

Climate Change Adaptation Research Grants Program

- Human Health Projects

Project title:

Climate Change impacts on Workplace Heat Extremes: Health Risk Estimates and Adaptive Options

Principal investigators:

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Lead organisation:

Australian National University

Objectives:

Deaths and adverse health effects due to over-heating occur every year in the Australian workplace. The extent of this health burden is unknown; workplace heat-related morbidity and mortality are significantly under-reported in hospital data, where diagnostic codes rather than physical cause prevail. Hence, the annual economic cost (healthcare costs, productivity losses) is also unknown. These burdens and costs are anticipated to increase under climate change as Australia warms within the projected range of 2-6° C by 2070.

Physical activity (working) generates excess heat that must be dissipated. Hot ambient temperatures, humidity and clothing raise core temperatures by restricting heat loss. To avoid workplace heat stress, the body's natural response is to rest, which reduces productivity. In sectors such as agriculture, construction, transport and urban services, outdoor heat exposure is a health risk; yet cooling is also unavailable for many indoor workers. Heat exposures experienced by workers in these micro-environments can exceed those implied by routine ambient-environmental meteorological data.

This project will study the relationship between occupational heat exposure and physiological parameters, especially dehydration, indicative of health risks. Heat-imposed limits on productivity will be estimated, and workplace heat policies, protocols and practices will be evaluated. We will assess workers' heat exposure by measuring temperature and humidity and calculate effective on-site thermal load. We will calculate trends in exposure since 1980, and model future workplace heat exposures and their health impacts under projected climate change with, and without adaptation strategies.

A crucial adaptation response to increased exposure to hot days and heat extremes will be to design, implement and monitor workplace practices that protect workers' health. This project will generate epidemiological evidence needed to develop health protective adaptation strategies.

Project design and methods

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