The value of animal health information: case studies on HPAI in Vietnam

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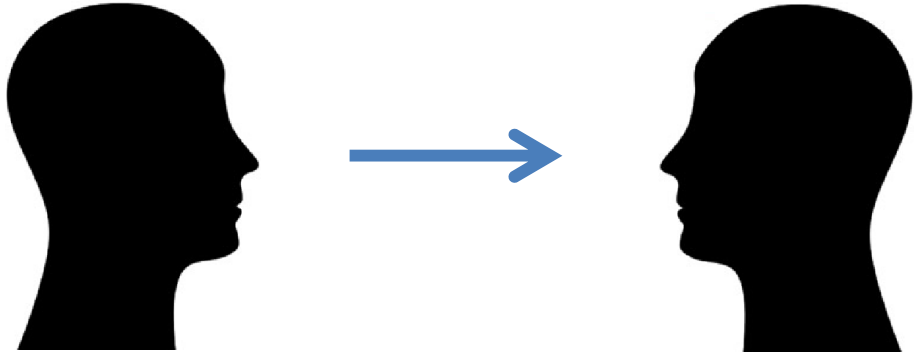
Introduction

- Surveillance (ICAHS 2011) :

  The systematic, continuous or repeated, measurement, collection, collation, analysis, interpretation and timely dissemination of **animal health and welfare related data** *from defined populations. These data are then used to describe health hazard occurrence and to contribute to the planning, implementation, and evaluation of risk mitigation actions*

- Surveillance is about information transmission. For evaluating surveillance, we need to value animal health related information

- Objective: test new methodologies to assess economic constraints associated with information transmission on poultry disease outbreaks

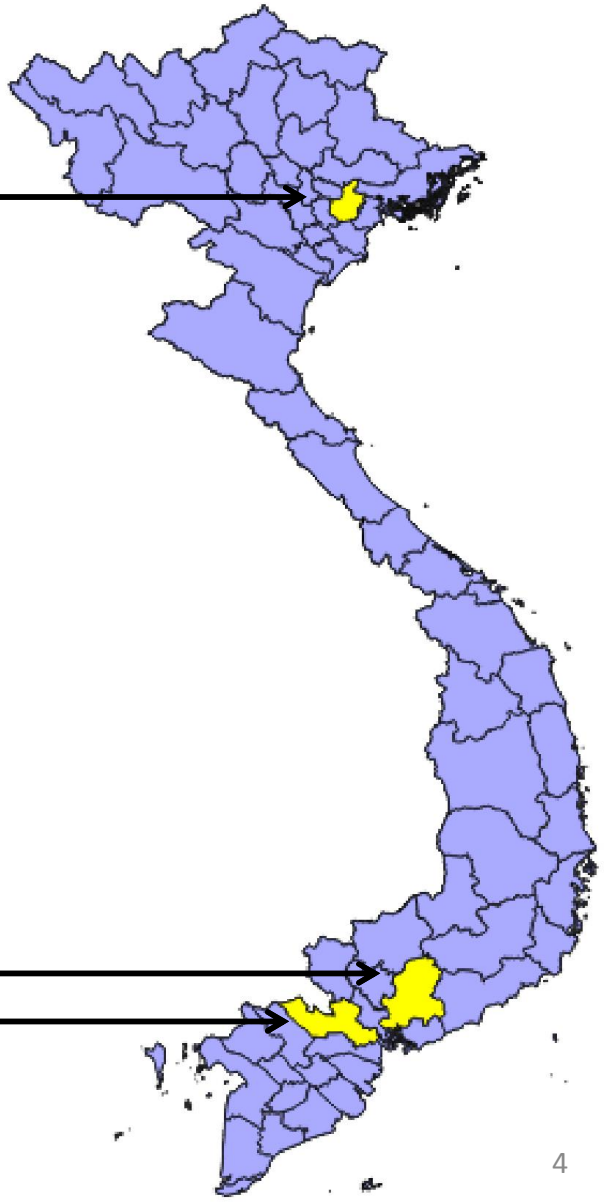


Methodology

1. Hải Dương (1 commune)
   - Red River Delta: classified high risk area (DAH)

2. Đồng Nai (4 communes)
   - Southeast: high concentration of large-scale poultry production
   - Not classified high risk area

3. Long An (1 commune)
   - Mekong River Delta: high risk area (DAH)



Methodology

- Snow
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erinary

Network analysis

Objective: Understand animal health information flow dynamics

General principle:

