

Higher Area Deprivation Index Is a Potential Marker of Alzheimer’s Disease Co-Pathology In a National Brain Bank Donor Sample



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BACKGROUND

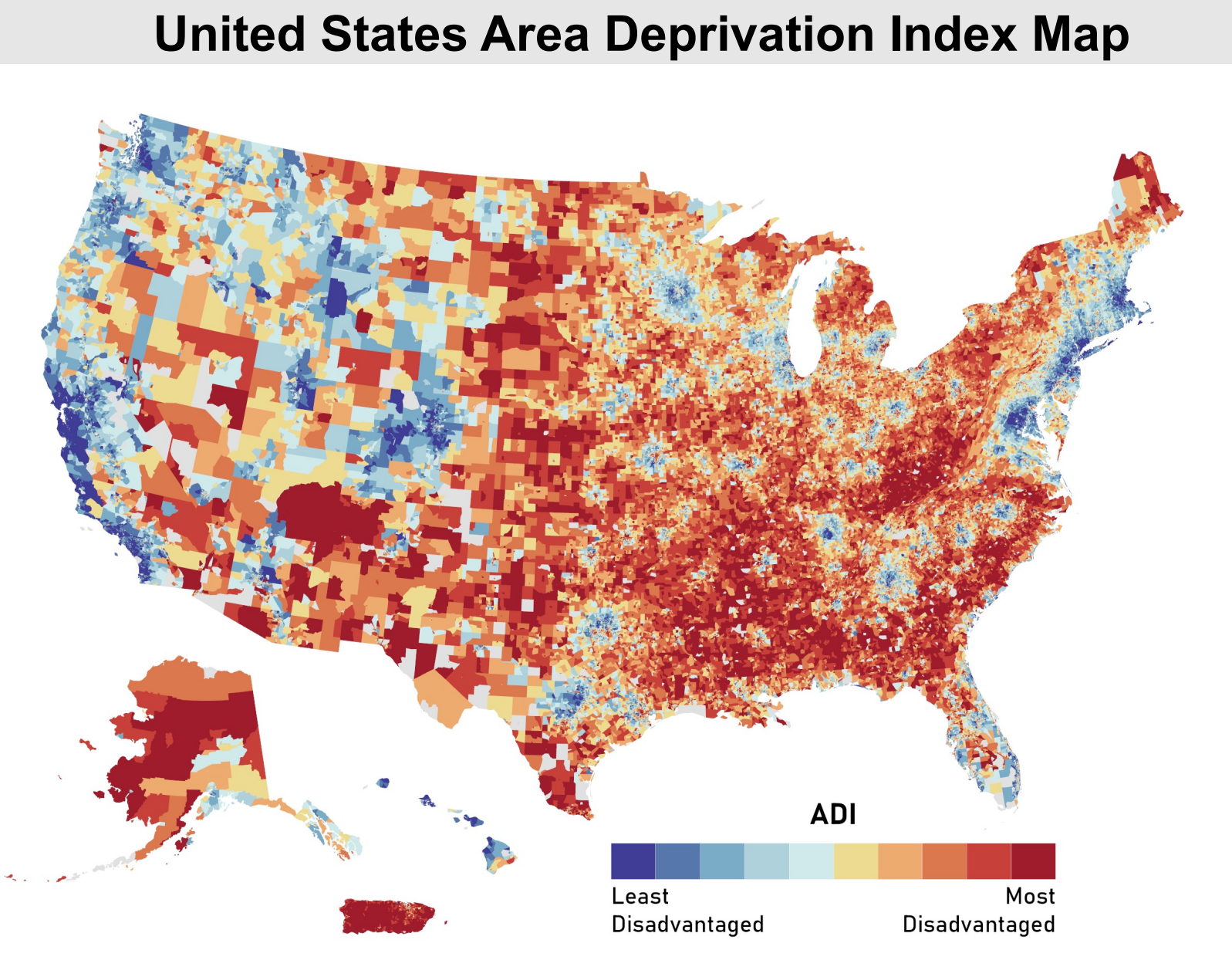
- Quantifying the presence of Alzheimer’s disease (AD) and co-pathologies is critical for patient eligibility for **anti-amyloid therapies**
 - Increased risk for adverse events accompany some co-pathologies¹
 - Persons with co-pathologies typically excluded from anti-amyloid clinical trials²
- Adverse social exposome**
 - Reflects contextual socioeconomic disadvantage
 - Measured by Area Deprivation Index (ADI)
 - Associated with increased clinical and neuropathological diagnoses of AD and related dementias
- ADI is widely available in clinical settings to screen patient risk, yet the relationship between ADI and AD co-pathologies is unknown

