DISCUSSION OF 'ESSAI D'APPLICATION D'UN SCORE DE DÉTECTION DE DÉMENCE DANS SHARE'

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Overview

- To construct a score of dementia in SHARE that would allow the identification of persons with dementia

- Two Data sources put toghether:
  - SHARE data: cognitive and physical functioning measures, + many demographics and social measures
  - PAQUID: Detailed neuropsychological assessments to identify people with dementia, together with commmon SHARE/PAQUID measures

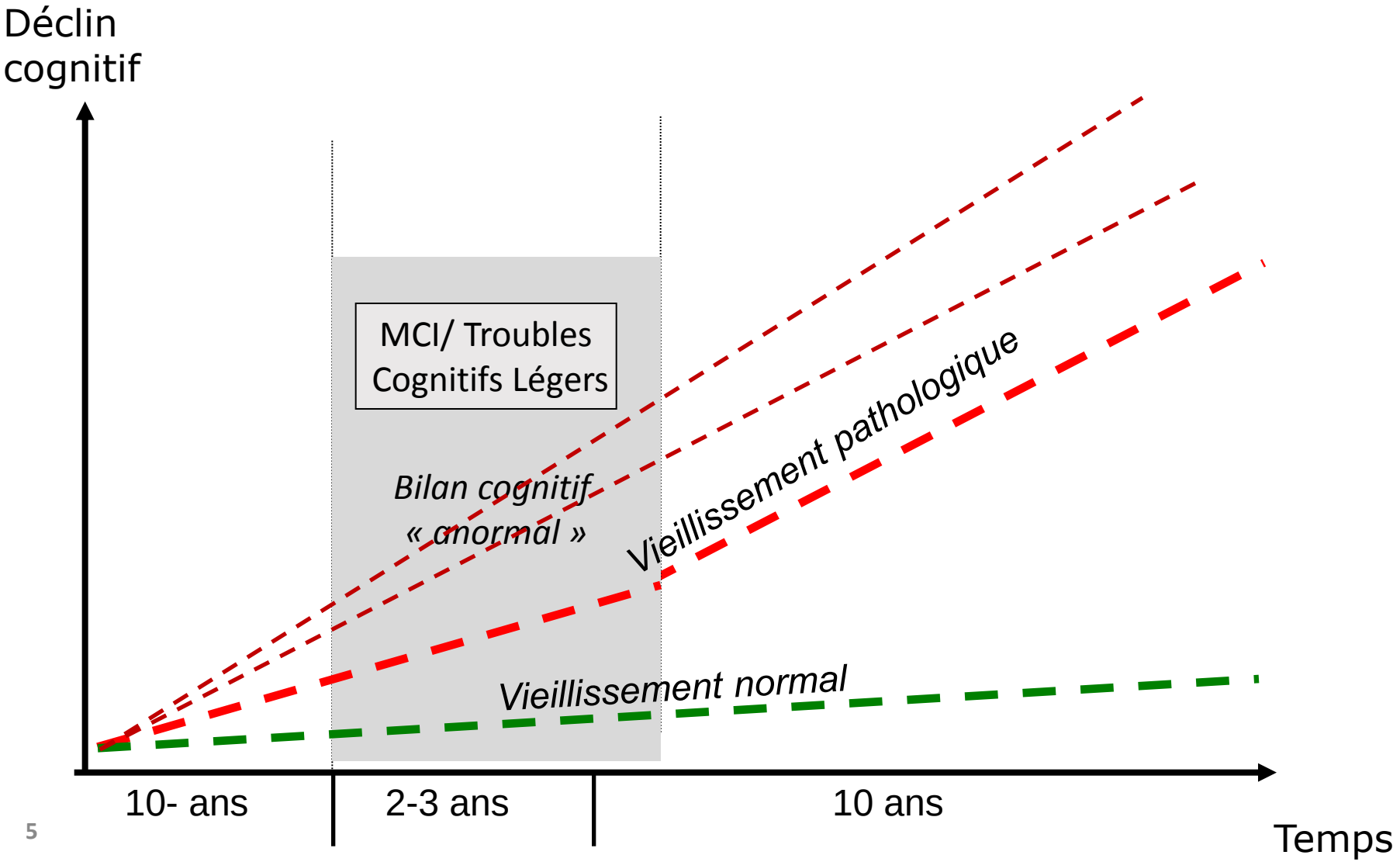
Strengths

- Identifying SHARE participants with dementia offers great potential for the study of
  - (a) socioeconomic determinants of dementia;
  - (b) behavioural consequences of dementia;
  - (c) needs for care at the population level
- Cross-national component –contextual influences
- Spill-overs: Potential sub-study of dementia within SHARE in the future
- Excellent interdisciplinary team

Is this a valid goal?

