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EPIDEMIOLOGY

Higher Household Air Pollution Levels Correlate with Poorer Cognitive Function in the Longitudinal Aging Study in India (LASI)

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Abstract

Background: Indians have some of the highest fine particulate matter ($PM_{2.5}$) exposures in the world, not only due to high ambient air levels but also because of household combustion of biomass fuel. To understand the burdens of these exposures for older adults, we evaluated associations of indoor $PM_{2.5}$ with cognitive function in India.

Method: We used data from the 2017-2019 baseline survey of the nationally-representative Longitudinal Aging Study in India (LASI) to derive a general cognition score for each participant. For indoor $PM_{2.5}$ levels, we used an India-specific prediction model informed by participant cooking and housing characteristics. We estimated associations between indoor $PM_{2.5}$ with cognitive function using linear mixed-effects models after adjustment for age, sex, individual and community-level socioeconomic variables, region, clustering by village, and sample weights.

Result: We observed a population of 61,708 participants aged 45 and over. Many of these individuals (48%) used highly polluting fuel, resulting in average indoor $PM_{2.5}$ concentrations of 205± 110 μg/m^3. After adjustment for individual and area-level confounders, we found that indoor $PM_{2.5}$ was associated with poorer cognitive function. For each 100 μg/m^3 of indoor $PM_{2.5}$, we observed -0.027 (95% CI: -0.033, -0.02) lower cognition scores. These associations were strongest among women as well as among adults less than age 65 years. When scaling these associations to the observed interquartile range (150 μg/m^3), household exposures resulted in cognitive differences comparable to those observed between people 2 years apart.

Conclusion: Among older adults living in India, household $PM_{2.5}$ is associated with poorer cognition at older ages even after adjustment for individual sociodemographic characteristics and regional trends.