

modification yielded the highest additional QALYs (€ 101.37/ QALY) and annual net benefit for employers (€ 56.56/ employee).

Discussion Combining nutrition education and system-level dietary modification is an effective approach for promoting healthy eating at work. The FCW intervention is a sustainable cost-effective model and wide-scale implementation is underway at local and national workplaces.

1638c PARTICLES AT WORK – AND EVERYWHERE ELSE

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Airborne Particulate Matter (PM) is ubiquitous in both indoor and outdoor environments. Its adverse effect on human health is well known and is associated with both size and composition of particles. PM is a complex and heterogeneous mixture, including a range of both toxic and non-toxic chemical compounds. These materials can penetrate in the human respiratory tract with the possibility to cause respiratory and heart related illnesses.

Small particulate pollution has health impacts even at very low concentrations – no threshold has been identified below which no damage to health is observed. WHO estimates that in 2012 around 1 in 8 deaths were attributed to exposure to air pollution, making it the number one environmental risk factor for ill health.

Particulate matter (PM) constitute a principal component of residential indoor air pollution and have been linked with both acute effects, such as irritation in the skin, eyes, nose and throat and upper airways, and chronic health effects including asthma and cardiac disease. It is also of concern in many workplace environments across a wide range of industries and sectors. Wood dust, especially hardwood dust, has been known to cause health problems and cancers in workers. Aerosols from cleaning spray products pose a threat to cleaning workers. In the ceramic sector workers can be exposed to a wide variety of powdered materials with different characteristics and chemical compositions during the manufacturing cycle (handling, materials preparation, bag filling, tiles production or cleaning processes, among others). Cooking aerosols are emitted in high concentrations from processes like frying and charbroiling, exposing kitchen and restaurant workers to high levels of airborne organic aerosols. Nanoparticles is a relatively new and little understood threat to both manufacturing and laboratory workers, and it is not known how many escape to the wider environment. Any workshop environment may contain high levels of particles in the indoor air, as will construction environments, where workers may potentially be exposed to a range of materials, including asbestos particles. Even office workers occupying near-road premises can experience high levels of toxic particles from vehicle emissions.

Furthermore, bioaerosols are a class of atmospheric particles that include bacteria, viruses, pollen and fungal spores, algae, plant debris, proteins, etc. This class of particles can also have an impact on public health, as they have been associated with infectious diseases, allergies, acute toxic effects and even cancer.

1638d THE PSYCHOSOCIAL WORK ENVIRONMENT, SUICIDE AND SELF-HARM: RESULTS FROM A CASE CONTROL STUDY

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Introduction Research shows that suicides are more common among the unemployed and in certain occupations such as elementary occupations, agriculture, construction and health care. Little is known about the specific psychosocial determinants in the occupational environment.

Methods A case-control study using psychological autopsy method with multiple sources including information from coroners' reports, GPs and next-of-kin interviews in 133 consecutive cases of suicide and probable suicide compared with frequency-matched general practice controls (n=53). Psychosocial work factors encompassed decision latitude, work demands, job insecurity social support and social relations. Chi² and logistic regression modelling with adjustment for confounders and comparison with Central Statistics Office employment data.

Results Of the 133 cases, 22% had worked in construction and 30% were unemployed, an overrepresentation when compared to national employment data. Of those unemployed, 36% had worked in construction. Cases were more likely to be unemployed (11% versus 6%) than controls and have worked in construction (29% versus 17%) and in agricultural/ fisheries (14% versus 6%). Controls had a significantly higher job decision latitude, higher social support and higher job security compared to cases. Additional comparisons with adjustment for confounding will be presented.

Discussion The results concerning decision latitude are in line with other research showing that workers in elementary jobs are more prone to suicide. The Irish construction sector has been highly affected by the recent economic recession with many layoffs and insecure jobs. The overrepresentation of this sector in the suicide cases and the finding of job insecurity being associated with suicide suggests that job loss but also the threat of job loss may be a precipitating factor to suicide. The results will inform Ireland's National strategy to reduce suicide 'Connecting for Life', which specifically highlights that prevention approaches should target priority groups, one of them being specific occupational groups.

1608 WORLD TRADE CENTRE RESEARCH STRATEGIES, IMPLICATIONS AND FINDINGS

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Aim of special session The World Trade Centre research enterprise posed particular logistical and strategical challenges, and its research findings have made contribution to occupational health and the understanding of respiratory health and chronic airway disease. All of those aspects will be discussed in this session.

