

## Heat and Health in the Changing Climate (HEATCLIM)



Central feature of the ongoing climate change is a gradual increase in ambient temperature. The predicted increase is not homogeneous, but northern areas will warm up the most. Not only will the mean temperature increase, but heat waves will become more frequent and intense. High summer-time temperatures pose a significant risk to health even in the current-day climate in northern areas as well. The severity spectrum of adverse health effects of heat is wide: exposure may increase mortality or the use of health care, or just cause symptoms restricting daily activities. The total burden of disease caused by heat is poorly known.

Societies are able to adapt to climate to some extent. Protective measures are needed on both national and local level to adapt to the on-going changes in climate. Management of indoor conditions is the most important adaptive measure, but health can also be protected by affecting behaviour. Cost-effective adaptation requires targeting measures especially towards vulnerable population groups. Both biological and social factors, and their complex interactions, may lead to increased vulnerability.

The overall objective of the project is to produce new knowledge on the effects of high temperatures on human health in northern areas, and to provide cost-effective and socially acceptable solutions to adapt to climate change. The consortium project is genuinely multidisciplinary, covering natural, health, and social sciences and engineering, which enables versatile approaches to research questions. Project is coordinated by the University of Eastern Finland; other participants are Aalto University, Finnish Meteorological Institute, and Finnish Institute for Health and Welfare

During the project, epidemiological analyses of health register data will be performed to evaluate the effects of heat and heatwaves on morbidity and mortality, and to identify susceptible population groups. Social and economic determinants of heat vulnerability will be evaluated using a questionnaire study, complemented with interviews and scenario work. A field study, including environmental and physiological measurements, will be conducted to

create thermal comfort models for vulnerable population groups, and to evaluate the efficiency of local cooling methods. Climate modelling will be conducted to improve heat wave predictions for early warning systems and climate scenarios, and to calculate of cooling capacity needs in future climate.

In the last, integrative step of the project, health impact of heat in different climate, societal and adaptation scenarios will be assessed. Results will be used to guide policy makers on the scaling and targeting of adaptation measures. Central questions to be answered include: How will the burden of disease caused by heat change in Finland because of climate change? Which adaptation options are most efficient considering health effects, costs of the measures, and greenhouse gas emissions? How do the costs of adaptation and health effects affect the Finnish economy?

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