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Effects of Heat Stress on Working Populations in Developing Countries Related to Climate Change

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ABSTRACT

It is widely accepted that the earth's climate is changing in an accelerating pace, with already documented implications for human health and the environment. This literature review provides an overview of existing research findings about the effects of heat stress; a direct implication of climate change, on the working population, with a focus on developing countries. In the light of climate change adaptation, the purpose of the literature review was to explore recent and previous research into the impacts of heat stress on humans in an occupational setting.

Heat stress has been researched extensively in the past. In the contemporary context of climate change, however, information is lacking on its extent and implications, especially in an occupational setting. It was found that factors exacerbating heat stress in current and future workplaces are the urban 'heat island effect', continuous urbanization, outdoor physical work, lack of information on vulnerable groups such as elderly people, individual differences, and the developing country context where technological fixes and certain control measures are often not applicable.

As increasing temperatures reduce work productivity, world economic productivity could be condensed, affecting developing countries in the tropical climate zone disproportionately. It is important to involve all academic disciplines to take a multidisciplinary approach in this complex field of research.

METHOD

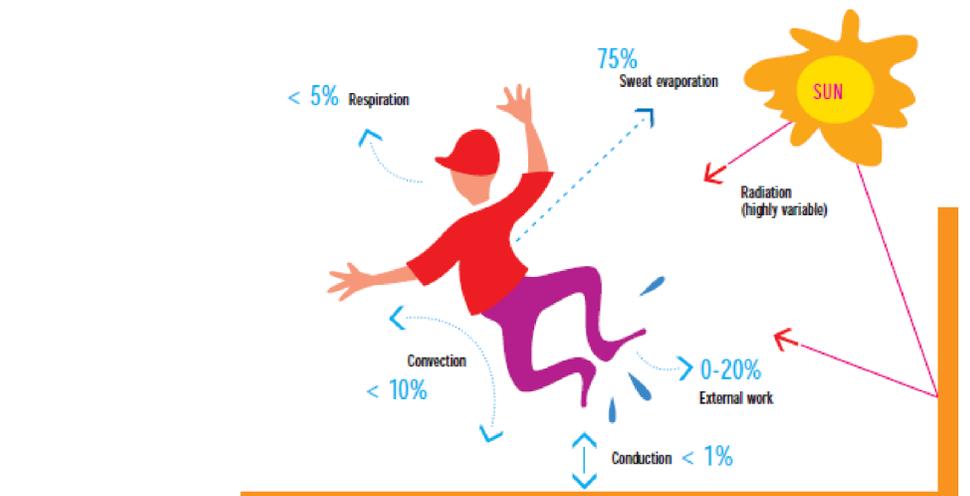
The extensive amount of information on heat stress made it necessary to have a strategic information search to find key articles. Climate change and occupational health is a highly multi-disciplinary field of study and requires scholarly information from a variety of sources. That is why the 'pearl picking' method was initially applied. This method uses one exceptionally useful article (often a review article) to track key articles in the field.

A thorough exploration of different databases and search engines was then carried out and several information retrieval tools were selected. Several search words were used such as 'occupational heat exposure', 'occupational heat stress', 'occupational heat strain', 'heat in/at workplace', 'work in the heat', 'occupational heat stress* AND climate change*' and the more broad search words 'heat stress*'. An internal database and library was also used.

SELECTED REFERENCES

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CONCLUSIONS AND RESEARCH NEEDS

Occupational health and safety is one of the basic rights that workers are being denied in many developing countries. In addition to this, as work productivity reduces with increasing temperatures, world economic productivity will be condensed, affecting developing countries and poor people disproportionately as most of these already are located in warm climates. To address these current and future occupational health problems, sustainable solutions must take into account the social, economic, environmental and technical aspects of the problem. Both mitigation and adaptation measures should be considered, sometimes in combination and including both preventative and control solutions, to achieve multiple benefits. Capacity building such as education and awareness, and involvement on all levels of society is needed to address this. From the review it became apparent that research is needed in these areas:

- Occupational heat stress in different countries and current adaptive practices; studies are especially needed in Africa.
- Heat island effects on workplaces in urban areas.
- Current adaptation practices in warm countries.
- Heat stress control options and possible sustainable solutions (low cost).
- Analysis of future productivity losses due to heat stress and economic analysis.
- Social and health effects of heat stress.
- Effects on vulnerable groups such as young and elderly people, women and poor people.

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