

Dual Sensory Loss and Cognitive Performance among Older Adults in Northern Ireland

Nicola Ann Ward¹, Calum Marr¹, Stanley Simoes¹, Leeanne O'Hara¹, Michael McAlinden², Charlotte Sterling¹, Claire Potter¹, Ruth Hogg¹, David R. Weir³, Bernadette McGuinness¹

¹ Centre for Public Health, Queen’s University Belfast, Belfast, UK; ² Northern Ireland Clinical Research Network, Belfast Health and Social Care Trust, Belfast, UK; ³ University of Michigan, Ann Arbor, MI, USA

Background

- The Harmonised Cognitive Assessment Protocol (HCAP) was implemented as a sub-study of the Northern Ireland Cohort for the Longitudinal Study of Ageing (NICOLA). (Ward, Marr et al. 2026)
 - NICOLA-HCAP provides detailed cognitive phenotyping in older adults in Northern Ireland.
 - Hearing impairment (HI) and vision impairment (VI) are common in later life and have each been associated with poorer cognitive outcomes. (Livingston, Huntley et al. 2024; Zhang, Zeng et al. 2025)
 - Dual sensory impairment (DSI) may place older adults at greater cognitive risk, but evidence from Northern Ireland is limited.
- Objective:** to examine cross-sectional associations with global and domain-specific cognitive performance in community-dwelling older adults.