- *Nodes*: actors or categories of actors
- *Links*: information flows on disease outbreaks

Purpose of network analysis:

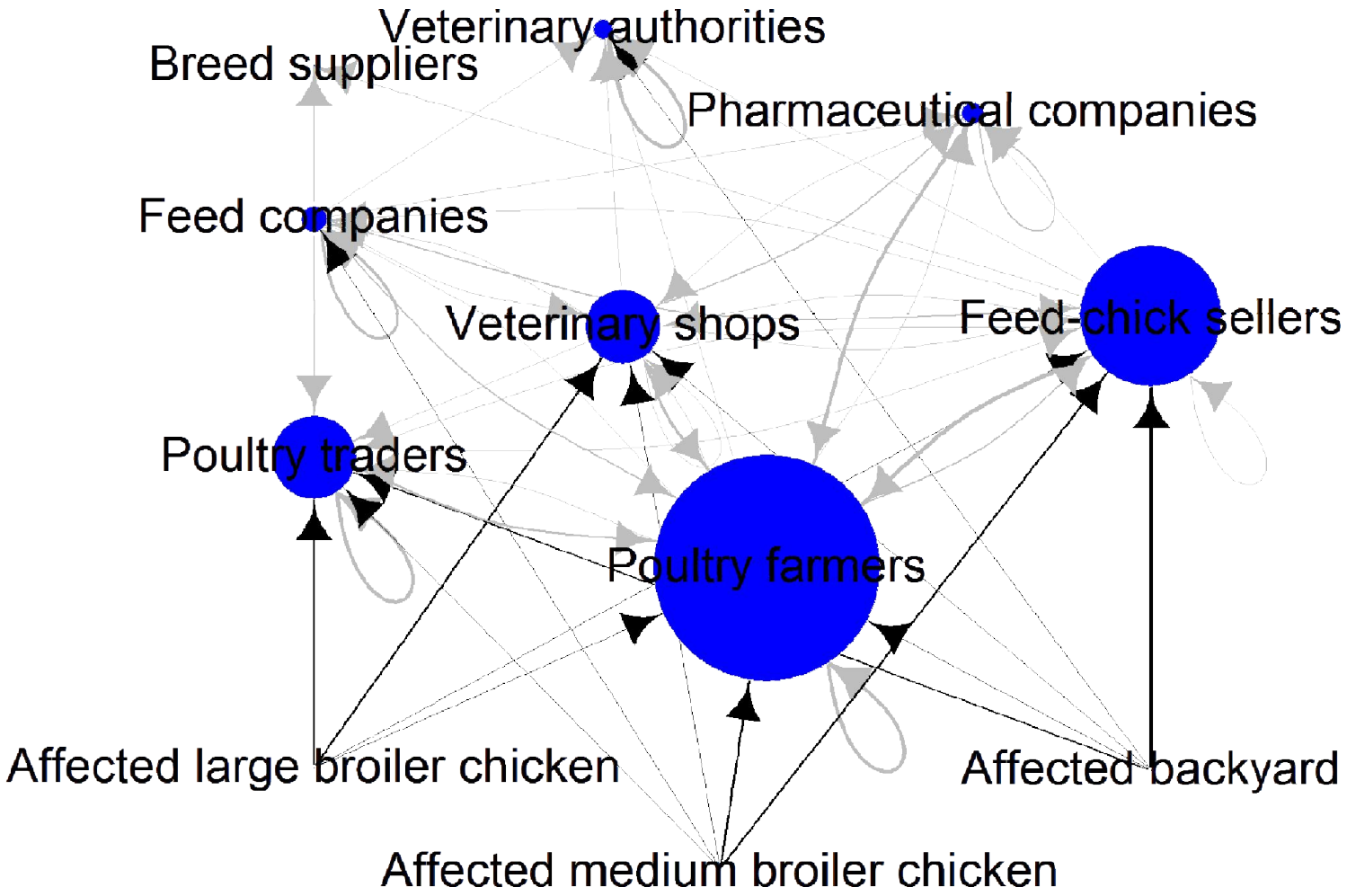
- Centrality attribute: indicate the position of the actors in the network
  - Identify actors who gather more information compared to others *(degree, eigenvector, alpha centrality)*
  - Identify actors who relay a lot of information compared to others *(betweenness)*

