

FEATURED ARTICLES & PUBLICATIONS

The following are the full abstracts of the articles featured in the **July 2005 WTCHR Quarterly Newsletter**. These articles mark work by members of our WTCHR Scientific Advisory Committee and approved external researchers. Their research examines health issues relating to 9/11/01 and provides health information about a variety of exposure groups. To view the complete article, please click on the web link listed at the end of the article (whenever available).

Alcohol Use In New York After The Terrorist Attacks: A Study Of The Effects Of Psychological Trauma On Drinking Behavior.

Boscarino JA, Adams RE, Galea S. et al.
Addict Behav. 2005 Jun 24; [Epub ahead of print]

Research has suggested that exposure to psychological trauma is associated with increased abuse of psychoactive substances, particularly alcohol. To assess this, we analyzed alcohol consumption, binge drinking, and alcohol dependence among a random sample of 1681 New York City adults 1 year and 2 years after the September 11 attacks. In multivariate models controlling for demographic factors, other stressor exposures, social psychological resources, and history of anti-social behavior, we found that greater exposure to the World Trade Center disaster (WTCD) was associated with greater alcohol consumption at 1 year and 2 years after this event. In addition, our analyses also indicated that exposure to the WTCD was associated with binge drinking at 1 year after but not 2 years after this event. Alcohol dependence, assessed as present in either year 1 or year 2, also was positively associated with greater WTCD exposures. Posttraumatic stress disorder was not associated with alcohol use, once WTCD exposure and other covariates were controlled. Our study suggests that exposure to psychological trauma may be associated with increases in problem drinking long after exposure and deserves further investigation.

An Analysis of Human Behavior During the WTC Disaster of 11 September 2001 Based on Published Survivor Accounts. Blake SJ, Galea ER, Westeng H. et al. *Human Behaviour in Fire Symposium 2004*, Belfast, Northern Ireland, UK. 181-192. (2004)

This paper presents an analysis of survivor experiences from the World Trade Center (WTC) evacuation of 11 September 2001. The experiences were collected from published accounts appearing in the print and electronic mass media and are stored in a relational data base specifically developed for this purpose. The evacuation of the WTC complex represents the largest

full-scale evacuation of people in modern times. The survivors of this disaster hold a tremendous amount of information concerning their experiences of the conditions within the structures and the evolving evacuation scenario. Only they know what they were doing immediately prior to and during the incident. By tapping into their experiences it is possible to investigate the inter-related processes associated with decision making, action planning and implementation and the information gathering activities which sustains these processes under adverse and rapidly changing conditions. Ideally, this information should be gathered from face-to-face interviews conducted as part of a scientific study. An alternative and less desirable approach relies on first hand accounts that have appeared in the mass media. These are usually the result of press interviews conducted by journalists or personal accounts produced by survivors on web sites or books. The difficulties with this approach include; an inability to target specific groups, interviewees are self selecting, journalists tend to only report the more sensational parts of peoples stories, inconsistency in questions posed, questions posed by journalists are not necessarily known, inability to ask specific questions. In effect, the accounts that appear in the mass media provide an uncontrolled snap shot view of the incident, and what we don't know from these accounts is as important as what we do know. Nevertheless, the data contained in such accounts can prove extremely useful in providing insight into behaviour during such incidents. Furthermore, the accounts were recorded very close to the event, some accounts being made a matter of days after the incident. Studies involving live interviews with survivors usually view the incident after the passage of a considerable amount of time, (in the case of the WTC, years) and so may be tainted by information gleaned from other accounts that have appeared in the public domain, memory lapses or selective amnesia. Therefore, the data collected from published accounts while not ideal, potentially contains invaluable information. Following the WTC disaster, the Building Disaster Assessment Group (BDAG) of the UK Office of the Deputy Prime Minister, funded the Fire Safety Engineering Group (FSEG) of the University of Greenwich to gather, collate, categorise, electronically store and finally analyse data concerning human behaviour during the WTC evacuation. Reports were gathered from the literature published in the public domain. Material sources ranged from survivor accounts printed in newspapers and newspaper web sites, interviews in the electronic media, survivor web sites and books. Over 250 separate accounts were gathered that described occupant behaviour. Information appearing in print newspapers represents 70% of the accounts while information from websites (news and personal) represents 16% of the accounts. The remainder of the accounts have appeared in books, journals and the electronic media. These accounts provided information concerning 120 people

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from WTC1 (north tower or WTC1) and 119 from WTC2 (south tower or WTC2) and 21 of unknown origin. This paper represents a selected summary of a detailed report published by the UK ODPM [1].

