

OBJECTIVE

To provide more information on the rate of kids who are at risk for hearing and/or vision difficulties in schools in the Denver, CO metro area as documented through regular screenings conducted by the Marion Downs Center (MDC). Specifically, the project aimed to:

1. Evaluate if OAEs are more efficient than pure tones for hearing screening for 3-year-olds and/or 4-year-olds,
2. Evaluate if socioeconomic (SES) status of children in Denver is associated with referral rate on screening, and
3. Investigate rate of referral on both vision and hearing compared to just vision or just hearing.

BACKGROUND

Universal newborn hearing screenings were first mandated in the late 1990s across the United States (National Conference on State Legislatures, 2021). The information gained from screening every child born in the United States has provided audiologists with a plethora of information regarding congenital hearing loss and associated syndromes. In addition to newborn hearing screenings, public schools are required to provide hearing and vision screenings for children throughout grade school and high school (exact ages vary by state), while Early Head Start and Head Start programs require developmental, vision, and hearing screenings within 45 days of the child entering the program. Still, there are several unknowns regarding the age on onset of progressive and acquired hearing loss that can develop or become apparent during the preschool years in children.

MDC is a non-profit health clinic that provides audiology, speech, and language services in both a clinic and community setting. The providers offer speech and hearing services using best practices and strive to educate patients, families and the community about the impact of hearing and speech challenges. One of the community programs at MDC is a screening program for hearing, speech, language, vision, and development. The MDC team provides on-site screenings to several Head Start, private, and public schools in the Denver metro area for kids ages 0-18. MDC collects data from low-, middle-, and upper-income families, as indicated by Head Start vs. Private/Public school enrollment.

METHODS

Retrospective data review on the existing MDC dataset. Specifically analyzed 15,091 hearing, vision, and speech screening records of children ages 0 months to 5 years 0 months who were screened by MDC between January 1, 2014, through December 31, 2020. Completed descriptive analysis on each variable to address each of the aims listed in the objectives.

Inclusion:

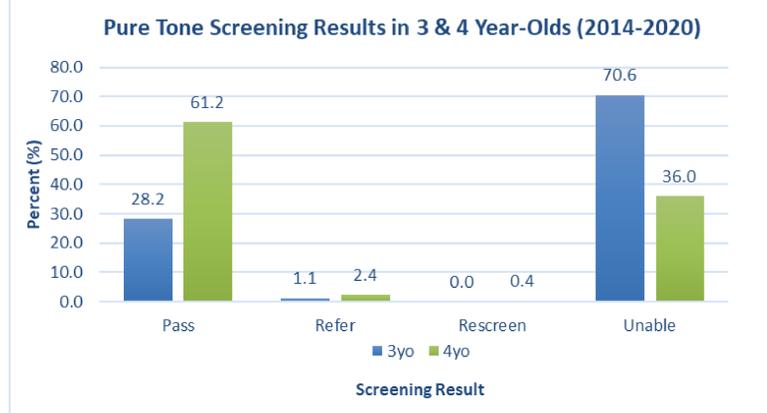
1. Children ages 0 months to 5 years 0 months that were screened through MDC between January 1, 2014, and December 31, 2020.
2. Children who were screened for hearing, hearing and vision, or hearing, vision, and speech.
3. Children who were rescreened after their initial screening to obtain a complete screening record. Possible reasons for a rescreen include refusal to participate in the task, unable to complete the task, sleeping at time of screening, or absent.
4. Children who were rescreened due to a refer result on the initial screening.

Exclusion:

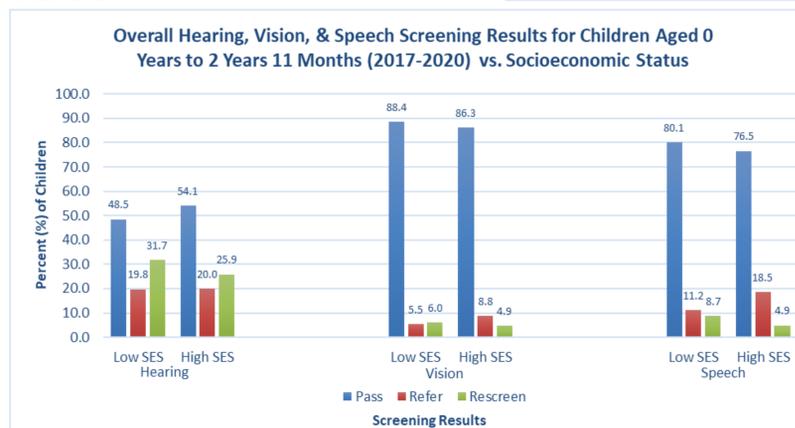
1. Children older than 5 years 0 months at time of screening.
2. Children seen before January 1, 2014, or after December 31, 2020.
3. Children with an incomplete screening record (i.e., missing a hearing screen result).

