Applying Qualitative Systems Dynamics and Social Network Analysis to Study One Health Policy Processes and Networks in Peru

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Body of Extended Abstract

Zoonotic diseases —diseases transmitted between animals and humans—present persistent and emergent threats to global health, especially in low-resource countries (LRC). One Health (OH) serves as a framework for understanding the interconnections among zoonotic risk factors and encourages collaboration, coordination, and communication among sectors. However, OH faces policy and organizational barriers to translating programs into policy and sustaining cross-sectoral work. The Institutional Analysis and Development framework and OH are applied in this paper to describe (1) the mental models and perspectives of policy communities on zoonoses risk factors and management, (2) the structure and function of policy networks in multisectoral collaborations, and (3) propose policy recommendations for OH implementation and multisectoral governance.

We conducted a case study using multiple methods: 75 semi-structured interviews and 77 network surveys with policymakers and experts on zoonoses programs in Peru (June-November 2023). Participants represented human, animal, and environmental systems at national and subnational levels. We applied rapid qualitative methods (RQM) to analyse the semi-structured interviews, qualitative system dynamics (QSD) to map perspectives on zoonoses risk factors, and social network analysis (SNA) to evaluate multisectoral connections. RQM-derived themes provided contextual information to QSD and SNA results and yielded implications for research and practice.

Representatives from animal, human, and environmental organizations described a structural conceptualization of zoonotic risk factors related to pets, humans, wildlife, and livestock. QSD-generated diagrams depicted risk factors linked to zoonoses' emergence and endemicity, including global economic and social forces, biodiversity and environmental changes, public health services, economic constraints, rural reliance on farming, limited public funding, agricultural services, and water, hygiene, and sanitation governance—with greater emphasis on those affecting livestock. SNA showed frequent collaboration between human and agricultural systems, but few connections between national and subnational actors. OH collaborations were more common between organizations than within. Barriers include inadequate regulations for cross-sectoral funding and resource inequities between human and agricultural systems. The need to formalize the roles of environmental health systems was highlighted.

By applying the OH approach and multiple methods, including systems science methods, we captured diverse sectoral perspectives across government levels in Peru. Participants conceptualized zoonoses risk factors as structurally embedded within socio-economic, cultural, and environmental systems. Limited connections between national and sub-national levels impede implementation and feedback. Further research should examine current multisectoral rules and the evolution of policy networks to inform strategies to improve the effectiveness and sustainability of OH.