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The Exposome in Practice: The Study of Biomarkers of Air Pollutants Exposure in Chinese aged 60-69 (China BAPE Study)

The adverse health effects associated with exposure to air pollution has attracted widespread public attention. Mounting evidence has demonstrated that air pollution exposure can be associated with biomarkers and relevant pathways, which help us to gain insights into the underlying mechanisms to the outcomes, e.g., cardiovascular, metabolic, and neurological diseases. To date, studies that comprehensively explore biomarkers of exposure to air pollution in healthy elderly subjects are limited. To this end, we established an exploratory panel study of Biomarkers of Air Pollutants Exposure in Chinese people aged 60-69 (China BAPE). The study included 76 healthy adults who were residents of Jinan City, Shandong Province. We conducted prospective longitudinal monitoring during five three-day assessment periods between September 2018 and January 2019. Herein we describe the rationale and design of a comprehensive biomarker plan to systematically explore how individual exposure is related to adverse health outcomes through the use of cutting-edge and consolidated exposomic approaches. This project centers on: 1) leveraging advanced tools and methods for personal exposure monitoring (external exposures), 2) laboratory measurements of bio-samples via multiple chemical and biological analysis technologies (e.g., high throughput assays and/or omics) to explore potential biomarkers, and 3) evaluation of the relationships between personal exposure to outdoor air pollution and novel biomarkers of exposure and effects through statistical modeling. The biomarker findings are essential for understanding air pollution exposures, mechanistic pathways of adverse health impacts, and identifying and monitoring early adverse health outcomes.

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