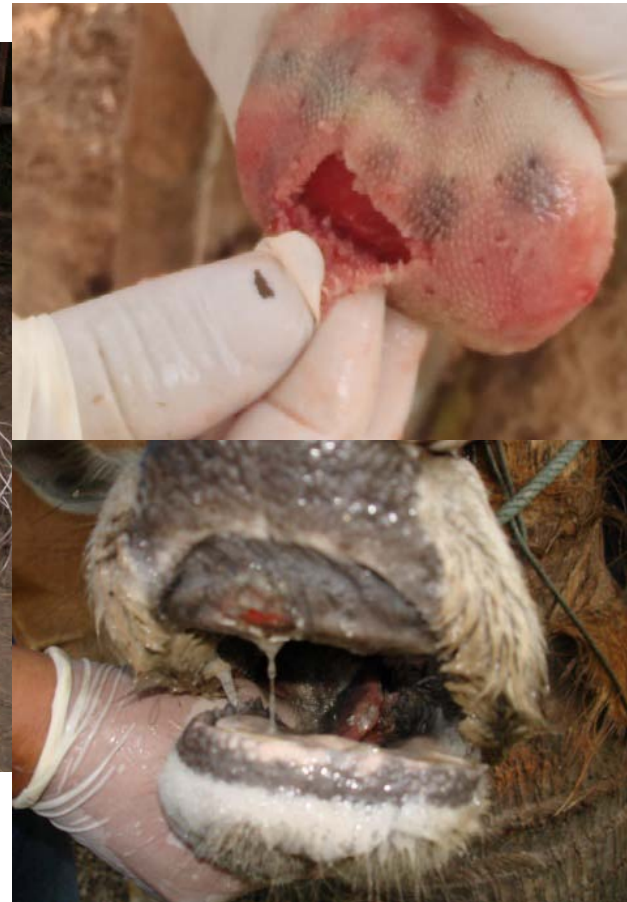


# The socio-economic impact of Foot & Mouth Disease strategic vaccination program implemented in Northern and Central Lao PDR