OBJECTIVE

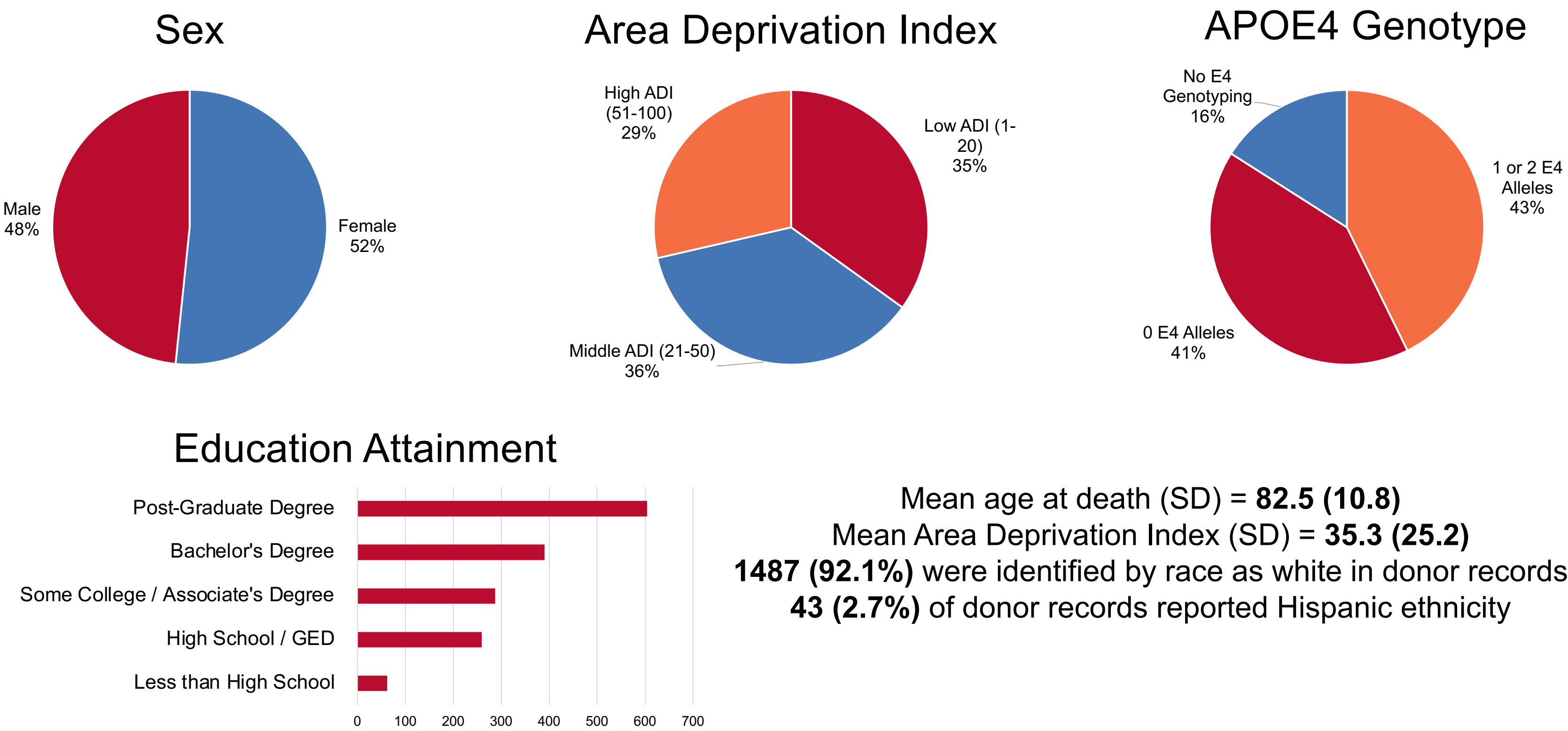
Determine the association of AD co-pathologies and adverse social exposome (by ADI) in a national sample of brain bank donors from the Neighborhoods Study

METHODS

- Sample**
 - Donors with AD and valid assessments for LATE-NC, Lewy body and cerebrovascular disease via the National Alzheimer’s Coordinating Center (NACC) Neuropathology Data Set (n=1615)
 - From 21 Alzheimer’s Disease Research Centers (ADRCs) as part of the Neighborhoods Study
 - Categorized by the presence of these outcomes into two groups: lone AD without co-pathologies and AD plus any co-pathology
- Adverse social exposome**
 - Linked donor addresses from year of death to ADI³
 - ADI incorporates measures of income, education, employment and housing quality at the neighborhood level
 - Grouped into low (ADI = 1-20), middle (ADI = 21-49), and high (ADI = 50-100) tertiles
- Analysis**
 - Logistic regression analyses estimated odds of AD co-pathology across ADI tertiles
 - Adjusted for age at death, sex, education, and APOE4 carrier status



SAMPLE CHARACTERISTICS (N=1615)



