

Climatic change and human health in Hesse

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The expected climate change will affect public health. The INKLIM 2012 project included possible health effects as a literature review considering the expected climate change and possible health threats.

Health hazards have changed considerably from the fifties to now due to changed living conditions, new vaccines, progress in medicine, demography, tourism, trade, traffic and other factors. These changes are complex and in part probably more pronounced and rapid than climate change and its consequences for health. Within the project INKLIM 2012, possible consequences of climate change for Hesse have been assessed including a literature review of the health aspect.

Consequences of climate change on health can be separated in direct and indirect effects. For Hesse direct effects on health can be expected due to prognosticated increase in heat waves which is in particular a hazard to the elderly or other people with reduced ability of caring for themselves. The predicted increase in sunshine during spring and summer increases the risk of sun burns, other light induced skin disorders, skin cancer and cataract (as higher temperatures may additionally increase exposure) if no adaption occurs or is stimulated. Possible effects on cataract frequencies or on UV-induced immune suppression cannot be inferred from literature. Weather extremes are expected to become more frequent with possible health hazards due to flood, lightning and storm.

Indirect effects of climate change on health result from changes of the ecosystem. Favourable conditions for certain agents and vector or reservoir species can increase the infection pressure. The global warming may lead to alterations in infection pressure from endemic agents or allow new agents to become endemic to the area. Knowledge of the areas infested by currently endemic or newly invading agents, vector- or reservoir species and their complex ecology is incomplete and distributed over several research fields.

The chances for malaria to re-establish or for other tropical diseases to become endemic appear low providing the current capacities for a respective case management and other counter measures. Nevertheless outbreaks of such imported diseases are possible. The southern part of Hesse and the Rhine is at higher risk and some diseases like leishmaniosis or west-nile-virus and vector species like sandfly or tiger mosquito may invade here. Favourable conditions may lead to mass propagation of already existent vector or reservoir species and lead to increased infections; an expanding population of rodents may increase the transfer of for example the hantavirus. Therefore changes in the risk of vector-borne infectious diseases and zoonoses due to global warming must be expected for Hesse but appear manageable with appropriate capacities for health care and counter measures.

Food-borne diseases may increase as higher temperatures usually allow a faster growth of these agents. But other factors such as food safety, cooling and food management and consumer habits (consumption of improperly barbecued meat) are much more important.

With climate change an increase in precipitation is expected for Hesse and hence shortages in water resources are unlikely. Problems may occur from flooding and contamination of drinking water facilities, crops and the soil. Whether higher temperatures might increase the problems with legionella or other water-borne agents in drinking water is unknown.

Infections and intoxications in bathing water can be expected due to more floods, higher water temperature accelerating the growth of agents or toxic algae and an expected higher exposure.

Nevertheless the quality of bathing water has increased in recent years due to improved management and control even though this is still incomplete and imperfect for certain agents.

Furthermore, higher temperatures and increased solar radiation may induce health problems due to increased exposure to ozone or summer smog.

The expected climate change in Hesse may influence the prevalence of allergies and asthma by changes of the quantity, quality and time of allergens in the air due to changes in flowering periods, vegetation (asthma weed) or sporulation. In addition to spores and pollen, toxic or allergenic substances from pests like oak processionary moths, flour mites or dermestidae in particular may occur when their reproduction increases under favourable conditions.

The complexity of all factors influencing health threats and their changes does not allow an isolated assessment of changes that can be expected due to global warming. Nevertheless, changes have to be expected for Hesse as well, but appear manageable with appropriate resources, health care and hygienic standards. The complexity of the factors requires interdisciplinary exchange and cooperation. The cooperation of e.g. entomology, ecology, veterinary medicine and medicine should be improved to monitor changes, recognise and assess relevant factors and develop prevention strategies.