

June 12, 2020

Authors' response to Referee 1

We would like to thank Referee 1 for the exceptionally constructive feedback. We found the comments and suggestions offered by the referee very helpful and we appreciate the opportunity to revise key aspects of the article. We have made all of the changes suggested by the referee, and we believe that the revisions create a stronger and clearer paper.

Referee comment: Abstract

The abstract outlines the findings of the survey and interviews, but the last sentence does not outline any new idea.

Authors' response:

We concluded the abstract by stating the uniqueness of this research: it studies a religious group that is also a cultural minority compared to the secular authorities and therefore requires special adaptations. It offers a perspective on the complex reality of hazard preparedness in a religiously diverse country. We also listed some of the key adaptations suggested to policy makers.

Referee comment: Introduction

Please rewrite with more specific and more precise data and observations.

Authors' response:

We rewrote the introduction using the following structure: Information on earthquake destruction, citing Bozorgnia and Bertero, 2004; The importance of considering the needs of religious groups in earthquake management, citing Baytiyeh and Naja, 2014; Sun et al., 2018, Gianisa and Le De, 2018; The goal of our research; The research questions; Summary of the main arguments.

Referee comment: Earthquake preparedness among marginalized minority groups and religious communities

Due to the title of the paper, this part should be rewritten to focus only on religious communities of the world or of the region, and not on 'marginalized minority groups'.

Authors' response:

We rewrote this section focusing mainly on the advantages and disadvantages of religious groups in disaster management, as described in past literature. We discussed the impact of religion on the three phases of an earthquake: the preparation phase, the emergency phase and the restoration phase. We presented suggestions from past literature on how to improve the three stages of an earthquake in religious communities and in the general populace. We added data citing additional sources such as Drabek, 2001; Sattler et al., 2000; Wilkin et. al, 2019, and others.

Since the social group that we study is also a minority in its country, we listed some characteristics of minorities which have a great impact on disaster preparedness.

Referee comment: The Jewish Ultra-Orthodox Sector

Does the word "sector" mean that the JUO community live in a specific area? As it is not well known in Europe for instance, please also precise if the JUO have a specific language, etc.

Authors' response:

Most ultra-orthodox people live either in towns of their own or in closed community neighborhoods within diverse cities.

Although some of the communities still speak Yiddish as their first language, most of the ultra-orthodox people are Hebrew speakers like most Israelis.

We added this information to the manuscript.

Referee comment: Earthquake Hazard in Jerusalem

Please add a figure showing Israel, Jerusalem, and fault lines with dots or stars illustrating historic and instrumental earthquakes with intensities or magnitudes. Make a zoom on the eventual JUO sector of Jerusalem and eventual seismic zoning (if it does exist) and eventual shaking maps (if they do exist): the aim of this demand is to illustrate the specific vulnerability of the people and buildings

Referee comment: Figure 1

in an inset, show map of Israel + Jerusalem location + any specific JUO sector Table 1: precise 'epicentral' or 'maximal' or 'downtown' or 'whatever' intensity

Authors' response:

We added two figures which demonstrate the specific vulnerability of the people and buildings of the ultra-orthodox sector:

Figure 1 - instrumental earthquakes (>3M) were added (Fig. 1b); historical earthquakes are presented in Fig. 1a. Moreover, in Fig. 1b the dominant faults are marked, and settlements with ultra-orthodox residents are presented.

Figure 2 - map of Jerusalem with ultra-orthodox neighborhoods. Calculated seismic intensities (Avni, 1999) and zone of ground amplification (Salamon et al., 2010) are presented. Instrumental earthquakes >2M in Jerusalem are also presented.

Please view the figures at the end of this letter.

Referee comment: Survey

How many questionnaires were sent OR give a percentage of responses (can help distinguishing persons interested in preparedness who could later be used as vectors of information), see line 337

Authors' response:

The response rate was around 90% for the in-person interviews. We do not know the response rate to the online questionnaire since we did not control its distribution.

Referee comment: Results

Please simplify and re-order the answers.

Referee comment: Quantitative findings

Help the reader with graphs, pie charts etc.

Authors' response:

We included diagrams to illustrate the main findings, e.g., we added a diagram to summarize the level of belief of the ultra-orthodox people regarding the occurrence of a disastrous earthquake in the near future (please see Figure 3 at the end of this letter).

