New York State Department of Health
Center for Environmental Health

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Development of an Exposure Assessment Tool for Epidemiological Studies of Workers Responding to the World Trade Center Disaster

Introduction

The NYS DOH is conducting three studies of NYS employees and National Guard personnel who responded to the September 11, 2001, World Trade Center (WTC) disaster. Individuals who responded to the disaster were exposed to various levels of smoke, fumes, dust and debris generated by the collapse of the buildings and the ongoing fires. We describe an exposure assessment tool designed to characterize the exposures of participants of these three studies. There have been no similar exposure assessments for WTC response workers published to date.

Methods

The tool consists of two algorithms that each represent a major component of the overall exposures at the site: dust/debris and smoke from the fires. The algorithms use duration of work assignment, location and time period of work assignment, respiratory protective equipment use and frequency of use, collected by a self-administered mailed questionnaire. The algorithms also use United States Environmental Protection Agency air monitoring data collected between September 23, 2001 and February 28, 2002. Taken together, this data is used to calculate an overall exposure score. Each algorithm uses the same methodology.

Findings

More individuals in the highest exposure score category performed tasks such as search and rescue and hand-digging than those in the lowest exposure category did. Also, those in the highest exposure category had a higher mean number of hours at the site than other exposure groups. Sensitivity analysis was performed on the two algorithms by making various substitutions for terms in the algorithms. Results of the sensitivity analysis show that the algorithms are robust to the changes made.

Conclusions

The exposure assessment algorithms presented are a unique, innovative method accounting for protective respiratory equipment use, amount of time at the site, and proximity to the site. This is an improvement over previously described exposure assessments for WTC response workers because of the addition of semi-quantitative components using objective environmental data in addition to individual work assignment data.

If you have any questions or would like more information about this study, please contact:

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