

Higher Tau PET Per Amyloid and Plasma Ptau217 in Lower Socioeconomic Status: Evidence for Accelerated AD Progression

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Introduction

- Older adults from lower socioeconomic status (SES) backgrounds are underrepresented in Alzheimer’s disease (AD) research but make up a substantial proportion of the U.S. aging population and are disproportionately affected by dementia.
- This study aimed to: 1) increase the generalizability of prior research findings in this area and 2) understand whether AD biomarker relationships differ by SES

Tau Harmonization and Measuring SES

Tau Harmonization

For each tau tracer, a reference sample (cognitively normal, 60-70 yr old, Aβ-negative) is used to Z-normalize meta-temporal SUVrs₃

SES

Hollingshead (HHS)_{1,2} = (occupational rank * 7) + (educational rank * 4)

Method

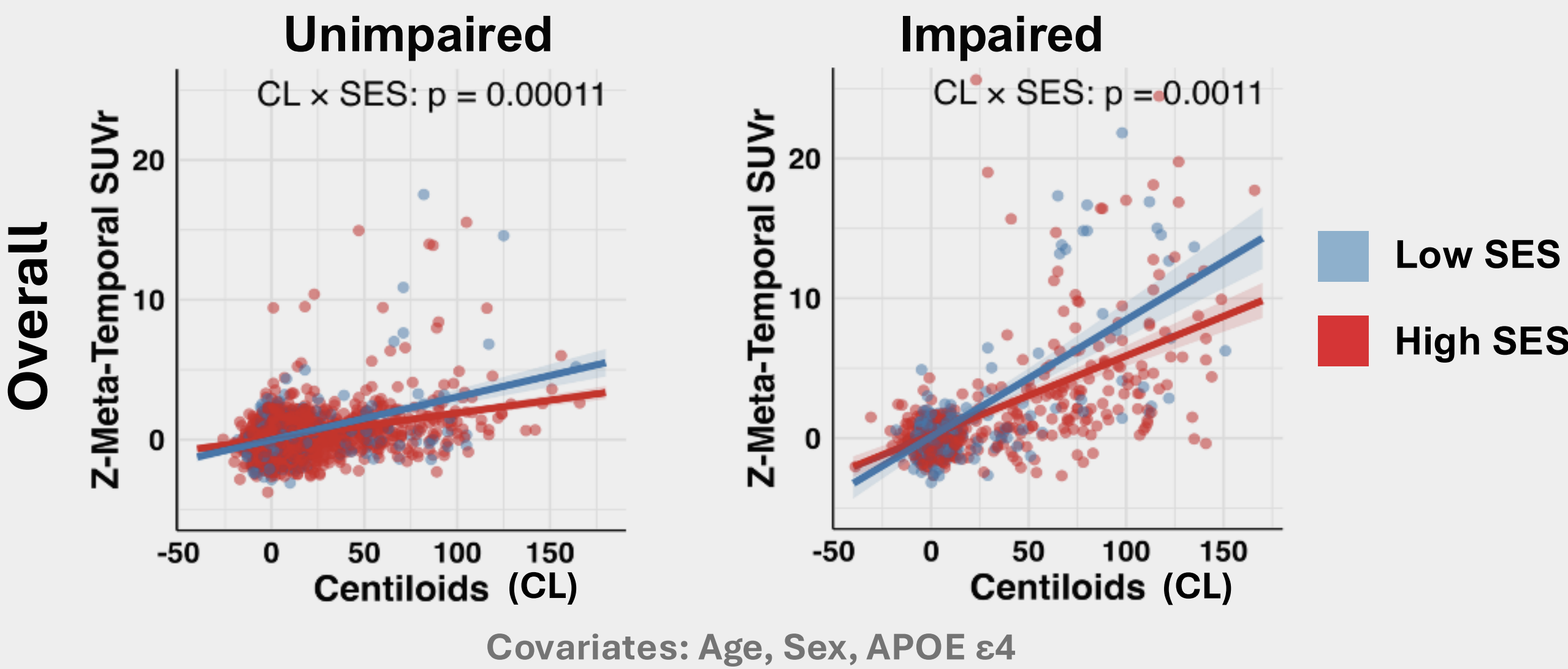
Measure/Cohort	Overall N = 2,914	ADNI N = 611	US POINTER N = 880	HABS-HD N = 1,423
Age	68± 8	71± 7	68± 5	66± 9
Sex % Female	60%	58%	62%	60%
SES Low SES > 47 HHS	20%	11%	15%	27%
Race and Ethnicity White/Hispanic/Black/Other %	53 18 23 6	68 7 18 7	68 7 14 11	38 29 31 2
% Aβ+ (>18 CL)	27%	36%	29%	21%
% APOE ε4	31%	36%	31%	30%
% Impaired MCI/Dementia DX	22%	35%	5.3%	28%

