Laos long-term study on zoonotic parasitic diseases in livestock: Approaches and initial challenges using a cross-sectorial approach

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ComAcross – Companion Approach for Cross-sectoral collaboration in health risks management in SEA
Food safety and parasitic contamination in food are one of the major public health concerns globally, particularly in many developing countries including Laos (FAO/WHO, 2014).

Parasitic infections in both humans and domestic livestock are often asymptomatic, in some cases they cause a significant burden of ill health in humans and substantial financial burden on livestock industries (Anantaphruti, 2001; Krause & Hendrick, 2011; Rushton, 2009; WHO, 2011).

It been estimated that humans can harbor approximately different 300 species of parasitic worms including around 100 species that are known to be food-borne (Cox, 2002; Krause & Hendrick, 2011; Orlandi et al., 2002).
Recently, FAO and WHO listed the "Top Ten" food-borne parasites of global concern, based on their burden on human health and trade impacts (FAO/WHO, 2014). Many of these identified parasites are endemic in Laos, including Taenia solium (pork tapeworm, ranked 1st), Trichinella spiralis (pork worm, ranked 7th) and Opisthorchiidae (family of flatworms in fresh water fish, ranked 8th).

Important zoonoses associated to food-borne parasites reported for Laos:

- **Pigs**: Taeniasis/Cysticercosis (T. solium), trichenellosis (T. spiralis)
- Food-borne zoonotic trematodes (FZT): Opisthorchiasis (Opisthorchis viverrini, human liver fluke) and Fascioliasis (Fasciola gigantica, large ruminant tropical liver fluke)
Parasites in livestock and fish are widely distributed in Laos and can have a significant impact as foodborne diseases and also on economy, public health and international food trade.

Multiple sectors are concerned: veterinarians, medical doctors, food scientists, social scientists….

Interdisciplinary research in Laos is not common.
Objectives

To assess *parasitic zoonoses distribution*, improve *animal health*, reduce *animal and human health risks* and develop a *cross-sectorial collaboration* platform and dissemination *strategy* by using *Companion Approach for Cross-sectoral collaboration*
From individual need & representation...

Exchanging viewpoints & knowledge

.. modifying individual one to facilitate collective action?

Changes / Outcomes
EXPECTED BENEFITS

- Tackle major sanitary burden faced by farmers’ communities
- Understand local perceptions of the major zoonotic diseases + acceptability of control measures
- Prioritization process regarding parasitic foodborne diseases’ burden
- Better understanding risk factors
- Improve knowledge about:
  - Prevalence of parasitic zoonosis in southern part of Laos
  - Risk factors of parasitic incidence and distribution
  - Control measurement of parasitic diseases in Laos
- Treatment effective for improving animal production and community (one health issue)
- Demonstrate to policy makers that an integrated approach can be effective to enhance collaboration,
- Prevention plan/recommendations for long term development
Methods

Conceptual framework
**Prevention plan**

**Policy maker’s agreement with treatment**

**Demonstration**

- Model/contextualize
  - The local zoonotic disease system

**Better Knowledge**

- Risk factor knowledge
- Perception and Practice

**Cross collaboration platform**
Better Knowledge

Policy maker’s agreement with treatment

Demonstration

Good treatment

Cross collaboration platform

Literature review

Bi-sampling

Perception and Practice

PE

PRA

Interview

PE

Meeting

Collective activities

Risk factor knowledge
Methods (cont.)

I. Literature review and team meeting conduction
   o Information concerned
   o Consensus consolidation

II. Location: 3 provinces
   o Champasak, 3 districts
   o Savannakhet, 3 districts
   o and Khammuan, 3 districts
III. Quantitative and qualitative surveys

- Participatory Rural Appraisal (PRA) and Participatory epidemiology (PE)
- Serological sampling
IV. Companion modelling approach

✓ Identify a common issue of interest
✓ System contextualization (co-construction)
✓ Stakeholders analysis and strategic planning
  • Finding key stakeholders
  • Study on recent situation and future outcome
  • Searching stakeholders needs and interests
  • How to best involve/engage stakeholders into collective process
  • **Document** change/progress of each stakeholder
  • Win/loss of each stakeholder during change/progress
  • Which methods, tools and other actions matched to each key stakeholder and step
  • Action plan and time line.
Results

I. Established an interdisciplinary team

- Veterinary medicine, Faculty of Agriculture, NUOL
- Faculty of Social Science, NUOL
- Veterinary Division, DLF, MAF
- Medical doctors, Sethathilath hospital, MOH
- One health expert, International Livestock Research Institute, Hanoi, Vietnam
- Companion modelling, Faculty of Agriculture, ChiangMai University

II. Literature review.

- 33 papers thoroughly reviewed
- *T. solium, T. spiralis, O. viverrini* and *F. gigantica* in Laos
III. The common issue

✓ Co-developed based on views points of the researchers

Cross-sectoral collaboration on zoonotic diseases in small holder and livestock system in Laos

Parasitic foodborne diseases
(at district level in Laos)
System contextualization

Problem-Actors-Resource-Dynamic-Interaction (PARDI) method:

- Define common problem / issue of concern
- Identify key actors contribute to the issue
- Identify ecological component (resources) involved
- Specify action of, and interaction among the actors / resource.
- Investigate/understand the process and dynamics of the system
System contextualization

From the kick-off meeting, May 2014 - Bangkok
IV. Participatory epidemiology training/pre-survey
(Savannakhet province during July 2015)

✓ Conducting PE training for team research
✓ Inception meeting with local governors (as part of the key stakeholders)
✓ Practice PE training within the field area for 2 villages
✓ Pre-survey in the target villages for 8 villages
Initial results from PE/pre-survey cont.

The common issues
- Water for agriculture
- Limited agriculture land
- Agriculture (drought)
- Flooding
- agriculture capital investment
- electricity problem
- Health (human/animal)
- Land used conflict
- water used domestic
- Drinking water
- Debt (bank ....)
- Market access
Initial results from PE/pre-survey cont.

- **Diseases prioritization in humans**
  - Liver diseases
  - Stomach diseases
  - Trichenenellosis
  - Opisthorchiasis
  - Fascioliasis

- **Diseases prioritization in animals**
  - Food and mouth disease
  - Hemorrhagic septicemia
  - Bloat
  - Newcastle
  - Fowl cholera
  - Parasites
PE practice & pre-survey highlight
V. Using inputs from PE/pre survey
   ○ Re-confirming of research topic

Parasitic Food Born Diseases, PFBD
System re-contextualization

Key actors/resource and action/interaction

- Initial mapping

Participatory workshop, Jul 2015 - Vientiane
Evolved of stakeholder mapping
Evolved of stakeholder mapping
Evolved of stakeholder mapping
Rainbow framework developed from PE/pre-survey

- Identifying key stakeholders concerned
- Awareness of before situation and after project done
- Searching stakeholders needs and interests
- How to best involve/engage stakeholders into collective process
- Change/progress of each stakeholder
- Win/loss of each stakeholder during change/progress
- Which methods, tools and other actions matched to each key stakeholder and step
- Time table
VI. Challenges observed

Identification of research topic

- Initial focus was rather narrowed in terms of diseases and species

Initial focus on biometric sampling

- Livestock: Ruminants, pigs
- Fishes
- Human
- Environments: water from lakes and vegetables

From PE experience

- Symptoms versus diseases
- PFBD are not ranked high by community ect.
Future steps

- PRA work
- Bio-sampling
- Training for leaders
- Conference
- Media development
- Strengthening networking
Thank you for kindly listening