We thank referee #3 for their review and the various suggestions to improve the manuscript. In the following we will respond in to the different comments and explain the general changes we intend to make to the manuscript based on them. The reviewer's comments are in black italics, our responses are shown in blue. All line numbers and references refer to the originally submitted manuscript.

This study aims to attribute excess mortality in the UK and Nordic regions to the 2018 SSW using stratospherically nudged ensemble forecasts. Exposure-response curves are derived using historical near-surface temperature data and mortality data and are then applied to the ensemble forecasts to calculate expected deaths in the 30 days following the 2018 SSW. I really enjoyed reading this study and thought that it was novel, well-written, and the figures were high quality and clear. I have only a couple of comments regarding the meteorology of the study.

We appreciate the referee's positive assessment of the manuscript.

Firstly, the ensemble experiments used in this study use stratospheric zonal mean nudging at 90 hPa and above. Are the results of this study sensitive to the level at which the nudging is executed? Additionally, is the nudging of the stratosphere gradually increased to full nudging at 90 hPa to ensure that edge effects do not occur? Please clarify.

In the SNAPSI experiments used here, zonal-mean wind nudging is applied following the standard SNAPSI protocol (Hitchcock et al., 2022). The nudging strength tapers smoothly with pressure from zero below 90 hPa to full strength at 50 hPa, which minimises edge effects near the tropopause and avoids directly impacting the troposphere. We will ensure the revised manuscript clarifies this.

Hitchcock et al. (2022). Stratospheric Nudging And Predictable Surface Impacts (SNAPSI): a protocol for investigating the role of stratospheric polar vortex disturbances in subseasonal to seasonal forecasts. Geoscientific Model Development, 15(13), pp.5073-5092.

My other comment is regarding the interpretation of the results. If I am not misunderstanding, the estimated mortality risk and excess death data is based on the difference between the nudged and control simulations. I therefore think it is very important to ensure clarity when describing the results, because the mortality statistics are therefore expected statistics based on how the model evolves at the surface in response to nudging. For example, there is the statement that says "We find that about 750 deaths in England and Wales were attributable to the impact of the February 2018 SSW" in section 285. However, surely this is expected deaths based on the ensemble predictions? Given that the mortality estimates are derived from model-simulated

differences in temperature responses to stratospheric nudging, the results support a conditional, model-based expectation rather than a direct attribution. I recommend revising this wording throughout to explicitly reflect the conditional and expected nature of the estimate.

We agree with the referee that it is important to clearly distinguish between direct attribution of observed mortality and conditional, model-based estimates. In our framework, mortality impacts are derived from differences between stratospherically nudged and control ensemble simulations and therefore represent expected excess deaths conditional on the presence of an SSW. We will revise the wording of the manuscript, and adjust the axis labels in some figures to clearly reflect this.