

Early assessment of cancer outcomes in New York City firefighters after the 9/11 attacks: an observational cohort study

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Summary

Background The attacks on the World Trade Center (WTC) on Sept 11, 2001 (9/11) created the potential for occupational exposure to known and suspected carcinogens. We examined cancer incidence and its potential association with exposure in the first 7 years after 9/11 in firefighters with health information before 9/11 and minimal loss to follow-up.

Methods We assessed 9853 men who were employed as firefighters on Jan 1, 1996. On and after 9/11, person-time for 8927 firefighters was classified as WTC-exposed; all person-time before 9/11, and person-time after 9/11 for 926 non-WTC-exposed firefighters, was classified as non-WTC exposed. Cancer cases were confirmed by matches with state tumour registries or through appropriate documentation. We estimated the ratio of incidence rates in WTC-exposed firefighters to non-exposed firefighters, adjusted for age, race and ethnic origin, and secular trends, with the US National Cancer Institute Surveillance Epidemiology and End Results (SEER) reference population. CIs were estimated with overdispersed Poisson models. Additional analyses included corrections for potential surveillance bias and modified cohort inclusion criteria.

Findings Compared with the general male population in the USA with a similar demographic mix, the standardised incidence ratios (SIRs) of the cancer incidence in WTC-exposed firefighters was 1.10 (95% CI 0.98–1.25). When compared with non-exposed firefighters, the SIR of cancer incidence in WTC-exposed firefighters was 1.19 (95% CI 0.96–1.47) corrected for possible surveillance bias and 1.32 (1.07–1.62) without correction for surveillance bias. Secondary analyses showed similar effect sizes.

Interpretation We reported a modest excess of cancer cases in the WTC-exposed cohort. We remain cautious in our interpretation of this finding because the time since 9/11 is short for cancer outcomes, and the reported excess of cancers is not limited to specific organ types. As in any observational study, we cannot rule out the possibility that effects in the exposed group might be due to unidentified confounders. Continued follow-up will be important and should include cancer screening and prevention strategies.

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Introduction

The attacks on the World Trade Center (WTC) on Sept 11, 2001 (9/11), created an environmental disaster of unprecedented scale for the New York area, and the potential for occupational exposure to known and suspected carcinogens. Many first responders, including about 12 500 firefighters employed by the Fire Department of the City of New York (FDNY), were exposed to aerosolised dust—an amalgam of pulverised cement, glass fibres, asbestos, lead, polycyclic aromatic hydrocarbons, polychlorinated biphenyls, and polychlorinated furans and dioxins produced as combustion byproducts from the collapsed and burning buildings.¹ They were also exposed to toxic fumes, initially from burning jet fuel and over the subsequent 10-month recovery effort from diesel fuel from heavy equipment.

The full extent of the association between WTC-exposure and cancer occurrence remains unknown. So far, only one study investigating WTC-related cancer has

described eight cases of multiple myeloma in WTC responders, but uncertainty related to the definition of exposure and the exact population at risk limit the generalisability of its conclusions.² Our study is a preliminary effort to examine incidence of cancers occurring within the first 7 years after 9/11 in a cohort of nearly 10 000 male firefighters with known health information before 9/11 and minimal loss to follow-up.

Methods

Study population

The original study population consisted of 10 567 firefighters who were employed by FDNY for at least 18 months, were active firefighters on Jan 1, 1996, and if alive on Sept 12, 2001, also had known WTC-exposure status (WTC-exposed or non-exposed). The Jan 1, 1996, start date was chosen on the basis of completeness of the New York state tumour registry data. We excluded data from 576 firefighters who were or would have been aged

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