

# IS THE ASSOCIATION OF AIR POLLUTION WITH INCIDENT CORONARY HEART DISEASE OR ALL CAUSE MORTALITY MODIFIED BY A HEALTHY LIFESTYLE?

**Jaime E Hart**, *Channing Laboratory, Brigham and Women's Hospital and Harvard Medical School and Department of Epidemiology, Harvard School of Public Health, Boston, MA, USA*

**Diane Feskanich**, *Channing Laboratory, Brigham and Women's Hospital and Harvard Medical School, Boston, MA, USA*

**Robin C Puett**, *South Carolina Cancer Prevention and Control Program and Departments of Epidemiology and Biostatistics and Environmental Health Sciences, Arnold School of Public Health, University of South Carolina, Columbia, SC, USA*

**Jeff D Yanosky**, *Department of Public Health Sciences, and Department of Medicine, Division of Cardiology, Penn State University College of Medicine, Hershey, PA, USA*

**Francine Laden**, *Channing Laboratory, Brigham and Women's Hospital and Harvard Medical School and Departments of Epidemiology and Environmental Health, Harvard School of Public Health, Boston, MA, USA*

**Background and Aims:** Chronic exposures to particulate matter (PM) have been associated with increased morbidity and mortality. Few studies, however, have been able to examine the impacts of a healthy lifestyle on these associations.

**Methods:** Monthly PM<sub>10</sub> levels 1988-2006 were assigned to the residential address history of 101,307 members of the all-female Nurses' Health Study and were used to calculate time-varying average exposure in the previous 12 months. Information on confounders and diet and physical activity was available from mailed questionnaires. Effect modification of the association of PM<sub>10</sub> with risk of incident coronary heart disease (CHD) and all-cause mortality by diet, alcohol consumption, and physical activity was assessed in stratified Cox proportional hazards models. All models were adjusted for calendar month, season, current age, region, family history, high cholesterol or high blood pressure, BMI, diabetes, cigarette smoking, median census tract income and home value.

**Results:** Each 10 µg/m<sup>3</sup> increase in 12 month average PM<sub>10</sub> was associated with an all-cause hazard ratio (HR) of 1.07 (95%CI: 1.04-1.11) and an incident CHD HR=1.04 (95%CI: 0.97-1.12). We observed suggestions of effect modification of the all-cause mortality associations by total antioxidant intake and physical activity. Similar patterns were seen for incident CHD with additional effect modification by the prudent diet pattern, fruit consumption, and alcohol consumption. Overall, increasing consumption of healthy foods was associated with a lower risk per unit increase of PM<sub>10</sub>, while increasing physical activity levels were associated with higher risks.

**Conclusions:** These results suggest that individuals with moderate alcohol consumption and increased consumption of healthy foods may be at a lower risk of incident CHD and all-cause mortality per 10 µg/m<sup>3</sup> increase in PM<sub>10</sub>. Individuals with higher levels of physical activity may be at a higher risk, possibly due to additional time outdoors.