S. Nampanya, S. Khounsy, R. Abila, & P.A. Windsor  
GFRA Meeting, Seoul, 25 October 2017



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# Background

## Location

- Land-locked country
- Southeast Asia

## Population

- 6.3 mil. (49 ethnic groups)
- Two-thirds rural

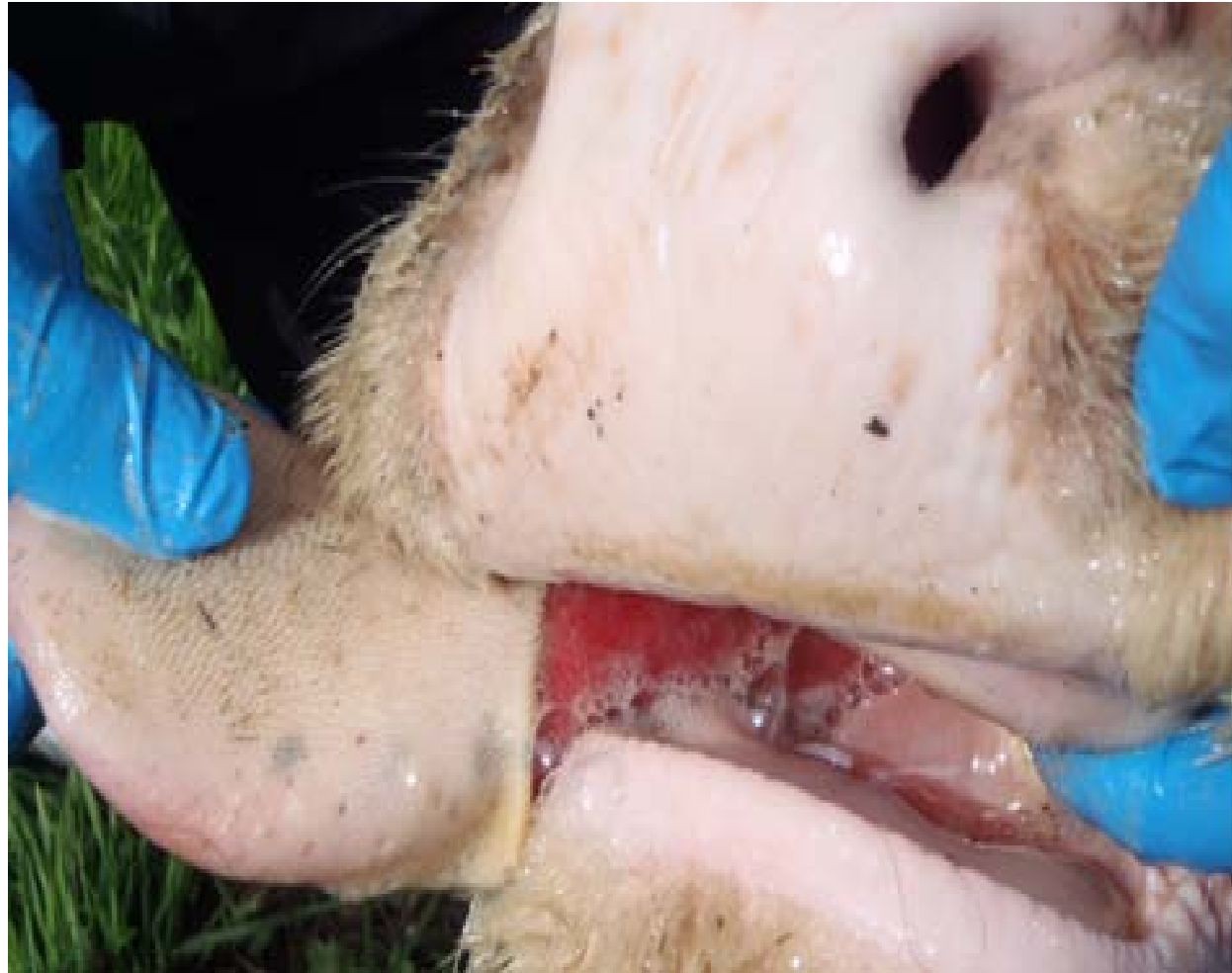
## Agriculture

- > 75% labour force
- 33% GDP
- 15% of GDP from livestock & Fisheries
- **Up to 50% of hh cash income from the sale of livestock**