- Spatial diffusion of information by different categories of actors

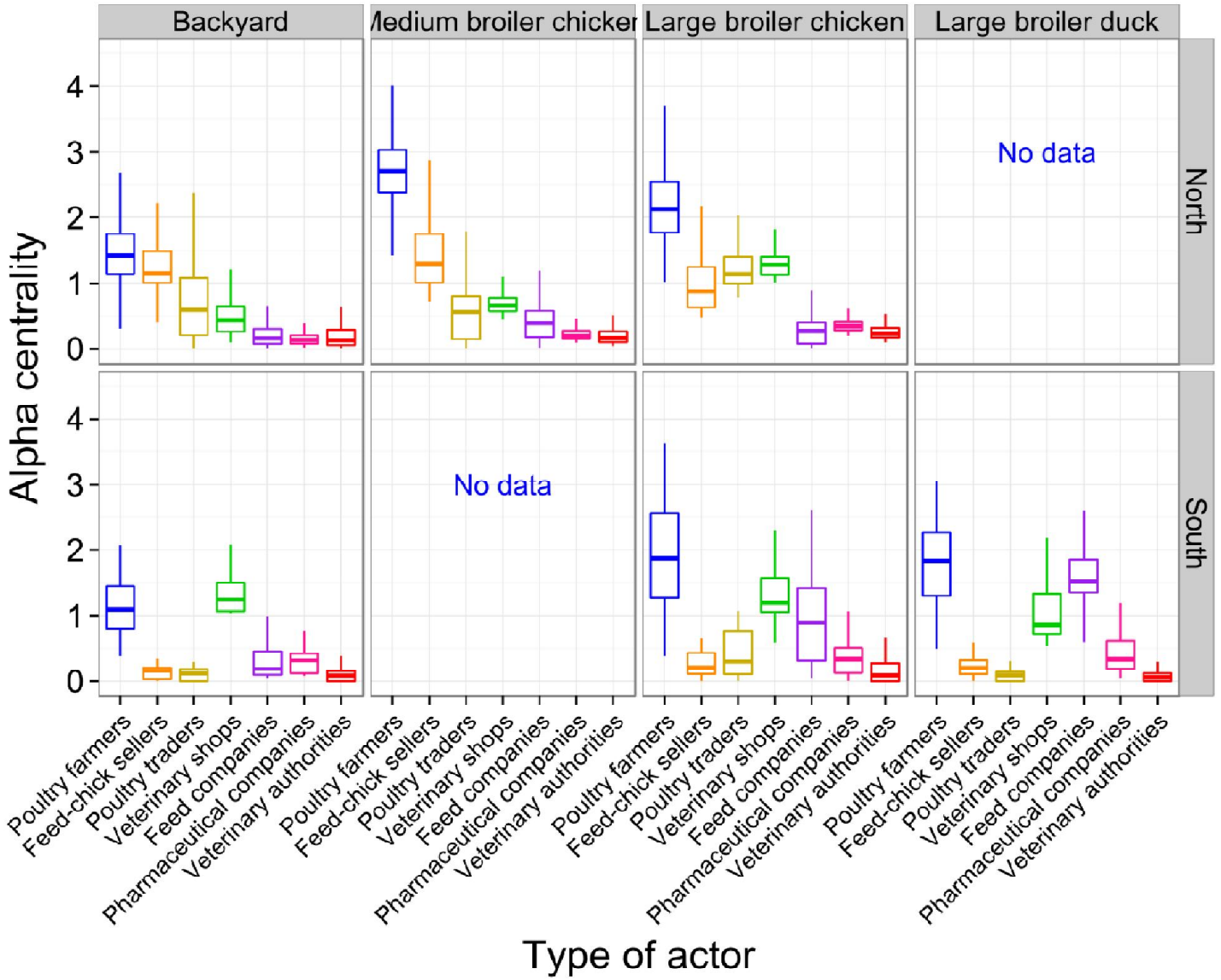
- Use statistical model to predict information flow occurrence

