Advancing Hearing Care in Rural Primary Care Clinics: A Pilot Study in New Hampshire and Vermont

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Background

- Hearing loss (HL) affects millions and is a leading cause of disability, especially in rural, aging populations like NH and VT. Rural areas face barriers to health care such as limited specialists, high costs, and transportation challenges.
- Primary care clinics are key healthcare access points and are often underutilized for hearing care. Our study seeks to provide insight into hearing screening implementation in these settings and discuss influence of various healthcare access barriers on hearing loss and handicap in our population.

Methods

Recruitment → English-speaking adults >18 years old at primary care settings in NH/VT

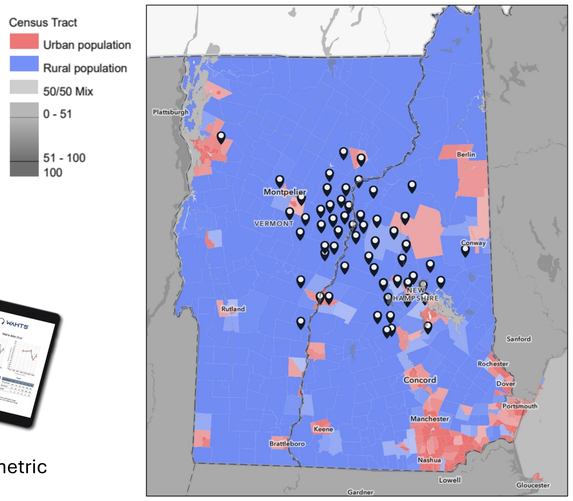
Data Collection → Pure tone audiometry (PTA) HHIE-S Demographic Survey

Referral Criteria → >10 on the HHIE-S or At least two consecutive frequencies >30 dB on PTA

Further audiologic evaluation → Comprehensive audiologic evaluation

- Cross-sectional study with 225 adults from NH and VT primary care clinics across 3 partnered sites between May 2024 – July 2025 (Dartmouth-Hitchcock Medical Center, Little River Health Care, and Mid-State Health Center).
- Participants completed demographic survey, Hearing Handicap Inventory for the Elderly – Short (HHIE-S) survey, and hearing screening at 1, 2, 4 kHz (6 & 8 kHz were added later).
- Chi-square and t-testing were performed between referred and non-referred participants.
- Logistic and linear regression identified predictors of hearing loss and referral.

The wireless audiometric hearing test system (WAHTS) manufactured by WAHTS Hearing LLC, Lebanon, NH.

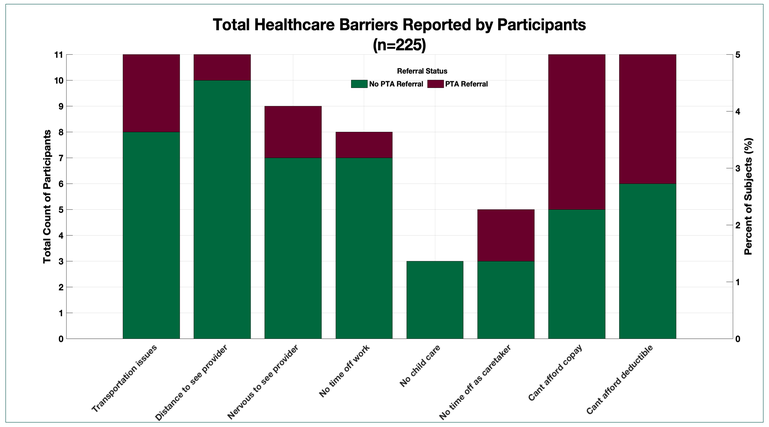


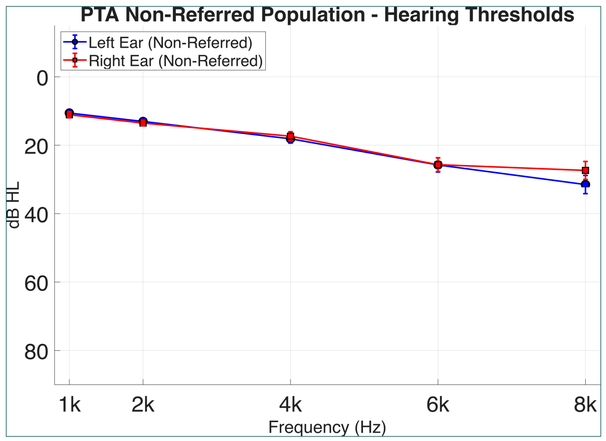
Map of NH and VT based on U.S. Census Bureau's 2020 Census Demographic and Housing Characteristics information. Labels represent individual patient reported home ZIP Codes.

