

POPULATION REPRESENTATIVENESS IN ALZHEIMER’S DISEASE BIOMARKER STUDIES CONDUCTED IN BRAZIL: A SYSTEMATIC REVIEW

Joana E. Senger^{1,2} · Priscilla V. Borelli¹ · Nubia Freitas¹ · Débora G. Souza^{3,8} · Maria Inês Schmidt⁴ · Bruce Duncan⁴ · Eduardo R. Zimmer^{1,3,5,7,8} · Wyllians V. Borelli^{1,2,3,5}

¹ Graduate Program in Biological Sciences: Pharmacology and Therapeutics (PPGFT), UFRGS, Porto Alegre, RS, Brazil ² Memory Center, Hospital Moinhos de Vento, Porto Alegre, RS, Brazil ³ Graduate Program in Biological Sciences: Biochemistry (PPGBioq), UFRGS, Porto Alegre, RS, Brazil ⁴ Postgraduate Program in Epidemiology, Universidade Federal do Rio Grande do Sul (UFRGS), Porto Alegre, RS, Brazil ⁵ Department of Morphological Sciences, UFRGS, Porto Alegre, RS, Brazil ⁶ Department of Pharmacology, UFRGS, Porto Alegre, RS, Brazil ⁷ Department of Pharmacology and Therapeutics, McGill University, Montreal, Canada ⁸ Brain Institute of Rio Grande do Sul (Brains), Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS), Porto Alegre, RS, Brazil

INTRODUCTION

Adequate **population representation is essential for the external validity of Alzheimer’s disease (AD) biomarker research.** Evidence from low- and middle-income countries remains limited, and Brazilian studies may not reflect the national demographic profile.



Objective: This study assessed whether Brazilian AD biomarker research represents the population in terms of sex, age, and educational attainment.

METHODS

- We conducted a systematic review following PRISMA guidelines, including studies published between 2015 and 2025 that evaluated AD biomarkers in Brazil.
- A total of 59 studies were included.
- Pooled demographic data (sex, mean age, and years of education) were extracted from eligible studies and compared with nationally representative data from the Brazilian Longitudinal Study of Aging (ELSI-Brazil).
- Z-tests were used to compare pooled means and proportions with the national population (ELSI-Brazil).

CONCLUSION

- Brazilian AD biomarker studies differ from the national population, including participants who are older and more highly educated despite a similar sex distribution.
- This demographic bias may limit the generalizability of findings and highlights the need for more representative recruitment strategies.

RESULTS

A total of 3,357 participants were included, of whom 60.6% were women, a proportion comparable to the Brazilian national reference. **Participants in biomarker studies were significantly older than the national older adult population.** They also had substantially **higher educational attainment.**

