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Extreme temperatures come at a high price

A study prepared at the University of Bern shows in detail for the first time how heat in Switzerland has increasingly led to high death rates over the past 50 years. The combination of climate change and an aging population, it concludes, will become a major source of problems in the future.

The effect that global warming has on Switzerland is becoming increasingly apparent. A study by the University of Bern just published in the journal "Environmental Health Perspectives" shows how the number of additional deaths attributable to the heat and the cold has changed over the past 50 years. The increasingly elderly population plays a large role, and is one of the most vulnerable groups. "Our findings demonstrate that climate change and aging present a double challenge for future generations," says Evan de Schrijver, the study's lead author. De Schrijver is a doctoral student in the Climate Change and Health research group at the Oeschger Center for Climate Change Research and the Institute of Social and Preventive Medicine at the University of Bern. "We estimate," he said, "that over the past 50 years, more than 9 percent of deaths were caused by very hot or cold temperatures."

For their nationwide study, the researchers were able to draw on a trove of previously unused data: causes of death by age group from all Swiss municipalities between 1969 and 2017. This information was statistically analyzed in combination with average local temperatures.

Consequences of heat increase despite measures already taken

The study concludes that number of deaths that could be associated with heat have increased sharply. In the 1970s, this amounted to 78 deaths per year; in the decade 2000-2010, there were more than 300. The cantons of Geneva, Zurich and Basel, as well as Ticino, were most affected by this higher mortality rate. About two-thirds of the additional deaths caused by heat were among people over 80 years of age. "Our results suggest that the public health measures taken after the 2003 heat wave were effective, as the number of heat-related deaths decreased from 2000 to 2009, despite the extremely warm summers we experienced then," said Dr. Ana Vicedo Cabrera of ISPM, last author of the study. "However, the heat-related burden on health remains significant - and more importantly, it is expected to increase due to climate change in the coming decades. So more needs to be done with sustainable public health measures to protect populations from the effects of climate change," she adds.

Aging exacerbates cold-related mortality

People in Switzerland are affected not only by the heat, but also by the cold - and to a much greater extent. Over the past 50 years, more than 5,200 people in Switzerland have died each year as a result of low temperatures. But from what exactly? "Unlike heat waves, where there are clearly evident health consequences, things are far more complex with cold," says Evan de Schrijver. Contributing factors include a higher rate of infectious diseases in winter, but also housing quality and access to health care. However, deaths associated with cold have decreased significantly over the period studied - probably because of better health care and rising socioeconomic status, which therefore means increased housing quality and heating. Still, while these factors have improved, leading to fewer cold-related deaths, this is offset by aging. "Aging amplifies the effect of climate change in the case of heat, while it cancels out improved conditions and potential adaptation to low temperatures in the case of cold," explains de Schrijver. "A main message of our study is therefore: cold-related mortality will continue in the coming decades despite rising temperatures because of the progressively aging population," de Schrijver adds.

Protecting older people from the effects of climate change

The new research results are relevant for the ways Switzerland adapts to climate change. "Protecting older people could be crucial," says Evan de Schrijver, "to mitigate the health impacts of a warming climate and strengthen the resilience of the population." That's because as we get progressively older, rising temperatures also have more and more of an impact on our health. The study found that the number of people who, because of their age, will potentially be affected by risks associated with heat waves will double by 2060, according to other studies. The combination of a warming climate and an aging population will tend to exacerbate the effects of heat. "So if we want to protect future generations from the threat of climate change, we should develop more ambitious adaptation strategies at the national and local level, such as more green spaces in cities to reduce heat," Schrijver believes.

World's most respected climate study

The Climate Change and Health research group at the University of Bern already caused a stir with a study last year. Ana Vicedo-Cabrera, the group's leader, coordinated an international study that for the first time revealed what man-made climate change actually contributes to heat-related deaths. The key finding: between 1991 and 2018, more than one-third of all deaths globally in which heat played a role were attributable to global warming. The research, published in the journal *Nature Climate Change*, made waves internationally. According to "Carbon Brief," a British website specializing in climate science and policy, it was the climate study most frequently mentioned in the media worldwide in 2021.

Publication details

Evan de Schrijver, Marvin Bundo, Martina S. Ragettli, Francesco Sera, Antonio Gasparrini, Oscar H. Franco, und Ana M. Vicedo-Cabrera: Nationwide Analysis of the Heat- and Cold-Related Mortality Trends in Switzerland between 1969 and 2017: The Role of Population Aging. March 9th, 2022; *Environmental Health Perspectives*. doi: <https://doi.org/10.1289/EHP9835>

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The Oeschger Center for Climate Research (OCCR)

The Oeschger Center for Climate Research (OCCR) is a key strategic center of the University of Bern. It brings together researchers from 14 institutes and four faculties. The OCCR conducts interdisciplinary research which is at the forefront of climate science. The Oeschger Center was founded in 2007 and bears the name of Hans Oeschger (1927-1998), a pioneer of modern climate research who worked in Bern.

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The Institute of Social and Preventive Medicine

Since 1971, the Institute of Social and Preventive Medicine (ISPM) of the University of Bern has been committed to improving the health and well-being of individuals and society. Through high-quality research in prevention, social medicine, epidemiology, biostatistics, and public health, and together with numerous national and international partners, the ISPM stands for "health for all".

In addition to cutting-edge research, the ISPM is dedicated to training the next generation of epidemiologists, public health researchers, and physicians. The ISPM is actively involved in university teaching programs for students of medicine, pharmacology, biomedical engineering, and biomedicine.

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