# Foot & Mouth Disease = failure of food security

## Farmers understand risk management if increasing income

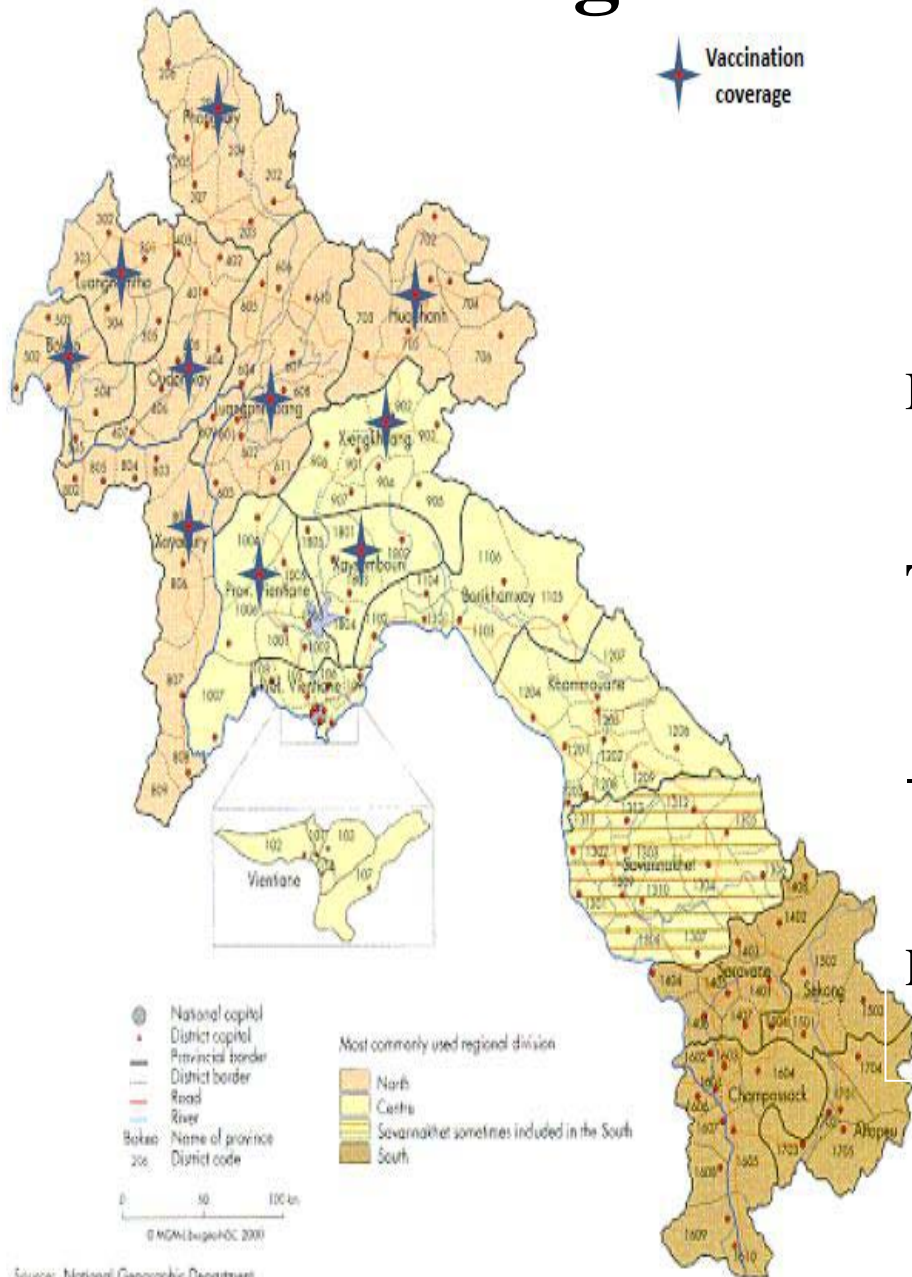


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# Strategic FMD vaccination campaign



Dec 2012 through 2016, DLF received donated 1.62 million does of FMD vaccine (O monovalent, O & A bivalent (Merial))

Initially < 200,000 in 2015, increased to 400,000 in 2015

**Two sources via OIE: STANZ & Japan Trust Fund**

-Vaccination implemented in 10 provinces: 8 north & 2 central

Project entitled: 'The Foot and Mouth Disease Vaccination Project' .

# Study objectives

An assessment of the socioeconomic impacts on large ruminant smallholder health and production in the vaccinated areas conducted, following completion of The Vaccination Project in Dec 2016,

Aim to:

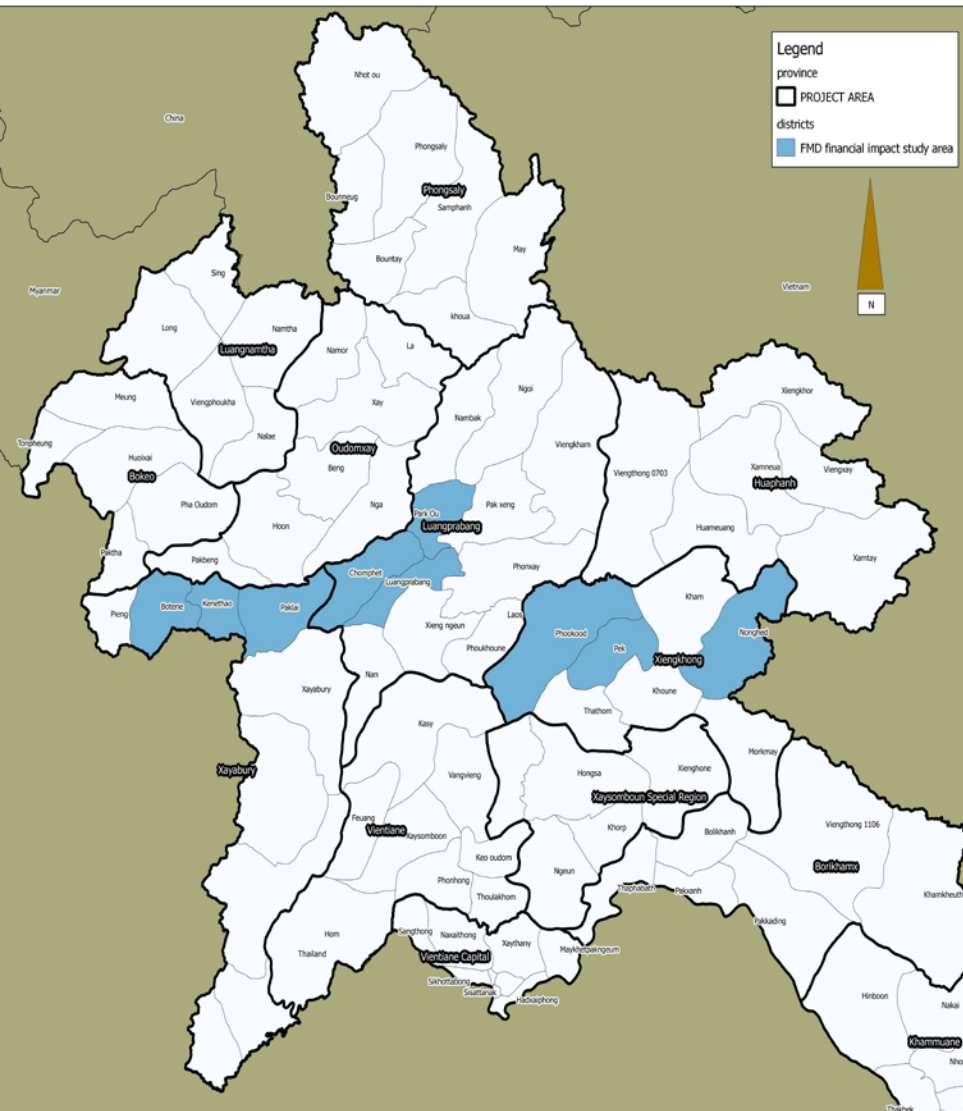
- Determine the socio-economic impact of FMD vaccination program on large ruminant smallholder farmers (esp. gender & social financial status aspects)
- Provide recommendations to assist in development of strategies on sustainable TAD control in Laos.



