

The Impact of COVID-19 on the Newborn Hearing Screening Programme in a Large Teaching Hospital

Malik S, Smalley J, Prendergast G and Hole K.

Nottingham University Hospitals Trust, The University of Manchester
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INTRODUCTION

- The Newborn Hearing Screening Programme (NHSP) aims to identify permanent, moderate, severe and profound deafness and hearing impairment in new-born babies ensuring appropriate assessments and habilitation for infants with hearing loss, whilst supporting their parents and guardians.
- Offering hearing screening for new-borns enables early identification of a hearing impairment to reduce the effects of impaired speech and language development, thus aiming for a better quality of life for individuals.
- In response to the initial COVID-19 outbreak, Nottingham University Hospitals (NUH) altered many of their services, which included changes to the NHSP and ceasing of audiological evoked potential diagnostic testing. The national consensus was to discharge patients rapidly where appropriate to reduce the risk of COVID-19 spreading and to keep beds free for those who require them.
- The British Academy of Audiology (BAA) and Public Health England (PHE) published recommended alterations to the conventional pathway, advising to conduct Automated Otoacoustic Emissions 1 as close to discharge as possible, with enough time to conduct an Automated Auditory Brainstem Response where no clear response is obtained, thus skipping Automated Otoacoustic Emissions 2 where time is limited.

OBJECTIVES:

- To evaluate whether the changes of The NHSP at NUH in response to COVID-19 impacted
 - i. the identification age,
 - ii. referral rate,
 - iii. number of infants identified with Permanent Childhood Hearing Impairment (PCHI),

METHODS:

- **DESIGN:** A service evaluation of the NHSP data from 1/12/2016 to 28/02/2021 obtained retrospectively through the Smart4Hearing software.
- **SAMPLE:** 31,489 infant data sets divided into five birth cohorts including a 'COVID-19' cohort (1st March 2020 - 28th February 2021).

TAKE HOME MESSAGES:

- Screening infants early can lead to an increase in referral rate to diagnostic audiological assessment
- In comparison to previous years, significant differences in age at identification of PCHI were not noted
- The number of infants identified with a PCHI and temporary conductive hearing loss did not differ greatly from the numbers obtained from the previous 4 birth cohorts.

RECOMMENDATIONS:

- Services to explore the impact COVID-19 may have had on their NHSP service, as this could impact timely identification and intervention.
- Evaluating the lost-to-follow-up rate to contact parents or guardians of infants who were not brought for diagnostic audiological assessments, reducing the risk of unidentified hearing loss.
- Future investigation into the long-term audiological effects of maternal COVID-19 infection on infants may also warrant future research.

REFERENCES:

- Public Health England (2021). Newborn hearing screening pathway requirements specification.
- Public Health England (2020). Newborn hearing screening programmes technical guidance and management of audiology referrals during the coronavirus (Covid-19) pandemic. England.
- Yoshinaga-Itano, C. (2003). From screening to early identification and intervention: Discovering predictors to successful outcomes for children with significant hearing loss. Journal of deaf studies and deaf education, 8(1), pp.11-30.

RESULTS:

- For infants born during the COVID-19 cohort, the mean chronological screening age in weeks was significantly earlier (0.15 weeks) and infants were over twice as likely to refer the screen.
- The mean chronological age in weeks at diagnostic assessment was also greatest for this cohort (8.83 weeks) as was the mean chronological age at identification of a permanent childhood hearing impairment (12.39 weeks).
- Infants born during COVID-19 did not show an increase likelihood of permanent childhood hearing impairment or a temporary conductive hearing loss at diagnostic testing, compared to other cohorts.

