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1 Acknowledgments

This research was led by Professor Barbara McPake, Director of the Nossal Institute for Global Health, and also included collaborators from:

- The Nossal Institute for Global Health and the Doherty Institute at the University of Melbourne;
- The National Institute for Public Health in Cambodia;
- The Lao Tropical and Public Health Institute; and
- The Health Strategy and Policy Institute Vietnam, the Hanoi University of Public Health, and Pasteur Institute in Vietnam.

The report was written by the Nossal Institute. Chapter 6 of the report was based on primary data collection and initial analysis conducted by each of the partners in Cambodia, Lao PDR and Vietnam mentioned above, as well as independent researchers in Cambodia, Bandeth Ros and Sreytouch Vong.

The Pasteur Institute in Vietnam hosted a workshop in Ho Chi Minh City in September 2019 at which the initial findings of the research project were discussed, which included representatives from government agencies responsible for animal health in each of the three countries.

2 Executive summary

2.1 Background

The need to further develop One Health approaches in the Mekong region is urgent and exemplified by previous zoonotic disease outbreaks of Highly Pathogenic Avian Influenza (HPAI). The World Organisation for Animal Health (OIE) and the World Health Organization (WHO) have identified the measures needed to protect populations from the risks of the spread of diseases, monitored by the WHO's International Health Regulation (IHR) 2005 Joint External Evaluations and the OIE's Performance of Veterinary Services assessments and, more recently, a joint assessment tool.

Governments in Cambodia, Laos and Vietnam have recognised the need to further develop policies relating to the prevention of and response to zoonotic diseases. Over the past 20 years, considerable attention has been placed in each of the three countries on policies that promote protection against HPAI, specifically HPAI H5N1. H5N1 is of concern among emerging infectious diseases because its case fatality rate in humans has ranged from 33-82% in recent outbreaks. Hence, should an outbreak become a larger epidemic, the consequences would be severe. Cambodia, Lao PDR and Vietnam have all been sites of disease in poultry resulting in human infection, although Lao PDR has only recorded two human cases of avian influenza to date.

Policies governing efforts to prevent and respond to HPAI and other zoonotic diseases sit at the interface between the animal and human health system. The interconnections between these systems, and the environment, have been highlighted through the concept of One Health, in which actions in all three sectors are essential to promoting human, animal and environmental health. A recent iteration of the One Health framework by Amuasi et al (1) (shown in Figure 1) to inform the work of the Lancet Commission on One Health, depicts the systems at this interface in a more connected way. It describes three dimensions of One Health, including the shared environment, food and food systems and interventions and medicines, each of which play a role in either the emergence of or response to zoonotic disease outbreaks.

Focussing on this interface, and using avian influenza as a case study, this project explored the role of both animal and human health systems in responding to zoonotic disease outbreaks and focussed on two areas: policies that promote i) timely notification of diseases and ii) early investment in preventative measures. It aimed to understand the socio-economic context in which the policies operate, the policies that are in place and the regulatory capacities in place to support their implementation, and how they are implemented in practice, with a focus on the level of interaction between the human and animal health systems, at both national and sub-national levels.

This Small Research Activity (SRA) was jointly funded by the Australian Centre for International Agriculture Research (ACIAR) and the Australian Government's Health Security Initiative for the Indo-Pacific region. It was carried out by Australian research partners (Nossal Institute for Global Health and the Doherty Institute, University of Melbourne), and regional research partners (the Lao Tropical and Public Health Institute, the National Institute for Public Health Cambodia, the Health Strategy and Policy Institute Vietnam, the Hanoi University of Public Health, Pasteur Institute Vietnam). Government partners from both the human and animal health sectors from each country were also involved in a meeting of partners in September 2019.

