

# Feasibility and Outcomes of Performing Head Start Hearing Screening Programs

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## INTRODUCTION

- Congenital hearing loss is typically identifiable through newborn hearing screening. However, newborn hearing screening (NBHS) may miss some congenital losses as well as hearing losses of later onset (post NBHS).<sup>1</sup>
- Unidentified congenital or acquired hearing loss in infants and children is likely to have long-term negative effects on speech and language acquisition, academic performance, socio-emotional development and self-esteem.<sup>2</sup>
- Universal NBHS has been instrumental in detecting congenital hearing loss. However, about 10% of newborns do not receive a hearing screening and in some states 50% or more of the infants who do not pass NBHS are lost to follow-up.<sup>3</sup>
- Head Start performance standards require that Head Start or Early Head Start programs provide screenings to identify concerns regarding participants' developmental, visual, auditory, behavioral, motor, language, social, cognitive, perceptual and emotional skills.<sup>4</sup>
- Head Start screening results may be used to identify children who have been lost to follow-up and lost to documentation.

## AIM

- Determine the pass/refer rates for middle ear disorders and hearing impairment for a cohort of children age 3 to 5 years enrolled in a Baltimore County Head Start program.
- Evaluate the characteristics of individuals, families or populations that are associated with loss to follow up for children with evidence of need for audiologic evaluation by 3 months.
- Assess the feasibility of performing a large number of hearing screenings outside of a typical audiology clinic setting.
- Assess the feasibility of coordinating Head Start hearing screening with MD-EDHI program in an effort to reduce the number of children lost to system (lost to follow-up and lost to documentation).

## METHODS

**PARTICIPANTS.** 253 preschool-aged children (130 boys, 123 girls) enrolled in a Baltimore County Head Start program. Approximately 68% of the newly enrolled children were screened by our department (See Table 1).

### APPARATUS.

- Testing was conducted in quiet / available rooms at each of the ten Head Start centers.
- Audiologic screening was completed with one or more of the following devices: GSI 39 Auto Tymp (portable audiometer and tympanometer), Welch-Allyn OAE Screener and Welch-Allyn otoscope. All devices were calibrated and worked according to the manufacturer's specifications.

### PROCEDURE.

- Children were screened by a Maryland-licensed audiologist and/or supervised graduate student in audiology.
- Screening tests were administered bilaterally to all children. For pure-tone screening, children participated in conditioned play audiometry using 0.5-4 kHz tones presented at 20 dB HL. A child was considered to pass the pure-tone screening, if two reliable responses were obtained at 20dB HL for all four frequencies in both ears.
- Pass criterion: passing each of the pure-tone, tympanometry and/or OAE screenings.
- Refer criterion: not passing one or more of the pure-tone, tympanometry or DPOAE screenings in one or both ears.
- Children who did not pass the audiologic screen were referred for a diagnostic audiologic assessment .
- MD-EDHI newborn hearing screening data were collected for all children who did not pass or could not be evaluated.

## RESULTS

Table 1. Child demographic information

Variable	No.	%
Gender		
Male	130	51
Female	123	49
Age		
3 years	81	32
4 years	119	47
5 years	53	21
Race		
Black	197	78
White	20	7
Latino	20	7
Asian	4	2
Other	12	5

