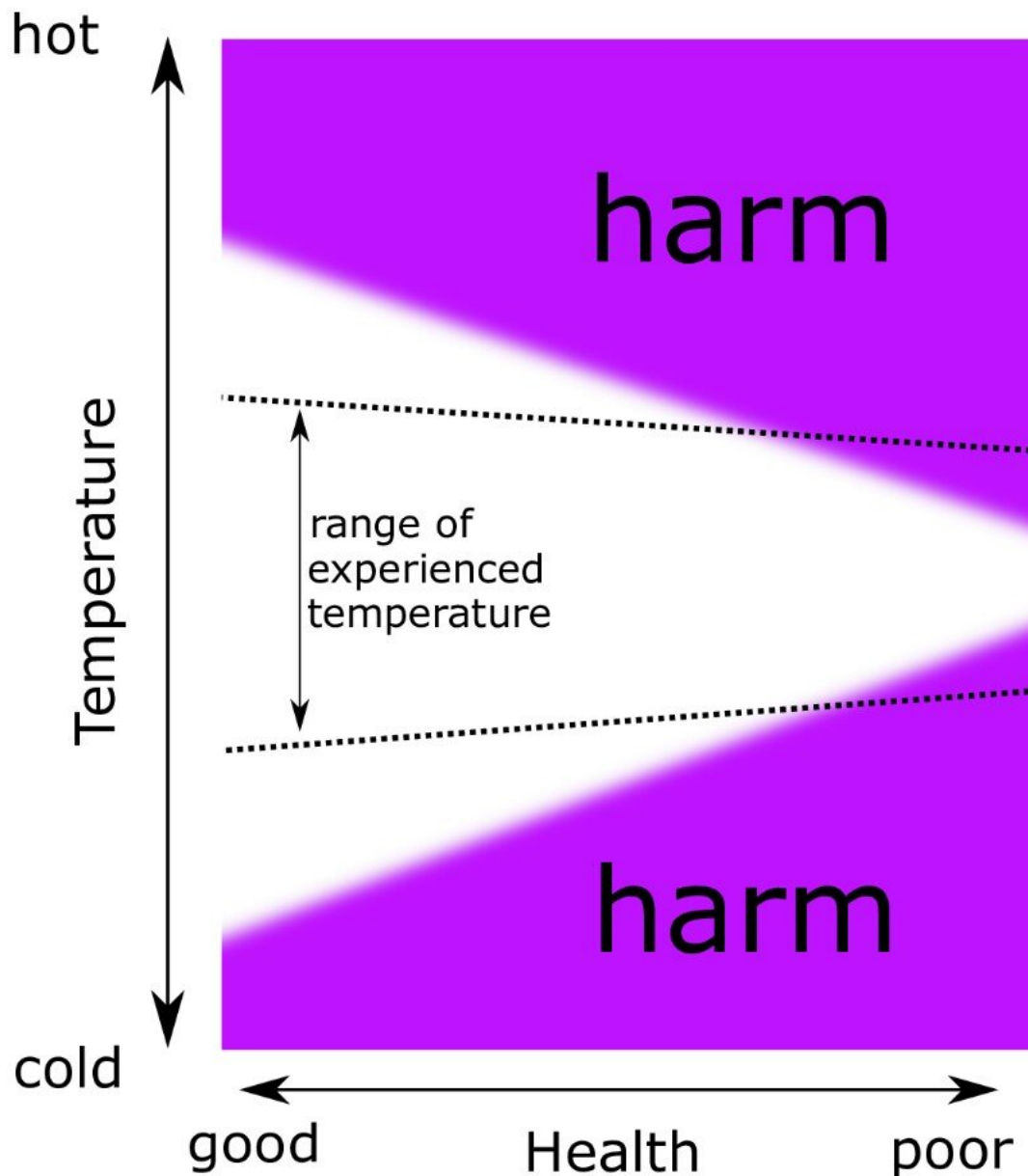


In the EU, space heating accounts for the majority of domestic energy use

July 22 2020



A schematic summary of the results of this study (dotted black lines) and the conceptual structure of the broader literature. Healthy individuals have a wider range of temperatures that are not harmful, and typically do not experience them. Individuals with poor health have a narrower range of experienced temperature, and are more likely to experience harmful thermal conditions, especially when living in poor housing which fails to guard against harmful temperature

exposure. This harmful exposure is understood to contribute to the observed seasonal variation in mortality. Credit: Kennard et al, 2020 (*PLOS ONE*, CC BY 4.0)

For healthy individuals, experiencing a wider range of temperatures than average—which can save on home energy costs—is associated with higher health satisfaction and a lower risk of cardiorespiratory conditions, according to a new study published July 22, 2020 in the open-access journal *PLOS ONE* by Dr. Harry Kennard of University College London, UK, and colleagues. However, for more vulnerable populations, a narrower range of temperature variety may be safer, the authors suggest.

In the EU, space heating accounts for the majority of domestic energy use, and a study found that decreasing home temperatures by 1°C could reduce CO₂ emissions by 13%. However, there is broad epidemiological data showing that low temperatures are associated with increased mortality; cold can exacerbate respiratory health conditions and increase blood pressure. Because of this risk, policies typically suggest a one-size-fits-all, narrow range of temperatures for domestic heating systems.

In the new study, researchers used data on 77,762 UK Biobank participants who each wore an activity and temperature monitor wristband for one week between June 2013 and December 2015. Temperature was studied in one-minute intervals and information on health, health outcomes and health satisfaction was also available for participants.

After controlling for age, activity level, and obesity, the researchers showed that thermal variety—the standard deviation of temperature someone experiences—is 0.15°C (95% CI 0.07-0.23) higher for people

whose health satisfaction is "extremely happy" compared to "extremely unhappy." It is also higher for people who are younger and have lower body mass index. A model which linked [health](#) outcomes to the temperature found that the risk of winter mortality increased with age and body mass index. Moreover, the risk of having a condition associated with excess winter deaths decreased for each degree increase in thermal variety. The findings suggest a larger range of temperatures which are not harmful for healthy individuals and a narrower range for those who are less healthy.

The authors add: "This study shows that healthier participants experience a wider variety of temperatures than less healthy ones. Considerable CO2 savings in buildings could be made by having healthy people experience more varied temperatures, but [vulnerable people](#) must be protected from harmful temperature extremes."

More information: Kennard HR, Huebner GM, Shipworth D, Oreszczyn T (2020) The associations between thermal variety and health: Implications for space heating energy use. *PLoS ONE* 15(7): e0236116. [DOI: 10.1371/journal.pone.0236116](https://doi.org/10.1371/journal.pone.0236116)

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