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Initial Assessment of the Impact of Poultry Sales and Production Bans on Household Incomes in Vietnam

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1. Abstract

Pathogens associated with domesticated and captive animals pose an increasing challenge to public health and economic security at the national and global level. In the three most prominent recent cases (BSE, SARS, HPAI), timely gathering, assessment, and dissemination of empirical evidence has proved critical to response effectiveness. To support more effective policies for control and mitigation of disease outbreaks occurring in managed animal populations, we have developed an integrated methodology of risk, damage, and response assessment.

The SPADA (Strategic Pathogen Assessment for Domesticated Animals) approach combines rigorous epidemiological and economic analysis to assess the effects of alternative control scenarios on disease occurrence and economic outcomes. Synthesizing detailed data, computer simulation models, and GIS mapping, SPADA provides new capacity for *ex ante*, concurrent, and *ex post* policy analysis. In this report, we apply the SPADA approach to the case of HPAI (Highly Pathogenic Avian Influenza), a significant global human and animal health risk whose emergence may necessitate significant restructuring of poultry (chicken and duck) production. In Thailand and Viet Nam, where the highest incidence of avian and human cases have been reported, poultry production is an essential economic activity for the rural poor, and their livelihoods could be adversely affected by control strategies implemented to mitigate disease risks. Our results indicate that policies must be designed carefully to facilitate accurate reporting, conformity, and to minimize propagation risks and more adverse economic consequences.

2. Introduction

Highly pathogenic avian influenza (HPAI) associated with the H5N1 virus strain first occurred in Viet Nam and Thailand in late 2003, causing severe mortality in affected flocks. The disease has recurred in 2004 and 2005, and is now considered endemic to the region. Given that the virus has crossed the species barrier between poultry and humans and caused human fatalities, concerted efforts are being mustered by national governments and international agencies to control the spread of the disease through a variety of measures, which may have to include a 'restructuring' of the poultry industry. Control measures could include the prohibition of certain production practices and/or of raising particular poultry species (e.g. scavenging ducks and chickens), which are important for sources of income for a large number of poor rural farming households. Measures put in place to control HPAI may consequently have larger impacts on the lives of the rural poor than HPAI itself.

Devising evidence-based responses to animal and human health risks that balance the interests of a wide variety of national and international stakeholders requires thorough analysis of epidemiological and economic information (past and present), development of scenarios of disease spread, their likelihood of occurrence, the identification of critical control points and interventions, the costs and impacts of the latter, and, finally, negotiation between stakeholders at different levels, ranging from local, through national to international.

This report describes an approach to systematically address the recurring need of national governments and the international community to respond to novel disease threats using the incursion of HPAI into the epicentre countries of Southeast Asia (Thailand, Viet Nam, Cambodia, and Lao PDR) as cases from which to derive broader lessons.

3. Materials & Methods

The SPADA (Strategic Pathogen Assessment for Domesticated Animals) approach combines epidemiological and economic components for *ex-ante* assessment of the effects of alternative control scenarios on disease occurrence and their economic outcomes.

The specific objectives of the epidemiological component are (a) to identify the main factors influencing the pattern of H5N1 avian influenza outbreaks in epicentre countries in South-East Asia and (b) to develop models describing the dynamics of H5N1 avian influenza infection within endemically infected countries in South-East Asia. Having these two objectives in mind, a stochastic simulation model is being developed to identify disease control policies that might reduce the transmissibility of HPAI at the local, sub-national and national level. The foundations

of the disease transmission model are described in a report of this series (Soares Magalhaes, 2006) and this report will therefore focus on the economic assessment component.

The economic ramifications of major animal disease outbreaks can extend far beyond the animal production systems themselves. Supply chain linkages propagate shocks from the afflicted animal sector up and down agro-food supply chains and across sectors associated with rural producers and urban consumers. In the event that risk aversion induces spillovers to other economic activities (tourism, health services, trade and transport, etc.), the indirect effects of disease outbreaks can far outweigh direct ones. To better understand these complex effects, a suite of analytical techniques, termed integrated poverty assessment of livestock policy, IPALP (PPLPI, forthcoming), has been developed covering four component areas of economic assessment:

(a) Analysis of initial macro-economic conditions: This component surveys the recent history of aggregate indicators to set the stage for examination of the more detailed determinants of household welfare.

(b) Micro-economic analysis of initial conditions: This component provides a systematic survey of existing patterns of household production, employment, asset holding, expenditure and other conditions. The micro results are further divided into three parts: Summary statistics and tables extracted from living standards measurement survey samples and other detailed data; Models of household-level production systems, labour supply, and consumption geared to better understand the behavioural basis of household economic activity, and a synoptic atlas of digital maps presenting selected micro-economic results.

(c) Dynamic simulation of policies and external economic conditions: These include, but are not limited to, pro-poor livestock policy interventions, development strategies, trade policy, tax policies, etc. Emphasis is on the estimation of the local impacts of these policies.

