Review of '*Demographic yearbooks as a source of weather–related fatalities: The Czech Republic, 1919-2022*' by Rudolf Brázdil,

   The manuscript under review is written by Rudolf Brázdil and co-authors, all three of them members of the Global Change Research Institute, Czech Academy of Sciences, Brno, Czech Republic. The authors deal extensively with the subject of weather-related human impact events in the content of Demographic Yearbooks of the Czech Republic over more than 100 years. The origin of the fatalities is statistically analyzed in terms of number, gender and age for the following climate aspects such as excessive natural cold, excessive natural heat, lightning, natural disasters, atmospheric pressure changes, and falls on ice or snow.

   Table 1 contains the categories of external death causes attributed to weather and natural extremes in the periods available in Demographic yearbook of the CZ Republic. Indeed, excessive natural cold, excessive natural heat and lightning are present over the entire period. Natural disasters (1931-1978), is replaced by Natural disasters and flooding (1979-1993), and later on Flood / Inundation (1994-2022). Other, less frequent causes like air pollution (e.g. smog) and whirlwind or tornado are not specified in the catalog of categories but are probably comprised in other categories.

   In a first instance, this reviewer was not expecting this material to be present in Demographic Yearbooks and it is the merit and original view of the authors to have worked on the subject. In particular, in Belgium, lightning data, dust rain, frost, storm were subjects which were currently mentioned in the Belgian Meteorological Yearbooks.

RESPONSE: We would like to thank Gaston Demarée for careful reviewing of the manuscript and several critical comments which we are trying to respond below.

I suggest to add the website of the Centre for Research on the Epidemiology of Disasters.

RESPONSE: Accepted. The corresponding sentence was changed as follows: "According to Emergency Events Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED, 2024), …"
New citation in references:
CRED: Centre for Research on the Epidemiology of Disasters, https://www.cred.be, last access: 6 January 2024, 2024.

The sentence '*Czechoslovakia was initially formed on 28 October 1918 following the end of the First World War*', seems a little bit strange for international readers as the end of WWI is fixed by the capitulation of Germany on 11 November 1918. Of course, Czechoslovak readers know in detail the emergence of their country out of the Austrian-Hungarian double monarchy in the context of the end of WWI.

RESPONSE: Accepted. The corresponding sentence was changed as follows:
"Czechoslovakia was initially formed on 28 October 1918 before the end of the First World War (11 November 1918)."

In the proportions of male vs. female fatalities, lightning with a female proportion of 36,8 % is rather near to the maximum female fatality of 37,6 % in the excessive natural heat category. As both proportions are very near to each other, they could be mentioned together.

RESPONSE: Accepted. The corresponding sentence was changed as follows: "Among the six weather categories, the highest proportion of male and the lowest of female fatalities were observed in the category of excessive natural cold (75.2 % male to 24.8 % female), while the opposite extreme proportions were recorded for excessive natural heat (62.4 % male to 37.6 % female), slightly higher than for lightning (63.2 % male to 36.8 % female)."

Although the authors distinguish three distinct periods in the yearly evolution of the excessive cold fatalities (see to graph in Fig. 1) the picture exhibits a statistically significant trend for the whole series. Maybe, a cup-like linear trend would be a fairer representation. Mathematically speaking all deviations from the trend line from 1919 till 1978 are all positive in the first part and negative in the second part (no random distribution) which suggest that a linear trend is not the appropriate statistical model. Similar note may be said about the top picture in Figure 6.

RESPONSE: We are aware of this problem (any fitting line of higher order would be better), but the idea was to show general development during the whole studied period as for other groups of fatalities in Fig. 1. We used it also in Fig. 6a to show some coincidence with increasing mildness of January–February temperatures described well with this trend. On the other hand, we always stressed that this series of fatalities related to excessive natural colds generally consist of three quite different parts (see text in Sections 4.1 and 4.3.1).

This paper is clear, well written and has a strong reference list. The authors were successful in exploiting the data base of the Demographic Yearbooks in the context of weather-related fatalities. This reviewer suggest publication as it stands leaving the authors, if they wish, taking care of the few minor suggestions mentioned in this review.

RESPONSE: Many thanks for this critical review.

Demographic yearbooks as a source of weather-related fatalities: The Czech Republic, 1919–2022

This is an interesting paper that presents new research on understanding long-term fatalities in the Czech Republic. The manuscript is well written and provides a thorough analysis of demographic year books over 104 years, in relation to their contents documenting fatalities resulting from environmental conditions. The authors undertake an impressive analysis of the data, and a detailed contextualisation of the results and significance of their findings in relation to other work in the field across Europe and globally. I have attached an annotated version of the manuscript with some suggested edits both in terms of language but also additional considerations or points of expansion, however, these are simply suggestions and are not fundamental to this manuscript, as it is an excellent piece of work.
RESPONSE: We would like to thank Neil Macdonald for careful reviewing of the manuscript and comments in the annotated version of the manuscript, which we are trying to respond below.

Comments from the annotated version of the manuscript
Abstract: Avoid use of 'natural disaster' - fine to use natural hazards, but growing body of literature discusses not using the term natural disaster, as no disaster is really natural.
RESPONSE: Accepted. We used "natural hazards" instead of "natural disaster" in the whole manuscript including Figures 1, 3 and 4.