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# Survey site & farmer selection



**Applied Field Research Survey:**  
conducted Dec 2016 through Mar 2017

**Survey Locations:** randomly selected  
based on the project participation list

- 3 Provinces: XYL, XK and HP
- 6 district (2 per province)
- 12 villages (2 per district)
- 168 farmers (12-16 per village)
  - ✓ 49 females
  - ✓ 119 males



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# FMD-affected farmer interviews:

The head of each household was interviewed (1 hr



The interviews were

- informal, offering open questions about the topic

## Questions covered

- Financial status data (household incomes, livestock owned etc)
- Knowledge, attitudes and practices of FMD vaccination and biosecurity programs.
- Opinions on the FMD vaccination program.

## Data management in Excel and analysis in Genstat

- Quantitative (household income): REML
- Dichotomous qualitative (husbandry practices): *Chi-square* test
- Survey location (Province)
- Gender of respondent (male vs female)



# Results- Annual household cash income (USD/hh)

|   | By Province |      |      | Livestock caretaker category |        |
|---|-------------|------|------|------------------------------|--------|
|   | XYL         | XK   | HP   | Male                         | Female |
| Cropping  | 1441        | 1678 | 55   | 1105                         | 949    |
| Small animals                                   | 133         | 206  | 272  | 186                          | 272    |
| Large ruminants                                 | 1178        | 1207 | 1148 | 1184                         | 1149   |
| Others  | 2303        | 1165 | 218  | 1254                         | 1286   |
| Total income                                    | 5060        | 4260 | 1691 | 3728                         | 3665   |
| % of income from large ruminant to total income | 23          | 28   | 68   | 31                           | 32     |

- The total annual household income was USD1,691 & USD5,060 in XYL & HP
- 23% and 68% of total incomes USD 1,174 & USD 1,1480 derived from the sale of large ruminants in XYL and HP.





# Results - Annual household cash income (USD/hh)

|  | By Province |       |       | Livestock caretaker category |        |
|--|-------------|-------|-------|------------------------------|--------|
|  | XYL         | XK    | HP    | Male                         | Female |
| Annual income increase since 2012- Yes (%)                   | 83          | 93    | 70    | 82                           | 84     |
| - Mean increased (%)   | 24±21       | 23±20 | 15±14 | 22±19                        | 20±19  |
| Annual income increased from                                 |             |       |       |                              |        |
| - Increased income from selling more stock (%)               | 47          | 64    | 41    | 53                           | 45     |
| - Increased income from selling more agriculture product (%) | 39          | 87    | 46    | 56                           | 57     |
| - Increased income from non-agriculture activities (%)       | 53          | 65    | 63    | 58                           | 57     |

- 47% and 41% of the farmers in XYL and HP. advised that their income increase from selling more stock



