The authors pursue in their incredibly compelling paper the question what the cause was of human mortality in Iceland after the Laki eruption of 1783. In a very well-structured manner, they present the socio-economic situation of Iceland and the environmental impact of the eruption, followed by a data and method section. In their analysis part they look at the mortality data and later on how hunger and disease alone may explain the excess mortality in Iceland. After a short excursion about the impacts on the European mortality rate, they discuss the possibility of human death due to air pollution. In the final section they asses the possibility of wide-spread lethal fluorosis in humans, finishing with a concise summary. The paper does address relevant scientific questions within the scope of NHESS as it examines previous research claims from the 1970s on about the contribution of fluorine poisoning towards human mortality after a natural hazard such as the Laki eruption of 1783. Though the tools presented in the paper are well-established, it presents a vast amount of new data on Icelandic mortality for the late 18th century. The historic data is presented up to international standards and the sources have interpreted and criticised according to historiography. The scientific methods and assumptions are outlined clearly and very extensively. The results support absolutely the interpretations, and the authors disprove fairly conclusively the mentioned previous research. All the results can be reproduced thank to the thorough explanation of the methodology, where the used functions are clearly defined, and due to the concretisation of the used data in the supplement.
The title of the paper clearly defines the content of the paper, i.e. what did the people die of after the Laki eruption of 1783, except for the that it doesn't mention it mainly concerns the geographical region of Iceland. This could be added in the title.

Changed title to: „.[...] What did people die of after the 1783 Laki eruption *in Iceland*?"

The abstract is a complete and concise summary of the research presented in the paper. Both – title and abstract – are targeted to a broad audience, especially working in an interdisciplinary field.

There are a few points to be said concerning some figures and their captions. In general, the figures are adequately used to facilitate and enrich the lecture of the paper. However, caption of two figures (Fig. 2 and Fig. 4) goes over the page numbers of pages nine (9) and thirteen (13).

This formatting issue is expected to be resolved by the journal's typesetting during production stage. Hence no action taken.

Figures 1), 2a), 2b), 2c) and 5a) have identical issues. Too much information is presented in a single graphic. The numbers of each region could be presented as a separate graphic or a table. For the same images the resolution is subpar and could be enhanced. This would allow the preexisting graphs to show the full county titles, whereas for now the abbreviations are sometimes hard to detect.

- In fig. 1b, 2c, 5a the numbers were removed from the graph (they are still in the SI) and the full county titles added. Note that the previous fig. 1 is now in the SI.
- In fig. 2a, 2b, the data were however kept, because the information about the timing of deaths (1783 vs 1784 vs 1785) is used a lot in the text and should therefore be present in the main text together with the mapped information. This means that full county titles could not easily be added here. Since fig 2a,b are rather less crowded

than the previous fig. 1b and 5a, and are grouped with fig. 2c which has full county names, we deem this an acceptable compromise between completeness and plot design. In fig. 2a, 2b we shifted some of the number and text boxes to improve readability and, where possible, made the county abbreviations a little longer (e.g. Snæ -> Snæfellsnes).

- In addition, in fig. 1a we removed the population numbers (available in the SI), increased the letter size for the county names, and lightly coloured the counties according to their region (Northeast etc), to improve deadability. Note that the previous fig. 1 is now in the SI.
- Finally, we moved the improved fig. 1 into the SI, seeing that it contains more detail than needed in the main text. Instead, the main text now contains a figure 1 which simply displays the locations and names of the counties and how we grouped them into regions.

In Figure 3 there is a mistake in the caption: In row 2, where it says "a value of 5 in December 1785 means that from January 1st 1783 till December 31st 1783", it should be called "a value of 5 in December 1785 means that from January 1st 1785 till December 31st 1785"

Thanks for pointing this out. In fact, the correct version is: "a value of 5 in December 1785 means that from January 1st **1783** till December 31st **1785**, 5 times as many people died as would normally die in one year" as these are cumulative data. Corrected.

The authors quite clearly give credit to previous work. This is done very precisely in the section where the problem of the previous research is presented. Another good example is the section where the mortality outside of Iceland is discussed by reference to research done by others. The number and quality of references are appropriate. There is no place where complementary references would be required. They are accessible to all scientists.

Whereas the overall presentation is very well structured, and the reader is guided towards the conclusions throughline, section 8 about fluorine poisoning might require some more specialized background knowledge to assess the final conclusions. Introduction and summary are supremely well and concisely written. A few other sections contain rather an extensive amount of information. Some part of the methodology section in 3.1. and 3.2 could be shortened and the still crucial but supplementary information could be placed into the annexe. Similarly, towards the end of the paper the methodology section in 8.2 could be pruned slightly and additional information be put likewise in the supplement.

We carefully re-read sect. 8.2 to check for possibilities to move material into the Supplementary Information. However, we found no satisfactory way to do this – either one could move small bits and pieces, generating a fragmented SI and forcing the interested reader to jump back and forth between the main and the SI, or one would have to move all the quantitative estimates and leave only a brief summary in the main text. This seems to us not a suitable approach, seeing that the quantitative estimates are an essential part of arriving at our conclusions, and that this journal aims at readers who have some interest in numbers. Therefore we propose to leave sect. 8.2 as it is.
We did however shift some index definitions in 3.1 and 3.2 into the SM, leaving only the qualitative descriptions in the main text.

The technical language is precise and understandable for sicentists from different fields. The English language is of high quality and presentable for a diversified audience.

The supplementary material serves deeper understanding and allows the repetition of research especially thanks to vast dictionary of Icelandic terminology.

Further notes:

Section 1 Line 41-50:

Concerning the eruption's climate impact: Just because it is probabilistic that doesn't mean it shouldn't be considered. However, given their focus on mortality statistics not studying climate impact does not detract from the author's conclusions.

Slightly reformulated to avoid the impression that probabilistic effects should not be considered in general (even though we don't focus on them here).

Section 4.1 Line 203:

Concerning the small Pox epidemic unrelated to Laki: Question: Doesn't hunger or lack of nutrition and migrating population, which the authors relate to Laki, worsen a smallpox epidemic?

Agree that such an effect cannot be excluded. However:

- Small-pox arrival was external: The disease was not endemic, but could flare up when an infected ship came to Iceland. This could have happened in any year (a devastating smallpox epidemic occurred in 1707), so the arrival of the disease in autumn 1785 was a coincidence.
- The famine was over by the time the smallpox epidemic started; anecdotal evidence (Steingrímsson 1788) suggests efforts had been taken in summer 1785 to send displaced persons back to their area of origin if they had not found a new residence, so probably the migration and overcrowding had diminished by autumn 1785.

Any conection between the famine and the smallpox would have been less direct than the flare-up of already present endemic diseases which often accompany famines. It is of course impossible to exclude that people were still weakened from their previous ordeal and therefore more prone to illness than they would have been if the same small-pox had arrived five years later or earlier. Conversely, it may be that the famine carried off some weakened or ill persons that would have been particularly susceptible to dying from smallpox, thereby lowering the death rates.
We now briefly discuss this in the paper (end of sect. 5).

Section 4.2 Line 274-275:

Concerning orthography: "were" is repeated

Corrected

Section 6.1 Line 400:

Concerning orthography: "hey" should be "hay"

Corrected