- **Yes**
  - The diagnosis of dementia represents a distinct pathological process and we may be able to use available tests in SHARE to identify individuals with dementia
  - We can estimate prevalence of dementia for different sub-groups and countries, and study the causes of dementia
- **Not necessarily**
  - Cognitive function is a **continuum** rather than a dichotomous variable ascertained with a diagnosis of dementia
  - A Dementia diagnosis is useful for treatment decisions`, prevalence estimates, etc., but for etiological research, it may not be clearly superior to a cognitive function continuum
  - Cognitive assessments are often not sensitive to whether a person is highly educated, highly literate, or just plain smart; human brain is very plastic and the more time someone has encountered a task the more likely they are to perform well

Progression of Dementia (from Briant et al)



Alternatives?

- Not an alternative for estimating prevalence and incidence…

- But **modelling** aimed to identifying risk factors:
  a) **Within-individual cognitive change** more useful than normalized scores, i.e., within-person change (disadvantage: no prevalence of dementia possible)
  b) Continuous score of the risk of Dementia, i.e., instead of a yes/no diagnosis, a 0-1 score of the probability of dementia

- Thus the goal is valid to the extent that it discriminates relevant deviations from individual slopes, and not only classifies individuals into dichotomous categories

Is it an achievable goal?

- **No:** We cannot use the limited set of common variables between SHARE and PAQUID to get a certain and precise clinical diagnosis of Dementia
  - 'Détection des personnes démentes dans SHARE' unlikely with the same certainty as clinical assessments
- **Yes:** We can get a probability of dementia score for each individual, in the same lines of a Framingham-like score of CVD

ORIGINAL ARTICLE

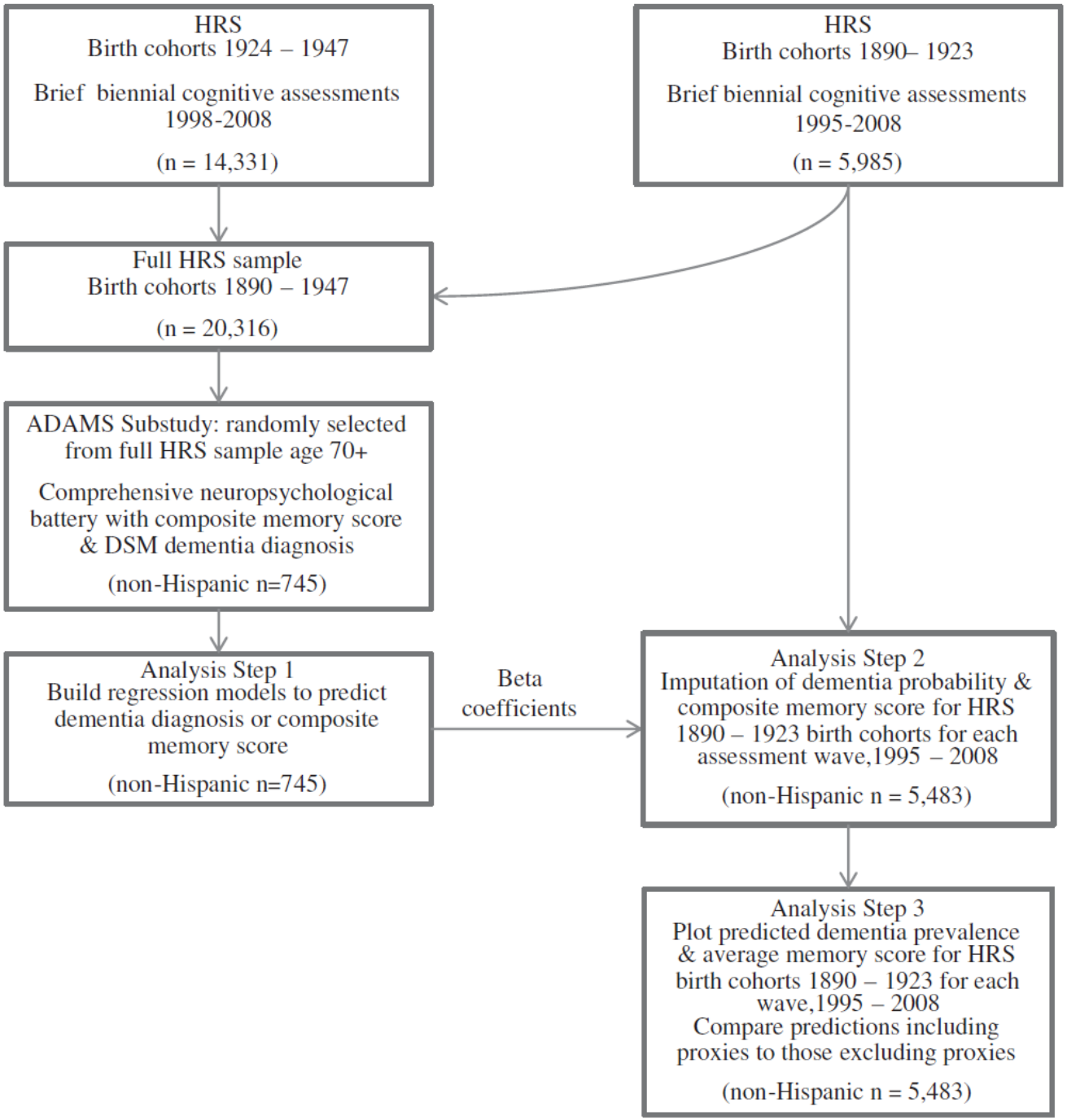
Combining Direct and Proxy Assessments to Reduce Attrition Bias in a Longitudinal Study