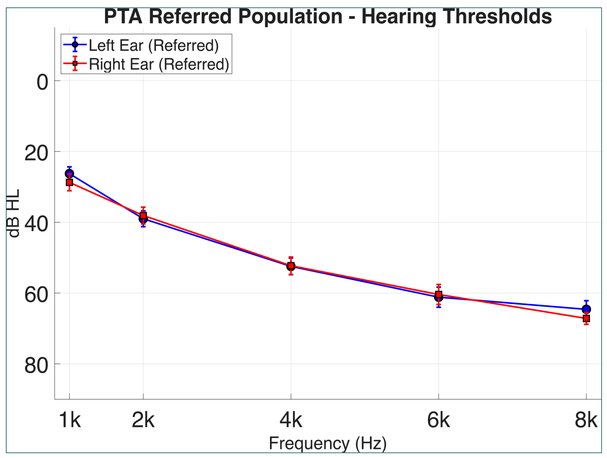
Results

Of our 225 participants:

- 86% reside in a small or isolated rural town
- 23% report healthcare access barriers
- 24% tested positive for hearing loss referral
- 16% have had no previous hearing care

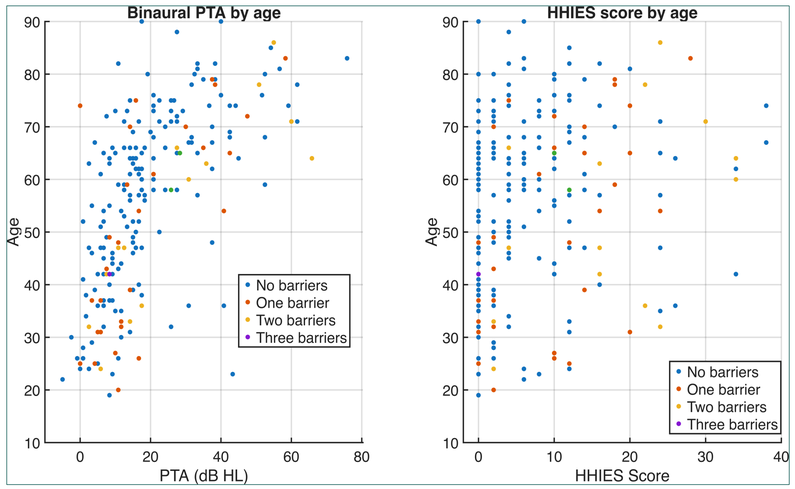






In multivariable regression models:

- Increased age (p=<0.001), gender (p=0.001), and barriers to health insurance (p=0.024) significantly increased odds of hearing loss referral as recommended on hearing screening.
- Increased age (p=0.005) and barriers to healthcare (p=<0.001), including difficulty affording copay (p=0.009), significantly increased reported hearing handicap.
- Confidence in seeking hearing care was protective against reported hearing handicap (p=0.012).



Discussion

- Many rural residents in New Hampshire and Vermont face significant, unmet healthcare and hearing care needs.
- Integrating hearing screening using Screening tools like the WAHTS system or HHIES survey in rural primary care settings is feasible and effective in identifying undiagnosed hearing loss.
- Perceived financial barriers (copay, deductible) and comfort seeking hearing care may impact hearing care and handicap, while traditional socioeconomic variables were not significant predictors of hearing outcomes.

Conclusion

- Contributors to hearing disability and referral were increased age, male gender, and increased barriers to healthcare access, including difficulty affording copay and gaps in insurance coverage.
- A protective factor against hearing disability was confidence in seeking hearing care.
- Inclusion of perceived financial strain and care-seeking confidence may more accurately capture social determinants influencing hearing loss or care outcomes.
- Hearing screenings can be readily integrated into routine primary care.

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