

**In a nutshell:** The European project ROADMAP (“Rethinking of Antimicrobial Decision-systems in the Management of Animal Production”) promotes transitions for a prudent and responsible antimicrobial use (AMU) in livestock farming. ROADMAP analyses the socio-economic drivers of AMU, develops tailored strategies for change and proposes transition and impact scenarios in diverse farm animal production systems in Europe and low- and middle- income countries. This change will be achieved through an improvement of antimicrobial decisions-systems all along the food and drug supply chains. The composition of the ROADMAP consortium makes it possible to build an interdisciplinary framework that combines different perspectives on AMU from social sciences, economics and animal and veterinary sciences. <https://www.roadmap-h2020.eu/>

## Background

In Vietnam, there is **misuse and overuse** of antibiotics (Kim et al. 2013) along with a high level of **resistance** in livestock production (Carrique-Mas et al., 2020).

In order to **fight against AMR** (antimicrobial resistance), within the framework of the ROADMAP project (see “nutshell”), this study aims to (1) determine **patterns of antibiotic use (ABU)** in all types of poultry production systems in North and South Vietnam; and (2) determine the **socio-economic and technical factors** associated with ABU patterns.

## Methods



- Done in Hanoi and Long An provinces (Fig. 2), in May and June 2020
- Using a stratified random sampling (Tab. 1)
- Design of a closed questionnaire on Kobo ToolBox
- Data analysis in R software: selection of key variables divided into antibiotic (AB) variables and farming practices, two successive Multiple Correspondence Analysis (MCA) and Hierarchical Clustering (HC)

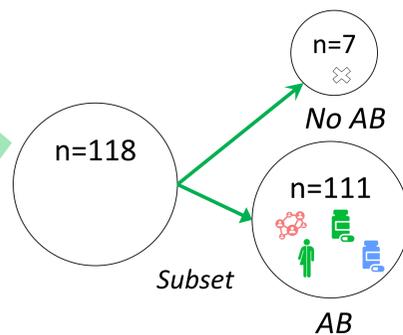


Fig. 1: Semi-intensive chicken farm in Long An province, Vietnam

Fig. 2: Map of the study zones in Vietnam

## Results

FarmType	Number of chickens	Status	Number
Backyard	<100	Family	28
Semi - intensive	100–2000	Family	28
Intensive	>2000	Family	37
Contract	>2000	Contract	25
<b>TOTAL</b>			<b>118</b>



Tab. 1: Distribution of sampled farms by type of production.

## ② MCA and HC on farming practices variables – ABU patterns as supplementary variable

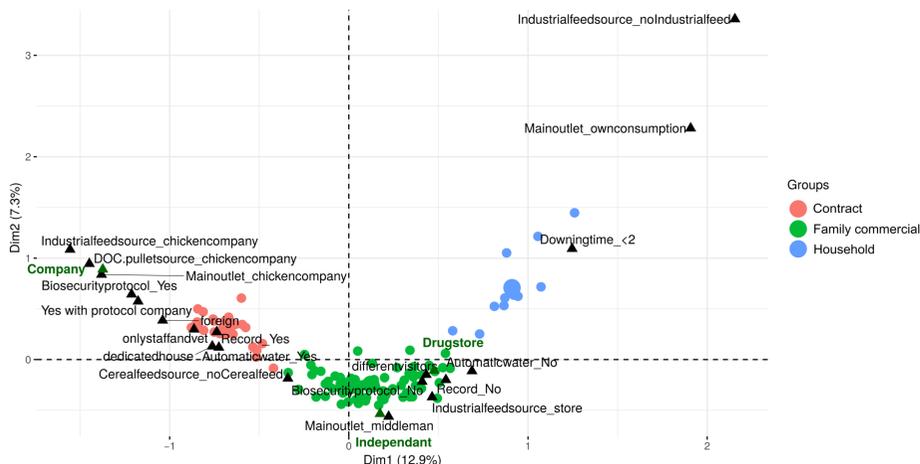


Fig. 3: Projection of the 111 vietnamese chicken farms that use AB on the first two dimensions within the 3 groups identified through HC realized on farming practices variables.  
In black: categories of variables that most characterize the farms; in bold green: ABU patterns (supplementary variable)

## Discussion and conclusion

**Three antibiotic use patterns** were identified and associated with three groups of farming practices. Contract farms use antibiotics according to the poultry companies’ recommendations while household farms follow the retailers’ advice. Finally, in the family commercial group, two ABU were identified: either independent or based on retailers’ recommendations.

Findings may help to better understand decision-making process of farmers when using antibiotics and, combined with other approaches, to **develop innovative AMR control strategies**.

## References

- Carrique-Mas, Juan J., Choisy, M., Van Cuong, N., Thwaites, G., & Baker, S. (2020). An estimation of total antimicrobial usage in humans and animals in Vietnam. *Antimicrobial Resistance & Infection Control*, 9(1), 16. <https://doi.org/10.1186/s13756-019-0671-7>
- Kim, D. P., Saegerman, C., Douny, C., Ton, V., Xuan, B. H., & Dang Vu, B. (2013). First survey on the use of antibiotics in pig and poultry production in the Red River Delta region of Vietnam. *Food Pub Health*, 3, 247-256

## ① MCA and HC on AB variables

### Groups of ABU patterns

- Company** (n=24): Buy antibiotics from the company that comes to the farm and provide advice on ABU; follow advice provided; last training on ABU < 6 months
- Independent** (n=28): Buy antibiotics from retailers but use antibiotics according to their own experience; with higher dosage and shorter duration; use for treatment and prevention
- Drugstore** (n=59): Buy antibiotics from retailers who provide advice directly in the shop or over the phone; follow their advice or own experience regarding withdrawal time; use for treatment

### Groups of farming practices

- Contract** (n=26): Indoor, exotic breed, use complete feed, input/output from chicken company, biosecurity, vaccination (advice from company), <30 years old, main activity
- Family commercial** (n=74): In and out, crossbred, complete feed, feed agency, hatchery, middle-men, no biosecurity, disinfection, >15y experience, 25/50% income
- Household** (n=11): Free range, local breed, scavenging, multiple age own production, own consumption, direct selling, no vaccination, low biosecurity, not the main activity

- “company” associated with “contract farms” (95% of “company” farms are in the group “contract farms”)
- “independent” and “drugstore” associated with “family commercial farms” (93% and 80% of farms)
- “drugstore” associated with “household” (19% of farms)