The contribution of ELSA to the study of cognitive ageing

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ELSA cognitive measures

	Wave 1 2002/03	Wave 2 2004/05	Wave 3 2006/07	Wave 4 2008/09	Wave 5 2010/11	Wave 6 2012/13	Wave 7 2024/15	Wave 8 2016/17	Wave 9 2018/19	Wave 10 2021/23
Self-rated memory	✔	✔	✔	✔						
Orientation in time	✔	✔	✔	✔	✔					
Immediate and delayed recall	✔	✔	✔	✔	✔					
Prospective memory	✔	✔	✔	✔	✔					
Word-finding (verbal fluency)	✔	✔	✔	✔	✔					
Fluid intelligence (number series)										
Letter cancellation	✔	✔	✔	✔	✔					
Numerical ability	✔			✔						
Literacy		✔			✔					

Early findings on cognition

- Cognitive function relates to investments and understanding of pensions (Banks & Oldfield, 2007)

- Association between cognitive function and alcohol consumption (Lang et al, 2007)

- Cognitive function and psychological wellbeing (Llewellyn et al, 2008)

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Emerging focus on Alzheimer's disease and related dementias

2011   Substantial increase in US Federal funding for AD/ADRD research

2012   UK Government launched dementia challenge

2014   Establishment of Dementias Platform UK

2015   Establishment of UK Dementia Research Institute

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Self-rated memory	✔	✔	✔	✔			✔	✔	✔	✔
Orientation in time	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Immediate and delayed recall	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Prospective memory	✔	✔	✔	✔	✔			✔		
Word-finding (verbal fluency)	✔	✔	✔	✔	✔		✔	✔	✔	✔
Fluid intelligence (number series)						✔		✔	✔	
Letter cancellation	✔	✔	✔	✔	✔					
Numerical ability	✔			✔		(✔)	(✔)	✔		✔
Literacy		✔			✔	(✔)	(✔)	✔		✔
Backwards counting							✔	✔	✔	✔
Serial 7s							✔	✔	✔	✔
Object naming							✔	✔	✔	✔

Harmonized Cognitive Assessment Protocol (HCAP)

- Comprehensive battery of 20 tests assessing a broad range of cognitive functions

- Administered to 1,273 participants aged 65+ (75.6% RR) in 2018

- Informant interviews for 82.5%

- Protocol identical to HRS

- Algorithmic estimates of dementia and mild cognitive impairment (Manly et al, 2022)

