

Chapter 4

Heat Stress Vulnerability among Indian Workmen

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ABSTRACT

The average global temperature increase is estimated to go up by 1.8-4.0 °C by the next century. This climate change ought to affect populations where the burden of climate-sensitive disease is high – such as the urban poor in low- and middle-income countries. Particularly in industrial applications, heat generates during manufacturing process. This heat transmits to the environment to make it hotter, as well as the community, especially affecting workers involved in the operation. The primary outcomes of working in such environment leads to three kinds of major heat-related disorders-heat cramps, heat exhaustion and heat stroke. Understanding the quantifiable volume of health impacts due to work habits in hot working environment would provide multiple avenues of suitable intervention. Elucidating the multiple avenues of work pattern, physical and physiological attributes would generate knowledgebase and yield numerically defined susceptibility limits of workers occupational front. The present chapter provides directions to research into the heat related health profile of Indian workmen which would ascertain the relative vulnerability of different occupational groups to their workplace heat eventuality.

BACKGROUND

Climate change threatens human health and well-being in many ways including extreme events, and wildfires, increased frequency and intensity of heat waves, decreased air quality and disease

transmitted by insects, food and water. Out of many topics related to climate change we focused on heat stress vulnerability at the occupational front, particularly in developing countries like India. Despite understanding that human being has enormous physiological and psychological

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potentials to combat work pressure demand, environmental adversities etc., resilience and capacity to cope up with the impacts of such exposure is limited. This subject would sensitize the policy makers to the exposed population to be aware of the prevailing circumstances as well as nurture the possibilities of mitigating the situation.

As per Census 2011, there are circa 482 million active workforce in India. It is also accounted that above 9/10th of the workforce work in the unorganized sector. Being in this unorganized sector, they get paid either on daily basis or on the basis of production output. Although these workers understand that working in such environment for long would result in gamete of health issues, they continue to work for long hours. This is because they understand that work intensity gets reduced due to heat exposure, their hourly output gets effected and consequently the income. Avoiding such reduction in income, working people keep up their work intensity or work for long hours which in turn stimulate risk of serious health effects of heat.

The World Health Organization estimates occupational health risks as the fifteenth leading cause of morbidity and mortality. Working under extreme environmental heat load along with a variety of hazards viz. chemicals, biological agents, physical factors, adverse ergonomics, allergens, complex network of safety risks, varied psychosocial factors etc. result in range of health outcomes, injuries, hearing loss, respiratory, musculoskeletal, cardiovascular, reproductive, neurotoxic and psychological disorders. Occupational risk factors account globally for a number of morbid conditions, including 37% of back pain, 18% of injury, 16% of hearing loss, 12% of deaths due to chronic obstructive pulmonary diseases, 8% occupational lung cancer. Above 9/10th of this injury burden is among men and half of the global burden occurs among men in the WHO South-east Asia and West Pacific regions. The burden of disease from selected occupational risk factors amounts to 1.7% of the global burden in terms of DALY (Disability

Adjusted Life Years) (WHO, 2009). Enriching the 2009 data, WHO reports that respiratory diseases (59.8%) and musculo-skeletal disorders (56.4%) are the leading occupational diseases followed by noise induced hearing loss (40.2%) (WHO, 2013).

Therefore, workplace heat is a serious concern in regards to the health of the workers. Research into the heat stress vulnerability, intervention strategies and most importantly legislative enforcement of appropriate work-rest cycle would lower down the heat stress vulnerability of the working population.

INTRODUCTION

The climate all around the globe is experiencing a non-steady, increase in temperature, frequency and intensity of heat waves, and by warmer summers and milder winter seasons. With this current trend, the average global temperature increase is estimated to go up by 1.8-4.0 °C by the next century (Bates et al., 2008). The Intergovernmental Panel on Climate Change (IPCC) confirms that climate change has already taken place (IPCC, 2007) and it also assesses future changes in the climate at the regional scale. Massive urbanization, industrialization, aforestation are the prime reasons of such climate change. It represents a range of environmental hazards and will affect populations where the current burden of climate-sensitive disease is high – such as the urban poor in low and middle-income countries (Kovats and Akhtar, 2008). Therefore, adapting to climate change in low and middle income countries is now additional concern for local governments (Satterthwaite et al., 2007).

Especially in developing countries like India, wherein tropical climate, population growth and industrialization are aggravating the scenario. It is observed that globalization and rapid industrial growth in India accounted for 6% of the annual economic growth in the last few years. Substantiating this growth, as per the census 2011, there are

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