Prevalence of Dementia and Mild Cognitive Impairment in the Health and Retirement Study

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2025-07-22

Abstract

**Importance:** Dementia and mild cognitive impairment (MCI) are common in older adults, but their prevalence is not well understood and challenging to assess in large population-based studies. **Objective:** Describe the prevalence of MCI and dementia in the Health and Retirement Study (HRS), using a novel approach to classifying dementia informed by the recently completed wave 1 of the Harmonized Cognitive Assessment Protocol (HCAP) study. **Design:** Cross-sectional analysis of the 2016 HRS Core sample, validation using existing consensus panel classifications. **Main Outcomes and Measures:** The prevalence of dementia and MCI is XYZ and PDQ. Our algorithm shows poor agreement with consensus standard classifications (weighted kappa = 0.33), but this is due to difficulties in reaching agreement regarding mild cognitive impairment, and the agreement statistic is excellent for dementia versus less impaired cognition (kappa = 0.77). **Conclusions:** The accurate classification of MCI is challenging in field research settings. This can’t be surprising, because the concept’s originator has steadfastly resisted attempts to operationally define it. Clearly more work is needed to develop a reliable and valid classification of MCI in field studies.

### Outline

* **Introduction**
  + Dementia, MCI, field studies
  + HRS: Langa-Weir, Hurd 1 & 2, HCAP
  + This study develops a new classification, termed an “actuarial classification” by Jak/Bondi, of dementia and MCI, following the methods reported in Manly et al (2022) but using only the Core HRS/HCAP cognitive and functional measures.
  + We describe the derivation and reliability of this new classification, and
  + use the new classification to describe the prevalence of dementia and MCI in the Core HRS sample.
  + **Methods**
    - HRS & HCAP, Subsample (N=2,993) rationale, Normative Reference Group
    - Measures of cognition
    - Derivation of actuarial algorithm described briefly, see Appendix 1 for details
    - Agreement with comparator measures and reference standard
  + ☐ **Results**
  + ☒ Figure 1, Algorithm
  + ☒ Table 1, N=20,912, N=2,993; participant characteristics
  + ☐ Table 2, Cognitive, Functional, Self-report and Proxy data (M (SD))
  + ☐ Table 3, Agreement
    - HRS/HCAP validation sample (N=50) = 0.33
    - HRS/HCAP actuarial classification (N=2,992) = 0.51
    - HRS Langa-Weir classification (N=2,992) = 0.57
    - Hurd (N=2,992)
    - Hudomiet (N=2,992)
  + ☐ Table 4, Participant characteristics by dx group
* **Discussion**
  + Poor-to-fair agreement for 3-way classification of dementia, MCI, and normal cognition with Langa-Weir and HCAP Consensus Panel classification, but ***excellent*** agreement with HRS/HCAP consensus panel dementia (vs MCI or Normal) classification (weighted kappa = 0.77).
  + ☐ Compare to Langa-Weir, Hurd, Hudomiet, Graves NACC, Kasper NHATS/ADAMS
  + ☐ Limitations
  + ☐ Strengths of data, methods, approach
  + ☐ Implications for future research: hint at other possible approaches (a la Hurd using HCAP algorithm as criterion)
* ☐ **Appendices**

**How well do we do compared to reference standard diagnoses × other classification systems?**

This is for the discussion. The comparisons below tell me that *the HRS/HCAP actuarial classification as reported in Farron et al (2025) is really good*, but that is not the point of this paper. On the other hand, The **HRS Core** actuarial classification:

* 3-way, with weighted kappa of 0.33, is not good at all relative to other algorithms.
* But, the classification of dementia vs MCI or Normal is excellent in the HRS Core, ***so far the best we have seen*** among field survey validation exercises, with a weighted kappa of 0.77, and positive predictive value of 0.70, and sensitivity of 0.83.
* Still need to finish comparison with HRS Hurd and Hudomiet classifications
* This means the problem with the HRS Core actuarial classification is: it is not very good at classifying MCI.

| **Source** | **Sample, N** | **Classification** | **Criterion** | **Statistic** |
| --- | --- | --- | --- | --- |
| **3-way** |  |  |  |  |
| Farron et al (2025) | HRS/HCAP validation (N=50) | Normal, MCI, Dementia (actuarial) | HCAP Consensus Panel | =0.75 |
|  |  |  |  |  |
| Graves et al (2020) | NACC (N=1524) | Normal, MCI, Dementia (actuarial) | NACC Consensus diagnoses | =0.54 |
|  |  |  |  |  |
| Kasper et al (2013) | ADAMS subsample (N=121) | Probable, Possible, Unlikely Dementia (NHATS algorithm) | ADAMS Consensus diagnoses | =0.67 |
|  |  |  |  |  |
| This paper (2026) | HRS Core (HCAP validation, N=50) | Normal, MCI, Dementia (actuarial) | HRS/HCAP Consensus Panel | =0.33 |
|  |  |  |  |  |
| This paper (2026) | HRS Core (HCAP validation, N=50) | Normal, MCI, Dementia (Langa-Weir) | HRS/HCAP Consensus Panel | =? |
|  |  |  |  |  |
| **2-way** |  |  |  |  |
| This paper (2026) | HRS Core (HCAP validation, N=50) | Dementia (actuarial) | HRS/HCAP Consensus | =0.77 |
|  |  |  |  | PPV=0.70 |
|  |  |  |  | SN=0.83 |
|  |  |  |  |  |
| Graves et al (2020) | NACC (N=1524) | Dementia (actuarial) | NACC Consensus | =0.72 |
|  |  |  |  | PPV=0.43 |
|  |  |  |  | SN=0.96 |
|  |  |  |  |  |
| Farron et al (2025) | HRS/HCAP validation (N=50) | Dementia (actuarial) | HCAP Consensus | =0.70 |
|  |  |  |  | PPV=0.57 |
|  |  |  |  | SN=0.96 |
|  |  |  |  |  |
| Kasper et al (2013) | ADAMS subsample (N=121) | Probable dementia (NHATS algorithm) | ADAMS Consensus | =0.53 |
|  |  |  |  | PPV=0.69 |
|  |  |  |  | SN=0.66 |
|  |  |  |  |  |
| This paper (2026) | HRS Core (HCAP validation, N=50) | Dementia (Langa-Weir) | HRS/HCAP Consensus | ? |
|  |  |  |  |  |
| This paper (2026) | HRS Core (HCAP validation, N=50) | Dementia (Hurd) | HRS/HCAP Consensus | ? |
|  |  |  |  |  |
| This paper (2026) | HRS Core (HCAP validation, N=50) | Dementia (Hudomiet) | HRS/HCAP Consensus | ? |

The details of this table may need to be it’s own appendix. The data from Kasper et al (2013) and Graves et al (2020) are modified from their as-published form. Neither of these authors provide 3-way agreement statistics. Graves was not a representative sample. I re-constructed 3-way agreement tables from the data provided by these authors, and for both re-weighted to estimated population marginal distributions for Normal, MCI, and Dementia with respect to their study’s reference standard diagnostic classification.

Thanks for reading.