Figure 1. Head Start Hearing Screening Results

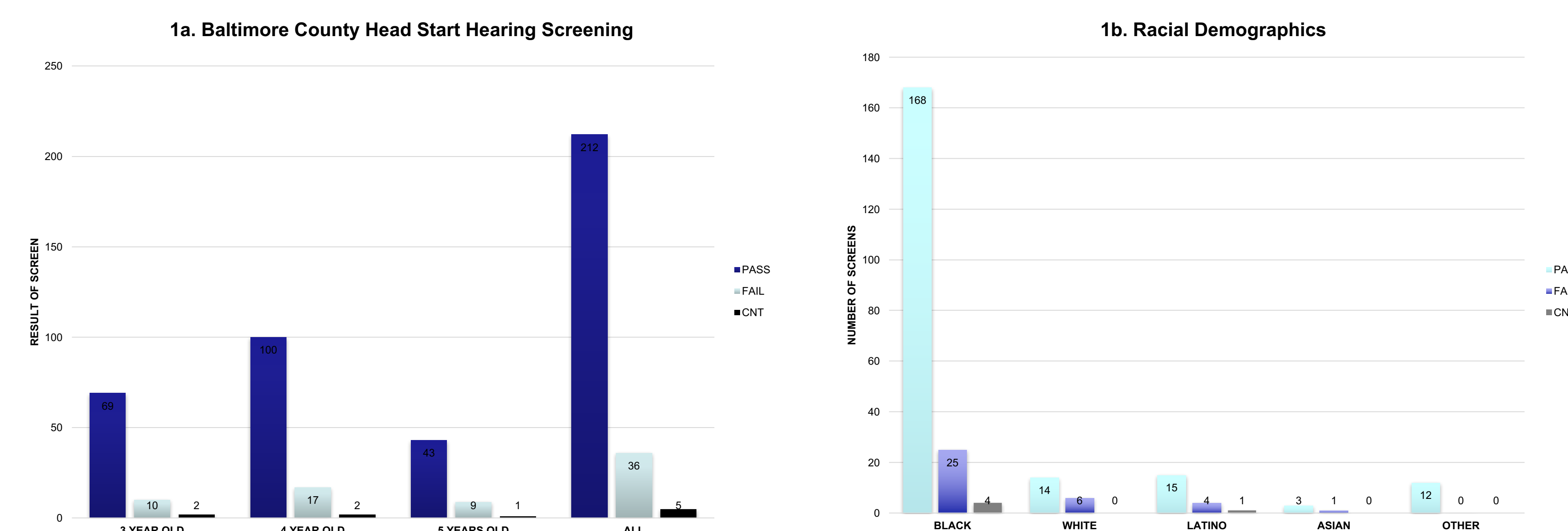


Figure 1 displays the number of Head Start children who passed, failed and could not be tested according to age (Fig. 1a) and Race (Fig. 1b).