We elaborated on the demographics of the respondents (age, gender, marital status, income, education, area of living, social subgroup and type of phone they own). We also added data regarding the level of preparedness of the community. Furthermore, we added the translated questionnaire and a table of the full findings as an appendix. Consequently, we believe that it is now easier to follow the results.

Referee comment: Qualitative findings

- Outline the answers of the religious leaders and key figures of the JUO community, for they could become vectors of preparedness information.
- Family names of safety officers are cited, is it common and accepted by the so-called persons, and is it allowed by the NHESS journal?

Authors' response:

- The answers of the respondents are summarized in a revised SWOT analysis and in clearer and revised points in the conclusion section. Our recommendations are deducted from the answers of the religious leaders and key figures that we interviewed.
- All the research participants' names in the manuscript are pseudonyms and appear there for simplification purposes only. We clarified this in the text.

We enclosed the interview guide, which was written to help the interviewers frame the interviews and keep them on track, as an appendix.

Referee comment: Discussion and Conclusions

The discussion needs to be reworked, also focusing on religious minorities. The SWOT analyze is a very good idea that could be more developed to offer preparedness perspectives based on the strong social capital of the JUO. A good perspective would be to submit preparedness ideas to interviewed religious leaders: then emphasis could be put on advices in hardware stores, simple and cheap home security (furniture organization and securing, basic rescue kits for the family), practical skills based on the specific neighborhood solidarity in the JUO, the organization of participatory experiences by the religious authorities for instance.

Authors' response:

We split the section “Discussion and Conclusion” into three: “Discussion”, “Conclusion” and “Recommendations”.

In the discussion we focused on religious minorities as suggested. We reviewed the level of awareness and preparedness of the ultra-orthodox sector and compared the findings with the literature. We discussed the community's unique characteristics and stated how they may increase preparedness or hamper it.

In the discussion we brought up an interesting point regarding retrofitting: Half of our survey respondents indicated that they do not live in buildings that meet the legal safety standards despite the fact that some of their neighborhoods are in areas with increased ground shaking during an earthquake (Salamon et al., 2010) (Fig. 2). Alarming, none of our respondents recommended retrofitting, a crucial strategy for minimizing the harm caused by earthquakes (Bozorgnia and Bertero, 2004). Our interviews with relevant stakeholders further confirmed that very few ultra-orthodox people are interested in retrofitting. They explain that the reasons for this include a lack of awareness regarding three factors: the potential impact of earthquakes, the significance of building conditions in reducing damage, and the government's willingness to support retrofitting. Additional reasons are the intangibility of the danger and the low economic status of ultra-orthodox society. These findings stand in agreement with Maldonado et al. (2016) and Lucini (2014), who found that minority groups show a low level of self-protection and preparedness, a low level of hazard knowledge and a low level of action during the emergency phase.

In the discussion, we compared the level of knowledge and readiness to prepare for an earthquake of the ultra-orthodox population to that of the general Israeli public, using the findings of Ya'ar et al. (2015) regarding the Israeli population. Please see Figure 4 at the end of this letter.

The research findings are summarized in the "conclusion" section. Our research questions included three main themes: the actual state of earthquake preparedness in the ultra-orthodox sector, characteristics that may hinder or promote preparedness, and ways of improving preparedness. The findings from the first two questions are summarized in a SWOT analysis that we further developed in accordance with the referee's recommendation, emphasizing the potential contribution of the ultra-orthodox society's strong social capital. The findings from the third question are summarized in bullets within the section.

We listed our recommendations in a separate section using a clear bullet format. We included the referee's important and creative ideas in the list.

To conclude, we addressed all the issues raised by Referee 1. We would like to thank the referee again for the work invested in reviewing our manuscript. We truly believe that the review process substantially contributed to the article and we hope that the current version will be accepted to *Natural Hazards and Earth System Sciences*.