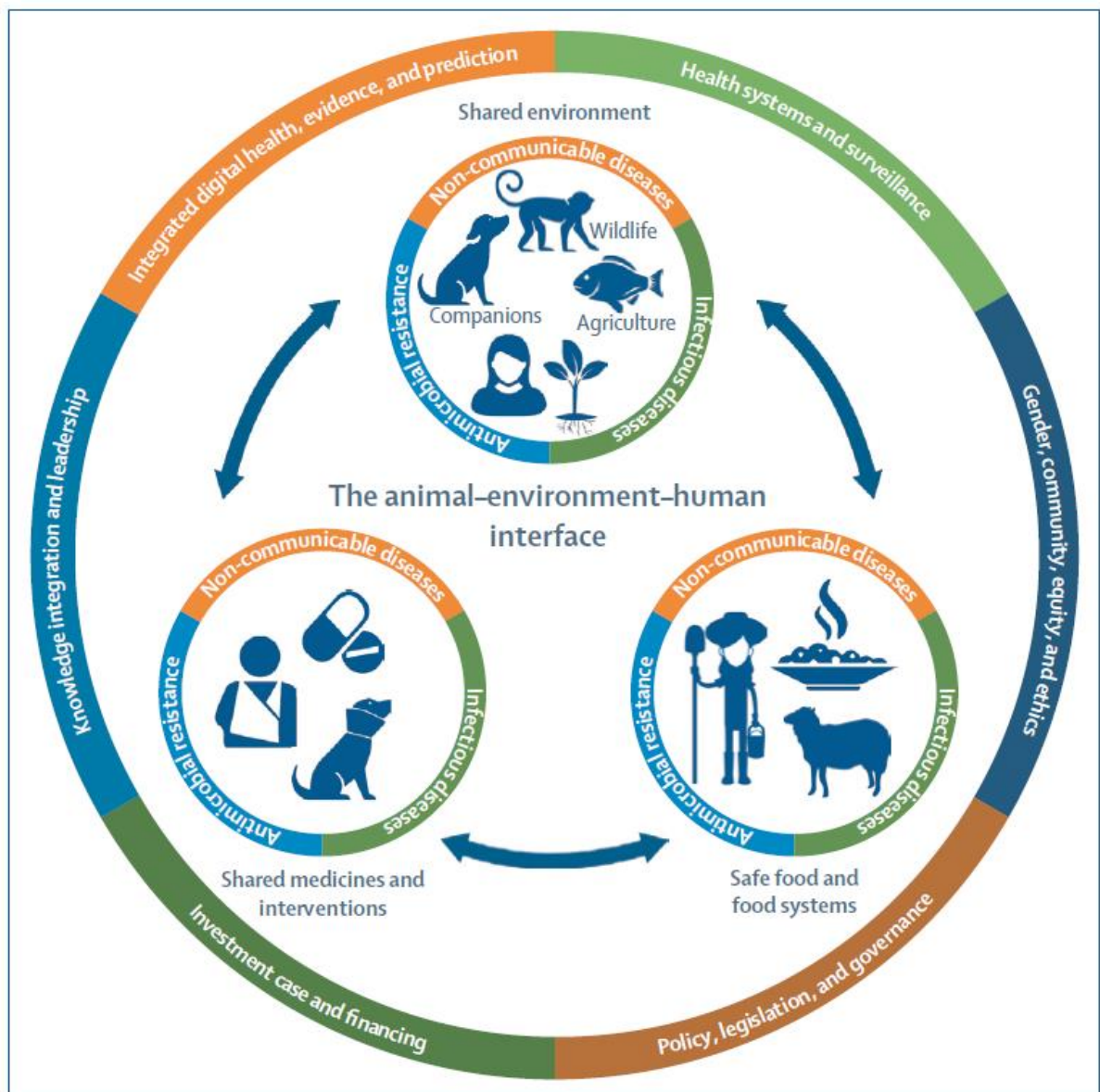


Figure 1: Lancet One Health Commission One Health framework, Amuasi et al (1)

2.2 Methods

Using avian influenza as a case study, this research project aimed to understand the policies in place in relation to (i) early reporting of poultry illness and death in flocks and (ii) policies for rapid containment of HPAI in poultry.

The objectives of the project, in Cambodia, Lao PDR and Vietnam, were to:

1. Establish the extent of existing knowledge around regulatory capacity and socio-economic factors affecting poultry production;
2. Gain a better understanding of the policy opportunities and challenges relating to the prevention and surveillance of infectious diseases in poultry, particularly with respect to early notification and investment in preventive measures relating to avian influenza; and
3. Share results and experiences with partners and decision makers and together identify questions for future research.