- Data available from UK data service (SN 8502)
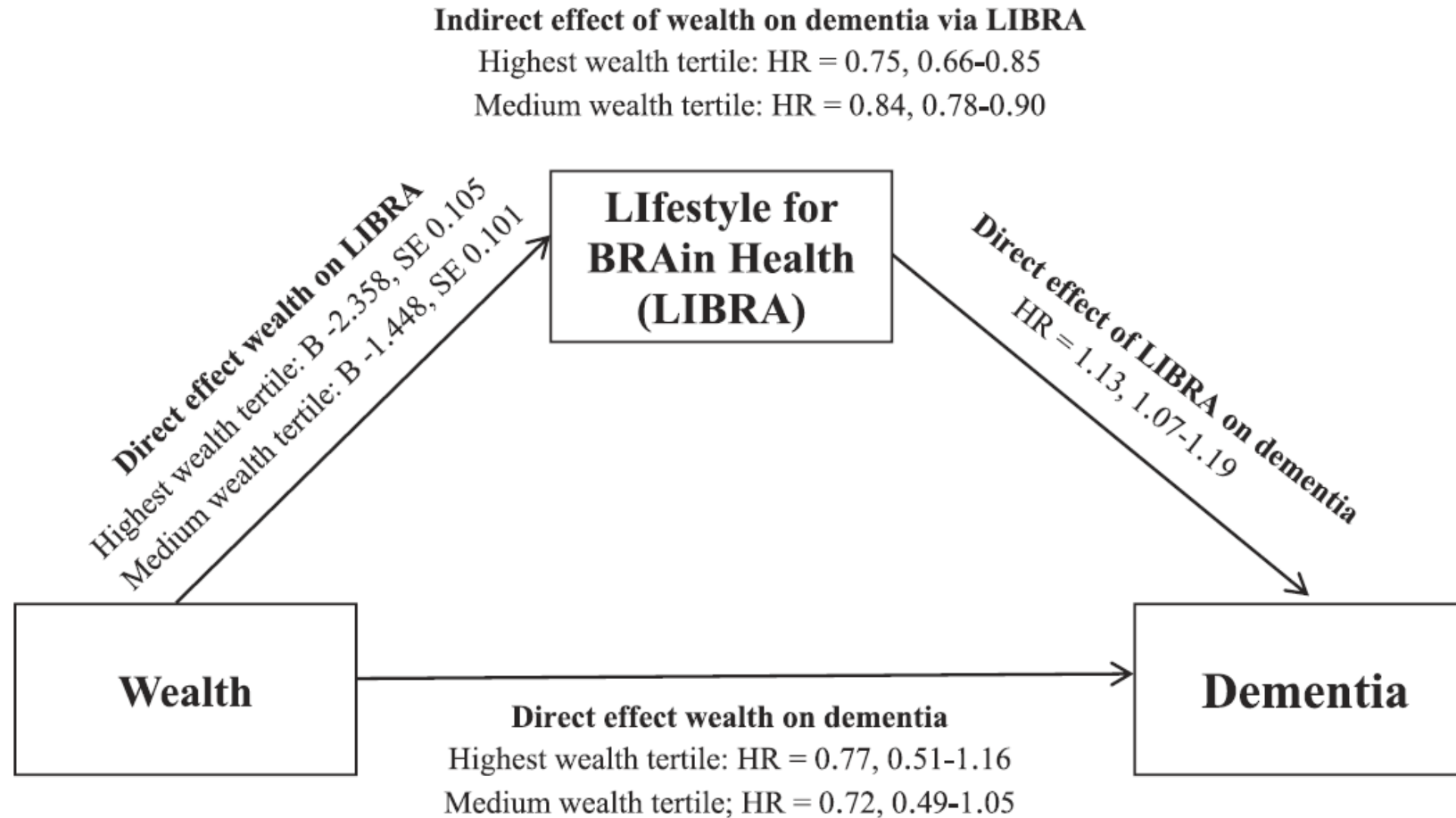
ELSA and dementia research

- Density of repeat measures of cognition

- Continued participation after dementia diagnosis

- Multidisciplinary perspective

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Socioeconomic gradients and dementia risk

Individual and area-based measures of deprivation

- 12-year follow-up of 6,220 men and women aged 65+
- Relationship between dementia incidence and education, wealth, and index of multiple deprivation
- Financial resources more consistently related to dementia incidence than education, after adjustment for demographics and health indicators
- Area deprivation not robustly associated with dementia risk

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Mediation of wealth gradient by lifestyle factors

**Indirect effect of wealth on dementia via LIBRA**
Highest wealth tertile: HR = 0.75, 0.66-0.85
Medium wealth tertile: HR = 0.84, 0.78-0.90

Direct effect wealth on LIBRA
Highest wealth tertile: B -2.358, SE 0.105
Medium wealth tertile: B -1.448, SE 0.101

LIfestyle for BRAin Health (LIBRA)

Direct effect of LIBRA on dementia
HR = 1.13, 1.07-1.19

Wealth

Direct effect wealth on dementia
Highest wealth tertile: HR = 0.77, 0.51-1.16
Medium wealth tertile; HR = 0.72, 0.49-1.05