Sincerely,

The authors

Figures

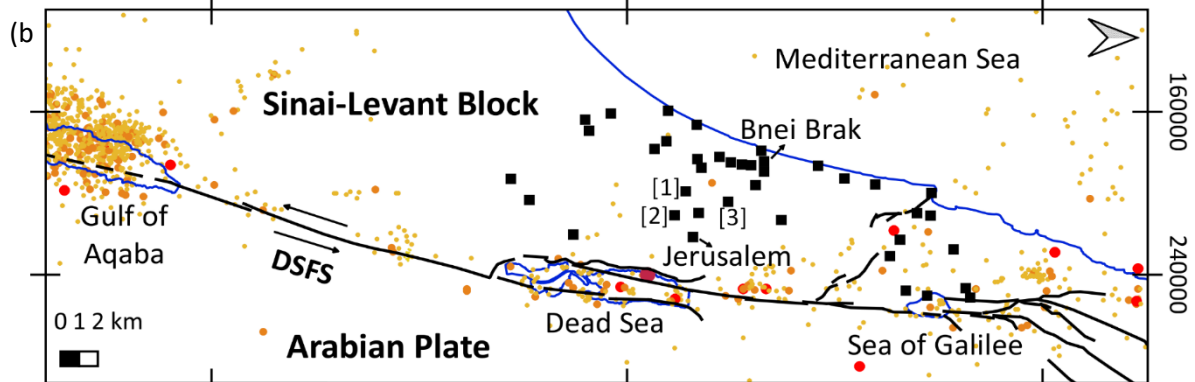
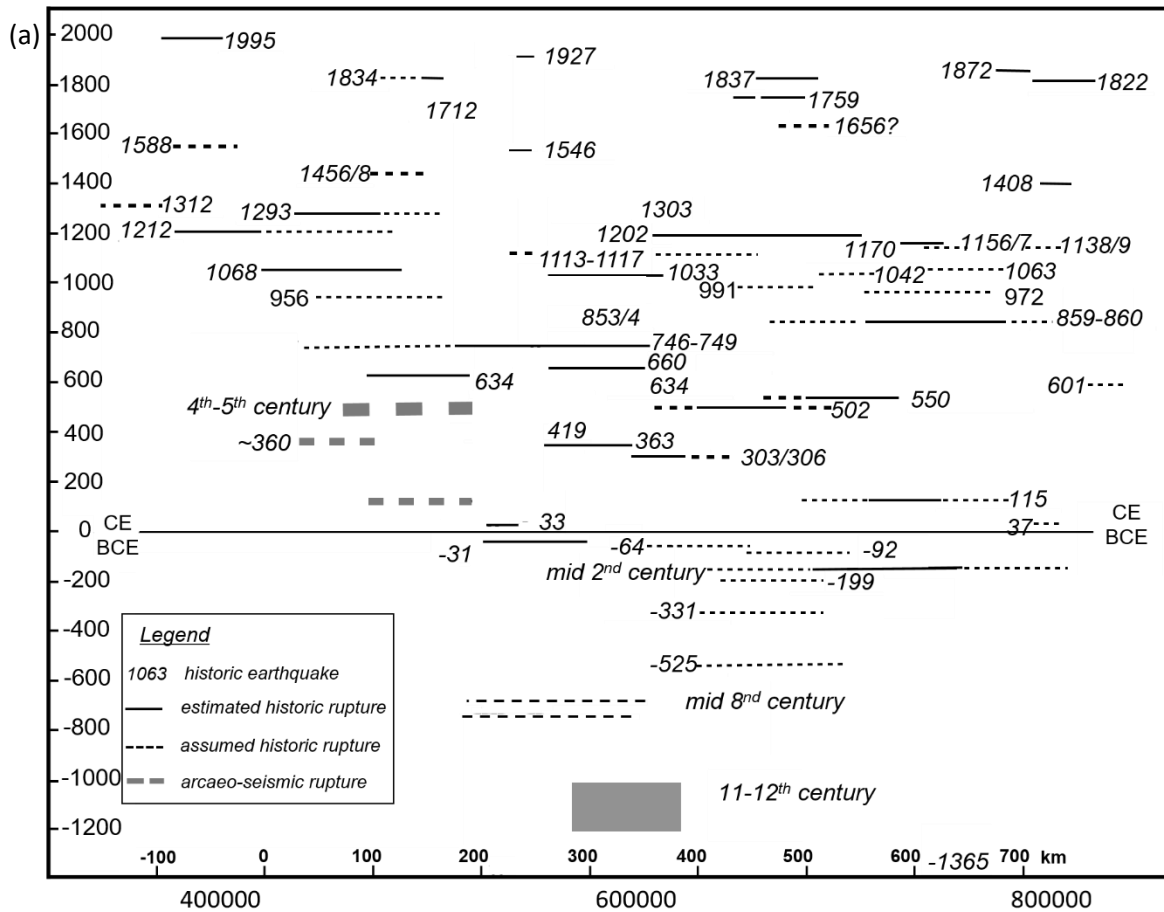


Figure 1:

(a)- Estimated spatial extent of ruptures from historic periods along the DSFS (after Agnon, 2014). The position of the events in the graph is projected from the map of the DSFS below in (b).

