Socioeconomic differences in hearing among middle-aged and older adults in the Health Survey for England 2014

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Hearing loss impacts on cognitive, social and physical functioning. Using data from a screening audiometry device (HearCheck Screener) collected from middle-aged and older community dwelling adults, we examined: (1) prevalence of hearing loss; (2) prevalence of hearing-aid use (among persons with hearing loss); and (3) associations of each with different markers of socioeconomic status (SES): equivalised household income, Index of Multiple Deprivation (IMD), and educational status.

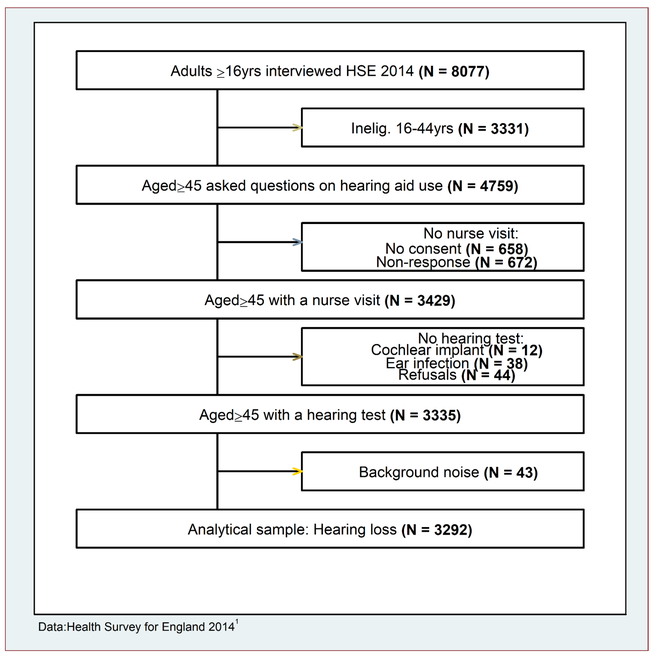
Methods

***Data**:* Nationally-representative survey of adults aged ≥45yrs in the Health Survey for England 2014 (*N*=3292) (**Figure 1**).[1]

***Definitions**:* Test conducted in participants' own homes. Hearing loss defined as ≥35dBHL at 3.0kHz in the better-hearing ear. Participants were asked if they ever wore a hearing aid nowadays.

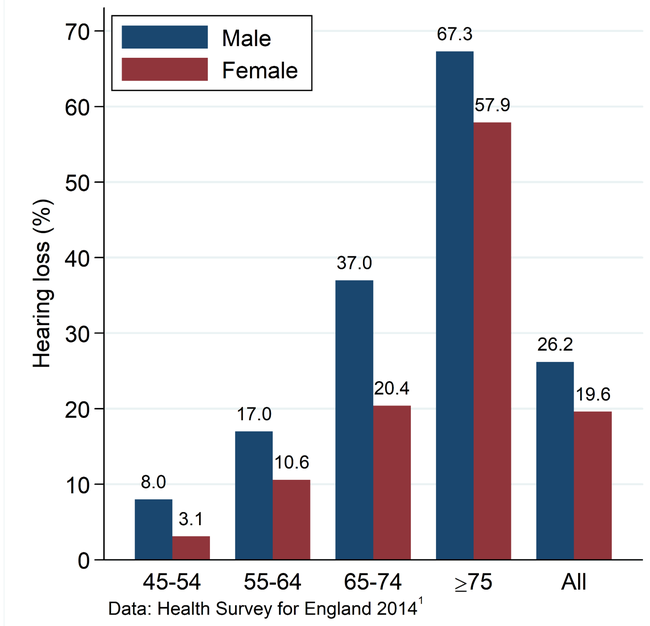
***Statistical analysis**:* Sex-specific logistic regression modelling used to examine associations between SES and hearing after adjustment for potential confounders (age; CVD risk factors; exposure to work-related noise).

Figure 1. Study population and exclusions.