Dementia

SES gradients in England and USA
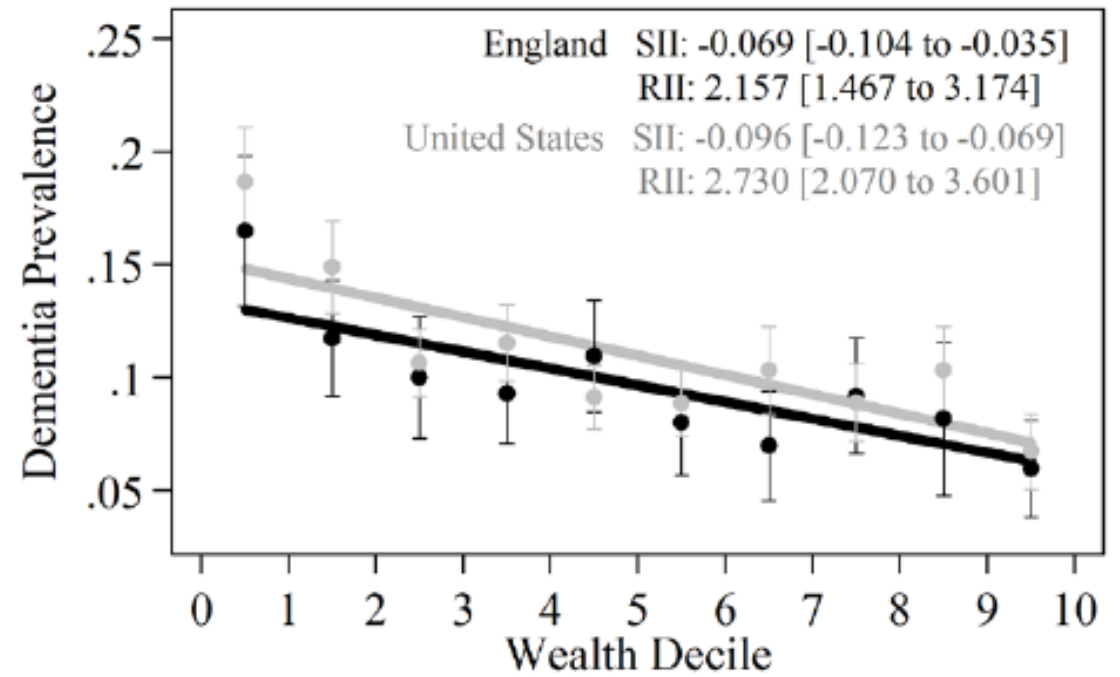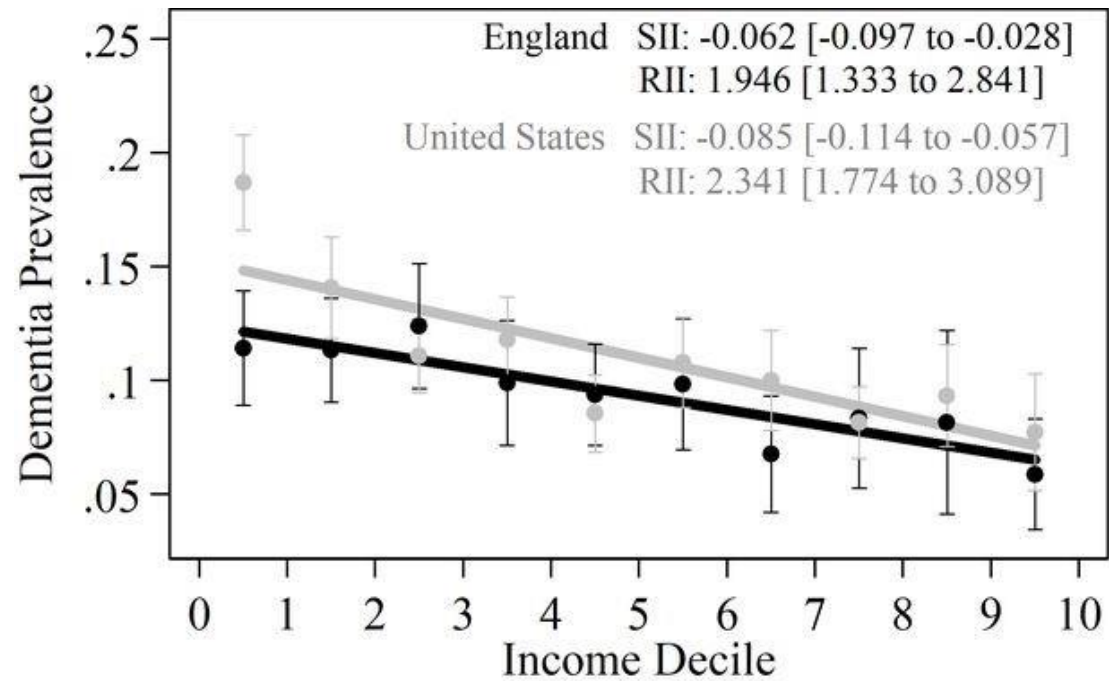
Health and health behaviours in dementia risk

