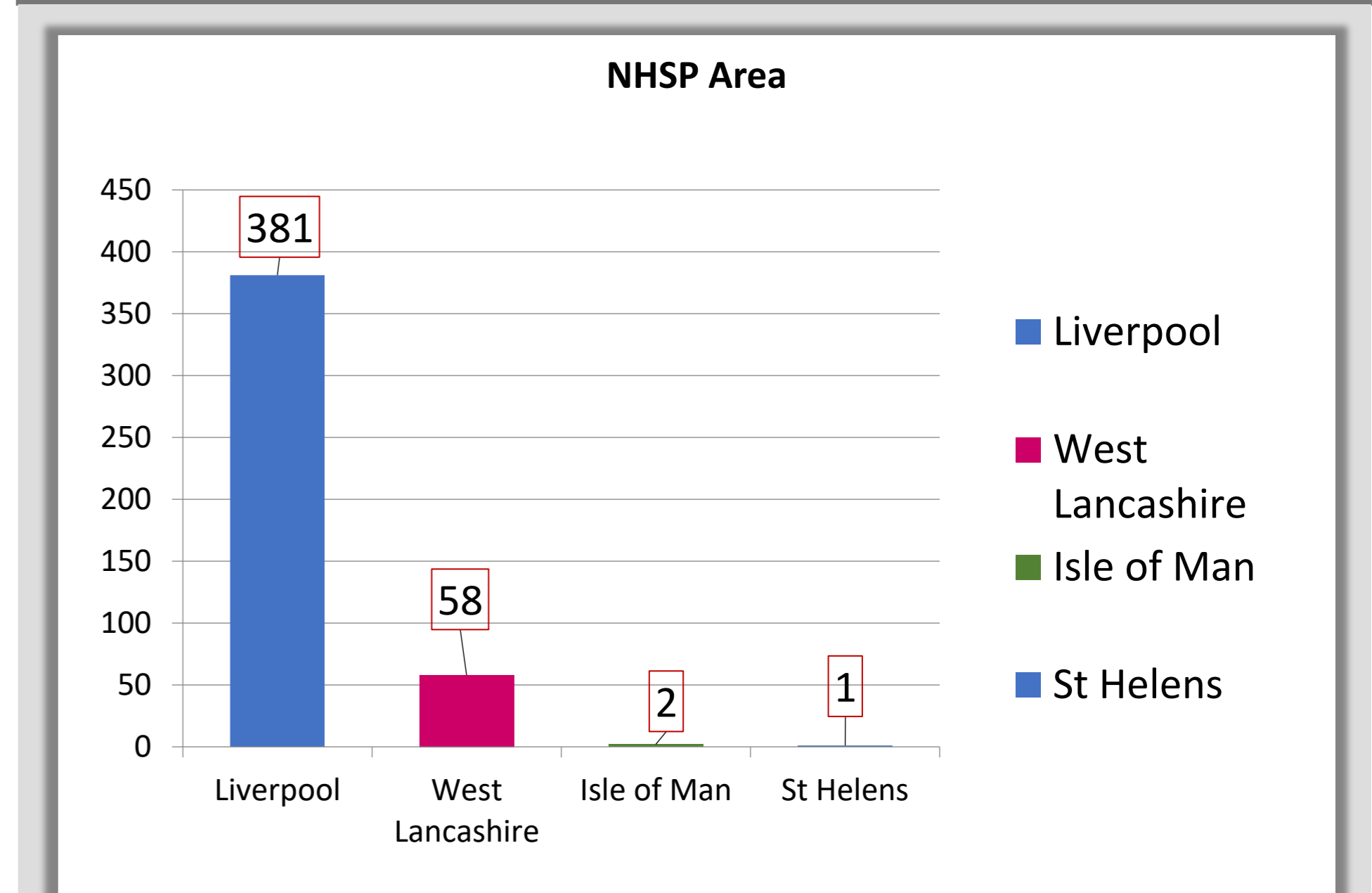
- Newborn cohort that had at least one auditory assessment: n = 442
- Male: Female = 268 (61%) : 174 (39%)