(b) - The DSFS main branches (Hamiel et al., 2018; Hofstetter et al., 1996; Kagan et al., 2011; Politi, 2011; Sharon et al., 2018) over instrumental earthquakes record (from 1984) of >3 M_d (www.gii.co.il).

Settlements with Ultra-Orthodox residents are marked; the majority is in Jerusalem and Bnei Brak. [1] – Beit Shemesh, [2] – Beitar Illit, [3] – Modi'in Illit.

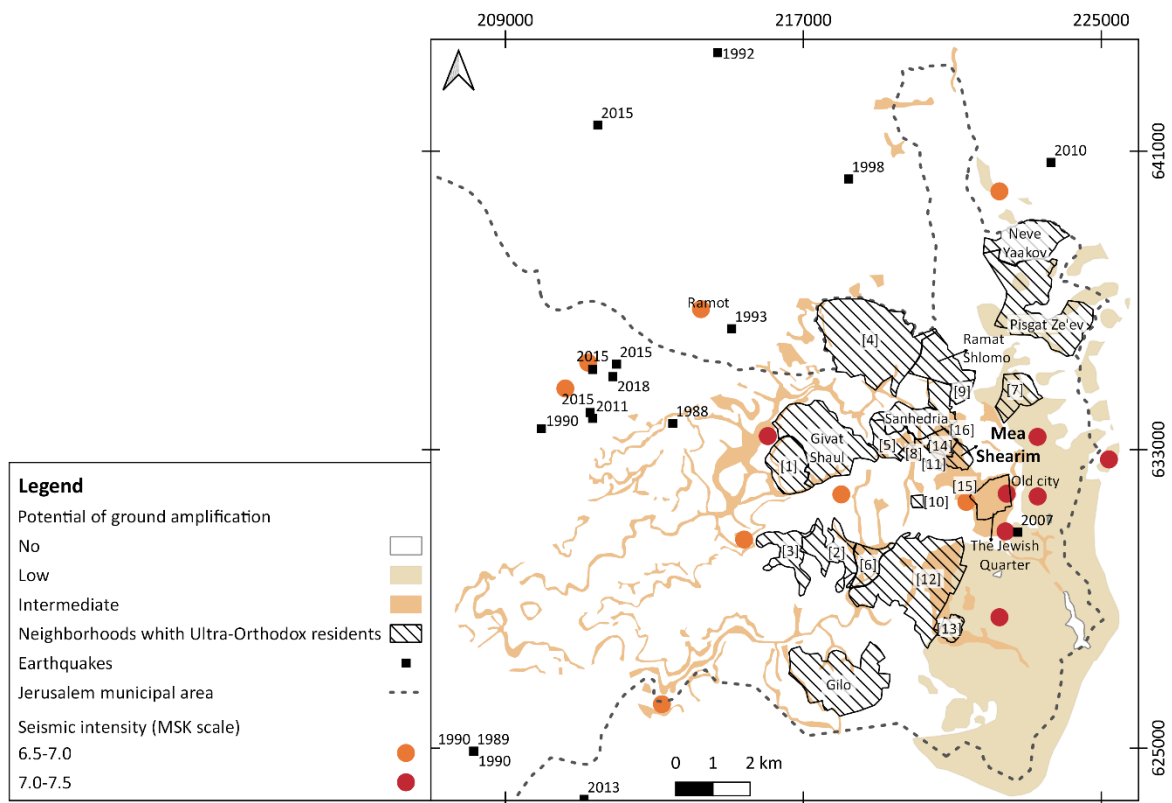


Figure 2:

Map of neighborhoods in Jerusalem with Ultra-Orthodox residents (modified after Community administrators Jerusalem map, 2009; Golan, 2020) over ground amplification map (Salamon et al., 2010).

[1] – Har Nof, [2] – Bait Vegan, [3] – Kiryat Hayovel, [4] – Ramot, [5] – Romema, [6] – Givat Mordechai, [7] – French Hill, [8] – Mekor Baruch, [9] – Ramat Eshkol, [10] – Sha'arei Hesed, [11] – Zikhron Moshe, [12] – Katamon and Katamonim, [13] – Arnona, [14] – Bukharim, [15] – Morasha, [16] – Shmuel HaNavi.

Mea Shearim, and the neighborhoods adjacent to it to the north are associated with the ultra-orthodox sector. They are in an area marked by increased ground shaking during an earthquake.