- Cardiometabolic risk (Ji et al, 2022; Li et al, 2022; Kontari et al, 2023)

- Multimorbidity (Bendayan et al, 2021)

- Frailty (Rogers et al, 2017)

- Walking speed (Hackett et al, 2018)

- Sensory impairments (Maharani et al, 2018; Davies et al, 2017)

- Body weight (Ma et al, 2020)

- Physical inactivity (Feter et al, 2021; Li et al, 2022)

- Lung function (Qiao et al, 2020)

- Diet (Francis et al, 2022)

- Self-rated health (Stephan et al, 2021)

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Cognitive stimulation and dementia risk

- Cognitive reserve (Almeida-Meza et al, 2021 a, b)
- Cognitively stimulating activities (Williams et al, 2020)
- Community group engagement (Fancourt et al, 2018)
- Cultural engagement (Fancourt et al, 2020)
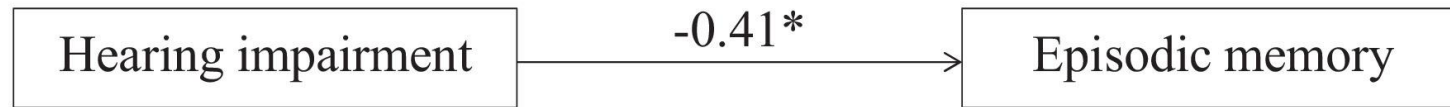
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Cognitive stimulation and cultural activity
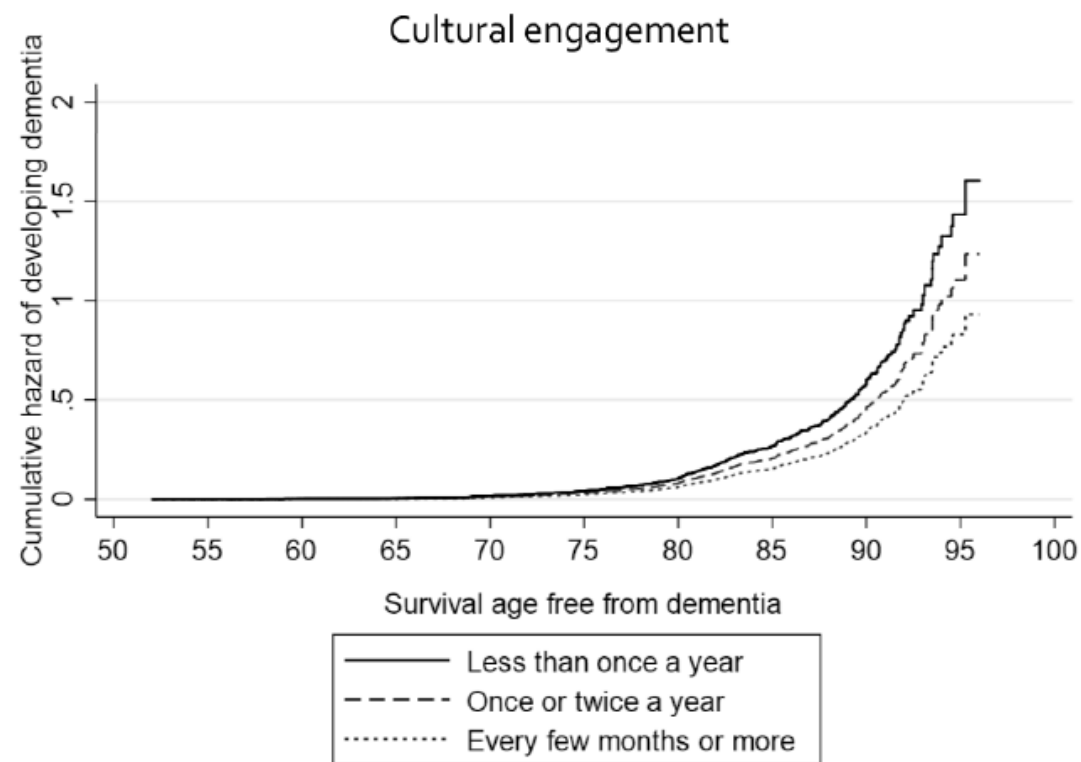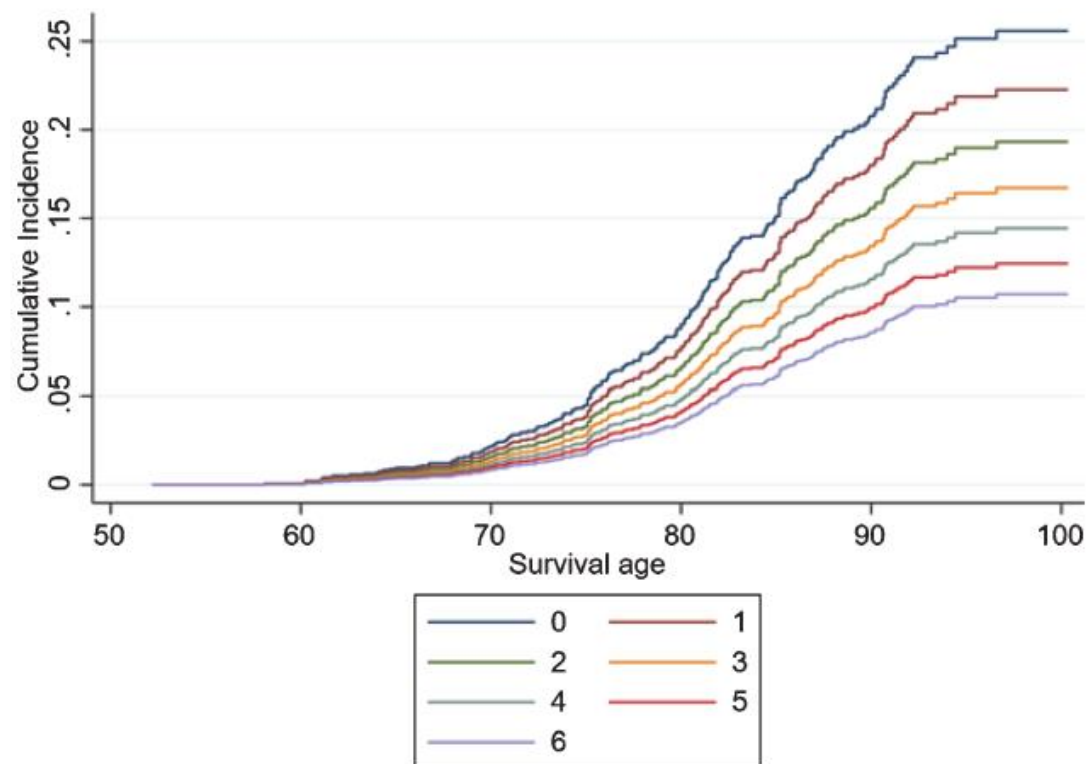
Social isolation and loneliness

- Loneliness as a determinant of dementia (Rafnsson et al, 2020)

- Loneliness trajectories and dementia (Li et al, 2022)

- Negative social interactions with children, other family, and friends and dementia (Khondoker et al, 2017)

- Social isolation, memory decline, and dementia (Duffner et al, 2022; Read et al, 2020)

- Gender-specific associations for family relationships (Scholes & Liao, 2023)

- Loneliness and isolation partly mediate links between hearing impairment and memory decline (Maharani et al, 2019)

