



Practices associated with Highly Pathogenic Avian Influenza spread in traditional poultry marketing chains: Social and economic perspectives

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ABSTRACT

In developing countries, smallholder poultry production contributes to food security and poverty alleviation in rural areas. However, traditional poultry marketing chains have been threatened by the epidemics caused by the Highly Pathogenic Avian Influenza (H5N1) virus.

The article presents a value chain analysis conducted on the traditional poultry marketing chain in the rural province of Phitsanulok, Thailand. The analysis is based on quantitative data collected on 470 backyard chicken farms, and on qualitative data collected on 28 poultry collectors, slaughterhouses and market retailers, using semi-structured interviews. The article examines the organization of poultry marketing chains in time and space, and shows how this may contribute to the spread of Highly Pathogenic Avian Influenza H5N1 in the small-scale poultry sector. The article also discusses the practices and strategies developed by value chain actors facing poultry mortality, with their economic and social determinants. More broadly, this study also illustrates how value chain analysis can contribute to a better understanding of the complex mechanisms associated with the spread of epidemics in rural communities.

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1. Introduction

In developing countries, smallholder poultry production is practised by a large number of rural households and traditional marketing chains constitute an important channel for supplying meat to urban centres (Kryger et al., 2010). Indigenous chickens produced by small independent farmers are consumed locally, either by the household which raised them or by consumers who purchase them through local marketing channels. Independent local collectors act as intermediaries, buying live chickens from poultry farmers and selling them to traditional small slaughterhouses (Fig. 1). Native chickens may be sold alive to final consumers in 'live bird markets', in countries such as Cambodia or Vietnam (Fournié et al., 2012a), or can be sold by retailers as whole carcasses

on traditional fresh food markets as in Thailand. Traditional food markets are also called 'wet markets' in Asia, in reference to the floor which is constantly wet from the spraying of vegetables and cleaning of meat and fish (Zhang and Pan, 2013). Traditional poultry value chain encompasses the full range of stakeholders, activities, networks and linkages that are required to bring meat of native chickens from production to final consumers (FAO, 2011).

The epidemic of Highly Pathogenic Avian Influenza (HPAI) H5N1 in Asia has prompted new efforts to assess the importance of the small-scale poultry sector and address gaps in what is known about traditional poultry marketing chains (FAO, 2011). Research to date suggests that the spread of HPAI H5N1 is influenced primarily by human activities related to poultry trading (Fournié et al., 2012a). Commercial movements of live poultry may facilitate transmission of HPAI H5N1 virus through direct contact between infected and susceptible birds (e.g. when purchased live chickens are introduced in a flock). Indirect dissemination of HPAI H5N1 along poultry trade networks may also be enhanced through movements of fomites including people, feed, egg crates, poultry manure, equipment, or vehicles contaminated with muds or faeces. A particularly critical

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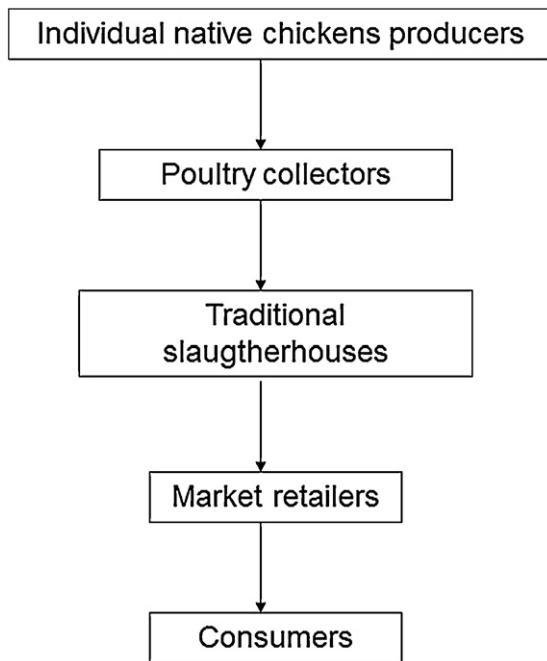


Fig. 1. Organization of traditional native chicken supply chains, Thailand.

question which has not been answered yet concerns the means by which the behaviour of actors in traditional poultry value chains serve to exacerbate the risk of HPAI H5N1 introduction and spread.

