

Nat. Hazards Earth Syst. Sci. Discuss., community comment CC1
<https://doi.org/10.5194/nhess-2021-361-CC1>, 2021
© Author(s) 2021. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on nhess-2021-361 WBGT calculations

Jonathan Buzan

Community comment on "Projected impact of heat on mortality and labour productivity under climate change in Switzerland" by Zélie Stalhandske et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-361-CC1>, 2021

The WBGT calculated in the manuscript is not WBGT and is an approximation. The authors should state this plainly.

WBGT is a standardization that is an engineering fit to in situ data. Since WBGT is an engineering fit, modifying the equation changes the range of validation. Without comparing their ad hoc approach with measured direct measurements of WBGT, their outcomes are guesswork, and the authors should plainly state this.

Furthermore, the authors are attempting to calculate an indoor WBGT from meteorological measurements. The R package has 3 different WBGT calculations: 2 ad hoc calculations, and 1 that is thoroughly stressed tested to represent outdoor environments. The indoor calibration in the R package is not the official WBGT, and should be noted in the manuscript that this is an ad hoc calibration. Furthermore, the authors are not measuring indoor humidity. The authors do not state how they get humidity at all. The ad hoc calibration for indoor WBGT in the R package calculates a psychrometric wet bulb temperature (it is not Bernard, 1999 as the R package is labeled, but actually Lemke and Kjellstrom, 2012 approximation). There are many assumptions in Lemke and Kjellstrom, 2012 approximation of Bernard's methods about the indoor radiation, humidity, and temperature environment that are heavily dependent on ventilation, worker metabolic activity, physical fitness, and clothing. Indoor humidity and temperature can vary substantially from outdoor measurements, depending on the working environment (Bernard, 1999). The authors Equations 2,3 in SI do not have moisture in them at all.

The authors should remove the word WBGT from their manuscript and replace it with a clear statement that this is an ad hoc calibration and that there are severe limitations to the interpretations of labor productivity.