Inclusion criteria: Aβ PET, tau PET, MRI, occupation, education, ADI, ADNI tau: FTP only

Key Findings

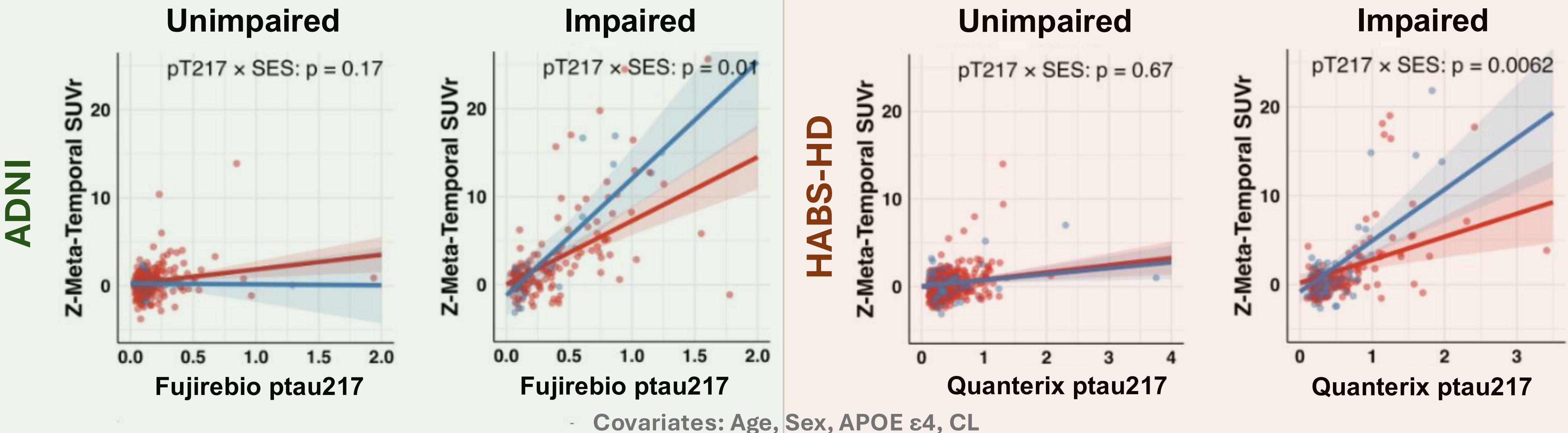
- Lower SES was associated with less AD biomarker burden and atrophy despite worse cardiometabolic risk and cognition.
- Lower SES impaired participants showed higher tau PET per Aβ burden than higher SES impaired participants, using either Aβ PET or plasma ptau217 (available in 83% of ADNI, 65% of HABS-HD, unavailable in POINTER). This pattern was also observed in unimpaired participants for Aβ PET only and persisted within race/ethnicity groups, in matched samples, and after adjustment for cardiometabolic risk.
- SES did not modify relationships between Aβ PET and ptau217, or between AD pathology and cognition (PACC) or cortical atrophy.

SES Moderates the Relationship Between Amyloid and Tau



Low-SES participants had lower overall tau PET than high-SES participants (not shown), but greater tau PET signal per Aβ burden in the merged POINTER, HABS-HD, and ADNI sample and within each cohort.

SES Moderates the Relationship Between Tau PET and Plasma Ptau217



Lower SES impaired participants had disproportionately higher tau PET for a given amount of ptau217 compared to their high SES counterparts. We obtained similar results using the C2N assay in ADNI, with %ptau217 instead of ptau217.

Conclusion

SES may capture multidimensional social and health-related factors that are linked to faster AD biomarker progression. Lower SES is related to higher tau for a given amount of Aβ, suggesting accelerated disease progression. These findings underscore the importance of research samples that are representative of US older adults and have implications for biomarker-based staging, clinical trial design, and treatment.

References: ¹Rentz et al., J Prev Alzheimer’s Dis, 2024; ²Hollingshead, Yale University, 1965; ³Landau et al., Alzheimer’s Dement, 2025.