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1608a THE CONTRIBUTION OF OCCUPATIONAL MEDICINE TO EMERGENCY PREPAREDNESS: NEW YORK CITY AND 9/11

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Background Occupational exposures to hazardous materials and to high levels of psychological stress are predictable consequences of civilian disasters and result commonly in physical and mental health problems among first responders. Emergency plans must anticipate these occupational health consequences of disaster and be prepared to address them.

Goal To assess the contribution of occupational medicine to emergency response after the attacks on the World Trade Centre of September 11, 2001.

Method Historical review

Findings New York had a network of Centres of Excellence in Occupational Health in place prior to September 11, 2001. These Centres were established in 1987, supported financially by the State of New York, and focused on the prevention, diagnosis, and treatment of injuries and illnesses among workers. They were staffed by trained personnel and provided a wide range of services including occupational medicine, occupational health nursing, industrial hygiene, ergonomics, and social work services.

The New York Centres of Excellence in Occupational Health were able to provide medical care to first responders immediately after September 11, 2001. Within a few weeks they had evaluated several hundred responders – firefighters, police, paramedics, and volunteers. Persistent cough, termed ‘World Trade Centre cough’, asthma, anxiety, depression, and post-traumatic stress disorder (PTSD) were the symptoms most commonly seen in the initial post-attack period. These symptoms were most severe in the most heavily exposed responders and were more frequent among 9/11 first responders than among unexposed workers in the same trades.

Documentation of these health effects and their persistence was critical in demonstrating that the attacks on the World Trade Centre and their aftermath had produced physical and mental health effects among first responders; in establishing the need for long-term medical and epidemiologic follow-up of the first responder population; and in ensuring that this follow-up included comprehensive diagnosis and treatment of both physical and mental health conditions. Follow-up of the 9/11 responders continues to the present, is supported by the US government through the National Institute for Occupational Safety and Health (NIOSH), and has documented multiple exposure-related health problems in this population including restrictive lung disease, chronic sinusitis, gastroesophageal reflux disease (GERD), PTSD, depression, and cancer.

Conclusion Pre-positioned resources in occupational medicine are an essential component of disaster response. Emergency preparedness planning must include long-term investments in occupational and environmental health services.

1608b INDICATIONS FOR LIFETIME HEALTHCARE OF AFFECTED POPULATIONS FROM THE WORLD TRADE CENTRE AND OTHER MAJOR INTERNATIONAL DISASTERS

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Background The disasters at Seveso, Three Mile Island, Bhopal, Chernobyl, the World Trade Centre (WTC) and Fukushima had historic health and economic sequelae for large populations of workers, responders and community members.

Methods Comparative data from these events were collected to derive indications for future preparedness. Information from the primary sources and a literature review addressed:

- i. exposure assessment;
- ii. exposed populations;
- iii. health surveillance;
- iv. follow-up and research outputs;
- v. observed physical and mental health effects;
- vi. treatment and benefits; and
- vii. outreach activities.

Results Exposure assessment was conducted in Seveso, Chernobyl and Fukushima, although none benefited from a timely or systematic strategy, yielding immediate and sequential measurements after the disaster. Identification of exposed subjects was overall underestimated. Health surveillance, treatment and follow-up research were implemented in Seveso, Chernobyl, Fukushima, and at the WTC, mostly focusing on the workers and responders, and to a lesser extent on residents. Exposure-related physical and mental health consequences were identified, indicating the need for a long-term health care of the affected populations. Fukushima has generated the largest scientific output so far, followed by the WTCHP and Chernobyl. Benefits programs and active outreach figured prominently in only the WTC Health Program. The analysis of these programs yielded the following lessons:

- Know who was there;
- Have public health input to the disaster response;
- Collect health and needs data rapidly;
- Take care of the affected;
- Emergency preparedness;
- Data driven, needs assessment, advocacy.

Conclusion Given the long-lasting health consequences of natural and man-made disasters, health surveillance and treatment programs are critical for management of health conditions, and emergency preparedness plans are needed to prevent or minimise the impact of future threats.

1608c RESPIRATORY DISEASE RESEARCH IN THE WTC HEALTH PROGRAM

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The terrorist attack on 9/11/2001, and subsequent rescue, recovery, and service restoration of the World Trade Centre disaster site in New York City, created an unprecedented and unique occupational and environmental exposure that affected a large and diverse group of rescue workers and volunteers.