

2020 HEI ANNUAL CONFERENCE
Renaissance Boston Waterfront Hotel
Boston, Massachusetts, USA
April 5-7, 2020

TRAVEL AWARD ABSTRACT INSTRUCTIONS

Submission Deadline: Wednesday, January 15, 2020

PLEASE NOTE: Because HEI Annual Conference attendees include policy-makers and scientists from a variety of disciplines, **HEI requests that you write the abstract in language appropriate for a broad audience** who may not be familiar with your scientific discipline. To assist you, we have attached a sample abstract (next page). A copy of the sample abstract is also available on the online form.

- Abstracts should be submitted online ([access the form](#)) and related queries can be e-mailed to **Ms. Lissa McBurney** (science-admin@healtheffects.org) with subject line **“HEI 2020 Travel Award”**.
- Your abstract should be **no more than 500 words** including the title, authors and affiliations. It should contain (1) the study background and objectives, (2) a brief overview of the methods and approach, (3) a summary of the results obtained, and (4) a statement of interpretation and conclusions. Do not simply state “the results will be discussed.”
- The use of abbreviations should be limited. The first time an abbreviation is used, it should be spelled out in full, followed by the abbreviation in parentheses.
- Please limit the use of special characters and ensure that all formatting and special characters are clear in the submitted abstract (e.g., R^2 for R^2 , $PM_{2.5}$ for $PM_{2.5}$, beta for β , *Title* for **Title**). Avoid the use of fields or special formulas as these may get lost during submission of the form.
- Do not include figures or tables in the abstract. However, inclusion of some numbers in the results section may be useful.

SAMPLE ABSTRACT FOR SUBMISSION

Respiratory Effects of Air Pollution Exposure During Exercise in Susceptible Individuals
Presenting A Investigator¹, Second B Author¹, Third C Author², Fourth D Author¹
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Background. Air pollution may contain irritants that affect human lung function. People with respiratory disease may be at higher risk for poor health due to air pollution exposure. In addition, physical activity may affect the magnitude of the effects of air pollution on health. We investigated the effects of short-term air pollution exposure during exercise and at rest in people with respiratory disease.

Methods. We recruited 40 adults with physician-diagnosed respiratory disease. In separate 30-minute sessions, we exposed them to ambient air pollution in a closed chamber while they exercised on a treadmill, and while performing sedentary activities (such as using a computer or reading a book). We made detailed real-time exposure, physiological, and immunological measurements, and analyzed the exercising and sedentary test results for each subject using a crossover design.

Results. Subjects had significantly reduced lung function when they were exposed to particulate matter (PM) and nitrogen dioxide (NO₂) while exercising. Average pollutant concentrations during exposure were $100 \pm 25 \mu\text{g}/\text{m}^3$ PM and $40 \pm 10 \text{ ppm}$ NO₂. Walking on the treadmill produced a circa 10% reduction in the forced expiratory volume in one second (FEV₁) compared to sedentary activity at similar PM and NO₂ concentrations. The combined effects of air pollution exposure and exercise were greater in individuals with moderate respiratory disease than in those with mild respiratory disease. Respiratory changes were accompanied by changes in biomarkers; for example, we observed a 20% increase in neutrophil levels in sputum samples. Changes in biomarkers were consistently associated with both PM and NO₂ concentrations.

Conclusions. This study explored the combined effect of exercise and air pollution exposure on respiratory responses. Our observations support epidemiological observations that associate increased physical exercise under more polluted conditions with increased severity of respiratory health effects.