

**Invited perspective: Redefining Disaster Risk: The Convergence of  
Natural Hazards and Health Crises**

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**General comments**

The manuscript calls for advancement in research to improve the assessment and management of natural hazards and health crises with a feasible research agenda. Looking forward to the exciting and impactful results in the future.

The manuscript proposes a research initiative on a topic within the scope of Natural Hazards and Earth System Sciences (NHESS). I would recommend this manuscript for publication with the following suggestions.

**Specific comments**

1. Widen interdisciplinary communities

Line 15: Besides the socio-hydrology community, other interdisciplinary communities (e.g., socioeconomic, biological, climatological, geophysical, hydrological, and meteorological) have also researched the complex impacts of natural hazards and health crisis and have knowledge and experience to offer in this research agenda (e.g., compound interaction between earthquake and public health service). It is suggested to widen the lessons learned from interdisciplinary communities

2. Additional point in the research agenda towards the management side

Abstract and Table 1: Three points and four items were listed for the call and research agenda, respectively, focusing on the multi-hazard risk assessment. I would suggest a complementary research topic focusing on “multi-hazard risk **management**”, which particularly addresses the gap from science to practice, including stakeholder engagement, knowledge translation, decision science, policy analysis, applied social science research, etc. This additional point will be directly linked to Line 146-147, Line 163-165, and Line 180-185.

3. Extending the literature

- The authors highlighted the most promising and ready technologies or tools for each point in the call. However, it is suggested to include or comment on other emergent methods and their challenges, for example, machine learning or AI for modelling of co-occurrence and data processing.
- Ongoing efforts, particularly Disaster Resilience Scorecard for Cities: Public Health System Resilience – Addendum (<https://mcr2030.undrr.org/public-health-system->

[resilience-scorecard](#)), are made to improve the health emergency and disaster risk management, the subject/issues and question/assessment listed in this Public Health Scorecard are very relevant and inspiring for the section “Health impacts in risk management framework”. Suggest including this reference.

- Compared to the quantitative DALY and YLD proposed, semi-quantitative metrics have already been considered in the national risk assessments. For example, population suffered from serious injuries (i.e., Serious injuries are all injuries that are not necessarily life-threatening, but require hospital treatment and/or may cause permanent damage, such as head injuries, burns and internal injuries.) and population experienced serious illness (i.e., serious illness refers to all illnesses that are not necessarily life-threatening, but require hospital treatment and/or can cause permanent damage, such as infectious diseases and mental illnesses.) in the Norwegian national risk assessment (<https://www.dsbinfo.no/DSBno/2014/Tema/FremgangsmteforutarbeidelseavNasjonaltisikobildeNRB/> in Norwegian). These semi-qualitative or quantitative metrics can be further enriched with more quantitative metrics like DALY and YLD.
4. Privacy and security of health-related data  
The use of health-related data raises concerns about its privacy and security. It is worth emphasising again that the research community will respect the data privacy regulation and laws, etc and perform ethical research for the public good.
  5. The challenge in the time and spatial scale for modelling the co-occurrence of disaster could be elaborated

#### **Minor comments**

6. Line 32: WASH acronym first appeared but the acronym was explained later in Line 123
7. Terminology: give examples of “stressors” and “interventions” for clarification for interdisciplinary communities