The research design included:

1. Scoping literature review on socio-economic factors affecting poultry production in Cambodia, Lao PDR and Vietnam.
2. Scoping literature review on regulatory capacity in Cambodia, Lao PDR and Vietnam.
3. A policy situation analysis and interaction study based on analysis of data from policy documents and key informant interviews with national and sub-national government officials and representatives of producers/poultry farmers in Cambodia, Lao PDR and Vietnam.
4. A regional workshop to discuss and refine results and co-design further research hosted by the Pasteur Institute in Ho Chi Minh City in September 2019.

Ethics approval was obtained by the University of Melbourne (1954014.1) and the Health Ethics Review Boards in Cambodia, Lao PDR and Vietnam.

The primary data collection was undertaken as a collaboration with project partners from Cambodia, Lao PDR and Vietnam who led the policy situation analysis and interviews, as follows:

- Cambodia: Sreytouch Vong and Bandeth Ros (independent consultants)
- Lao PDR: Latsamy Siengsounthone (Deputy Director, Lao PDR Tropical and Public Health Institute)
- Vietnam: Khuong Anh Tuan (Deputy Director, Health Strategy and Policy Institute), Pham Duc Phuc (Deputy Director, Hanoi University of Public Health), Nguyen Duc Hai (Pasteur Institute)

2.3 Findings

The major cross cutting findings of the project were:

- The published literature on avian influenza in the three countries was largely focussed on epidemiology of outbreaks and efficacy of vaccination and less on the socio-economic context of poultry farming and on strategies to strengthen the animal health sector, and its collaboration with the human health sector.
- There is significant heterogeneity amongst smallholder poultry farmers with respect to their scale of operations, and their horizontal and vertical relationships in the production chain. While poultry farming has been found to constitute a small proportion of household income, poultry also serves as a savings mechanism and holds social and cultural value in gift giving, ritual sacrifice and religious and secular celebrations. There is some evidence arising from our interviews that smallholders in Cambodia take on loans to finance their poultry farming, suggesting that a more current understanding of the contribution of poultry farming to livelihoods is needed.
- Poultry farming is gendered in that women and children are primarily responsible for the day to day management of poultry. Further research is needed to understand how these dynamics carry through to decision making with respect to whether to seek care for veterinary services when poultry show signs of illness, and whether to make a notification of poultry illness or deaths to the village chief or other authorities.
- In response to avian influenza outbreaks in the region beginning in the mid-2000s, in all three countries there was commensurate policy development relating to early notification and response to avian influenza, including the development of joint standard operating procedures for emergency response and the establishment of mechanisms to promote collaboration between the Ministry of Agriculture (MOA) and the Ministry of Health (MOH). Much of this work was supported by external

donors and further steps remain to fully integrate these reforms within both the national policy and governance structures, and to ensure adequate funding to guarantee sustainable implementation of such reforms. For example, some policies remain in draft, some legislative measures need to be further detailed through sub-regulations in order to be enforceable, and some multi-sectoral committees are not part of the official governance structures for managing zoonotic disease outbreaks.

