Component 5: Health and productivity impact assessment for local climate change

Aims

This component of the Hothaps program aims at producing first stage quantitative estimates of how the health and productivity of people working in heat exposure situations at specific locations will be influenced by climate change in that location.

Study design

This component uses standard health impact assessment quantitative methods to calculate future impacts from estimates of future heat exposure in vulnerable occupations, numbers of exposed workers and exposure-response relationships for specific heat-related health risks and productivity impacts. The detailed methodology for this Hothaps field study component is still under development and will be shared with all participants in the global program as soon as has been completed and tested.

Data required

Future occupational heat exposures in vulnerable groups are estimated from IPCC climate change projections (or other internationally recognized projections) at this location, building on current climate data and modelling. The location may be defined geographically at different levels -- village, city, province, nation.

The occupational distribution in the future needs to be considered. How will the numbers of workers change in different exposure situations: outdoor, indoor work; with or without air conditioning or other efficient cooling systems; level of work intensity for the heat exposed workers. The exposure-response relationships will be documented with the Hothaps quantitative studies, and can also be modelled approximately from some existing physiological heat-effect relationships. The Hothaps program aims at filling the evidence gap in this area.

Data collection

The global Hothaps team is assembling databases with geographical distributions of future climate change modelling. These gridded data with estimates of future temperature, humidity and any other modelled variables will be provided to participating research groups for their specific location. Future changes in the occupational distributions will need to be assessed by the local research groups. National labour force data and projections can be of great help. Changes in the occupational distribution may in fact be caused by the increasing heat exposure as certain agricultural or industrial production becomes difficult or impossible due to the changing climate.

Data analysis and reporting

In principle the future impacts (I) are calculated as

I = f {WBGT change, worker population change, exposure-response relationship, modifying factors}

Calculations can be carried out by age-sex groups if sufficient input data by group are available.

The gridded climate data may need to be adjusted for altitude, "urban heat island effect" and other factors that influence actual local heat exposures. This component of the Hothaps program will be developed in detail when the results of other component studies are accumulating. The

reports from different locations should ideally include data that can be combined to higher geographic level analysis (national, regional, global).