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Assessing multi-hazard risk assessment capabilities of Early Warning Systems considering potential interactions among pandemics and natural hazards

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This work aims to improve existing Early Warning Systems (EWSs) assessment tools in appraising multi-hazard risk including natural hazards and infectious diseases epidemics or pandemics. The improved EWS assessment tool is applied in four Eastern Partnership countries through the development of a questionnaire, in the framework of the EU-funded PPRDEAST3 project. The analysis of the results of the questionnaire allowed identifying a series of lessons learned to be factored into a revision of the EWSs towards a permanent state of multi-hazard risk.

Because of the spread of the COVID-19, every country has been encountering challenges in several sectors. In addition to socioeconomic impacts, the declined capacities, especially in the health sector, led to changes in priorities for allocation of the resources in the short term and alteration of the development pathways of governments in the long term.

Furthermore, the long-lasting nature of the pandemic has increased the possibility of the concurrence of other natural hazards during the spread time of the virus. In this multi-hazard risk condition, civil protection organizations have to consider extra countermeasures for response to prevent the outbreak of the disease, including restrictions in sheltering and evacuation procedures.

In the proposed approach, a conceptual model for multi-hazard EWSs, including natural hazards and infectious diseases, based on literature review and experts' opinion, has been developed and used to derive a new set of indicators useful to understand current EWSs pandemics and multi-hazard risk capabilities.

The final assessment tool is obtained by integrating the new indicators with the previous ones already present in the EWS assessment tool developed by CIMA Foundation. The tool consists of five groups of indicators, four (already present) assessing the traditional EWS pillars, (i) disaster risk knowledge, (ii) detection, monitoring, analysis, and forecasting of the hazard and possible consequences, (iii) warning dissemination and communication, (iv) preparedness and response capabilities, and the last one added to assess (v) pandemics (specifically COVID19) and multi-hazard capabilities. Each group is divided into three to five sub-indicators.

Partner countries were asked to score each on a 0-5 scale in the way that 0 corresponds to "no steps have been made regarding that indicator", and 5 means "they fully meet the requirements relating to that indicator."

The results have been discussed and validated using extra open-source information to evaluate the accuracy of the assessment tool and the compatibility of the given scores with the real situation in partner countries. From this comparison, some biases in the responses have been observed. Therefore, to further improve the assessment tool, it is suggested to firstly, determine the criteria for each point that may give by the responders and secondly, ask for the evidence for each response.

Finally, the result of this research emphasized the necessity of the integration of infectious disease and natural hazard EWSs, the inclusion of the Health Ministry in the decision-making processes of the civil protection, and the coordination between slow onset and rapid onset hazard EWSs.