



A framework to promote collective action within the One Health community of practice: Using participatory modelling to enable interdisciplinary, cross-sectoral and multi-level integration



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ABSTRACT

As Southeast Asia (SEA) is characterized by high human and domestic animal densities, growing intensification of trade, drastic land use changes and biodiversity erosion, this region appears to be a hotspot to study complex dynamics of zoonoses emergence and health issues at the Animal–Human–Environment interface. Zoonotic diseases and environmental health issues can have devastating socioeconomic and wellbeing impacts. Assessing and managing the related risks implies to take into account ecological and social dynamics at play, in link with epidemiological patterns.

The implementation of a *One Health* (OH) approach in this context calls for improved integration among disciplines and improved cross-sectoral collaboration, involving stakeholders at different levels. For sure, such integration is not achieved spontaneously, implies methodological guidelines and has transaction costs. We explore pathways for implementing such collaboration in SEA context, highlighting the main challenges to be faced by researchers and other target groups involved in OH actions. On this basis, we propose a conceptual framework of OH integration. Throughout 3 components (field-based data management, professional training workshops and higher education), we suggest to develop a new culture of networking involving actors from various disciplines, sectors and levels (from the municipality to the Ministries) through a participatory modelling process, fostering synergies and cooperation. This framework could stimulate long-term dialogue process, based on the combination of case studies implementation and capacity building. It aims for implementing both institutional OH dynamics (multi-stakeholders and cross-sectoral) and research approaches promoting systems thinking and involving social sciences to follow-up and strengthen collective action.

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Introduction & context

The implementation of a *One Health* (OH) approach [1–4] cannot be limited to collaborations and improved communication between public health and veterinary medicine stakeholders (the “historical” OH actors). These latter actors are also challenged to collaborate with other actors that should be included within the OH approach, such as environment and agriculture officers, social workers, social scientists, ecological scientists, etc. [5,6]. In this paper, we propose a framework for such an

enlarged OH approach and give examples in the context of Southeast Asia.

Sharing knowledge across OH's researchers

Beyond the implementation of institutional dynamics and cross-sectoral policies, the OH approach can also represent a research topic in itself. Designing an interdisciplinary framework for a better understanding of complex health issues at the Animal/Human/Environment interface is a real challenge for researchers involved into OH projects. Strengthening the interactions between biological, medical and social sciences implies that we should be able to share knowledge among disciplines (veterinary science, medicine, health ecology, geography, economics, sociology of risks, and modelling sciences).

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For instance, if we have to understand how ecological processes (such as the interactions between hosts and reservoirs, pathogens and the environment and possibly vectors) interact with social processes (risk perception, local practices, power games, surveillance and control measures' acceptability by beneficiaries), we are dealing with a particular research object which does not belong on its own to any discipline. To address this new object, we need to adopt systems thinking (a classical approach in ecology) with a wide range of data [7–9].

Relationships between scientists from different disciplines are mainly driven by controversies regarding the complexity of the research topics raised by the *OH* approach, such as socio-ecosystem based approaches, ecosystem services and ecological functions, social interactions and perceptions at the Animal/Environment/Human interface etc. Scientists hardly speak with one voice [10,11], in particular when it deals with the necessary integration of inputs from social sciences in *OH* research [12–15].

The knowledge in animal health science, public health, social sciences, engineering, ecological and environmental sciences is disseminated among several research institutions. Strengthening synergies represents a real challenge in terms of scientific coordination [16]. Furthermore, the design of specialized curriculums in the field of public health, environment and agriculture in higher education obviously does not promote the emergence of an interdisciplinary scientific culture. Therefore, strengthening sustainably *OH* capacities also requires thinking about “the next generation” and developing *OH* academic training programmes involving public health, veterinary public health and environmental health officers to develop a new culture of interdisciplinarity and systems thinking, involving social and environmental sciences.

Strengthening cross-sectoral institutional collaboration

Beyond this research-based interdisciplinary challenge, the question of cross-sectoral institutional collaboration constitutes another brain teaser [17–19].