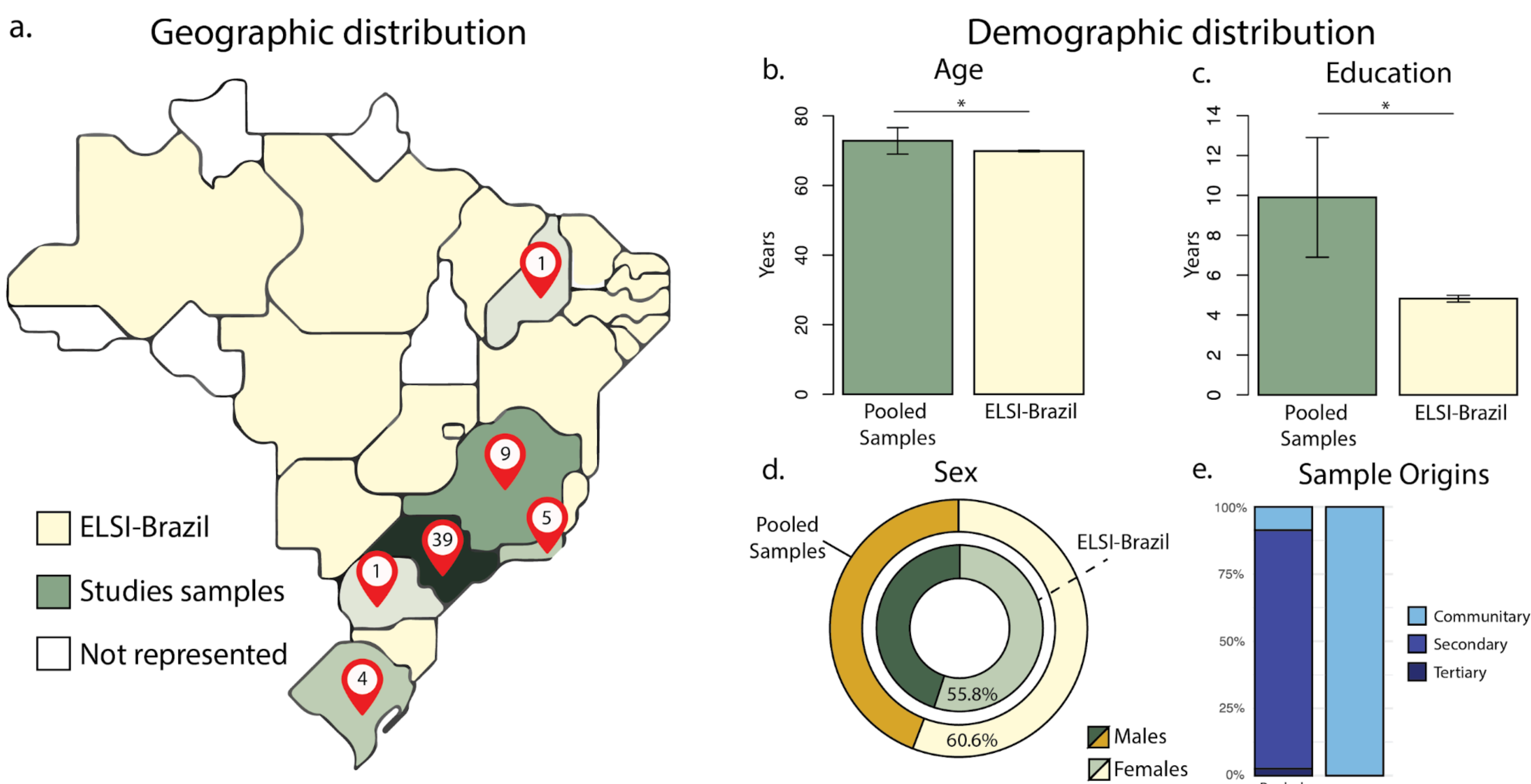


Figure 2:Geographical distribution of studies retrieved from this review, with the total number of studies by state and in the ELSI-Brazil

Participants with Alzheimer's disease (AD) were significantly older than cognitively unimpaired individuals and had lower educational attainment. Women comprised the majority of both groups (61% in CU and 60% in AD). On average, the pooled cohorts included 32.3 ± 18.5 CU participants and 28.2 ± 14.6 AD participants.

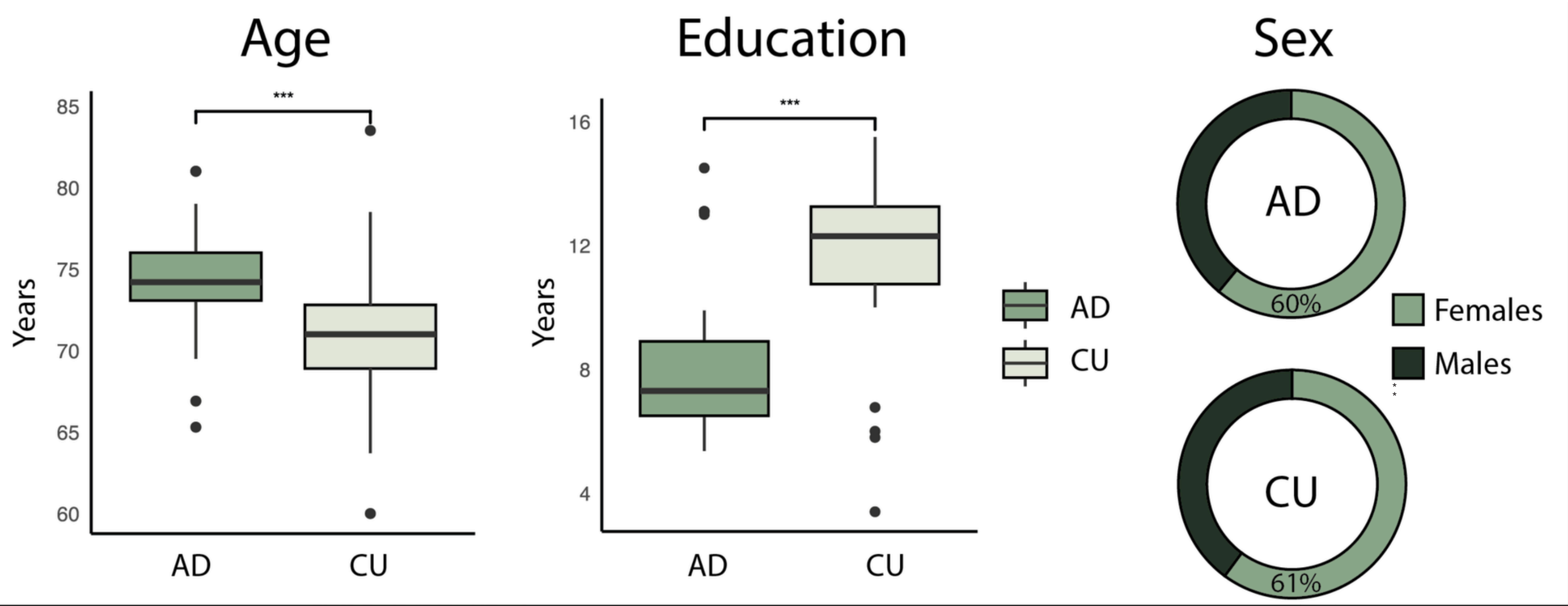


Figure 3. Demographic characteristics of included samples according to age, education, and sex separated by group.

Acknowledgement



Any question?
joanasenger@hotmail.com