- Collaboration between the animal and human health sectors and implementation of policies at the sub-national level remains below that desired by policy makers. This is due to both challenges with differing policy objectives and policy making processes, as well as different administrative and political structures. For example, our interviews found that information sharing between the ministries was limited before a formal declaration of an outbreak (for example, notifications of suspected cases were not shared systematically), given the varying objectives (trade and quarantine versus public health) at play. With respect to financing initial investigations, no country has a common resource pool to support cross-sectoral collaboration, which is a common constraint facing One Health initiatives. Sectoral resources tended to be available once a declaration of an outbreak was made, and investigations led by animal and human health officials tended to take place in parallel with minimal, distinct resourcing. Local animal health officials perceived an imbalance of resources to engage in such investigations.
- There are several constraints to the implementation of policies relating to early notification. In each country, early notification mechanisms rely on farmers identifying and reporting illness in their poultry to commune or village animal health workers (VAHW) or other officials, which can sometimes initiate outbreak investigations and, in the event that an HPAI outbreak is declared, mandatory culling in a control zone. There is a key tension in the incentives for poultry owners associated with the decision to seek care and/or make a notification. Poultry farming is described as “low value” compared to other forms of livestock and thus owners may not seek care for diseased poultry. Yet diseased poultry retains sufficient value to serve as a disincentive to avoid making official notifications of flu-like illness in poultry, or to help facilitate culling, which is a difficult task without cooperation from farmers, particularly where flocks roam freely. This was particularly the case in Cambodia and Lao PDR where poultry in areas affected by HPAI are culled without compensation (compared to Vietnam where a compensation mechanism is in place). In addition, while the decision as to whether to seek care for diseased poultry may be made at the household level, culling programs impact the entire village, and potentially those neighbouring, and thus the decision to make a notification may be referred to the Village Chief.
- Other constraints relate to the issues with supply and demand within the animal health sector. There was evidence from our interviews with poultry owners in Cambodia that they prefer private para-veterinarians or traditional providers over VAHW, who were difficult to contact, difficult to access and negatively associated with culling programs. Knowledge limitations on the part of both farmers and VAHW were considered a key constraint to improved service provision and utilisation.
- Both the MOH and MOA face the challenge of enforcing regulations in the context of partly decentralised animal and human health systems, but this may be more challenging within the animal health system for several reasons. First, the regulatory enforcement mechanisms within the animal health sector appear to be more impacted by local politics, competing interests between health and livelihoods highlighted above and, in some circumstances such as the regulation of private drug stores, revenue raising within the animal health sector. Second, the MOA has limited funding and staffing, particularly in Cambodia and Lao PDR, to achieve both its service delivery and regulatory functions.

- The MOH in each country has adopted incentive-based approaches to regulate service provision by public providers including through contracting, performance-based financing and payment methods, with improvements in access to and the quality of health services. Analysis of the emergence of incentive based approaches from the health sector in Cambodia, suggest that they evolved from a mix of national policy priorities, donor investment and donor proposals to use incentive based approaches, and that the MOH has adapted these approaches over time based on policy learning and to align with the changing national policy context.
- In contrast, little is known about the market for veterinary services, and there has been limited analysis of how to, or documented attempts of efforts to, better regulate the market through incentives to achieve One Health objectives. An example of the difference in information available in the two sectors relates to the supply of services. While health information systems are strengthening in each of the three countries, they are only in the process of emerging from paper to electronic form in the animal health sector. Monthly reports are completed by village animal health workers in each of the countries and submitted to the People's Committee in Vietnam or the district department of animal health in Cambodia, yet there is no consolidated, and publicly available information about the nature and level of veterinary services provided at any level (an electronic information system is currently being developed in Vietnam). There is also no information on service provision by other private providers.

2.4 Next steps

These findings highlight a divergence between the approaches taken in relation to *how* to strengthen human and animal health systems. In all three countries, human health systems now use a set of interventions that combine incentive-based regulation with more traditional 'command and control' approaches, attracting increased public investment. In contrast, animal health systems have relied almost wholly on 'command and control' approaches and appear not to have attracted the same level of increased public investment. There is significant responsibility placed on the animal health sector to contain outbreaks of zoonotic diseases where there is a complex and conflicting mix of incentives, and to do so with limited resources. A better understanding of veterinary service markets is thus urgently needed in order to inform the development of context specific strategies to strengthen them.

The findings also hold implications for the notion of One Health. This study has reinforced the notion that response to zoonotic disease outbreaks require strong responses from the animal and human health sectors, in order to be contained as early as possible. However, the optimal level of collaboration to achieve effective early notification and response between the two sectors, beyond information sharing, needs further exploration in each context so that the current policies and plans can be adapted in a context specific manner. More broadly, the role of the animal health system in relation to public health is also poorly defined within national policy frameworks. By better articulating the potential contribution of the animal health system to public health, there may be increased support for adapting the current coordination mechanisms into the national and sub-national governance structures, and for strengthening the animal health system to meet these public health objectives. Incentive based regulatory approaches may be a useful tool in this both in enabling better alignment between human and animal health systems and potentially, in increasing effectiveness of animal health system regulation.