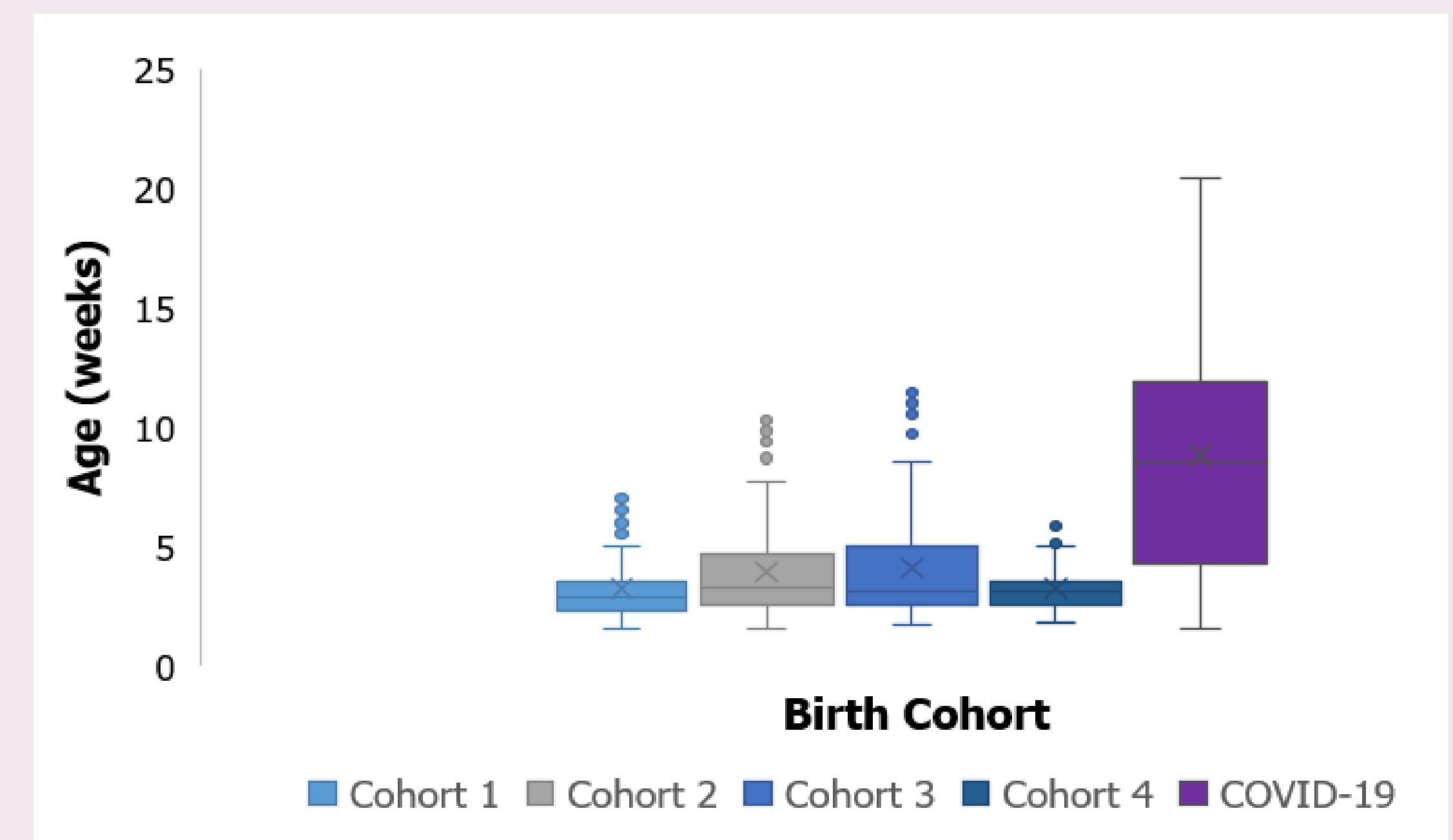


Figure 1. Box plot to display the chronological age at diagnostic testing (in weeks) per birth cohort.

	Cohort 1	Cohort 2	Cohort 3	Cohort 4	COVID 19
Total Babies Screened (n)	1861	7992	7470	7454	6712
Infants Referred/Failed Screen (n)	45	160	139	162	287
Referral Rate (%)	2.42	2.00	1.86	2.17	4.28

Figure 2. Calculated referral rates to diagnostic testing following a no clear response result per birth cohort

DISCUSSION:

Age at Screening:

- Implications of screening early can result in a high number of false positives.

Number of infants who referred the screen:

- Infants being twice as likely to refer the screen in turn could have implications on cost to patients/parents, healthcare services and parental anxiety, especially where diagnostic audiological testing is delayed.

Age at Diagnostic Assessment:

- 36% of infants were seen within the required 4 week time frame, in comparison to the previous 4 years. This suggests that infants were without care for longer periods as a result of the changes to the service.
- A delay in diagnostic audiological assessment can lead to a delay in identification and intervention of hearing loss, which can negatively impact the development of the infants speech and communication.