# SEASONAL IMPACT ON HIGHLY PATHOGENIC AVIAN INFLUENZA (HPAI) CASES IN CHICKENS COMING TO POULTRY COLLECTING FACILITIES (PCFS) IN JAKARTA

[1]A Jatikusumah, , [2]C. Basri , [1]Sunandar, [3]Deswarni, [4]D. Hidjah

[1]Center for Indonesian Veterinary Analytical Studies,
Jl. RSAU No. 4. Atang Sandjaja, Semplak, Bogor 16000
[2]Laboratorium Epidemiologi, Bagian Kesehatan Masyarakat Veteriner . Fakultas Kedokteran Hewan,
Institut Pertanian Bogor.
Jl. Agatis, Kampus IPB Dramaga. Bogor 16000
[3]Balai Pengujian Kesehatan Hewan dan Ikan Provinsi Provinsi DKI Jakarta
Jl. Ragunan, Jakarta Selatan
[4]Dinas Kelautan dan Pertanian Provinsi DKI Jakarta
Jl. Gunung Sahari Raya XI No.11 Jakarta Pusat

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## Introduction

In December 2003, an incursion of a highly pathogenic Avian Influenza (HPAI) H5N1 virus strain occurred in Indonesia. Although control measures were implemented to a limited scale yet the virus kept spreading and the country is now considered to be endemically infected. It is assumed that Poultry Collecting Facilities (PCFs), as media for AI transmission between flocks and to humans, is one of the factors causing the virus to spread. Every day, hundreds of batches of broilers and spent layers arrive at PCFs for further trade. Indonesia, a tropical country with two seasonal climates, could possibly have increased development of pathogen or parasitic organisms due to higher or warm temperate in all year round (Harvell et al., 2002). Moreover, high humidity in tropical countries may lead to the survival of pathogens sensitive to moist or dry conditions. However, the pattern of AI cases related with the dry and rainy season in the PCFs is still unclear. Hopefully, this information might help develop better control measures for these facilities.

## Method

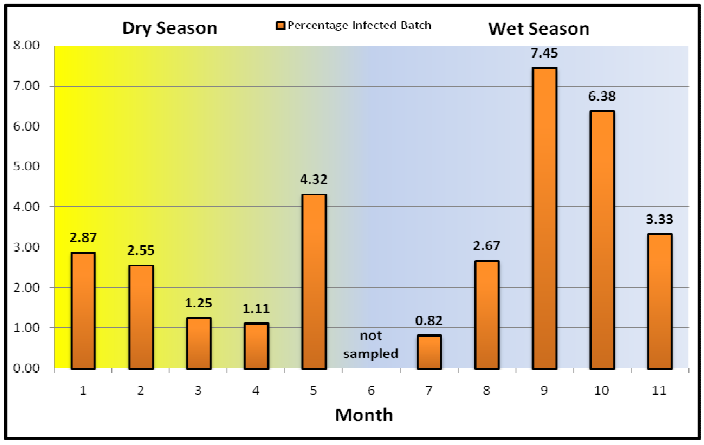
The study design is cross sectional. The study was conducted for 11 months starting from April 2009 until March 2010 in 40 PCFs in Jakarta. PCFs were observed and sampled for 10 months only, from 21 April to 21 September 2009 (month 1 to 5) and from 22 October 2009 until 27 March 2010 (month 7 to 10). Sampling was not conducted in month 6 because there was another surveillance activity using a different method. Each PCF was observed and sampled for a week for each observation period (10 weeks), therefore in a year each PCF was observed for 4 weeks in 4 different observation periods. Samples were collected from each batch of chickens coming to PCFs, prioritized on sick or dead birds. Healthy birds were sampled when there was not any sick or dead bird. The sample collected was tracheal swabs, taken from 10 birds per batches with a maximum of 10 batches sampled per day. A batch is defined as one poultry delivery from one farm in one day to one PCF. Tracheal swab samples were tested with Reverse Transcription-Polymerase Chain Reaction (RT-PCR) to detect H5 HPAI virus antigens. Data collected was analyzed descriptively. The study also tested the association between different seasons and AI cases detected in PCFs using the t-test.

## Result and Discussion

The study detected HPAI in all 10 months of observation (Figure 1). In the first month (21 April 2009 to 21 May 2009), 5 of 174 batches sampled (2.87%) were found infected by AI. In the second month (22 May 2009 to 21 June 2009), 5 more batches were found infected, but from a total of 196 batches (2.55%). The total number of HPAI infected batches detected in 10 months observation is shown in Table 1.

Tabel.1. Total Number of HPAI Infected Batches by Month

| Time | Month | Positive Batch | Total Batch | Percentage Infected Batch | Note |
|---|---|---|---|---|---|
| 21 April 2009-21 May 2009 | 1 | 5 | 174 | 2.874 | Rain to Dry |
| 22 May 2009-21 June 2009 | 2 | 5 | 196 | 2.551 | Dry |
| 22 June 2009-21 July 2009 | 3 | 2 | 160 | 1.250 | Dry |
| 22 July 2009-21 August 2009 | 4 | 2 | 180 | 1.111 | Dry |
| 22 August 2009-21 September 2009 | 5 | 7 | 162 | 4.321 | Dry to Rain |
| 22 September 2009-21 October 2009 | 6 | - | - | 0.000 | Not sampled |
| 22 October 2009-21 November 2009 | 7 | 1 | 122 | 0.820 | Rain |
| 22 November 2009-21 December 2009 | 8 | 4 | 150 | 2.667 | Rain |
| 22 December 2009-21 January 2010 | 9 | 12 | 161 | 7.453 | Rain |
| 22 January 2010-21 February 2010 | 10 | 9 | 141 | 6.383 | Rain |
| 22 February 2010-27 March 2010 | 11 | 4 | 120 | 3.333 | Rain |




Note: Month 1 (Apr-May '09), Month 2 (May-Jun '09), Month 3 (Jun-Jul '09), Month 4 (Jul-Ags '09), Month 5 (Ags-Sep '09), Month 6 (Sep-Oct '09), Month 7 (Oct-Nov '09), Month 8 (Nov-Dec '10), Month 9 (Dec-Jan '10), Month 10 (Jan-Feb '10), Month 11 (Feb-Mar '10)

Figure 1. Percentage of HPAI Infected Batches in PCFs by Month

Figure 1 shows that in the rainy season of 2009 - 2010 (month 7 to month 11) (Badan Metereologi Klimatologi dan Geofisika, 2010) the total number of HPAI infected batches is higher than in the dry season of 2009 (Badan Metereologi Klimatologi dan Geofisika, 2009) (month 1 to month 5). This finding is consistent with a report from Bandung district LDCC which states that HPAI cases are high in the rainy season and low in the dry season (Local Disease Control Centre Bandung District, 2008). A spike in HPAI detection was seen during the change of the seasons, in month 1 and month 5 (Badan Metereologi Klimatologi dan Geofisika, 2009). Similar findings were also reported by the Emergency Preparedness System (EMPRESS) from Food Agriculture Organization (FAO). Reports from the Participatory Disease Response and Surveillance (PDSR) in Indonesia indicated that HPAI cases in surveyed areas reach its peak in the rainy season (EMPRES/FAO-GLEWS, 2010). Statistical testing of HPAI batches detected in the study using an Independent t-test did not find any significant difference between the dry and rainy season (p value=0,087).

**Conclusion**

The study concludes that the total number of HPAI infected batches was higher in the rainy season compared to the dry season, even though it is not statistically different, and HPAI incidence spikes during the change of seasons.

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