Can participatory co-design improve the operability of risk-based community surveillance for zoonoses in transforming landscapes? Philippines case-study.

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INTRODUCTION:

Climate change and land-use change are transforming ecological and socio-economic systems, increasing interactions between humans, domestic animals, and wildlife, and raising the risk of zoonotic disease emergence. In the Philippines, these dynamics are exacerbated by high biodiversity, rapid environmental change, and uneven surveillance capacity, particularly in remote and resource-limited areas. While the One Health approach promotes integrated and intersectoral responses, its operationalization remains inconsistent. Community-based surveillance offers a promising, adaptive approach to early warning, yet often lacks sensitivity and structure. Integrating risk-based approaches into community-based systems may improve their efficiency, timeliness, and operability by focusing resources on high-risk areas. This research aims to examine how participatory co-design can support the integration of risk-based approaches into community-based early warning surveillance systems for zoonotic diseases in the Philippines.

MATERIALS AND METHODS:

This methodological PhD project combines qualitative and quantitative approaches across four main activities. First, a situational analysis and scoping review will assess existing surveillance systems and the integration of risk-based approaches into early warning systems. Second, spatial risk mapping will be conducted using multi-criteria decision analysis (MCDA), integrating environmental, socio-economic, and epidemiological data, as well as local knowledge and gender perspectives, to identify high-risk areas for zoonotic disease emergence. Third, a stakeholder analysis using interviews, focus groups, and participatory methods will inform the co-design of a localized, risk-based, community-based surveillance system through iterative workshops involving actors from human, animal, and environmental health sectors. The proposed system will be modeled and prospectively evaluated using scenario tree analysis to estimate its sensitivity. Finally, insights from all activities will be synthesized into a transferable operational framework, validated through participatory processes and supported by policy engagement activities.

RESULTS:

This study will generate a scoping review on the integration of risk-based approaches into early warning systems, a spatial risk mapping methodology adapted to data-scarce contexts, and a co-designed pilot surveillance system illustrating how risk-based strategies can enhance operability and adaptability. The main output will be a practical framework outlining key principles, tools, and performance indicators for integrating risk-based approaches into community-based surveillance systems.

DISCUSSION:

By emphasizing participatory co-construction, local knowledge, and gender considerations, this research seeks to strengthen intersectoral collaboration and improve the acceptability, sustainability, and effectiveness of early warning systems. Aligning surveillance design with context-specific risk dynamics is expected to support more timely and cost-effective detection of zoonotic disease emergence in the Philippines.

Keywords: One Health, Inter-sectorality, Early-warning surveillance, Emerging infectious diseases, Climate change.