Network analysis

Network of categories of actors

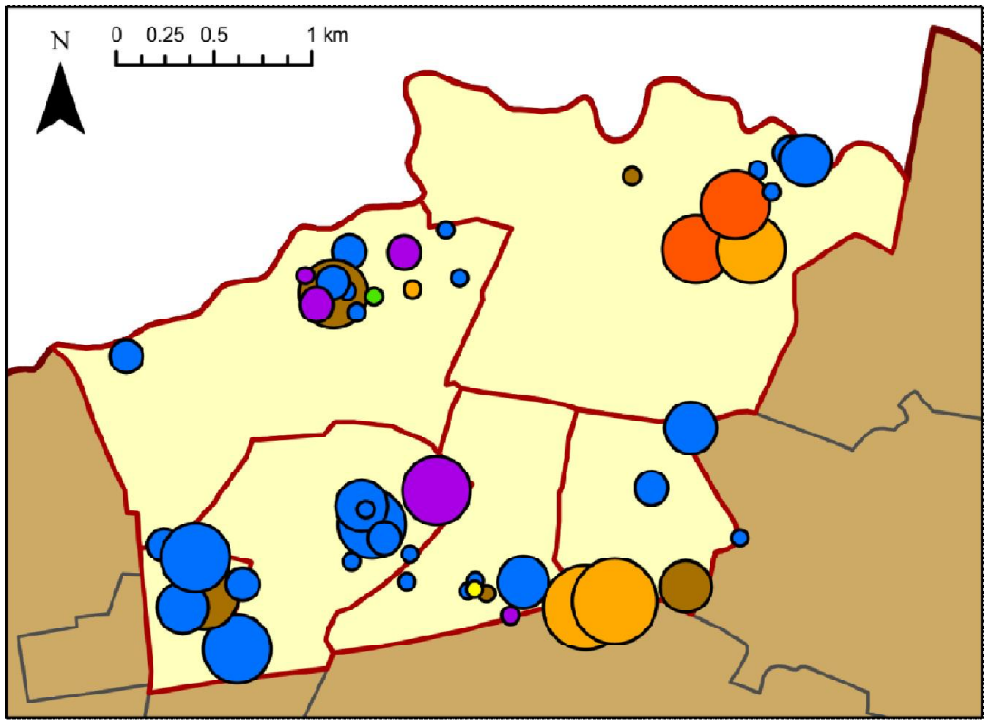


Network analysis



Information flows

Network of individuals (n=50)



Alpha = 0.14

Actors

- Poultry farmer
- Feed seller
- Poultry trader
- Private veterinarian
- Commune government veterinarian
- Village government veterinarian
- Village head

Alpha = 0.14

- 0 - 10
- 10 - 20
- 20 - 30
- 30 - 50
- 50 - 100

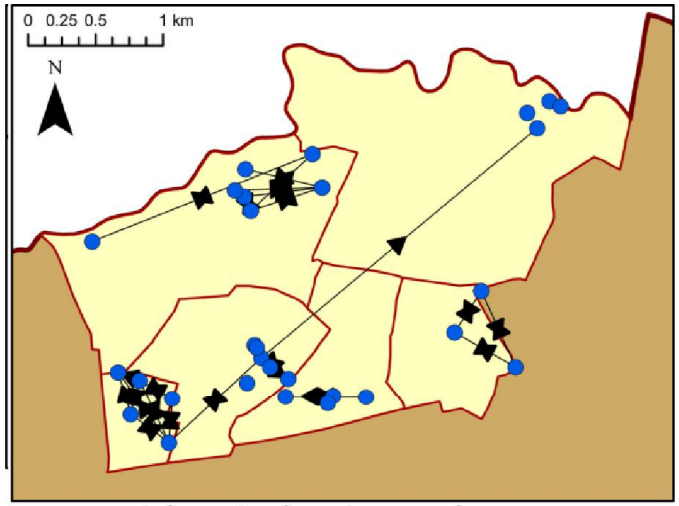
Permuted linear regression

Significant attributes:

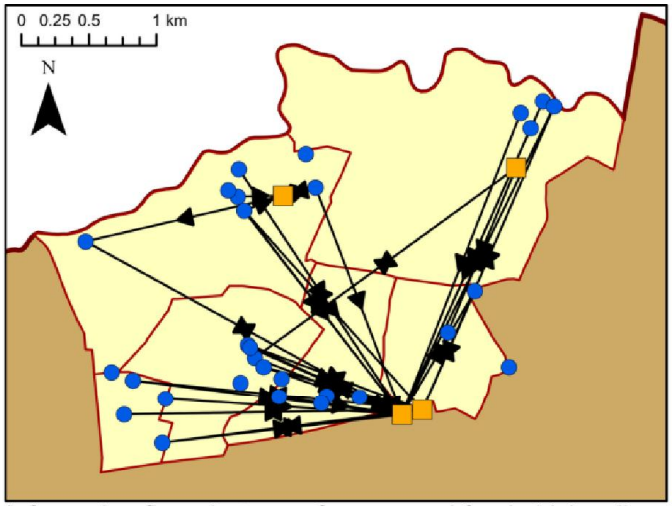
- feed and medicine sale (*p = 0.01*)
- Level of education *(p=0.016)*