Cardiac Events in New Jersey After the September 11, 2001, Terrorist Attack. Allegra JR, Mostashari F, Rothman J, et al. *J Urban Health*. (2005) [Epub ahead of print]

The higher stress associated with the World Trade Center (WTC) attacks on September 11, 2001, may have resulted in more cardiac events particularly in those living in close proximity. Our goal was to determine if there was an increase in cardiac events in a subset of emergency departments (EDs) within a 50-mi radius of the WTC. We performed a retrospective analysis of consecutive patients seen by ED physicians in 16 EDs for the 60 days before and after September 11 in 2000-2002. We determined the number of patients admitted to an inpatient bed with a primary or secondary diagnosis of acute myocardial infarction (MI) or tachyarrhythmia. In each year, we compared patient visits for the 60 days before and after September 11 using the chi-square statistic. For the 360 days during the 3 years, there were 571,079 patient visits in the database of which 110,766 (19.4%) were admitted. Comparing the 60 days before and after September 11, 2001, we found a statistically significant increase in patients with MIs (79 patients before versus 118 patients after, $P = .01$), representing an increase of 49%. There were no statistically significant differences for MIs in 2000 and 2002 and in tachyarrhythmias for all three years. For the 60-day period after September 11, 2001, we found a statistically significant increase in the number of patients presenting with acute MI but no increase in patients admitted with tachyarrhythmias. <http://jurban.oxfordjournals.org/cgi/reprint/jti087v1>

Induced Sputum Assessment in New York City Firefighters Exposed to World Trade Center Dust. Fireman EM, Lerman Y, Ganor E, et al. *Environ Health Perspect*. 112(15):1564-1569. (2004)

New York City Firefighters (FDNY-FFs) were exposed to particulate matter and combustion/pyrolysis products during and after the World Trade Center (WTC) collapse. Ten months after the collapse, induced sputum (IS) samples were obtained from 39 highly exposed FDNY-FFs (caught in the dust cloud during the collapse on 11 September 2001) and compared to controls to determine whether a unique pattern of inflammation and particulate matter deposition, compatible with WTC dust, was present.

Control subjects were 12 Tel-Aviv, Israel firefighters (TA-FFs) and 8 Israeli healthcare workers who were not exposed to WTC dust. All controls volunteered for this study, had never smoked and did not have respiratory illness. IS was processed by conventional methods. Retrieved cells were differentially counted, and metalloproteinase-9 (MMP-9), particle size distribution (PSD), and mineral composition were measured. Differential cell counts of FDNY-FF IS differed from those of health care worker controls ($p < 0.05$) but not from those of TA-FFs. Percentages of neutrophils and eosinophils increased with greater intensity of WTC exposure (< 10 workdays or ≥ 10 workdays; neutrophils $p = 0.046$; eosinophils $p = 0.038$). MMP-9 levels positively correlated to neutrophil counts ($p = 0.002$; $r = 0.449$). Particles were larger and more irregularly shaped in FDNY-FFs (1-50 μm ; zinc, mercury, gold, tin, silver) than in TA-FFs (1-10 μm ; silica, clays). PSD was similar to that of WTC dust samples. In conclusion, IS from highly exposed FDNY-FFs demonstrated inflammation, PSD and particle composition that was different from non-exposed controls and consistent with WTC dust exposure.

<http://ehp.niehs.nih.gov/members/2004/7233/7233.html>

Collection and Analysis of Human Behaviour Data appearing in the Mass Media Relating to the Evacuation of The World Trade Center Towers of 11 September 2001. Galea ER, Blake S. *Office of the Deputy Prime Minister (London)*. (2004)

The evacuation of the World Trade Centre (WTC) complex represents the largest full-scale evacuation of people in modern times. The survivors of this disaster hold a tremendous amount of information concerning their experiences of the conditions within the structures of the evolving evacuation scenario. In December 2002, the Building Disaster Assessment Group (BDAG) of the UK Office of the Deputy Prime Minister (ODPM), engaged through the Fire Statistics and Research Division, the Fire Safety Engineering Group (FSEG) of the University of Greenwich to gather, collate, categorise, electronically store and finally analyse data concerning human experiences during the WTC evacuation. Reports were gathered from the literature published in the public domain. Over 250 separate accounts were gathered that described the behaviour of 260 occupants. This report documents these activities and presents the findings of the analysis. The database contains reference to a total of 3,291 experiences from 260 people derived from a content analysis of the 250 accounts (1869 experiences from WTC1, 1,411 from WTC2 and 11 from unknown locations). Gender information was available for 240 people, 164 of which were male and 76 female. The quality of this data varied enormously. While some accounts were several pages long, others were only a couple of paragraphs in length.

