Lung Cancer, Cardiopulmonary Mortality, and Long-term Exposure to Fine Particulate Air Pollution
Vol. 287 No. 9, March 6, 2002

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Context  Associations have been found between day-to-day particulate air pollution and increased risk of various adverse health outcomes, including cardiopulmonary mortality. However, studies of health effects of long-term particulate air pollution have been less conclusive.

Objective  To assess the relationship between long-term exposure to fine particulate air pollution and all-cause, lung cancer, and cardiopulmonary mortality.

Design, Setting, and Participants  Vital status and cause of death data were collected by the American Cancer Society as part of the Cancer Prevention II study, an ongoing prospective mortality study, which enrolled approximately 1.2 million adults in 1982. Participants completed a questionnaire detailing individual risk factor data (age, sex, race, weight, height, smoking history, education, marital status, diet, alcohol consumption, and occupational exposures). The risk factor data for approximately 500 000 adults were linked with air pollution data for metropolitan areas throughout the United States and combined with vital status and cause of death data through December 31, 1998.

Main Outcome Measure  All-cause, lung cancer, and cardiopulmonary mortality.

Results  Fine particulate and sulfur oxide–related pollution were associated with all-cause, lung cancer, and cardiopulmonary mortality. Each 10-µg/m³ elevation in fine particulate air pollution was associated with approximately a 4%, 6%, and 8% increased risk of all-cause, cardiopulmonary, and lung cancer mortality, respectively. Measures of coarse particle fraction and total suspended particles were not consistently associated with mortality.

Conclusion  Long-term exposure to combustion-related fine particulate air pollution is an important environmental risk factor for cardiopulmonary and lung cancer mortality.

JAMA. 2002;287:1132-1141

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Funding/Support: The research for this article was supported largely by grant ES09560-01A1 from the National Institutes of Health/National Institute of Environmental Health Sciences (NIEHS). It was also supported in part by grant ES00260 from the New York University Center/NIEHS, grant R-827351 from the Environmental Protection Agency PM Health Effects Research Center, and funding from the R. Samuel McLaughlin Centre for Population Health Risk Assessment at the University of Ottawa.

Acknowledgment: We thank Morton Lippmann, PhD, for his help in developing the research grant application and various comments and suggestions and Yuanli Shi, MD, for computer programming and statistical analysis support.

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