Qiong Wu, PhD, Eric J. Tchetgen Tchetgen, PhD,†‡ Theresa L. Osypuk, ScD,§ Kellee White, PhD,‖ Mahasin Mujahid, PhD,¶ and M. Maria Glymour, ScD#*

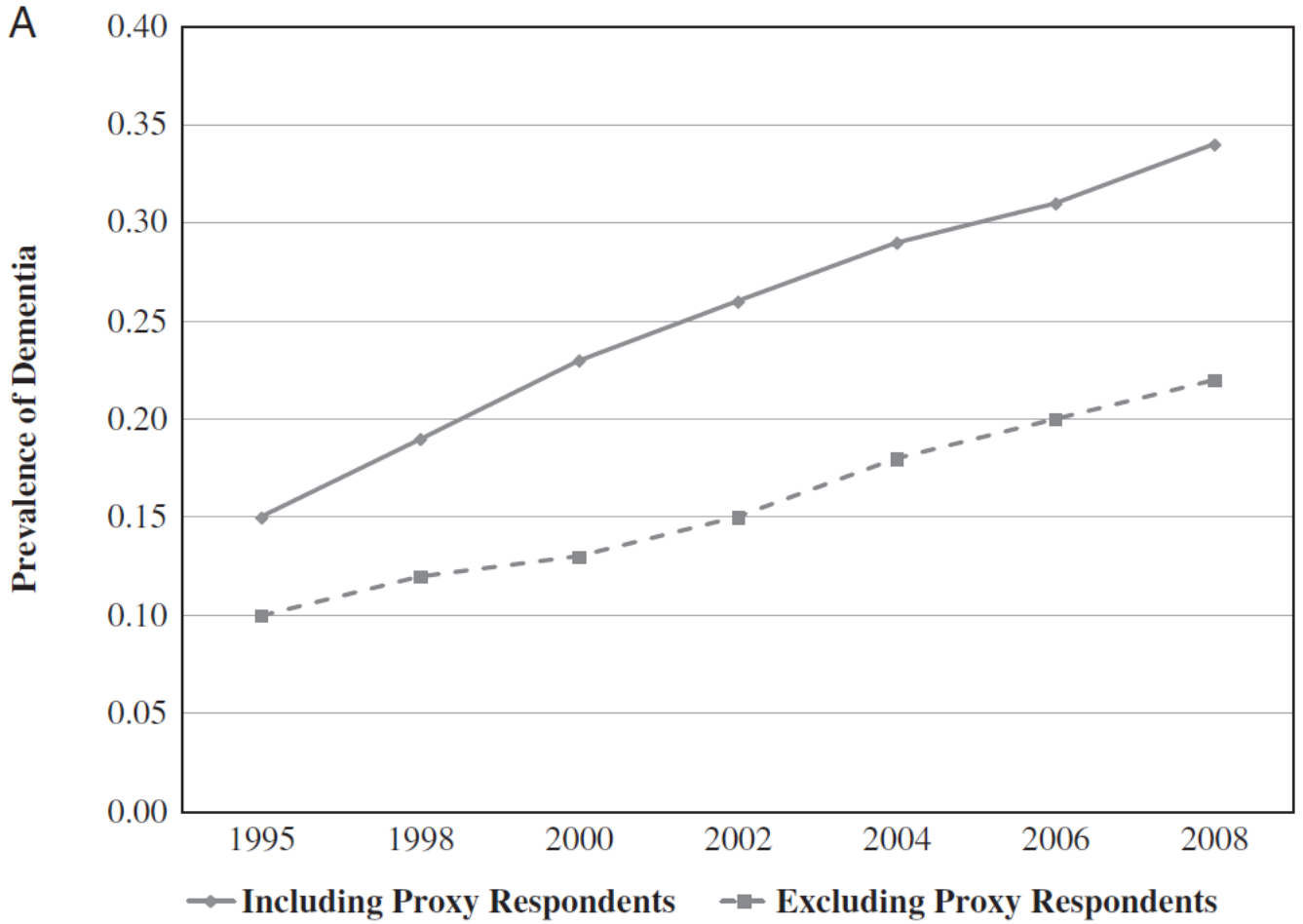
Wu et al, Alzheimer Dis Assoc Disord, 2012