Figure 2. NBHS Results of Children Who Failed Head Start Screen

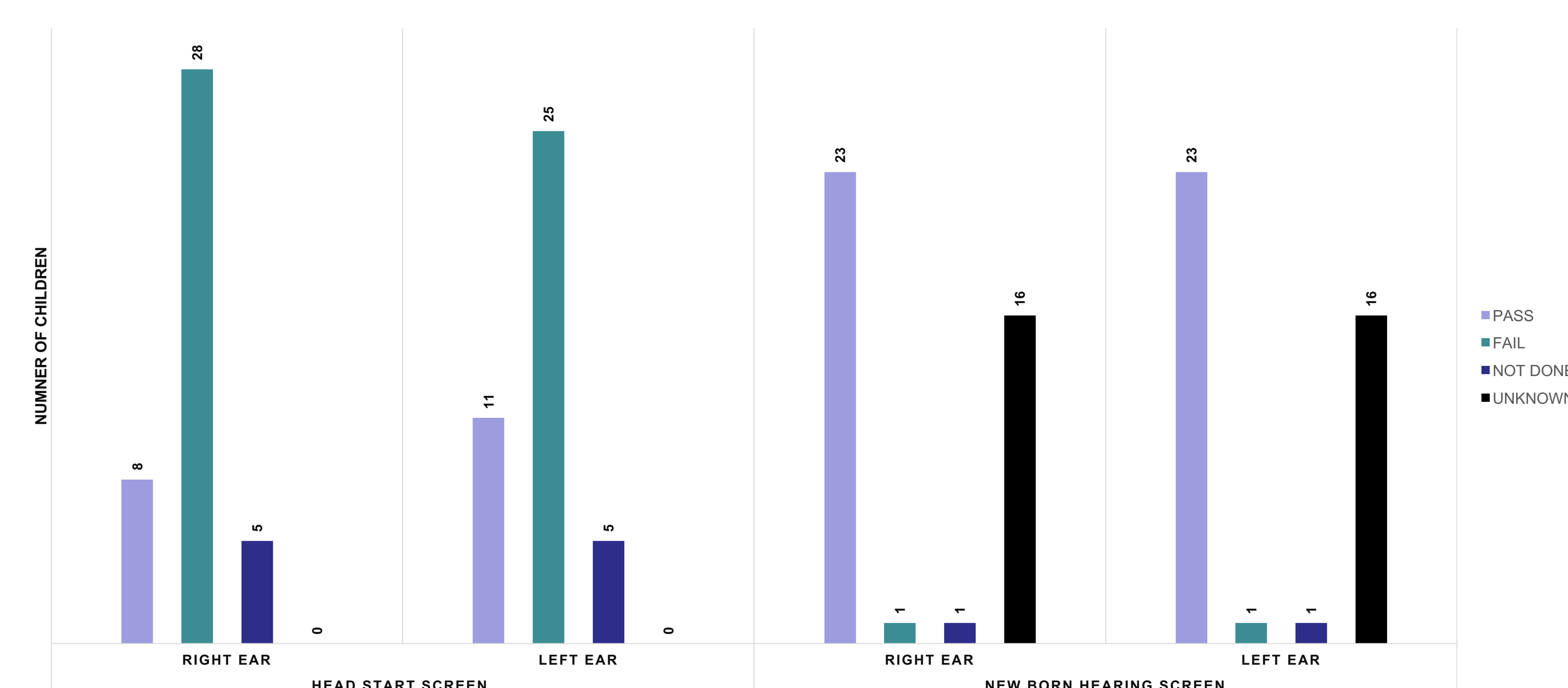


Figure 2 shows the ear-specific newborn hearing screening results of the 41 children who failed the Head Start screen or could not be tested.

## HEAD START SCREENING PROTOCOL

- The Head Start Program Performance Standards outline the mandatory regulations that grantees and delegate agencies must implement.<sup>4</sup>
  - Hearing screening must be completed within 45 days of when the child first attends the program.
  - A rescreen of all children who fail must be completed within 2-4 weeks of initial screen.
  - A Screening Result Letter is completed with all the results and shared with the family.
  - All children who fail the screening are referred to a physician and/or licensed professional for further evaluation.

## DISCUSSION

- Eighty-two percent of all children passed the initial screening. For the individual tests, pass rates were approximately 89%, 90%, 85% for pure-tone audiometry, tympanometry and OAE screening, respectively.
- The pass rate of the children who participated in the rescreen was low (12%), yielding an overall pass rate of 84%. Per Head Start standards, all screenings and re-screenings must be conducted within 45 days.<sup>4</sup> Hence, middle ear dysfunctions may not be resolved before the rescreen.
- The age and race of the children did not have a significant effect on the pass/fail rate which may be attributed to the socioeconomic status (SES) of the children's families. Low SES is a requirement for Head Start eligibility<sup>5</sup> and research has shown that children from low SES families are more likely to have middle ear disorders.<sup>6</sup>
- Although all 36 children who failed the Head Start screening were referred for a full diagnostic audiological evaluation, only one child had results reported back to the Head Start health care coordinator. None of the children are yet to be diagnosed with a hearing loss.
- Fifty-six percent of the children who failed the Head Start screen passed the NBHS. One of the children failed the NBHS and was previously diagnosed with a bilateral hearing loss while another was lost to documentation. In addition, one child was flagged for risk monitoring.
- NBHS data could not be retrieved for 16 of the 41 children. This may be attributed to documentation errors, lack of adequate tracking procedures, and/or changes in the name of child. Additionally, not all children were born in the state of Maryland.
- There are challenges that affect the success of a hearing screening program. They include, space availability, room acoustics, equipment malfunction, attributes of the child, staff cooperation and tracking of children.
- Overall, the identification of hearing loss is highly dependent on adherence to a follow-up protocol when children do not pass the screening. It is imperative that every child that does not pass receives accurate and timely diagnostic evaluation and when necessary, intervention.

## REFERENCES

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