Influenza Surveillance in 15 Countries in Africa, 2006-2010: The ANISE Network

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Introduction

• In 2003, influenza A(H5N1) spread countries in Asia and eventually reached Africa. Human cases reported in Djibouti, Egypt and Nigeria.

• Few reports of seasonal influenza outbreaks in Africa with high case-fatality proportions.

• Estimation of mortality in the case of global pandemic concluded consequences in East Asia and sub-saharan Africa dire (Murray, 2006).
Introduction, cont’d

• In response to this pandemic threat, several international institutions and governments partnered with African counterparts to build capacity for influenza surveillance in Africa.

• OBJECTIVE: Document increased capacity for influenza surveillance in 15 countries in Africa received financial and/or technical support form the CDC and other sources.
Methods, cont’d

- Collected influenza surveillance data from 2006 through 2010

15 countries:

- Angola
- Côte D’Ivoire
- Democratic Republic of Congo (DRC)
- Egypt
- Ethiopia
- Ghana
- Kenya
- Madagascar
- Morocco
- Nigeria
- Rwanda
- South Africa
- Tanzania
- Uganda
- Zambia
Methods, cont’d

• Standardized form:
  – Date surveillance started
  – Number of sites conducting surveillance for influenza like illness (ILI) and/or severe acute respiratory infection (SARI)
  – Number of specimens collected and tested
  – Percentage of specimens that were positive for influenza by age and by month
  – Influenza types and subtypes

• Compared to FluNet
Four separate sub-regions:

- North Africa (Egypt and Morocco)
- West Africa (Côte D’Ivoire, Ghana, and Nigeria)
- East Africa (Ethiopia, Kenya, Rwanda, Tanzania, and Uganda),
- South/Central Africa (Angola, DRC, Madagascar, South Africa and Zambia)

Country of South Africa alone for seasonality analysis
Results, 2006-2010

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Countries supported</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>Countries reported to FluNet</td>
<td>8</td>
<td>26</td>
</tr>
<tr>
<td>ILI sites</td>
<td>21</td>
<td>127</td>
</tr>
<tr>
<td>ILI private practitioner</td>
<td>210</td>
<td>357</td>
</tr>
<tr>
<td>SARI sites</td>
<td>2</td>
<td>101</td>
</tr>
<tr>
<td>Specimens tested per year</td>
<td>4,623</td>
<td>44,530</td>
</tr>
<tr>
<td>Influenza positive specimens</td>
<td>1,474</td>
<td>6,325</td>
</tr>
</tbody>
</table>
Among ILI cases, 22% tested positive for influenza (14,556 / 67,817)  
  - Range: 7% in Angola to 40% in Madagascar

Among SARI cases, 10% tested positive for influenza (4,386 / 43,287)  
  - Range: 5% in Ethiopia to 26% in Côte d’Ivoire
<table>
<thead>
<tr>
<th>Country</th>
<th>ILI</th>
<th>SARI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>32/478 (7)</td>
<td>37/371 (10)</td>
</tr>
<tr>
<td>Côte D’Ivoire</td>
<td>890/4620 (19)</td>
<td>24/94(26)</td>
</tr>
<tr>
<td>DRC</td>
<td>404/2510 (16)</td>
<td>77/662 (12)</td>
</tr>
<tr>
<td>Egypt</td>
<td>984/10777 (9)</td>
<td>993/9368 (11)</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>11/115 (10)</td>
<td>6/131 (5)</td>
</tr>
<tr>
<td>Ghana</td>
<td>1619/7669 (21)</td>
<td>61/688 (9)</td>
</tr>
<tr>
<td>Kenya</td>
<td>1739/11577 (15)</td>
<td>1814/17388 (10)</td>
</tr>
<tr>
<td>Madagascar</td>
<td>2310/5712 (40)</td>
<td>N/A</td>
</tr>
<tr>
<td>Morocco</td>
<td>1424/5473 (26)</td>
<td>379/1990 (19)</td>
</tr>
<tr>
<td>Nigeria</td>
<td>225/2748 (8)</td>
<td>43/755 (6)</td>
</tr>
<tr>
<td>Rwanda</td>
<td>273/1081 (25)</td>
<td>96/1471 (7)</td>
</tr>
<tr>
<td>South Africa</td>
<td>4089/10164 (40)</td>
<td>701/8052 (8)</td>
</tr>
<tr>
<td>Tanzania</td>
<td>97/1097 (9)</td>
<td>57/713 (8)</td>
</tr>
<tr>
<td>Uganda</td>
<td>421/3359 (13)</td>
<td>41/642 (6)</td>
</tr>
<tr>
<td>Zambia</td>
<td>38/437 (9)</td>
<td>57/962 (6)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>14556/67817 (22)</strong></td>
<td><strong>4386/43287 (10)</strong></td>
</tr>
</tbody>
</table>
Number of ILI and SARI Cases and Percent Positive for Influenza by Age, 2006-2010*

*Excludes Angola
North Africa
(Egypt, Morocco)

Egypt = 73%; Morocco = 27%
East Africa
(Ethiopia, Kenya, Rwanda, Tanzania, Uganda)

Ethiopia = 1%; Kenya = 77%; Rwanda = 7%; Tanzania = 5%; Uganda = 10%
West Africa
(Côte D'Ivoire, Ghana, Nigeria)

Côte D'Ivoire = 28%; Ghana = 50%; Nigeria = 22%
Angola = 8%; DRC = 28%; Madagascar = 51%; Zambia = 13%
Country of South Africa

- Percent Influenza Positive
- Number of Influenza Positive Specimens

Month, Year

2006 2007 2008 2009 2010

A
B
Influenza Strain Circulation, 2006-2010

- 2006 and 2007: Influenza B was the predominant strain in every region except South/Central Africa (where H3N2 predominated).

- 2008: Strain predominance varied across sub-regions.

- 2009: Influenza A(H1N1)pdm09 was the predominant strain in every region except West Africa (where H3N2 predominated).

Summary

- Influenza surveillance on the African continent has improved tremendously in the last few years- presentations and posters presented at this ANISE Meeting are a testament to this.

- 10% of SARI cases among 15 countries tested positive for influenza.

- Children 0-4 years accounted for approximately half of all ILI and SARI cases.
Discussion

- Represents only 15 of the 54 countries on the African continent.

- The relative burden of all-cause SARI and ILI in the under 5 year age group compared to older children and adults may not be accurately represented.

- Further strengthening influenza surveillance as well as conducting special studies on influenza burden, cost of illness, and role of other respiratory pathogens in Africa are important.
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- Laurence Randrianasolo, Madagascar
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Thank you!