Despite the challenges involved in implementing HPAI H5N1 response systems in small-scale poultry sector, the task is essential for two main reasons. The first is the management of risk regarding animal and human health. The majority of outbreaks have been reported in the backyard poultry sector, which may perpetuate the circulation of the H5N1 virus (Capua and Marangon, 2007). It is essential to control HPAI in the backyard sector in order to limit its spread in the entire poultry population. Moreover, human infection by the HPAI H5N1 virus is favoured by the close contact that occurs between poultry and humans in backyard systems (Van Kerkhove et al., 2011). Controlling the spread of HPAI in poultry should thus contribute to the reduction of risk for humans, by limiting poultry-to-human transmission and preventing the emergence of a viral form with efficient human-to-human transmission. The second reason is socio-economic. Backyard poultry constitute a source of protein and a financial security net for poor farmers (Otte et al., 2008), with periodic sales of chickens providing ready cash to rural families. By limiting poultry mortality, controlling diseases in the backyard sector helps to preserve smallholders' income and thus contributes to poverty alleviation in developing countries (Mack et al., 2005).

With more than 1700 poultry outbreaks recorded throughout the country from January 2004 to July 2005, Thailand ranked at that time second worldwide in terms of number of outbreaks. In addition, 25 human cases were also reported. Since 2006, the country has experienced only sporadic outbreaks in poultry; no case has been reported since 2008. Overall, the Thai response system has proven its efficacy for detecting and controlling HPAI H5N1 outbreaks (Goutard et al., 2012).

The traditional poultry sector has social, cultural and economic importance in Thailand. Backyard poultry is important as social capital in gift exchanges, and for relational bonds (Hancock and Cho, 2008). Cockfighting in Thailand is one of the most obvious illustrations of the social and cultural role of poultry, but native chickens also are essential for various rituals including those carried out during the Chinese New Year festival. In addition, despite the

overwhelming weight of the industrial sector in the national economy, the traditional poultry sector has also economic importance in Thailand (Choparakarn and Wongpichet, 2007).

Since 2004, the Department of Livestock Development (DLD), which is in charge of HPAI surveillance and control, has implemented strict control measures that are based on the massive pre-emptive culling of poultry and restrictions on movement of poultry. Poultry farmers receive financial compensation for their losses corresponding to 75% of the value of the animals destroyed by DLD in the suspected farm or area (Tiensin et al., 2005). The vaccination of poultry against H5N1 virus always has been forbidden in Thailand. The challenge for Thailand consists now in preserving the high sensitivity of the surveillance and control system while ensuring its sustainability, meaning that it is both cost-effective and acceptable to local stakeholders. Surveillance of HPAI in backyard systems remains, however, particularly difficult due to the large number of backyard poultry farmers concerned (approximately 2 millions) and their reluctance to report outbreaks. Moreover, the conditions of HPAI H5N1 spread between backyard farms in Thailand may differ somewhat from those reported elsewhere in Asia: live poultry markets, which were shown to play a major role in HPAI dynamics in Hong Kong and Vietnam (Fournié et al., 2012a), have always been rare in Thailand (Amonsin et al., 2008). Backyard chicken supply chains are organized on an informal basis and little is known about their stakeholders. Studies of the organization of these chains consequently are needed in Thailand in order to better adapt the HPAI response system to the actual social and economic context that is prevailing in the small-scale poultry production sector.

There is increasing acceptance of the view that to improve understanding of the factors underlying the spread of infectious diseases in livestock populations and to resolve health problems, researchers must venture beyond biomedical concerns to consider the socio-economic context (Neudoerffer et al., 2005). Interdisciplinary research that involves for example epidemiologists, economists and sociologists is needed, as it would allow understanding the factors that influence stakeholders' risk perception, analyzing their behaviours in regard to epidemiological risks (Fournié et al., 2012b), and finally should make it possible to tailor surveillance and control measures. To date, however, research largely has concentrated on a narrow number of the multitude of social and economic impacts related to livestock diseases. Also, control strategies often failed to recognize the economic constraints encountered by farmers and other value chain actors (Rich and Perry, 2011). Furthermore, while it is recognized that the planning of livestock disease prevention and control strategies must take into account all of the stakeholders in a marketing chain (FAO, 2011), few studies achieve this goal.

We developed a study which aimed to: (i) examine how the organization of the traditional poultry value chain, including practices of actors and functioning of the chain in time and space, may contribute to the HPAI H5N1 spread process, (ii) describe the economic and social context in which actors operate, including the local beliefs regarding avian influenza, and (iii) discuss the strategies developed by each group of stakeholders facing an epidemic of highly pathogenic avian disease. We coupled epidemiological evaluation on spread of HPAI with methodologies taken from social sciences and economics (value chain analysis) into an interdisciplinary framework. Results of this study should help understanding to what extent stakeholders may participate to the spread of HPAI, and analyzing how economic constraints and disease risk perception may influence these behaviours. Finally, our findings should inform on possibilities for tailoring the response system (surveillance, control and incentives) to the actual context of small-scale poultry chains in Thailand and in countries with important backyard poultry production. This work also will illustrate how an

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