(d) Microeconomic assessment of livestock sector and related policies, in concert with national and international policies and market forces, to more clearly identify patterns local economic adjustment and, in particular, their implications for poverty alleviation. In this component, a broad spectrum of poverty assessment tools are implemented.

Data from the 2002 Vietnam Household Living Standards Survey (VHLSS) have been used to calibrate the economic models for Viet Nam.

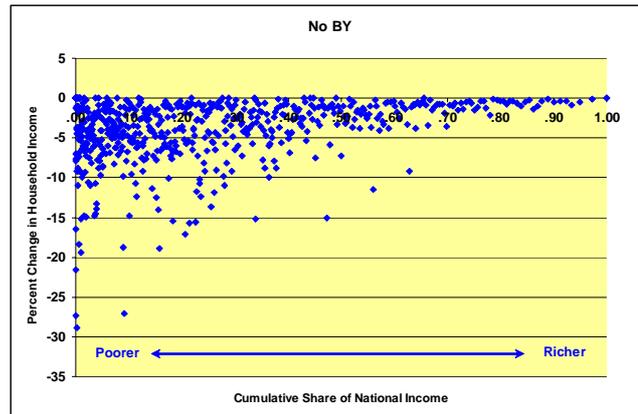
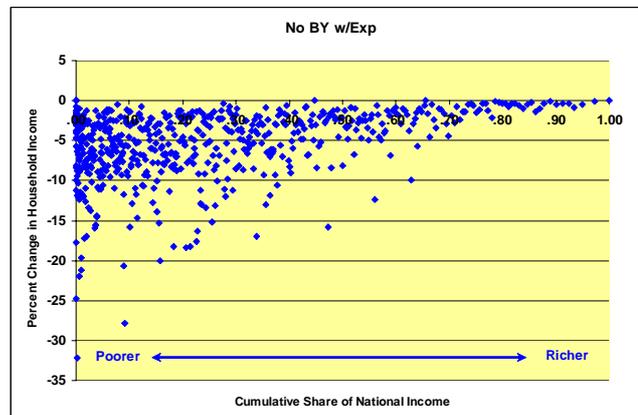
An epidemic of highly pathogenic avian influenza (HPAI) started in Viet Nam at the end of December 2003 and outbreaks have occurred repeatedly until end 2005, making it one of the most severely affected countries in the region. A broad array of HPAI control measures are being considered for the poultry sector and the exclusion of smallholder poultry keepers from market participation or banning them from poultry keeping altogether have been proposed. As smallholders are highly represented in Viet Nam's poultry production, this paper assesses the potential welfare impacts of a smallholder poultry production and/or sales ban.

4. Results

Although most rural households in East Asia derive the bulk of their subsistence income from cropping, poultry act as an important source of protein and constitute an investment, which yields extremely high returns. In Viet Nam, approximately half of all households, rural and urban, keep chickens. In rural areas, typically seven out of ten households, that are around eight million households, own chickens. Average flock size prior to the HPAI epidemic was around 16 birds (4 hens, 1 cock and 11 growers and chicks), with slight variation between regions. Only one percent of flocks consisted of more than 100 birds (Maltsoglou and Rapsomanikis, 2005).

Figure 1a presents the effects on annual household income for the 600 representative households in the sample, ordered across the horizontal axis by share of total income (i.e. the poorest are on the left). Clearly, this control / eradication policy would disproportionately affect the poor. Most poor households could probably diversify production to limit losses to below 10 percent of annual income, but some would lose over 25 percent. The anti-poor effects of this policy are relatively evident.

If rural households cannot raise poultry for sale, they might also not be permitted to raise birds for their own consumption as separation of these two uses could be very difficult to enforce. Figure 1b indicates the cost to Vietnamese households of giving up sale of poultry and buying poultry for their own consumption. In many cases, this more than doubles the household cost of the policy, with an average negative income effect for the lower quartile that is several percentage points higher.

Figure 1a Household income effects of a backyard poultry sale ban**Figure 1b** Household income effects of a backyard poultry production ban

5. Conclusion

This brief research report discusses the importance of microeconomic analysis and localized design and implementation of policies to reduce HPAI risk such that it is most likely to achieve stakeholder acceptance, and therefore successful control. Concurrent with the global momentum for rapid and intensive measures to control poultry stocks and restructure management practices, in the HPAI epicentre countries these policies must address the economic and institutional realities of poor rural majority populations. To reconcile such macro and micro perspectives effectively is a much greater challenge than simply allocating international resources to national governments.

6. References

Maltsoglou, I. and Rapsomanikis, G. (2005) The contribution of livestock to household income in Vietnam: A household typology based analysis. FAO, PPLPI Working Paper No. 21.

PPLPI (forthcoming) Integrated Poverty Assessment for Livestock Promotion (IPALP), Technical Reference

Soares Magalhaes, (2006) Development of the epidemiological component of SPADA. Visiting Scientist Report to FAO.

7. Disclaimer & Contacts

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