RESULTS

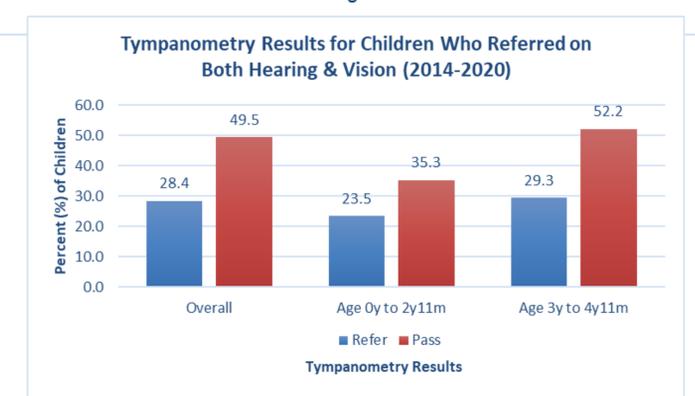
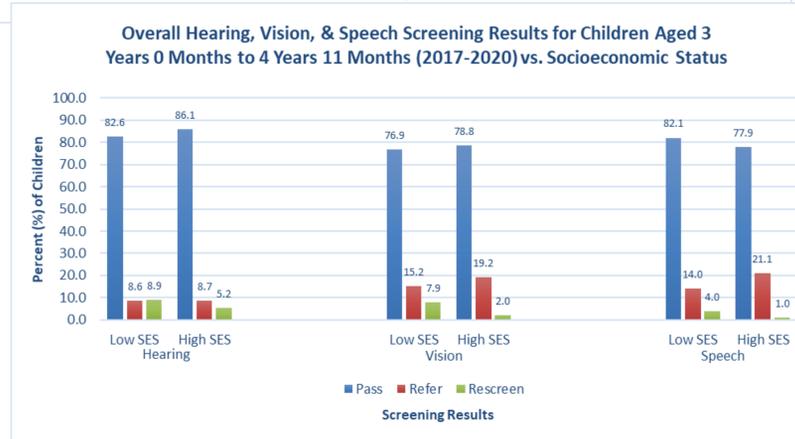
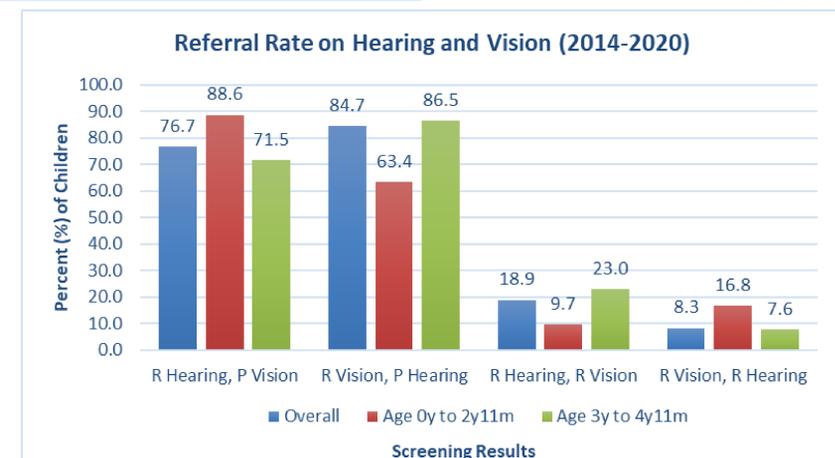
AIM 1



AIM 2



AIM 3



SUMMARY & DISCUSSION

OAEs are a more efficient first level screening tool on 3-year-olds and potentially 4-year-olds.

- From 2014-2020, twice as many 3-year-olds were unable to complete pure tone testing as 4-year-olds and twice as many 4-year-olds passed pure tone testing compares to 3-year-olds.
- Similar findings to Cedars et al. (2018) and Sideris and Glatke (2006).

Regardless of SES, all children could benefit from regular health screenings.

- No significant differences were found between low SES and high SES in terms of pass, referral, and rescreen rates on hearing, vision, and speech for children aged 0 years to 4 years 11 months from 2017-2020. SES data was not documented from 2014-2016.

Younger children are more likely to refer on hearing while slightly older children are more likely to refer on vision.

- Children aged 0 years to 2 years 11 months were more likely to refer on hearing than vision.
- Children aged 3 years 0 months to 4 years 11 months were more likely to refer on vision than hearing.
- 10-20% of children in each age group referred on both vision and hearing.
- About 30% of children in each age group referred on tympanometry after referring on hearing.

Future Directions

- Evaluate associations between rate of referrals on hearing screenings, the need for additional supports, and/or additional diagnoses.
- Investigate associations between parent concern and referral rate for hearing, vision, and speech.
- Investigate follow-up rate of children who are referred for either speech, vision, or hearing.
- Expand the range of ages to 18 years 0 months to further explore associations across screening data.

ACKNOWLEDGEMENTS

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