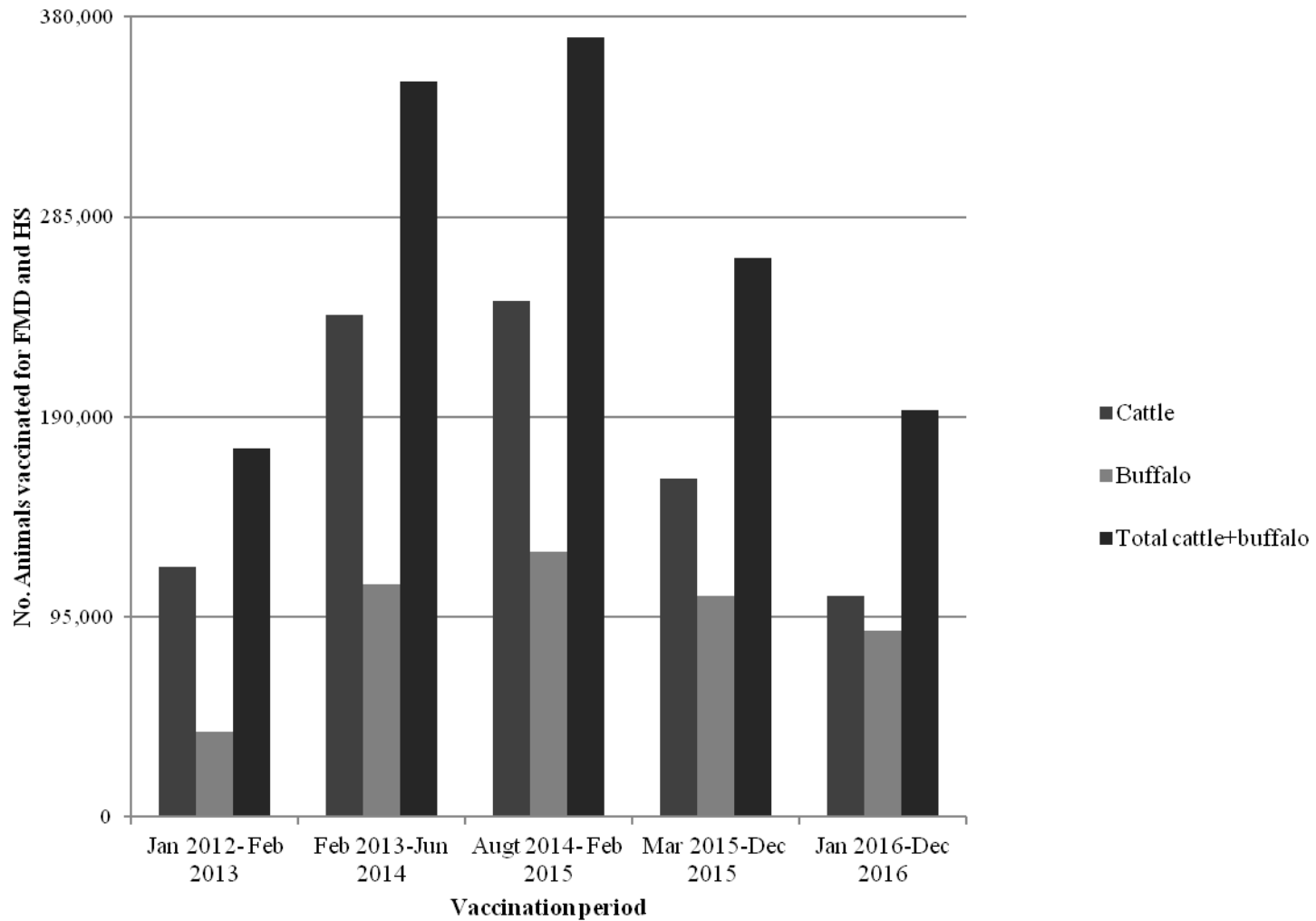
# Results - FMD vaccination at village level (cont)