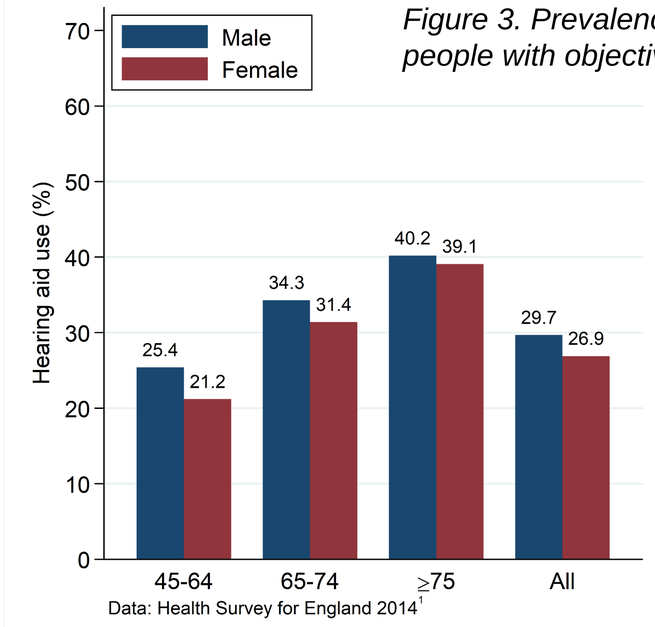
Prevalence of hearing loss and hearing aid use

Figure 2. Prevalence of objective hearing loss



26% of men and 20% of women had hearing loss (P<0.001) (**Figure 2**). This is equivalent to 5.2m persons. Hearing loss increased monotonically with age.
Among men, loss varied by work-related noise exposure and by each measure of SES. Patterns among women were similar, yet typically weaker.[2]

Figure 3. Prevalence of hearing aid use among people with objective hearing loss



Among those with hearing loss, 30% of men and 27% of women used a hearing aid nowadays (**Figure 3**). 7% of men and 10% of women had tried aids in the past, but were not using them currently. Use increased monotonically with age but was confined to the minority, reaching close to 40% for participants aged ≥75yrs.

Socioeconomic status and hearing loss

Hearing loss was higher among men in the lowest SES groups. For example, the multivariable-adjusted odds of hearing loss were almost twice as high for those in the lowest versus the highest income tertile (OR: 1.77; 95% CI: 1.15, 2.74) (**Figure 4**).

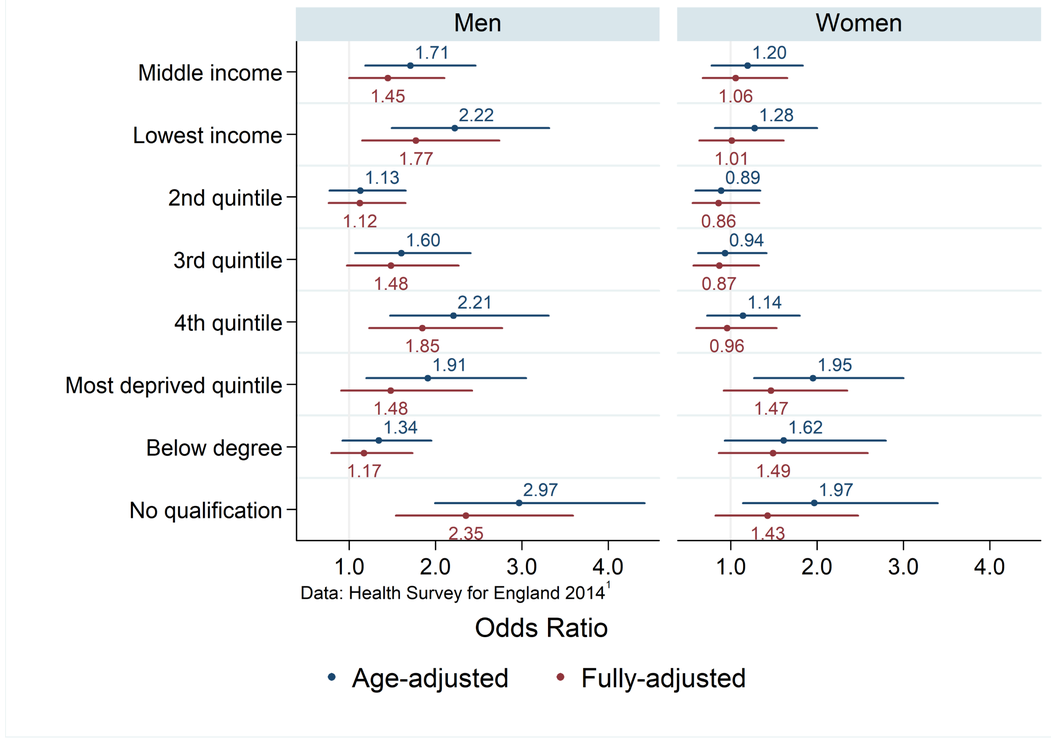


***Figure 4:** Associations between SES and **hearing loss** in middle-aged and older adults.* Indicators of SES: equivalised household income tertiles (highest as reference), IMD quintiles (least deprived), and highest educational attainment (degree or higher). Lines represent Odds Ratio (outcome = hearing loss) and its 95% CI. **Model A**: adjusted for age. **Model B**: adjusted for age, exposure to work-related noise, region, and CVD risk factors (smoking, body mass index, diabetes, hypertension, dyslipidaemia, and physical inactivity).

