

Authors' Responses to Comments from the Referee 1

Referee #1: This is an important, interesting topic. The paper is clearly written and easy to follow. There are a number of short-comings which should be addressed in a revised version:

We thank you for your helpful suggestions and constructive feedback to help us improve our manuscript. We have responded to your specific comments below.

1. More details on the monitoring and detection; information processing and delivery of information should be better clarified; it is not clear what training and public information was delivered prior to and how often prior to the earthquake event;

Response: In the previous version of our manuscript, we introduced the modules in the EEWS (retained in Lines 32-35). We have added additional details on the monitoring, detection, and delivery of China's EEWSs and its pilot regions (e.g., Fujian and Sichuan Province) in our revised manuscript (Lines 69-72, 83-95, 99-101). For more information about technical capabilities, we also recommend the published articles (e.g., Peng et al., 2011, 2020; Zhang et al., 2016) (retained in Lines 75-77).

As to the public training and education, in China, these are usually carried out by the relevant emergency management agencies, earthquake administration bureaus, schools, or research institutions. For example, the webpage of the Sichuan Earthquake Administration (<http://www.scdzj.gov.cn/>) includes articles, posters, and videos about earthquake preparedness (e.g., earthquake hazards, past events, proper response actions, etc.), but it is difficult to obtain more detailed information (e.g., how often, to whom, and where these materials are disseminated).

For our study, local people's knowledge about earthquake risks as well as their previous training/education about how best to respond was ascertained in our survey by asking whether respondents had received training and/or actively/passively obtained education (Questions 5-6, Supplement). To further clarify this, we have added the survey questions as an appendix to this article. We found that of the 770 respondents to our survey, 518 (67.3%) had received general education about earthquakes and their risks, but only 26 (3.4%) had received specific education related to the EEWS. Nevertheless, the lack of reliable data about dissemination of earthquake awareness and education materials is a challenge for these types of studies, as noted elsewhere (Becker et al, 2020; Santos-Reyes, 2019).

2. More details regarding the survey respondent recruitment, sampling, and representation should be included; is this valid sample?

Response: As stated in Paragraph 1 on Page 6, the online questionnaire was administered by the survey platform Wenjuanxing and delivered to the public via social media (WeChat). Therefore, the survey respondents were not randomly selected, so there was likely a self-selection bias in the types of people who responded. Although this does limit the generalizability of our findings to some extent, due to the

lack of similar surveys in the immediate aftermath of earthquake events in China, we believe this sample was sufficient to ascertain the general lack of effectiveness of Sichuan's EEWS messaging at the time of this particular earthquake.

3. The statistical analysis is very thin; need to include at a minimum standard test of significance, prob values, confidence interval for the comparisons between groups and categories.

Response: We have added the statistical analysis as you suggested. The results with corresponding descriptions can be found in Lines 132-137.

4. Missed opportunities for more analysis of both differences between the characteristics of those who understood and those who did not the EEWS; what is the role of education, social status, age, gender, previous experience, etc.

Response: We have compared the differences between the responses of those who understood and those who did not understand the EEWS (Lines 132-137; Figure 2). We agree with the importance of understanding the roles of these variables you mentioned in predicting the level of awareness of the EEWS in Sichuan, however, the survey respondents were not randomly selected, so the likelihood of a self-selection bias in the types of people who responded limits the types of analyses otherwise possible. Therefore, this type of analysis was beyond the scope of this study, but certainly merits further research.

5. More discussion of the implications for improving earthquake warning and how to increase awareness, knowledge, comprehension and actions resulting from EEWS;

Response: We appreciate the value of the points you raised, but are unsure of the extent of discussion you see is lacking, since our study found a big gap existed between the EEWS's message and the public's response following the Changning Earthquake. Therefore, our results highlighted the lack of effectiveness of the EEWS messaging prior to the earthquake event. We discussed this at length in our manuscript (Section 4). As a brief communication format article, it is not possible to explore every aspect of these challenges within the word limitation and scope of this paper. Moreover, there is limited research in and outside of China on public perceptions and responses to EEWS messaging, and the published work is limited in the exploration of how to improve their effectiveness (Nakayachi et al., 2019), so we believe our discussion significantly advances current understanding in the field, especially within the context of Sichuan.

6. Comparative analysis between hardware and systems between China/Sichuan and Japan/US/Mexico would be useful;

Response: As you know, the designs of EEWSs (e.g., sensors, communications and telemetry, processing capabilities, and transmitters/receivers to deliver alerts) in various countries are quite different depending on each country's very unique context. Previous studies have summarized the utility of EEWSs from the technical perspective, including best approaches, instruments, and algorithms for EEWSs

implemented in various countries, providing comprehensive and synthetic insights (Allen and Melagr, 2019; Cremen and Galasso, 2020). As stated in Lines 75-77, the utility of EEWSs (mainly physical networks and algorithms) in China's main pilot regions (e.g., Beijing capital region, Yunnan-Sichuan border region, and Fujian) can be found published elsewhere already (e.g., Peng et al. 2011, 2020; Zhang et al. 2016). These studies highlight the importance of assessing technological capabilities of EEWSs in terms of accuracy and latency of alert delivery, so this study did not seek to replicate their findings. However, unlike those studies, the goal of this study was not to provide insights into the hardware or software systems of the EEWSs themselves, but instead to assess the relative effectiveness of the messaging in terms of public understanding/perception of Sichuan's EEWS in order to provide insights to local authorities on how to improve before future earthquake events.

Specifically, given the limited research on the public's perceptions and response to EEWS alerts, we sought to examine the effectiveness of the messaging/alerts for personal protection rather than technological capabilities. Our study sought to examine whether the public could reasonably be expected to take appropriate protective actions with the types of alert messages issued during the 2019 Changning Earthquake. The findings of our survey indicate that the public in Sichuan were not adequately prepared to take appropriate actions based on the types of messaging they had received before and during the earthquake event. Thus, as a brief communication, rather than duplicating what other studies have already done (in terms of comparing the technical hardware/software, etc.), we tried to instead provide more detail about how to better deliver alerts and increase awareness, knowledge, and appropriate actions by comparing the case of Sichuan's EEWS to other regions.

While the paper has potential, in its present form even as a brief communication, it simply raises more questions than it answers...

We appreciate your constructive feedback, but disagree with your conclusion. In a brief communication format, we believe it best to advance understanding of a relatively limited research question (e.g., how effective is Sichuan's EEWS messaging in terms of public understanding), particularly in the context of China, where these types of studies are more limited than in other earthquake-prone regions of the world. Thus, we do not agree that a brief communication-type manuscript should address every interesting and thought-provoking angle about EEWSs, especially not those that have already been addressed in great detail in previous manuscripts.