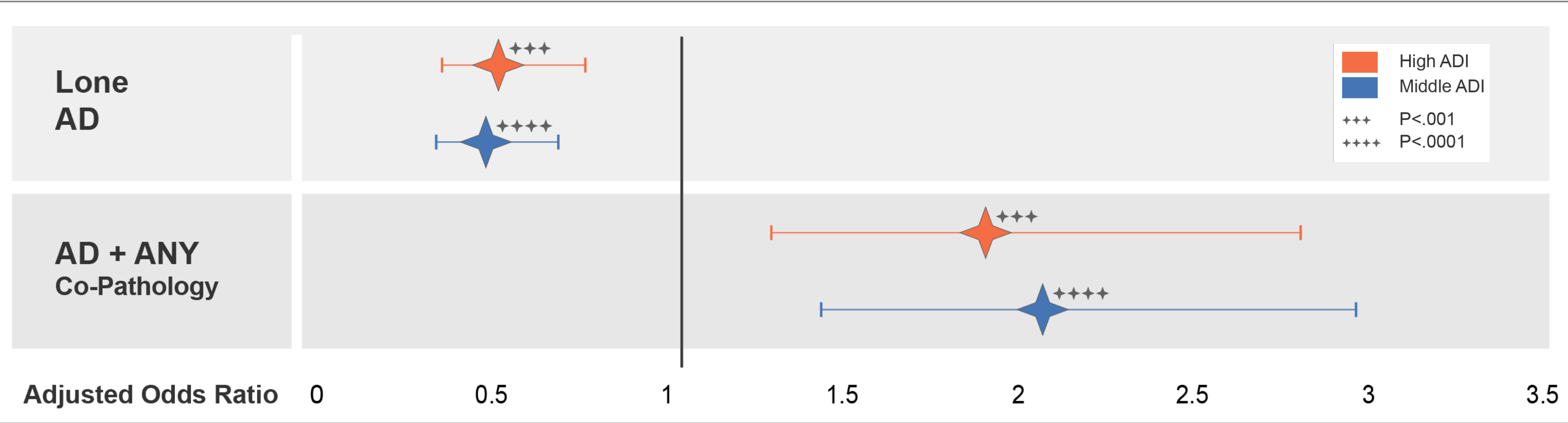
RESULTS

AD Co-Pathology Frequencies in AD Positive Donor Sample across ADI Tertile Groups

Characteristic	Low ADI Tertile n=564 (34.92%)	Middle ADI Tertile n=589 (36.47%)	High ADI Tertile n=462 (28.61%)	P-Value
LATE-NC				P<.01
Present	189 (29.62)	251 (39.34)	198 (31.03)	
Absent	375 (38.38)	338 (34.60)	264 (27.02)	
Lewy Body Pathology				P=.54
Present	233 (33.72)	262 (37.92)	196 (28.36)	
Absent	331 (35.82)	327 (35.39)	266 (28.79)	
Vascular Brain Injury				P<.01
Present	370 (32.06)	446 (38.65)	338 (29.29)	
Absent	194 (42.08)	143 (31.02)	124 (26.90)	
AD Co-Pathologies				P<.01
Lone AD	95 (49.74)	52 (27.23)	44 (23.04)	
AD + Any Co-Pathology	469 (32.94)	537 (37.71)	418 (29.35)	
AD + 1 Co-Pathology	95 (49.74)	52 (27.23)	44 (23.04)	
AD + 2 Co-Pathologies	227 (36.55)	217 (34.94)	177 (28.50)	
AD + 3 Co-Pathologies	161 (29.43)	218 (39.85)	168 (30.71)	

- Most donors (**88.2%**) had AD with at least one co-pathology

Adjusted odds of Lone AD and AD plus Co-Pathologies in High, Middle vs. Low ADI groups in AD Positive Brain Bank Donors



- Significantly **reduced odds of having lone AD** were found in those with high (adjusted OR=0.52, 95% CI: [0.36-0.77]) and middle (adjusted OR=0.48, 95% CI: [0.34-0.69]) ADI groups, compared to low ADI
- High (adjusted OR=2.07, 95% CI: [1.44-2.97]) and middle (adjusted OR=1.91, 95% CI: [1.30-2.81]) ADI groups had **significantly increased odds of having AD with at least one co-pathology**, compared to low ADI

CONCLUSIONS

- Donors exposed to adverse social exposome (indexed by high ADI) had significantly greater odds of having AD with co-pathologies**
- Highlights the potential use of ADI as a readily clinically-available index to **inform risk stratification when evaluating individuals for anti-amyloid therapies**
 - Life-course study is needed to fully understand this potential
- Non-amyloid AD co-pathology-targeted therapies are needed, particularly for persons in high ADI adverse social exposomes
- Limitations**
 - ADI from time of death – future work will incorporate social exposome measures from across the life course
 - Non-representative sample – ADRC brain banks are taking active steps to recruit donors to better reflect the general population of the United States

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