Challenges

- Common measures across SHARE and PAQUID limited
  - Identify the predictive values of common vs missing measures
  - Test in other datasets (e.g., HRS) what happens when you leave out key measures not available in both surveys
- How to treat missing values and proxy interviews?
  - In SHARE, individuals complete biennial interviews until they are too impaired to do so; proxy respondents in several cases report on memory and cognitive function
  - No common scale for respondent and proxy responses
  - SHARE: relatively low retention rates
  - Compared with estimates excluding proxy respondents in the full cohort, incorporating information from proxy respondents in HRS increased estimated prevalence of dementia by 12 percentage points (Wu et al, 2012)


HRS
Birth cohorts 1924 – 1947
Brief biennial cognitive assessments
1998-2008
(n = 14,331)
HRS
Birth cohorts 1890– 1923
Brief biennial cognitive assessments
1995-2008
(n = 5,985)
Full HRS sample
Birth cohorts 1890 – 1947
(n = 20,316)
ADAMS Substudy: randomly selected from full HRS sample age 70+
Comprehensive neuropsychological battery with composite memory score & DSM dementia diagnosis
(non-Hispanic n=745)
Analysis Step 1
Build regression models to predict dementia diagnosis or composite memory score
(non-Hispanic n=745)
Beta coefficients
Analysis Step 2
Imputation of dementia probability & composite memory score for HRS 1890 – 1923 birth cohorts for each assessment wave,1995 – 2008
(non-Hispanic n = 5,483)
Analysis Step 3
Plot predicted dementia prevalence & average memory score for HRS birth cohorts 1890 – 1923 for each wave,1995 – 2008
Compare predictions including proxies to those excluding proxies
(non-Hispanic n = 5,483)

Estimates of dementia probability scores in HRS (n=5,483), including and excluding proxy respondents



Wu et al, Alzheimer Dis Assoc Disord, 2012

Other suggestions

- Current plan includes using mostly cognitive assessments; detailed assessments of ADL, IADL and mobility can be included to increase predictive power
- Unique element is the validation of a score for different countries; allow coefficients to differ by country
- In the same lines, allow coefficient to vary according to socioeconomic characteristics
- Physical performance measures may add to predictive value
- Examine the extent to which the dementia score distinguishes mild cognitive impairment from dementia
- Vascular Dementia vs. Alzheimer's disease: use doctor's diagnosis of e.g., stroke in SHARE?