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Hearing impairment, loneliness, isolation and memory
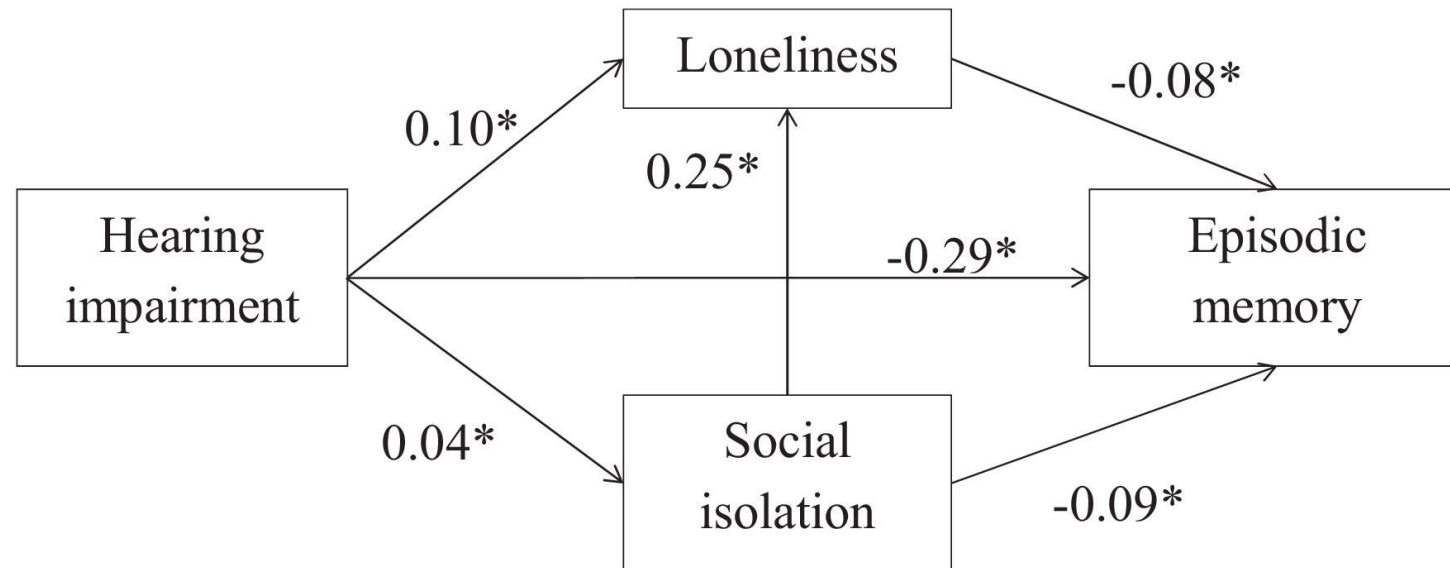
Other ELSA studies of dementia and cognitive decline

- Modelling research (Ahmadi-Abhari et al, 2017; Bandosz et al, 2020; Collins et al, 2022)

- Care and care needs (Read et al, 2021, 2022)

- Genetic and gene-environment interaction (Ajnakina, 2022; Kepinska et al, 2020)

- Adverse childhood experience (Lowry et al, 2022; O'Shea et al, 2021)

- Depression (Zhu et al, 2022; Jindra et al, 2022)

- Biomarkers (Santoso et al, 2022; Liu et al, 2022; Elpers et al, 2020; Jackowska et al, 2020)

- Air pollution (Wood et al, 2022)

- Job insecurity (Yu et al, 2022)

- Free bus passes and cognitive function (Reinhard et al, 2019)

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Enhancements of the AD/ADRD exposome

- Repeat of HCAP study

- Objective measures of physical activity and sleep

- Proteomic profiling in ~5,000 with nested dementia case-control study

- Extension of life history assessments

- Linkage with air pollution data

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Policy implications

- Understanding trajectories of AD/ADRD incidence and prevalence
- Better understanding of the determinants of AD/ADRD and cognitive decline
- Investigation of risk over 20-30 years
- Bringing together multiple perspectives on cognitive decline
- Modelling of health and social care needs
- Identification of new avenues for prevention and treatment

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