86% of respondents claimed FMD vaccination was good or very good

| Variables   | XYL      | XK       | HP       | Overall       |
|---|----------|----------|----------|---------------|
| Mean households (hh)  |          |          |          |               |
| - Total households  | 210(±70) | 96(±60)  | 88(±34)  | 113 (±78)     |
| - Households with cattle and buffalo                                      | 136(±47) | 84(±55)  | 50(±31)  | 90(±55)       |
| - Households with cattle and buffalo participating in the FMD vaccination | 56(±27)  | 53(±27)  | 37(±24)  | 49(±25)       |
| - Household with cattle and buffalo participation rate (%)                | 43(±18)  | 66(±7)   | 75(±13)  | 62(±9)        |
| Mean number of cattle and buffalo (heads)                                 |          |          |          |               |
| -Total  | 796 ±394 | 444 ±222 | 335 ±181 | 525 ±327      |
| - Cattle and buffalo aged > 6 mth   | 642 ±312 | 360 ±178 | 273 ±146 | 425 ±261      |
| - No. cattle and buffalo vaccinated for FMD                               | 286 ±144 | 257 ±145 | 192 ±99  | 245 ±129      |
| - <b>Vaccination rate (%)</b>   | 44 ±3    | 69 ±13   | 73 ±10   | <b>62 ±16</b> |
| FMD outbreaks   |          |          |          |               |
| - Latest FMD outbreaks report (yr)  | 2012     | 2012     | 2012     | 2012          |
| - Mean FMD outbreaks 2006-2016  | 2        | 1        | 1        | 2             |
| - Report the case   | Yes      | Yes      | Yes      | Yes           |
| - Means days reporting after knowing the case                             | 2±1      | 4±3      | 5±1      | 3±2           |



# Results- FMD vaccination at project level



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# Discussion

- The study suggests FMD vaccination is well regarded & farmers saw positive benefits, with no outbreaks reported after 2013 in surveyed sites, despite not achieving the preferred vaccination coverage >80%, at a time of significant increases in returns from:
  - Large ruminants between 41% (HP) to 64% (XK)
  - Overall income between 70% (HP) to 90% (XK) since 2012.
- Previous partial budget analysis suggested FMD vaccination programs in Laos likely to be cost effective; each dollar invested potentially achieving USD5.3 in benefits, with net benefits of biannual vaccination: USD22 cattle & USD33 for buffalo.

Transboundary and Emerging Diseases

Transboundary and Emerging Diseases

ORIGINAL ARTICLE

**Financial Impact of Foot and Mouth Disease on Large Ruminant Smallholder Farmers in the Greater Mekong Subregion**

S. Nampanya<sup>1</sup>, S. Khounsy<sup>2</sup>, A. Phonvisay<sup>3</sup>, J. R. Young<sup>1</sup>, R. D. Bush<sup>1</sup> and P. A. Windsor<sup>1</sup>



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# Discussion

- Vaccines help manage FMD by ‘suppression’, protecting against clinical FMD oral & pedal vesicular lesions leading to inappetance & weight loss, but reducing risk of spread in populations.
- FMD control strategies can be enhanced with an improvement in
  - Quarantine & animal movement control compliance
  - Surveillance, disease investigation & reporting, emergency response
  - Public awareness that improve biosecurity practices



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# Recommendations

- possibility of under-reporting suggests continuation of vaccination program for **at least 2-3yrs** , particularly FMD ‘high risk’ areas;
- increasing vaccination days from one to 2-3 days per village to enable most of the adult cattle and buffalo in the village to be vaccinated; a field vaccination day vaccinates a maximum of 100-200 animals
- payment of vaccinating staff by numbers of animal vaccinated per day or per trip, rather than a set per diem as used currently
- attention to improving biosecurity knowledge & practices in addition to vaccination; biosecurity training programs for farmers required & delivered separately from vaccination due to time constraints



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# Recommendations

- improved animal restraint facilities; bleeding poles v portable yards and basic animal crushes, using vaccine guns with protective sheathes
- vaccination efficacy studies ensuring vaccine matching
- improving data management system i.e. no. adults animal in each villages and district; better determination of FMD vaccination coverage
- improved animal movement control & biosecurity practices including law enforcement/compliance for live animal and their products movement;
- strengthening active & passive disease surveillance & disease reporting including 'FMD negative reporting' at the village to national levels;



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# Acknowledgements



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# Further information on MLR:

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## Welcome to Mekong Livestock Research!

This website provides a platform for recent research outcomes to be shared to interested parties and stakeholders. Since 2005 our research team from the Faculty of Veterinary Science, University of Sydney, Australia has partnered with the Department of Livestock and Fisheries, Lao PDR and the Department of Animal Health and Production, Cambodia to conduct a number of large scale research projects focusing on improving large ruminant health, production, trade and marketing.



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