Instrumental earthquakes (from 1984) of <2 Md are presented by black rectangles together with the year of quaking (www.gii.co.il). Medvedev–Sponheuer–Karnik scale (MSK) intensity scale evaluates the severity of ground shaking in an area of earthquake occurrence; the mean seismic intensity in Jerusalem shows strong-to very strong shaking zones from the 1927 6.2 M Jericho earthquake (Avni, 1999).

Level of belief that a disastrous earthquake will occur in Israel/in your area in the next five years

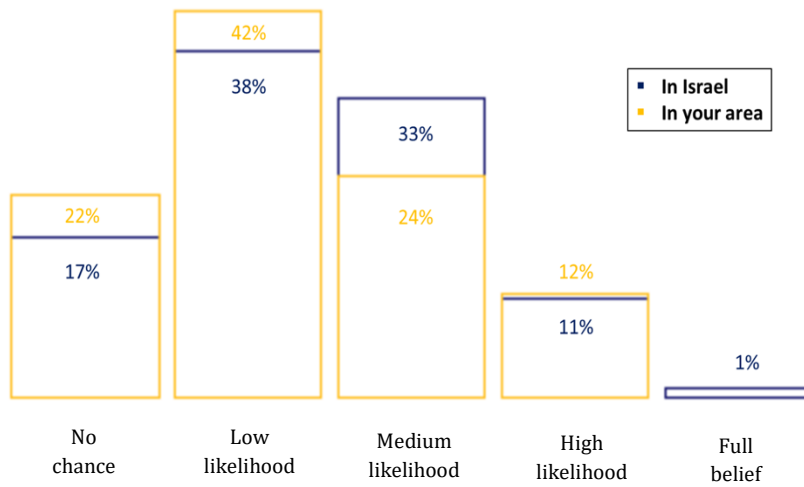


Figure 3:

Level of belief that a disastrous earthquake will occur in Israel/in your area in the next five years

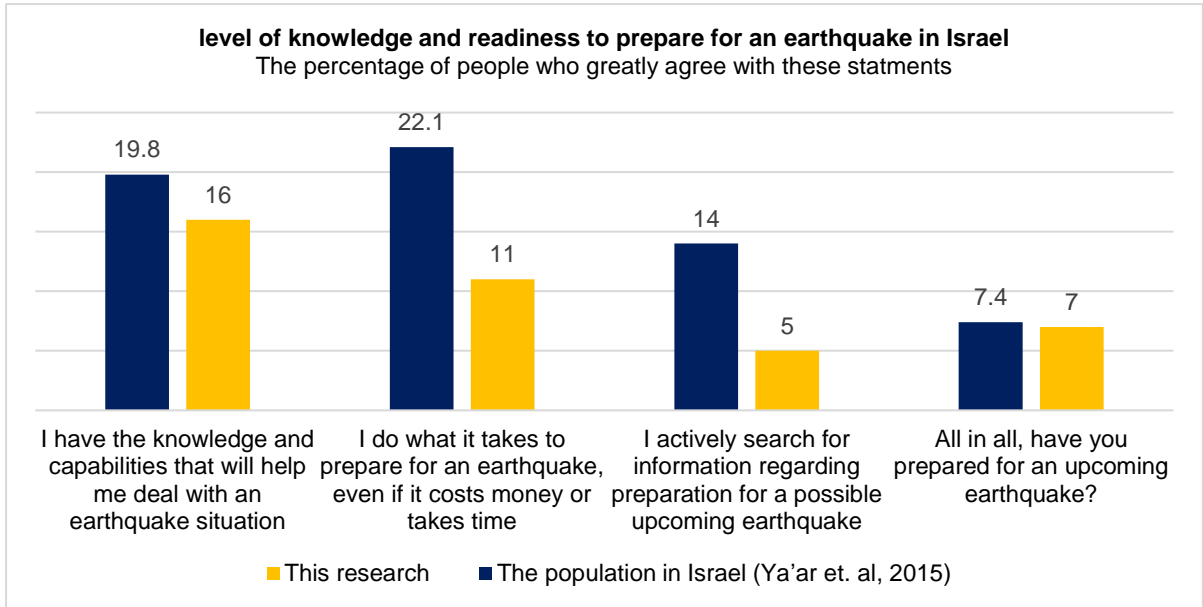


Figure 4:
Level of knowledge and readiness to prepare for an earthquake in Israel