

Smog in Aging Brains:

The Impact of Exposure to Air Pollution on Cognitive Performance

Xin Zhang^a Xi Chen^b Xiaobo Zhang^{c, 1}

^a School of Statistics, Beijing Normal University, Beijing 100875, China

^b School of Public Health and Department of Economics, Yale University, 60 College St, New Haven, CT 06520

^c National School of Development, Peking University, Beijing 100871, China
International Food Policy Research Institute (IFPRI), 1201 Eye St, NW, Washington, DC 20005

Corresponding author E-mail: x.zhang@nsd.pku.edu.cn

Abstract

This paper examines the effect of both *cumulative* and *transitory* exposures to air pollution for the same individuals over time on cognitive performance by matching a nationally representative longitudinal survey and air-quality data in China according to the exact time and geographic locations of the cognitive tests. We find that long-term exposure to air pollution impedes cognitive performance in verbal and math tests. We provide the first evidence that the effect of air pollution on verbal tests becomes more pronounced as people age, especially for men and the less educated. The damage on aging brain by air pollution likely imposes substantial health and economic cost considering that cognitive functioning is critical for the elderly to both running daily errands and making high-stake decisions.

Keywords: cognitive decline; air pollution; aging; gender difference

JEL Codes: I24, Q53, Q51, J16