Seroresponse against avian influenza A/H5N1 among poultry workers in Jakarta, 2007

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### Background

#### Influenza
- Types: A, B, C.
- Subtype of A: H1-16
- Pandemics: 1918, 1957, 1968
- Spanish Flu (1918): 20–40 million deaths

#### Avian influenza in animals and humans, Indonesia, 2007
- 1997: H5N1 in Hong Kong: 18 cases, 6 deaths
- 2003: First detection of H5N1 in poultry in Indonesia
- 2005: First human case in Indonesia
- 2006: Family cluster in Sumatra: 8 cases, 7 deaths
- As of 16 Oct. 2007 in Indonesia:
  - poultry: 31 of 33 provinces H5N1 outbreaks
  - humans: 109 cases, 88 deaths

#### Methods

**Objectives**
- To estimate prevalence of human H5N1-seroresponse in Jakarta.
- To identify risk factors for H5N1 seropositivity.
- To strengthen public health and diagnostic capacities.

**Study design**
- Cross-sectional seroprevalence study among persons working at collector houses (see photo) in Jakarta, where healthy sentinel chickens had been place by agriculture.
- Questionnaire: demographics, activities at work, medical history, clinical symptoms, vaccination status, oseltamivir intake, use of personal protective equipment (PPE), time and type of exposure to sick or dead poultry at work or at home, knowledge of avian influenza (AI).
- Serological testing: hemagglutinine-inhibition (HI) using horse erythrocytes at NIHRD.

#### Results

**4%**

H5N1 seropositive in HI test **

**HI test results**

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study population</td>
<td>216</td>
<td>9 (4)</td>
</tr>
<tr>
<td>Suspect Chikungunya controls from Jakarta</td>
<td>50</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Healthy controls From Sukabumi</td>
<td>50</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

**Risk factors for seropositivity**

Univariate analysis, N =216

<table>
<thead>
<tr>
<th>Variable</th>
<th>No seropositive (N = 207)</th>
<th>Seropositive (N = 9)</th>
<th>OR (<em>95% CI</em>)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use cloth mask</td>
<td>61 (30)</td>
<td>8 (92)</td>
<td>19.2 (2.4-16)</td>
</tr>
<tr>
<td>Use of gloves</td>
<td>4 (2)</td>
<td>0 (0)</td>
<td>-0.0 (n.a.)</td>
</tr>
<tr>
<td>Smoking</td>
<td>154 (74)</td>
<td>3 (33)</td>
<td>0.17 (0.03-0.81)</td>
</tr>
<tr>
<td>Work &gt;50 h/w</td>
<td>140 (70)</td>
<td>9 (100)</td>
<td>0.2 (0.4-1.4)</td>
</tr>
<tr>
<td>Administration</td>
<td>21 (10)</td>
<td>0 (0)</td>
<td>-0.0 (n.a.)</td>
</tr>
<tr>
<td>Dead sentinels in company</td>
<td>63 (30)</td>
<td>5 (56)</td>
<td>2.9 (0.6-13.2)</td>
</tr>
<tr>
<td>Afraid of AI</td>
<td>97 (48)</td>
<td>2 (22)</td>
<td>3.2 (0.6-23.1)</td>
</tr>
</tbody>
</table>

Not significant: age, gender, education, lung disease in medical history, allergy, scratches, keep floor wet

#### Discussion

In this setting, there seems to have been transmission, which could reflect:
- low sensitivity of the HI test
- low transmissibility of this H5N1 virus
- Low susceptibility of the workers

Limitations:
- HI test needs to be validated
- one-point serum sample
- recall and responder bias, healthy worker effect

#### Conclusions

Among Jakarta workers:
- 4% seroprevalence using HI test
- Risk factor: use of cloth mask
- No association between seropositivity and cough / rhinitis reported in past 6 months

**HI-seropositivity in Jakarta collector houses**

#### Recommendations

- Remain vigilant!
- Serological tests need validation
- Collector houses: correct use of PPE, compensation, move out of Jakarta, rest-days for disinfection of stables
- Enhance (inter)national surveillance
- Government regulations/sanctions needed
- Second sampling (cohort study)

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* Buxton Bridges et al. JID 2002.
** Further testing needs to be performed in order to validate our results