

Nat. Hazards Earth Syst. Sci. Discuss., author comment AC3  
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## Authors' Reply to Referee 2

Elena Mondino et al.

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Author comment on "Longitudinal survey data for diversifying temporal dynamics in flood risk modelling" by Elena Mondino et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-88-AC3>, 2021

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In our response below, we will use Rn.m to indicate the referee comment and An.m to indicate the authors' reply, where n is the referee number and m the comment number.

**R2.1: I find this paper is both an interesting and relevant contribution to the topics considered important to the audience of NHESS. This is especially regarding how we can improve socio-hydrological models, or other forms of climate and disaster risk adaptation.**

A2.1: We thank the Referee for their kind, positive, and constructive comments, which will definitely contribute to improve our paper.

**However, I have several comments on the paper, that I hope to provide the constructive criticism required to push the paper forwards towards full publication in NHESS, especially as I am receptive to the central messages of the paper. Therefore, my main criticism of the paper is how the authors go about comparing the different data sets. I hope this sparks a fruitful discussion and seeing the revised version.**

**R2.2: I would perceive that the central value of the paper, and its useful extension of the scientific literature, is not on the results that they present per se, but rather the comparison that is conducted between the repeated cross-sectional analysis results and that for the longitudinal data analysis. Therefore, rather than presenting new 'results' the manuscript indirectly aims to be a methodological contribution to the literature. This is the added value that the authors wish to demonstrate. They then demonstrate this by comparing the differences in their results and determine 'good' results are those that are consistent across both sampling approaches. In my view, and to be a bit provocative, this requires additional justification or presentation. This is for several reasons. The first as the authors say, the purpose of RCS and Panels are different, panels follow people over time, while RCS look for changes in the population average. Therefore, in terms of how they can be integrated into socio-hydrological models (for example) would be quite different. Most of the argumentation presented in the paper tends towards questions and approaches that would require panel datasets to avoid the creation of the artificial**

**relationships and dynamics in the data (e.g., Agent-based models). Therefore, while I would normally agree with the authors that consistent results across multiple sets of data/methods would be the best, I am not sure with the argumentation they have presented for why we need longitudinal data that a comparison of the results is the best way to 'sell' the data and the benefits of longitude data. As I would disagree that consistent findings can be used to parametrize socio-hydrological models but rather the result from the data that best matches the model to be developed. The consistent patterns in their case might be useful for models in their study area, but now I do not know how that would transfer to models outside of their study area for instance.**

A2.2: We thank the Referee for bringing up a number of critical points. In the revised version of the paper, we will expand our discussion on the integration of different types of longitudinal data in different model types. Indeed, which data can benefit which model depends not only on the structure of the model itself, but also on the model's purpose (e.g. descriptive of generic patterns vs. tailored on a specific case). This will also be followed by a discussion on the respective opportunities and limitations of the two approaches and resulting datasets, and in turn on their respective potential for generalizability. In the revised discussion we will also reflect more on when and for which models converging results can be considered robust.

**R2.3: Furthermore, on a similar note, I feel that an extended and more detailed discussion on the relative benefits and cons of each surveying method based on the authors' experiences would improve the discussion section. For instance, repeated cross-section is easier than panel datasets and this could provide a useful input for the dynamic modelling of population wide interventions and not polices aimed at specific people for example. A greater discussion of these relative merits could be an improvement. You have mentioned pros and cons within a specific example (notwithstanding the previous comment of if it is a good idea to directly compare behavior in an RSC vs. Panel) but not on the overall pros and cons what are more widely discussed (from what I understand of the literature you present).**

A2.3: We agree with the Referee that pros and cons of the two approaches can be discussed more in depth. In the revised paper, we will add a section in the discussion in which we will present and examine the benefits and drawbacks of the two approaches in general, not only in our specific context, as this will benefit readers more broadly.

**R2.4: Socio-hydrological models or socio-psychological models, in my experience, are quite dependent on local conditions. Therefore, the argumentations that risk perceptions overall did not hugely change could be the result of the short time span between the survey waves, or because of the interventions. The first rationale, I would argue, is more likely to be transferable (especially with in the context of papers the authors cite) than the second. So, the transferability of these results should also be mentioned because of how there were ongoing interventions in the study site.**

A2.4: We agree with the Referee. In the revised version, we will discuss more openly about issues and potential for transferability of the two methodologies.