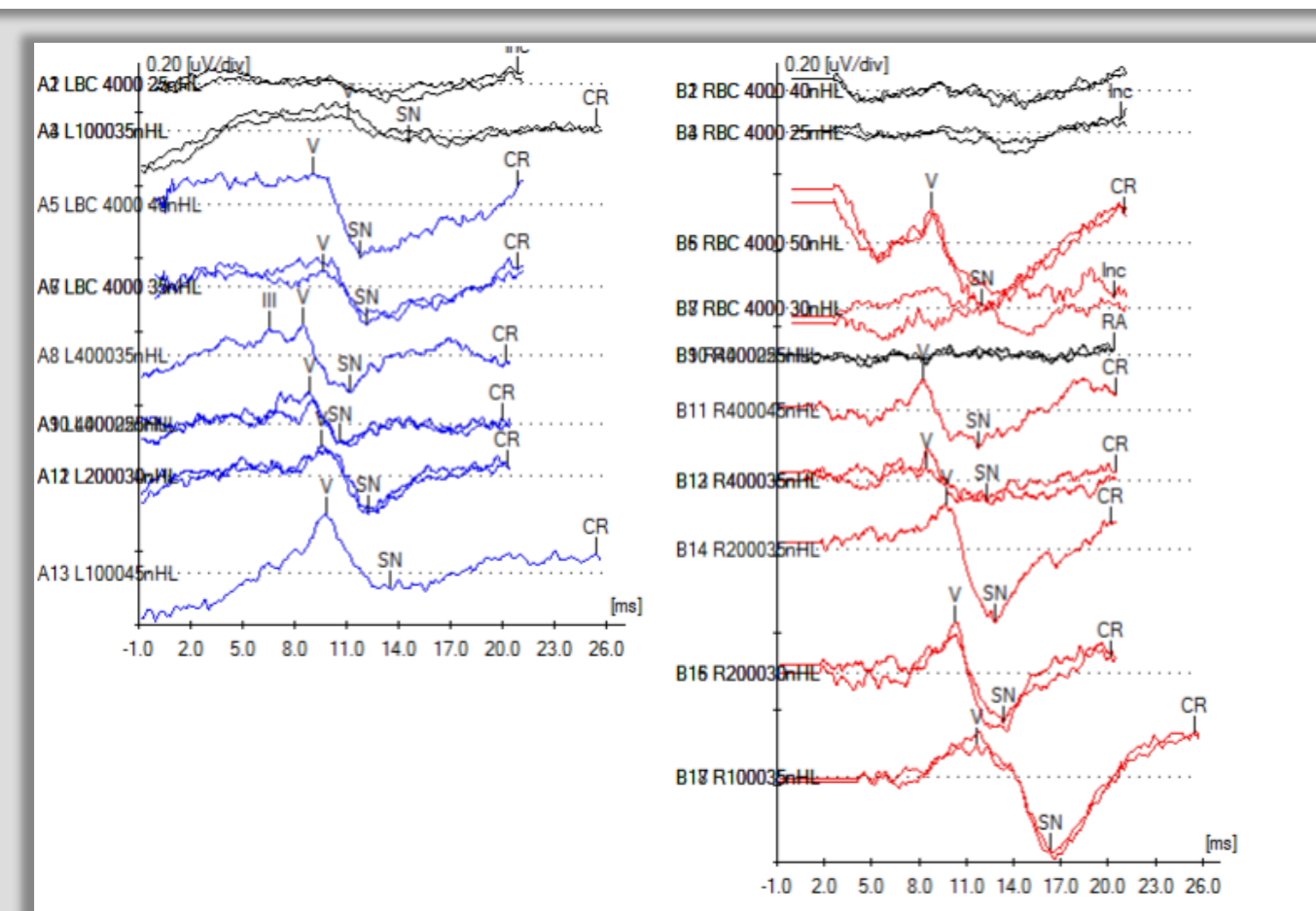
