

Highly Pathogenic Avian Influenza in Moeyingyi wetland (Myanmar)

Findings of an epidemiological study

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Introduction

H5N1 Highly Pathogenic Avian Influenza (HPAI) in Myanmar

- first occurrence in March 2006
- further epidemics in 2007, 2008 and 2010 → controlled by stamping out without vaccination
- last outbreak notified on 18th January 2011

Surveillance for AI in Myanmar

- not yet an established practice
- only few cross-sectional studies in some risk areas
- trial of surveillance schemes with longitudinal designs



AIM

To investigate the epidemiology of avian influenza in Moeyingyi wetland by means of a longitudinal survey

Material and methods

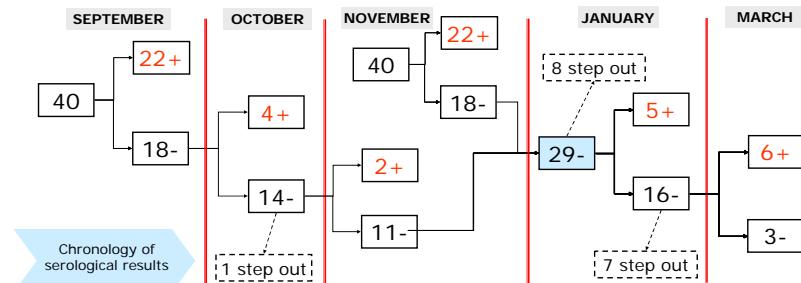
Study area:

- Moeyingyi wild bird sanctuary (Bago East District)
- wetland hosting 125 avian species and approximately 3000 semi-commercial duck farms (about 60% of the national duckling production)
- farms are resident or make short transhumances and rear ducks for up to two laying cycles. Flocks are confined during night-time and are conducted to water bodies in day-time
- 4 agro-ecological setting are identified:
 - (1) Moeyingyi lake (Lake);
 - (2) West lake side (Road Side);
 - (3) South lake side (Bank);
 - (4) Channel district (Canal).

80 farms in total

Samples & Analyses:

- 30 blood samples + 30 cloacal and/or tracheal swabs collected from each farm
 - * blood samples → tested for H5 Ab by means of HI
 - * swabs tested by embryonated egg inoculation
 - 3 suspected farms were further sampled and tested by means of RT-PCR for Type A and H subtype
- Time to sero-conversion → investigated by means of **Survival Analysis** with Kaplan-Meyer method carried out on 29 farms



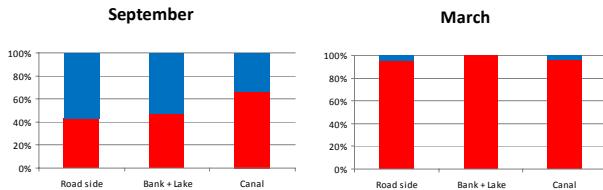
Results

Laboratory analysis

The AI virus was never isolated nor was PCR for H5 AIV subtype positive. Instead, gene M was detected → Type A AIV circulation

- Antibodies against the H5 AIV subtype were found in 61/64 fully investigated farms
- In September the cross-sectional study showed 55% (22) farm seroprevalence for H5 Ab
- Incidence rates based on sero testing + 95% exact CI:
 - Oct: 22% (6%-47%)
 - Nov: 15% (2%-45%)
 - Jan: 24% (8%-47%)
 - Mar: 66% (29%-92%)

Seroprevalence per agro-ecosystem at beginning and end of the study:



Survival analysis

Diagram 1.

Seroconversion probability

- 1 month after the 1st sampling: 7%
- 3 months after the 1st sampling: 35%
- 4 months after the 1st sampling: 47%
- 6 months after the 1st sampling: 62%

Median seroconversion time: 4.23 months

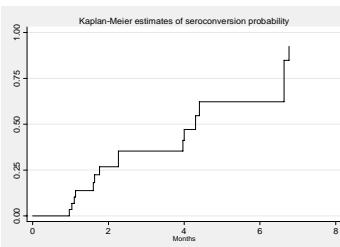
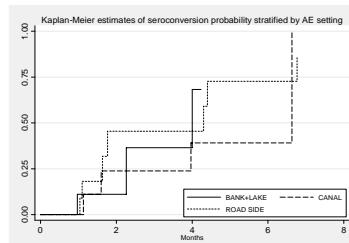


Diagram 2.

Comparison of survival curves

The 3 curves are not statistically different (p-value long-rank test: 0.9289)



Discussion

• Due to the impossibility to isolate AIV and the abundance of Ab data, the results stem from serological testing. We hypostasize that the virus isolation was negative given the short viral shedding time after infection. Only in 3 cases we could test farms suspected of being infected over the antecedent 2 weeks. Nevertheless the isolation remained negative

• Serological incidence indicates that H5 epidemic propagates quickly and constantly during the production cycle. This is confirmed by the survival analysis (Diagram 1) which shows the increasing probability of being infected. There are no significant differences when comparing different agro-ecosystems (Diagram 2)

• In conclusion to control AIV spread, whenever new flocks are housed it is recommended to concurrently enforce control measures in all the agro-ecosystems