Network analysis

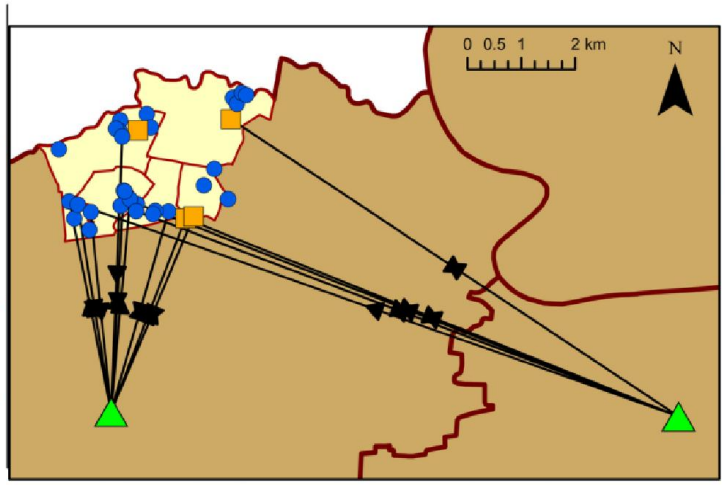
Spatial diffusion of information



Information flows between farmers



Information flows between farmers and feed-chick sellers



Information flows including veterinary shops

Legend

- Villages of the study commune
- Districts of Hai Duong province

Actors

- Feed-chick seller
- Poultry farmer
- Information flow
- Pharmacie vétérinaire

Summary

- Who talks? Information network dominated by the private sector (network analysis study)
- Why? Why not?

Introduction

Information sharing constraints

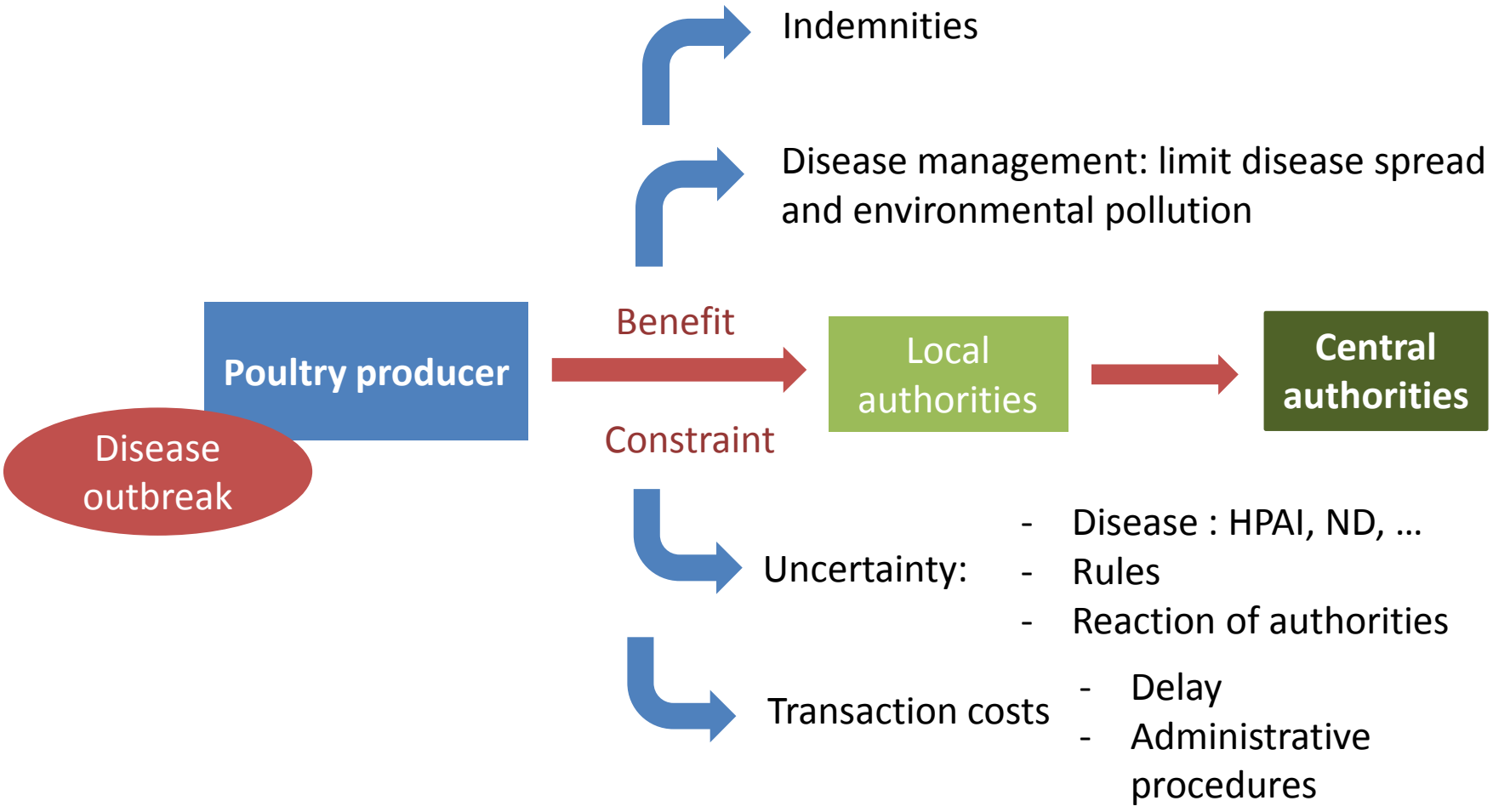
The management of diseases matching HPAI suspicions definition was explored in focus groups of poultry farmers