Socioeconomic status and hearing aid use

Among persons with hearing loss, current use of a hearing aid was higher in the most advantaged groups. Compared with men in the highest income tertile, the multi-variable adjusted odds of using a hearing aid nowadays were lower for men in the middle (OR: 0.50; 95% CI: 0.25-0.99) and lowest (OR: 0.47; 95% CI: 0.23-0.97) income tertiles. SES was not associated with hearing outcomes amongst women (**Figure 5**).

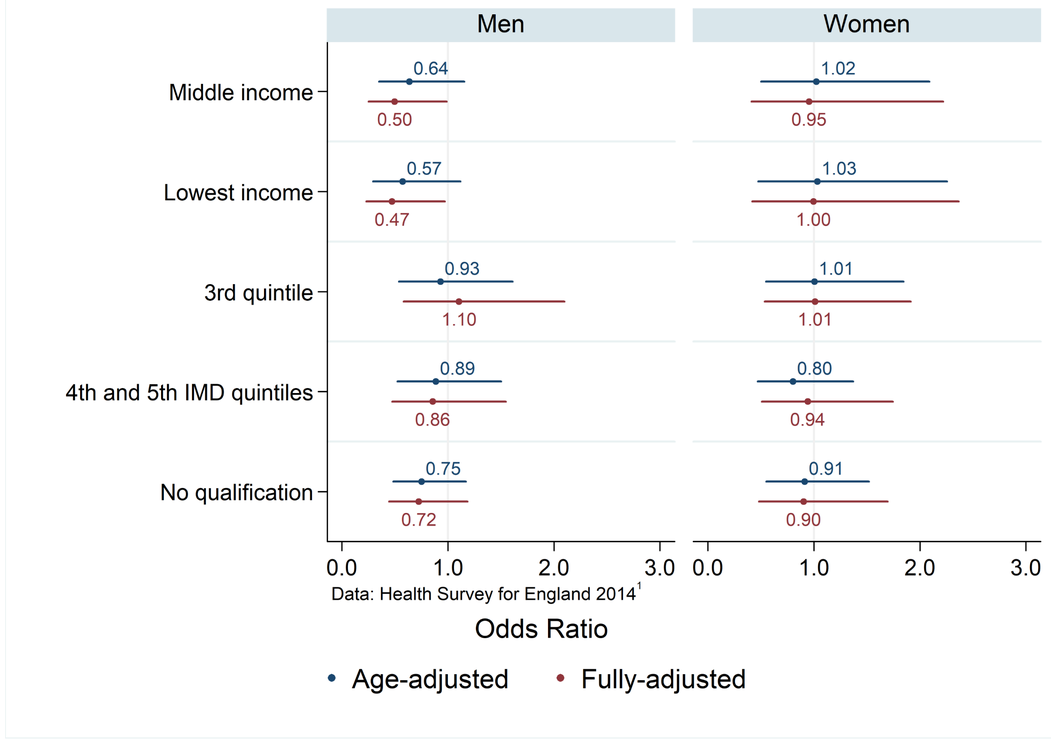


***Figure 5:** Associations between SES and **current hearing aid use** in middle-aged and older adults with hearing loss.* Indicators of SES: equivalised household income tertiles (highest as reference), IMD quintiles (least deprived Q1 and Q2), and highest educational attainment (O level or above). Lines represent Odds Ratio (outcome = hearing aid use) and its 95%CI. **Model A**: adjusted for age. **Model B**: adjusted for age, severity of hearing loss, exposure to work-related noise, region, and CVD risk factors (smoking, body mass index, diabetes, hypertension, dyslipidaemia, and physical inactivity).

Conclusions

Whilst the highest burden of hearing loss falls among persons in the lowest SES groups, hearing aid use is demonstrably lower in that group. Initiatives to detect hearing loss early and to increase uptake and use of hearing aids may provide substantial public health benefits and reduce socioeconomic inequalities in health.

References

[1] Scholes S, Mindell J. 'Hearing'. In: Craig R, Mindell J, eds. *Health Survey for England 2014. Volume 1 Health, social care and lifestyles.* Leeds: Health and Social Care Information Centre, 2015. http://content.digital.nhs.uk/catalogue/PUB19295/HSE2014-ch4-hear.pdf

[2] Scholes S, Biddulph J, Davis AC, Mindell JS. Socioeconomic differences in hearing among middle-aged and older adults: cross-sectional analysis using the Health Survey for England. *Manuscript in preparation.*