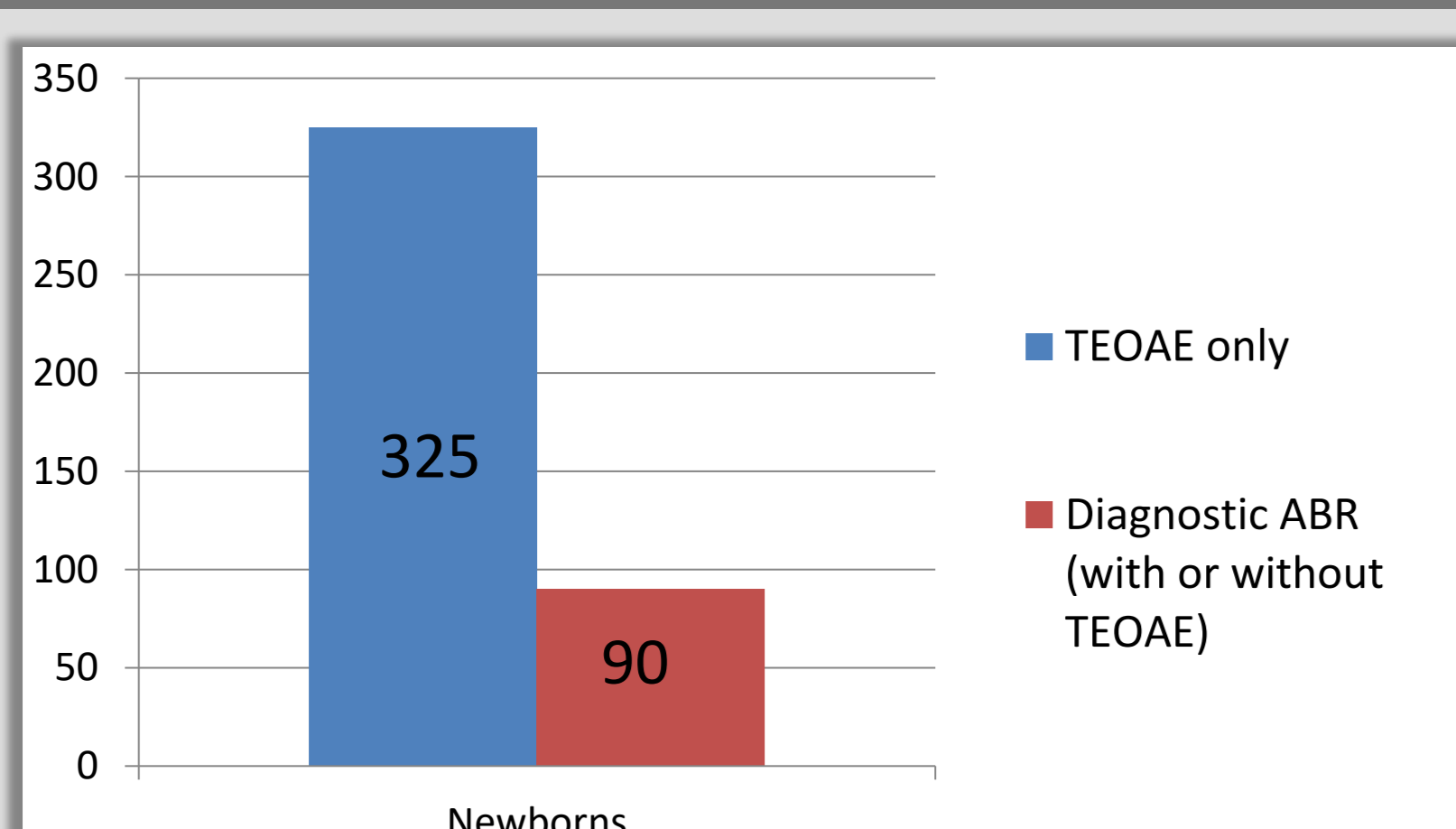
NHSP referrals