Production scale	Production system	Study Area*	Relative likelihood of decision**						
			PF	RS	FS	VS	FC	VA	SR
Large (>1000 birds / flock)	Broiler chicken	HD	17	28	18	37	0	0	0
	Broiler chicken	DN	0	0	0	100	0	0	0
	Broiler duck		9	0	0	24	67	0	0
	Layer quail		0	0	0	30	6	0	64
Medium (100-1000 birds / flock)	Broiler chicken	HD	39	0	36	18	7	0	0
	(n=2)		38	19	27	16	0	0	0
Small (<100 birds / flock)	Backyard chicken	HD	17	25	49	9	0	0	0
	(n=4)		27	0	56	17	0	0	0
			8	62	25	5	0	0	0
			6	7	53	26	0	8	0
	Backyard chicken	DN	0	0	0	80	0	0	20
	(n=2)		31	0	0	69	0	0	0

*The study areas: HD = Hải Dương, DN = Đồng Nai

**Decision: PF: warning of other poultry farmers, RS: Rapid sale of animals, FS: ask support from the feed seller, VS: ask support from the veterinary shop, FC: ask support from the feed company, VA: report to veterinary authorities, SR: self-reliance

Information sharing constraints



Introduction

Information sharing constraints

Agro-industry

Feed

Feed/chick suppliers

DEBT

Poultry producer

Disease outbreak

Money

Rapid sale

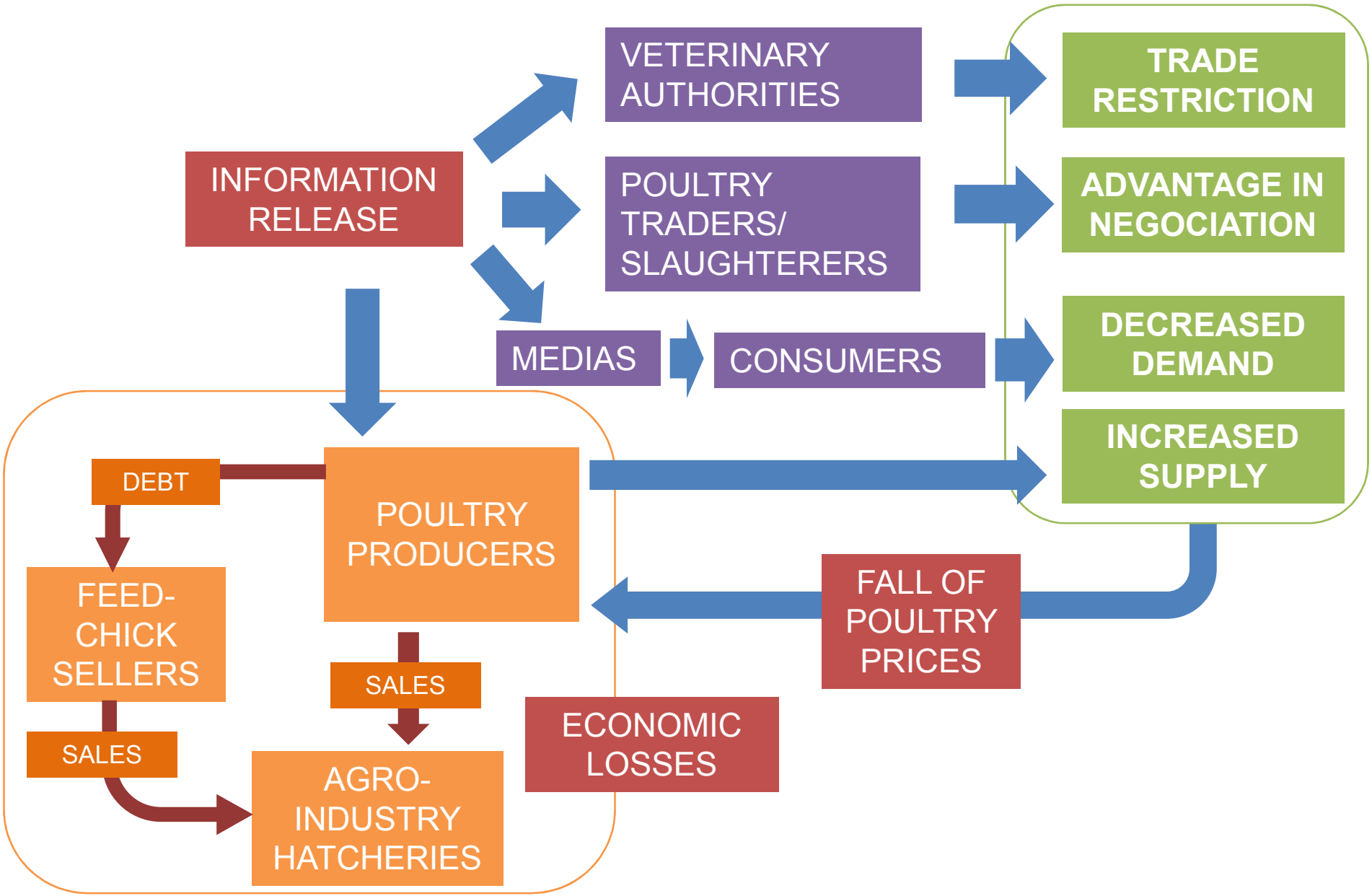
Traders of sick animals

Crocodile / pythons farms

Canteens, low-cost restaurants

Consumers

Market impacts



Summary

- Who talks? Information network relies on private sector (network analysis study)
- Why? Why not?
  - Uncertainties of output of reporting
  - Available alternatives (sick bird value chain)
  - Transaction costs
  - Market impacts
- Which solution?

Introduction

Measuring the constraints : choice experiment

1/ Fixed attributes of the scenario

- Clinical observation → 50% mortality in the poultry flock in less than 5 days
- Benefit from rapid sale of animals → Expected price based on participant's experience