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The reports mainly came from occupants that began their evacuation in the upper floors of either tower. Within the database, 73 (61%) and 91 (76%) of the occupants from WTC1 and WTC2 respectively were initially located on or above the 78th sky lobby. In reviewing the findings of this report, it must be remembered that the data on which the analysis is based was not collected in a scientific manner but from accounts in the public domain, primarily press accounts. As such it is difficult to generalize many of the findings. However, as much of the data was reported days after the incident, it provides a unique and insightful glimpse into the human response to such emergencies.

http://www.odpm.gov.uk/stellent/groups/odpm_fire/documents/downloadable/odpm_fire_033348.pdf

Biomonitoring of Chemical Exposure among New York City Firefighters Responding to the World Trade Center Fire and Collapse.

Edelman P, Osterloh J, Pirkle J, et al. *Environ Health Perspect.* 111(16): 1906-1911 (2003)

The collapse of the World Trade Center (WTC) on 11 September 2001 exposed New York City firefighters to smoke and dust of unprecedented magnitude and duration. The chemicals and the concentrations produced from any fire are difficult to predict, but estimates of internal dose exposures can be assessed by the biological monitoring of blood and urine. We analyzed blood and urine specimens obtained from 321 firefighters responding to the WTC fires and collapse for 110 potentially fire-related chemicals. Controls consisted of 47 firefighters not present at the WTC. Sampling occurred 3 weeks after 11 September, while fires were still burning. When reference or background ranges were available, most chemical concentrations were found to be generally low and not outside these ranges. Compared with controls, the exposed firefighters showed significant differences in adjusted geometric means for six of the chemicals and significantly greater detection rates for an additional three. Arrival time was a significant predictor variable for four chemicals. Special Operations Command firefighters (n=95), compared with other responding WTC firefighters (n=226), had differences in concentrations or detection rate for 14 of the chemicals. Values for the Special Operations Command firefighters were also significantly different from the control group values for these same chemicals and for two additional chemicals. Generally, the chemical

concentrations in the other firefighter group were not different from those of controls. Biomonitoring was used to characterize firefighter exposure at the WTC disaster. Although some of the chemicals analyzed showed statistically significant differences, these differences were generally small.

<http://ehp.niehs.nih.gov/docs/2003/6315/abstract.html>

Injuries and illnesses treated at the World Trade Center, 14 September-20 November 2001.

Perritt KR, Boal WL; The Helix Group Inc.

Prehospital Disaster Med. 20(3): 177-83 (2005)

Introduction: In response to the 11 September 2001 terrorist attacks on the World Trade Center (WTC), the United States Public Health Service (USPHS) deployed Disaster Medical Assistance Teams (DMATs) and the Commissioned Corps to provide on-site, primary medical care to anyone who presented. Patients included rescue and recovery workers, other responders, and some members of the general public.

Objective: A descriptive analysis of WTC-USPHS patient records was conducted in order to better understand the short-term impact of the WTC site on the safety and health of individuals who were at or near the site from 14 September-20 November 2001.

Methods: The Patient Treatment Record forms that were completed for each patient visit to these USPHS stations over the 10-week deployment period were reviewed. Results: Patient visits numbered 9,349, with visits peaking during Week 2 (21-27 September). More than one-quarter of the visits were due to traumatic injuries not including eye injuries (n = 2,716; 29%). Respiratory problems comprised more than one-fifth of the complaints (n = 2,011; 22%). Eye problems were the third most frequent complaint (n = 1,120; 12%). With respect to the triage class, the majority of visits fell into the lowest category of severity (n = 6,237; 67%).

Conclusion: USPHS visits probably were skewed to milder complaints when compared to analyses of employer medical department reports or hospital cases; however, given the close proximity of the USPHS stations to the damage, analysis of the USPHS forms provides a more complete picture of the safety and health impact on those who were at or near the WTC site.

<http://pdm.medicine.wisc.edu/current/20-3%20PDFs/Perritt.pdf> [username: test password: test]