Methods

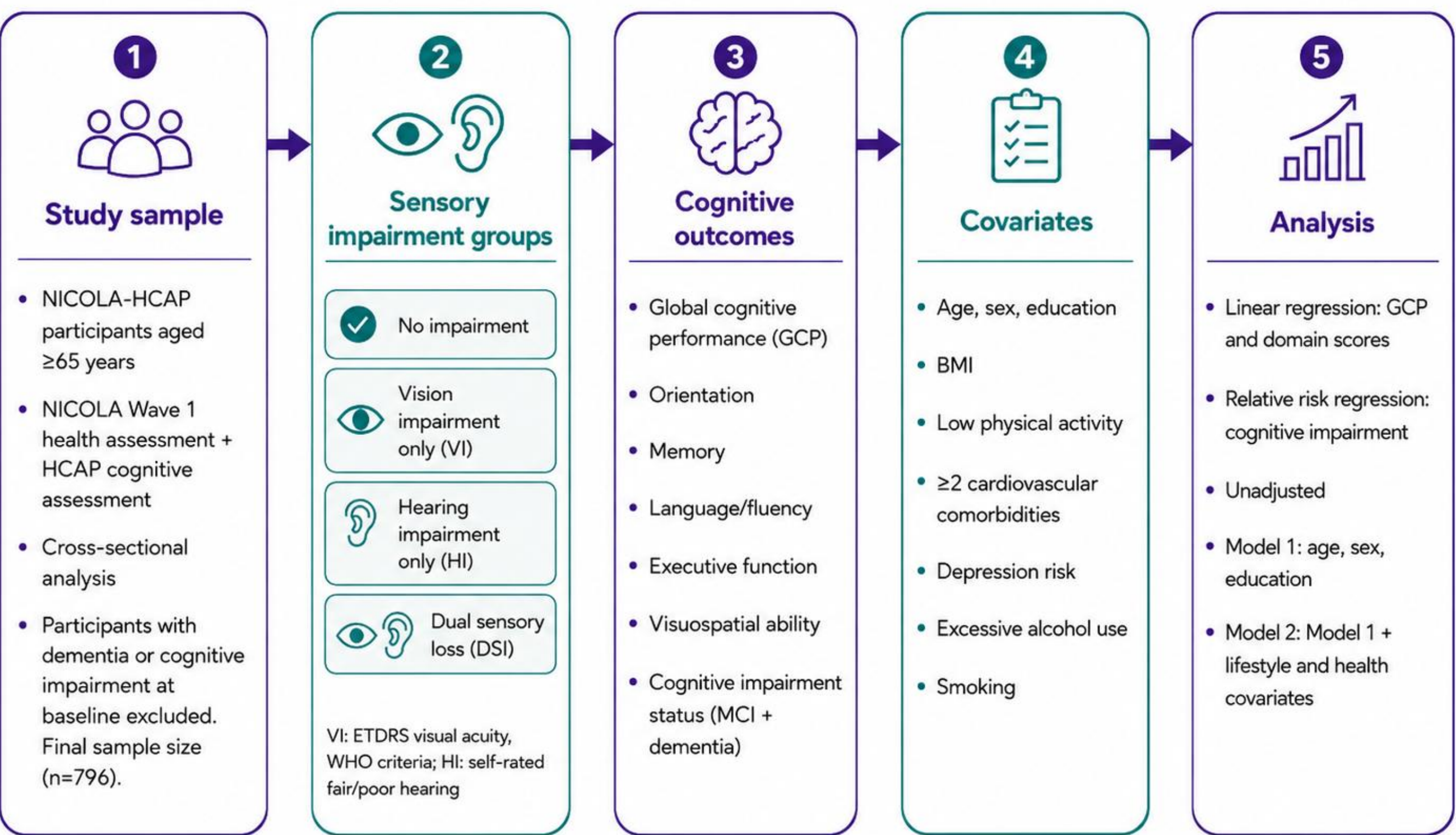


Figure 1: Overview of study design.

Participant characteristics

Table 1: Participant characteristics by sensory impairment category.

Characteristic mean ± SD/ n (%)	No impairment n = 535 (68%)	Vision only n = 43 (5.5%)	Hearing only n = 186 (23.5%)	Dual sensory loss n = 23 (3%)
Age, years	73.4 ± 5.9	79.4 ± 7.4	74.0 ± 6.0	78.6 ± 8.2
Female, (%)	292 (54.6)	26 (60.5)	74 (39.8)	11 (47.8)
Primary school or less, (%)	63 (11.8)	15 (34.9)	28 (15.1)	6 (26.1)
BMI, kg/m ² ,	29.0 ± 5.0	28.5 ± 4.7	29.7 ± 4.8	30.2 ± 5.9
Excessive alcohol use, (%)	215 (40.3)	20 (46.5)	84 (45.4)	10 (45.5)
Low physical activity, (%)	313 (58.5)	27 (62.8)	116 (62.4)	14 (60.9)
≥2 cardiovascular comorbidities, (%)	224 (43.1)	15 (36.6)	75 (40.8)	11 (52.4)
Depression risk, (%)	126 (23.7)	14 (34.1)	54 (29.3)	12 (52.2)
Cognitive impairment, n (%)	103 (19.3)	11 (25.6)	34 (18.3)	11 (47.8)

References
(Livingston, G., et al. (2024). "Dementia prevention, intervention, and care: 2024 report of the Lancet standing Commission." The Lancet **404**(10452): 572–628.
Zhang, X., et al. (2025). "Association between sensory impairment and cognitive frailty among older people: Evidence from four nationwide cohort studies." The Journal of
nutrition, health and aging **29**(8): 100590.
Ward, N. A., et al. (2026). "Methodological adaptations for applying the Harmonised Cognitive Assessment Protocol diagnostic algorithm in the Northern Ireland Cohort for
the Longitudinal Study of Ageing (NICOLA-HCAP)." BMC Research Notes.