2/ Variable attributes of the scenario

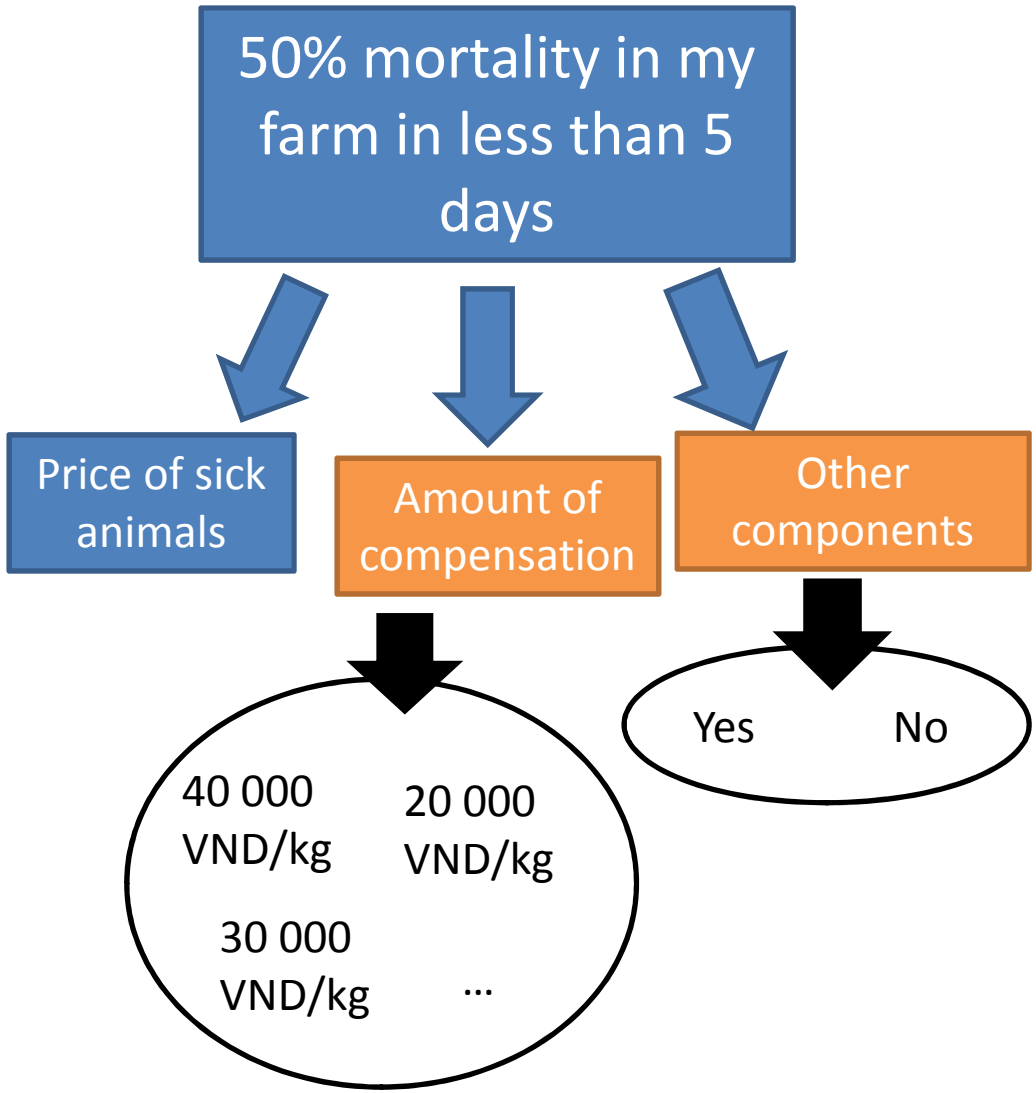
- Financial benefit from reporting → Amount of financial indemnities
- Elements influencing the decision-making (e.g. delays, market impacts) → Present / Not present

3/ response variable

- REPORT
- NOT REPORT

Introduction

Measuring the constraints : choice experiment



Introduction

Measuring the constraints : choice experiment

50% mortality in my farm in less than 5 days

- Price of sick animals
- Amount of compensation
- Delay before compensation

Proportional piling

- REPORT
- NOT REPORT
- ASK OTHER FARMERS

Pilot test

- 17 interviews performed with chicken broiler producers. 11 results were interpretable.
- Analytical aspect: multinomial logistic regression (Louviere et al., 2000)
- *Market impact*
  - For 5 farmers : no effect on their decision (null cost)
  - For 5 farmers : median value = 442 USD (range: 108 - 2,979 USD)
- *Transaction costs : delays before getting compensations, administrative procedures*
  - 5 farmers : not mentioned (null cost)
  - 6 farmers : median value = 694 USD (range: 236 - 1,081 USD)
- *Help in disease management: avoidance of disease spread, environment pollution*
  - 7 farmers = not mentioned (null cost)
  - 4 other: median value of 292 USD (range: 248 - 829 USD)
- Other survey based on a similar protocol to test the costs and benefits associated with different policy alternatives: on a sample of ≥ 200 pig producers

Recommendations

Limitations to HPAI surveillance

- Presence of alternative choices available in poultry disease management. How to manage sick bird value chain?

- Need for integration of informal and formal surveillance. How to build bridges?
  - The informal network is predominant
  - Disease information is mainly obtained from informal sources

- Reporting HPAI suspicions is associated with specific costs. How to account for it in the design of disease management program?
  - Transaction costs: delays, administrative procedures
  - Market impacts: effect of disease information release on poultry market prices

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  - Tropical Veterinary Institute, University of Liège, Belgium: Nicolas Antoine-Moussiaux
  - Royal Veterinary College: Guillaume Fournié


Thank you for your attention