National Institute of Environmental Health Sciences

Acute upper and lower respiratory effects in wildland firefighters

Author(s): Gaughan DM, Cox-Ganser JM, Enright PL, Castellan RM, Wagner GR, Hobbs GR, Bledsoe TA, Siegel PD, Kreiss K, Weissman DN

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Abstract:

OBJECTIVES: To assess acute respiratory effects experienced by wildland firefighters. METHODS: We studied two Interagency Hotshot Crews with questionnaires, spirometry, and measurement of albumin, eosinophilic cationic protein (ECP), and myeloperoxidase (MPO) as indicators of inflammation in sputum and nasal lavage fluid. Assessments were made preseason, postfire, and postseason. RESULTS: Fifty-eight members of the two crews had at least two assessments. Mean upper and lower respiratory symptom scores were higher postfire compared to preseason ($P < 0.001$). The mean forced expiratory volume in 1 second was lower postfire compared to preseason ($P < 0.001$) and then recovered by postseason. Individual increases in sputum and nasal ECP and MPO from preseason to postfire were all significantly associated with postfire respiratory symptom scores. CONCLUSIONS: Wildland firefighting was associated with upper and lower respiratory symptoms and reduced forced expiratory volume in 1 second. Within individuals, symptoms were associated with increased ECP and MPO in sputum and nasal lavage fluid. The long-term respiratory health impact of wildland firefighting, especially over multiple fire seasons, remains an important concern.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Extreme Weather Event

Extreme Weather Event: Wildfires

Geographic Feature:

resource focuses on specific type of geography

Mountain, Valley

Geographic Location:

resource focuses on specific location

United States

Health Impact: ☒

specification of health effect or disease related to climate change exposure

Respiratory Effect

Respiratory Effect: Other Respiratory Effect

Respiratory Condition (other) : respiratory symptoms

Population of Concern: A focus of content

Population of Concern: ☒

populations at particular risk or vulnerability to climate change impacts

Workers

Resource Type: ☒

format or standard characteristic of resource

Research Article

Timescale: ☒

time period studied

Time Scale Unspecified