Results

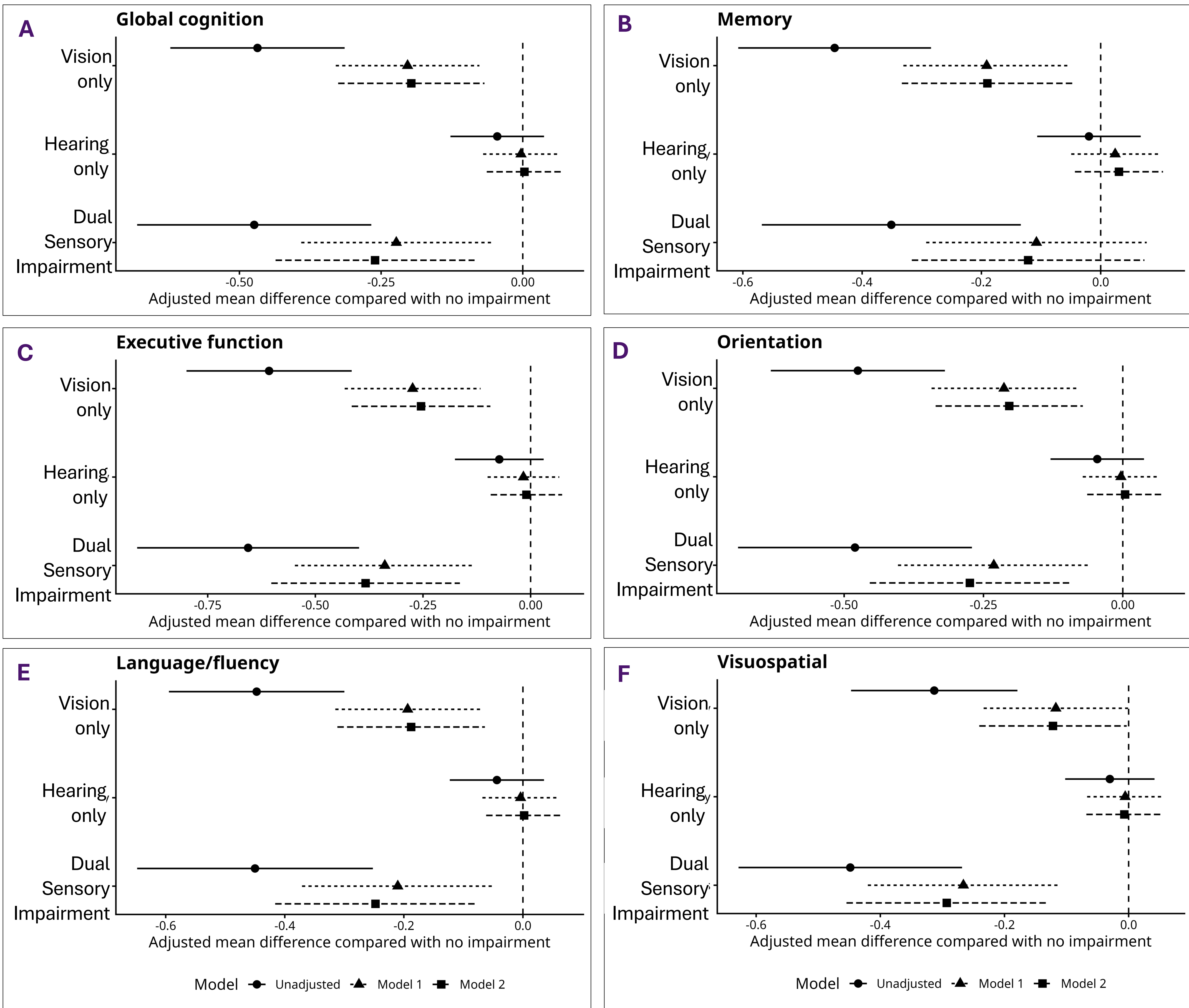


Figure 2. Associations between sensory impairment category and global and domain-specific cognitive performance. Estimates represent regression coefficients and 95% confidence intervals for VI only, HI only, and DSI, compared with no sensory impairment (reference group). Model 1 adjusted for age, sex, and education; Model 2 additionally adjusted for BMI, low physical activity, cardiovascular comorbidity, depression risk, excessive alcohol use, and smoking.

Table 2. Risk of cognitive impairment by sensory impairment category. Reference group: no impairment.

Sensory impairment category	Fully adjusted RR (95% CI)
Vision only	1.16 (0.62–2.19)
Hearing only	0.98 (0.69–1.38)
Dual sensory loss	2.20 (1.41–3.43)

Discussion & conclusion

- VI and DSI were associated with poorer cognitive performance compared with no impairment.
 - DSI was associated with approximately twice the adjusted risk of cognitive impairment, highlighting DSI as a potentially important
- marker of cognitive vulnerability in later life.

Limitations:

Cross-sectional design; small DSI group; hearing impairment was self-reported; cognitive testing may be influenced by sensory demands; limited representation of care-home residents.

Email: n.ward@qub.ac.uk