NHSP area coverage

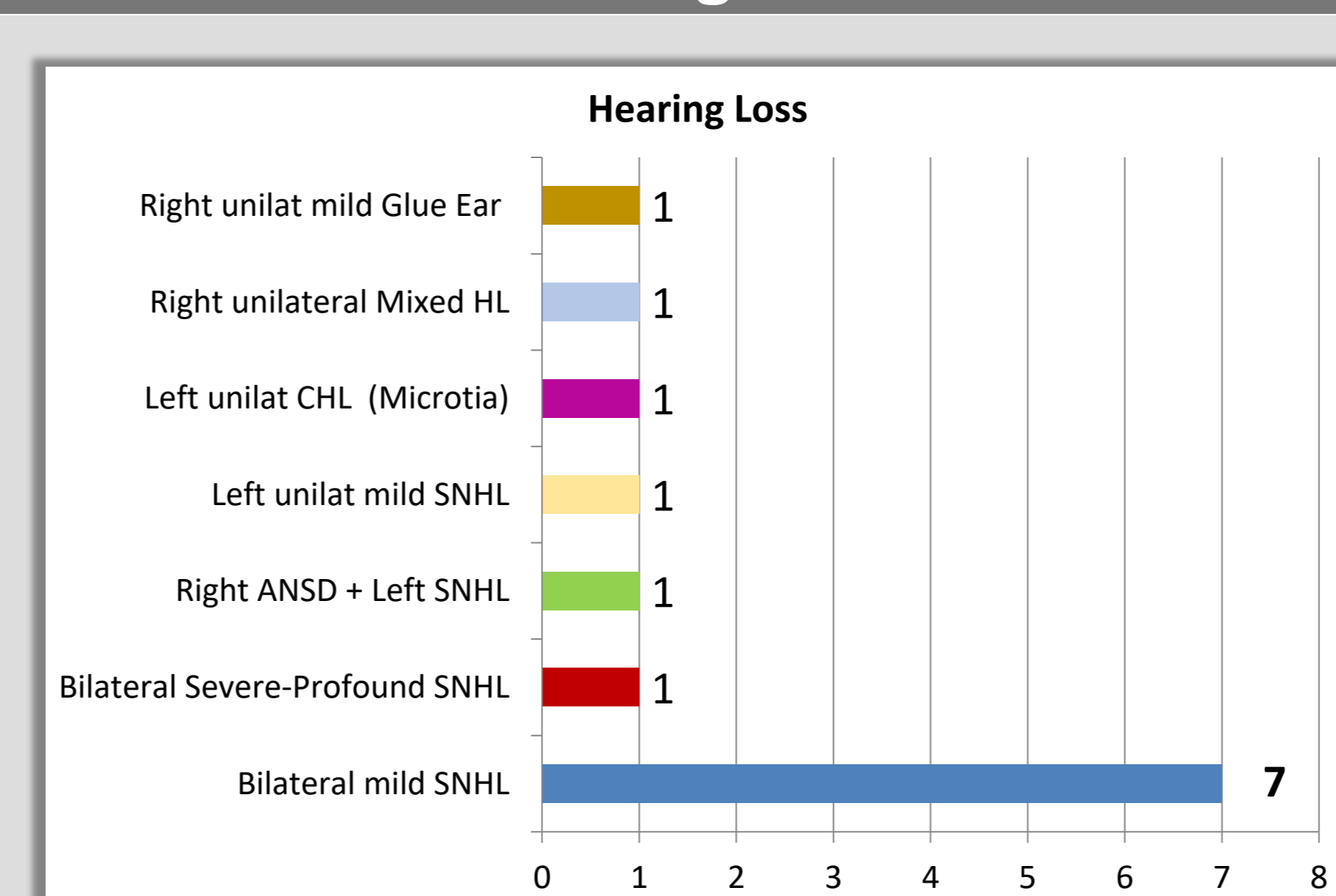


Post-NHSP auditory tests



Summary ABR - Bilateral mild SNHL in Congenital CMV with Cystic Fibrosis

Hearing Loss



LEGEND
 SNHL = Sensorineural Hearing Loss
 CHL = Conductive Hearing Loss
 ANSD = Auditory Neuropathy Spectrum Disorder

Normal Hearing	Targeted Follow-up at 8 months	Discharged after Diagnostic Auditory tests
Newborns	37	392

Deafness Aetiology & Amplification

Hearing loss	Medical Aetiology and Amplification
Bilateral mild SNHL = 7	Vohwinkle Syndrome = 1 - unaided (Autosomal Dominant Connexin 26 condition + family members with affected skin and hearing)
	Congenital Cytomegalovirus (CMV) with Cystic Fibrosis = 1 - unaided
	Autosomal Recessive Genetic Deafness = 2 (One each - Homozygous <i>TECTA</i> gene variants and Homozygous <i>OTOGL</i> variants) - both BTE aided
	Unknown Aetiology = 3 - 1 baby BTE aided
Bilateral Severe-Profound SNHL = 1	Unknown Aetiology - *Cochlear Implant referral*
Right ANSD + Left SNHL = 1	Johanson-Bliizzard syndrome - *Cochlear Implant referral*
Left unilateral mild SNHL = 1	Unknown Aetiology - unaided
Left unilateral Moderate permanent Conductive Hearing Loss	Ocular-Auricular-Vertebral Spectrum (Goldenhar Syndrome) with Left Microtia, Craniofacial dysmorphism and Cardiac anomalies - unaided
Right unilateral moderate Mixed hearing loss	Unknown Aetiology (ongoing) - Subtle Right Craniofacial dysmorphism - unaided
Right unilateral mild Glue Ear (Conductive Hearing Loss)	Trisomy 21 (Down's syndrome) - born prematurely at 31 weeks - unaided

Conclusions

- By adopting modified interim pathways, it was possible to deliver a safe diagnostic auditory NHSP pathway during the COVID pandemic.
- There was no compromise in time-critical aetiological investigations (e.g. urine for CMV) or auditory interventions (e.g. cochlear implant referrals).
- Close multi-disciplinary working ensured complete completion of both audiological and medical assessments for babies referred from newborn hearing screening.

References

- Brown J and Kirk-Wade E. (2021) **Coronavirus: a history of 'Lockdown Laws' in England**. House of Commons Library. <https://commonslibrary.parliament.uk/>.
- British Association of Audiovestibular Physicians. (2015) - **Guidelines for aetiological investigations of permanent childhood hearing impairment (mild to moderate bilateral / severe to profound bilateral / unilateral)** : <https://www.baap.org.uk/documents-guidelines-pathways-and-clinical-standards.html>