Although officers from Veterinary Services and from Public Health appear to have set up ad-hoc collaborations for risk management (for example regarding Avian Flu surveillance and control in crisis times), long-term collaboration with Agriculture (including livestock), Environment and Rural Development sectors remain insufficient.

Ministerial departments are defined together with political national priorities and cannot embrace all relevant topics as a whole. Then, designing knowledge sharing methods and protocols is essential to promote collaboration between various stakeholders who do not have habits of routine collaboration but are embedded in habits to think and work in silo [20].

Involving field based actors and local decision makers

Field-based actions and multi-stakeholders innovations at local level are essential for improving public health in collaboration with other sectors [21,3]. But inter-level relationships (involving civil servants, researchers, international organization members, health workers etc.) are also essential to ensure consistency with national policies and scaling-up. *OH* implementation definitely calls for multi-level and multi-stakeholders approach.

Blending together stakeholders from international organizations (global level), governmental structures (national and provincial levels), and local officers (district and municipality levels) cannot be achieved without adequate methodology for identifying the relevant target groups to get involved, their interests and potential incentives towards cross-sectorial action. It constitutes a recurrent issue for *OH* institutional actors as well as for scientific ones. Recent work shows that modelling, participatory approaches and social sciences' inputs can greatly help driving such an integration process [22–24].

The implementation of OH approach to be implemented in the context of Southeast Asia

Southeast Asia (SEA) particularly needs an effective *OH* approach. This region is characterized by fast environmental changes driven by its economic development and insertion into the global economy. The growing in human and livestock densities and the intensification of cropping and trading lead to drastic land use changes. These changes participate to the erosion of the biodiversity and do impact on the emergence and the burden of diseases [25,26]. SEA region is then at particular risk for new pathogen emergences, and environmental health problems [27,28]. In this context, building bridges among Health, Environment and Agriculture sectors is one of the main challenges that ASEAN community has to handle, in accordance to ASEAN Socio-Cultural Community (ASCC) Council. We are currently involved in a European project to elaborate and implement an enlarged *OH* framework in SEA. We introduce this framework in the following.

Conceptual framework: managing public health as a common public good

As we just highlighted, *OH* is both an institutional movement and a set of research topics that calls for inter-disciplinary, cross-sectoral and multi-level integration. These integration processes call for strong methodological guidelines.

We make the assumption that participatory modelling¹ and social sciences could significantly facilitate this integration. More specifically, participatory modelling could be a great tool promoting One Health collective action and enabling institutional and scientific *OH* integration. We also identify the challenges linked to the implementation of such an integration as well as know-how to take it up, based on an in-depth understanding of *OH* institutional and scientific dynamics at play in the specific context of Southeast Asia.

The conceptual framework that we propose for *OH* integration is focusing on the management of public health and environmental resources viewed as common public goods. Following Ostrom [29], we make the assumption that willingness of cooperation among citizens is the key to successful common good management. It is then crucial to identify pathways towards common and shared interest. Therefore, setting up a community of practice at different levels is supposed to enforce collective action mechanisms. These mechanisms are supposed to help stakeholders going beyond silo thinking, going beyond individual knowledge to manage public goods through collective action influencing individual behaviours [30–32].

We based our conceptual framework on the concept of “community of practice” [33] as it is supposed to drive collective action for *OH* stakeholders. A “community of practices” is defined as “a group of people who share a concern, a set of problems, or a passion about a topic and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” [34]. Being part of the same community of practice means that members frequently interact through both formal and informal settings and share techniques, vocabulary, routines and habits, as well as common perceptions about the issues they address [35,36,32]. We make the assumption that such conceptual framework would significantly help to reveal and explicit interactions between agriculture, environment and health in our context of intervention.

In order to set up this community of practice, integration process needs to be done in a one–two addressing both “institutional” and “scientific” *OH* dynamics. The first objective is to pre-identify relevant issues and dynamics, involving knowledge sharing by researchers within an interdisciplinary analysis grid strongly involving social

¹ See [Setting-up a OH community of practice through participatory modelling](#) section about participatory process.

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