

# UNDERSTANDING OCCUPATIONAL RISKS TO HEALTH AND WELLBEING

How our work affects our health



Professor Neil Pearce  
(Photograph: Massey News)



MASSEY UNIVERSITY  
TE KUNENGA KI PŪREHUROA

*To the average person, the term occupational health calls to mind the deaths and injuries that occur every year in high-risk industries, such as construction, agriculture, forestry, transport and mining. More difficult to quantify are the deaths that occur as a result of long-term exposure to something harmful in the work environment.*

In New Zealand, the average death toll in the high-risk industries over the past decade has been about 100 people each year. Occurring mostly in summer, these preventable deaths gain headlines as families struggle to come to terms with their loss. Researchers at the Centre for Public Health Research at Massey University, estimate that around 1,000 lives a year are lost to work-related illness, and 200-400 of these deaths are thought to result from occupational cancers. This is two to three times our annual road toll. These deaths, they argue, go unrecorded, or may never be linked to the original cause. More recent studies in the UK put occupational cancers at nearly five per cent of all cancers, rising to eight per cent in men (half of which are asbestos related), and Australian research suggests it may be even higher. Fewer than 40 of the cancer deaths are notified to the Department of Labour, and most of these involve asbestos-related cancers; there are very few reports for other occupational cancers.

The argument for more research in this area is compelling, because these deaths are preventable, and because more suspected hazards are being identified every year. We describe the work of Professor Neil Pearce, and Professor Jeroen Douwes, and the outstanding contribution their work has made to our understanding of occupational health.



A period as a bus driver in the 1980s initiated Professor Neil Pearce's interest in occupational health. He still remembers what it felt like to breathe in diesel fumes, whilst driving daily for periods that most people would only contemplate on family holidays.

Fortunately, he decided to put his degree in statistics to full use as a public health researcher, and is now an expert on occupational respiratory diseases and cancer in New Zealand. Formerly the Chair of the National Occupational Safety and Health Advisory Committee, he has built a strong team at the Centre for Public Health Research, Massey University.

In September 2010, the tenth anniversary of the founding of the Centre for Public Health Research, Professor Jeroen Douwes took over as Director. Also in 2010, Professor Pearce received a life-time achievement award for services to occupational health, for his research into workplace disease risks, from *Safeguard* magazine. The HRC has been funding Professor Pearce, Professor Douwes, and their team since 1990, including Dr Andrea t'Mannetje, Dr David McLean, and Dr Lis Ellison-Loschmann, and they have attracted HRC support ever since.

Since he first developed an interest in this area, Professor Pearce has covered an extraordinary array of topics to gather evidence about occupational health risks in New Zealand. He was part of the team that first described the increased risk of leukaemia associated with exposure to electromagnetic fields in electrical workers, and particularly those exposed to the highest doses – welders/flame cutters and electrical line workers.

Over the years, the Centre for Public Health Research has amassed large amounts of data on cancer risk related to different jobs and has collaborated with The International Agency for Research on Cancer, which regularly reviews the research evidence and has compiled a list of about 40 occupational carcinogens. Professor Pearce points out that that this information is supposed to be available to everyone, but most of it never finds its way to the workplace.

Studies at the Centre for Public Health Research have identified a broad, and at times surprising, list of occupations in which there is increased risk of certain cancers.

The team were the first to demonstrate significant excess risk for cancers of the lung and blood among meat workers, perhaps related to breathing in micro-organisms when slaughtering animals and processing meat. They are now investigating further, with HRC funding to look at the bioaerosols (air-borne viruses, bacteria, proteins or other fine particles from the animals slaughtered) that meat workers are exposed to, and test whether they have the potential to cause cancer. The findings will allow the team to understand why meatworkers are at risk and develop effective interventions to protect them from occupational exposures.

Research at the Centre for Public Health Research has also highlighted the risks of occupational cancers in agricultural workers, cleaners, painters, truck drivers, sales assistants, hairdressers and machinists. In one study of occupational bladder cancers, the team found that truck drivers had an excess risk. No-one knows exactly why this may be, but an inability to take frequent drinks and toilet breaks has been suggested as a possible factor, as a small increased risk has also been observed in sales assistants. Carcinogens from fumes, smoking and other toxic exposures are excreted in the urine.

The team at the Centre for Public Health Research have also studied health risks in timber workers exposed to pentachlorophenol (PCP). They found that high exposure was linked to nerve damage, mood disorders, lung infections, heart palpitations and loss of libido. More recently, the team have analysed dioxin levels in New Zealand sawmill workers exposed to PCP, and showed that they remain elevated twenty years after



Professor Jeroen Douwes  
(Photograph: Massey News)

*“Current exposures take priority over historic exposures because we can stop them now. However, if you have asbestos in your lungs or dioxin in your body fat, you’re still being exposed.”*

Professor Neil Pearce



exposure to PCP ceased. Dioxin is known to increase the risk of developing cancer, and there was an increased risk of cancer in the PCP-exposed workers in the study.

Another risk for timber workers is of respiratory diseases from breathing in wood dust. Work by the group has shown that exposure to both green and dry sawdust is related to lower lung function, and exposure to green pine sawdust increases the risk of asthma. The HRC is currently funding the Centre for Public Health Research to establish whether these exposures actually cause lung disease or just make existing disease worse. In another study, they have shown that sawmill labourers are three times more likely to currently have asthma. Other occupations with high asthma risks included metal processing plant workers and bakers. Earlier work showed that food processors other than bakers are at elevated risk of chronic bronchitis and that the risk for chemical processors is 18 times that of other workers.

## Working across Government

Collaboration and co-operation between Government agencies is essential for real progress to be made in occupational health. This is a strong focus for the HRC's Partnership Programme. Through the Occupational Safety and Health (OSH) Joint Research Portfolio, the HRC has partnered with the Accident Compensation Corporation and the Department of Labour, OSH, to support research on risks encountered in a wide variety of work situations. Currently, the initiative is supporting research on: interventions to reduce wood dust exposures; workplace exposure to carcinogens; indicators to improve surveillance for occupational disease, and prevention of noise-induced hearing loss.

## Building research in occupational health

In 2008, the HRC partnered with the Department of Labour to provide \$3.5 million for a three-year programme of studies on occupational health and cancer risk. The Building Research in Occupational Health in New Zealand programme brings together investigators with a broad range of skills to address gaps in what we currently know

and, crucially, will provide training for the next generation of researchers. The programme is based in, and coordinated by, the Centre for Public Health Research.

The primary risk for metal processing plant workers appears to be in welding. The team has shown that lung function is reduced in welders working without local exhaust ventilation, illustrating the preventable nature of most workplace illnesses.

Most adults spend a third of their waking life at work, Professor Pearce points out. During this time they could be exposed to any number of toxins, including dust, oils, solvents, pesticides, chemicals, fumes, smoke or magnetic fields. In addition there are the hazards associated with lifting, loud noises and accidents. Future challenges will not be restricted to addressing the large gaps in our understanding of current hazards, as there is no shortage of new and emerging risks to consider.



*"We must also seek to understand the challenges that our changing world will have on occupational health. Such issues include an ageing workforce, global pandemics, nanotechnology and the 24/7 operating environment that takes a toll on social functioning, sleep and mental health."*

Professor Neil Pearce