Abstract: Rephrase - "No trend was identified in natural hazards, whilst..."
RESPONSE: Accepted, we changed it as "No trend was identified in natural hazards, whilst statistically significant decreasing trend …"

Lines 31-36:
Is it worth adding a note that EMDAT only captures events that cause >10 fatalities/affects >100/ or where international assistance is called for. As such many events are not recorded. This means that there is a bias in recording to large events.
https://doc.emdat.be/docs/protocols/entry-criteria/
RESPONSE: Here we are citing results from WMO (2021) paper which reports Emergency Events Database as a source of data. To put other information about this database is probably not needed here because we do not know how exactly such data have been used in results presented in the WMO (2021) paper.

Line 68:
Add ,.
RESPONSE: We added comma to our sentence: "This analysis is facilitated by the fact that each yearbook includes not only the number of deceased, but also details regarding the causes of death.

Lines 159-164:
Worth noting that fatalities from cold events may also be shared across calendar years? Was this accounted for?
RESPONSE: From our text clearly follows that numbers of fatalities are based on the annual scale, i.e. from January to December of a given year. Responding to such annual numbers, we are only saying, how severe were standard winters counted from December of preceding year to January-February of the given year. Number of fatalities related to the standard winters from December to February were used in Sect. 4.3.1, Figure 7.

Figure 2:
Would it be worth adding a y-axis showing the number/proportion of the population over 60/65 Years of age?
RESPONSE: Accepted. But instead adding of such information to Fig. 2, we extended Fig. 3 by part (b) with graph showing proportion of three different age categories, including the category ≥65 years (see Fig. 3 below). The following sentences were added to the last paragraph in Section 4.1: "Fig. 3b shows general decreases in relative proportions of age categories 0–14 and 15–64 years in all weather-related fatalities during the 1931–2022 period, while proportions for the category ≥65 years were increasing. Linear trends in proportions of all three age categories were statistically significant ($p < 0.01$): –0.8 %/10 years for 0–14 years, –0.9 %/10 years for 15–64 years, and 1.8 %/10 years for ≥65 years. But both the youngest and oldest age categories showed clear breakpoints around the mid-1970s."
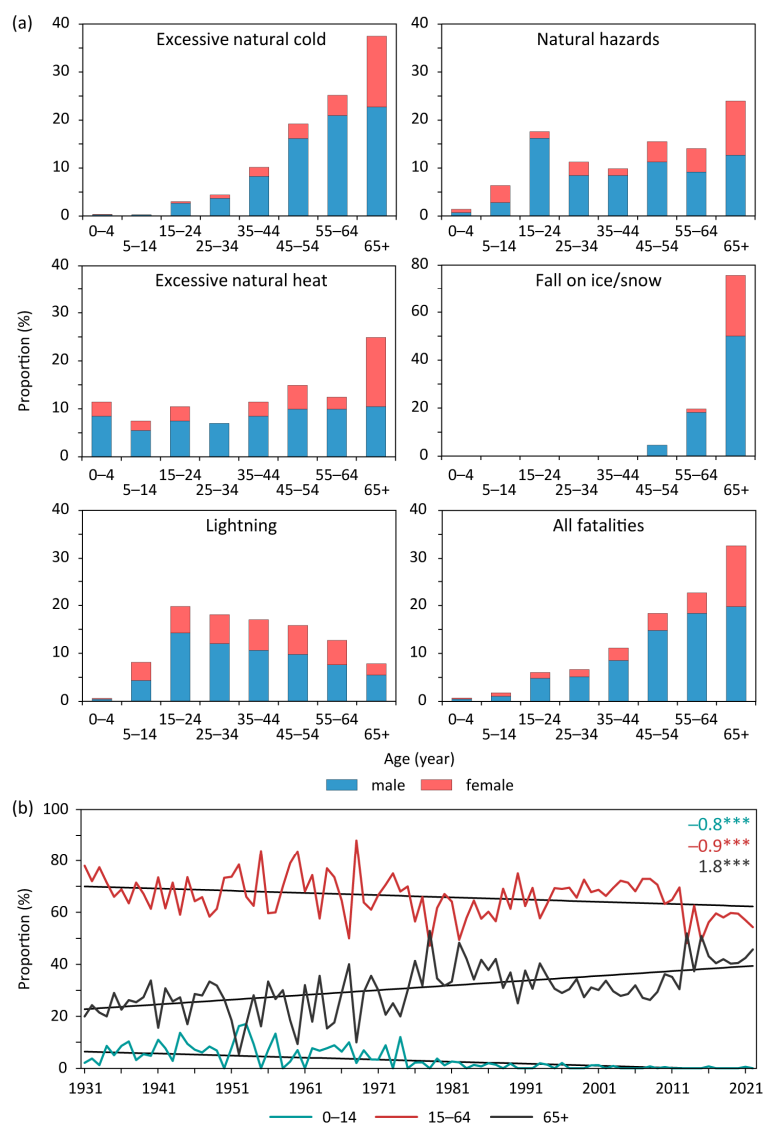

Figure 3. Age and gender structure of weather-related fatalities in the Czech Republic during the 1931–2022 period, based on data from demographic yearbooks: (a) relative proportions (%) in individual and all weather-related fatalities; (b) fluctuations and linear trends in relative proportions (%) of three age categories in all weather-related fatalities (slopes of linear trends indicated right above are expressed in %/10 years, the statistical significance: *** $p < 0.01$).