Air Force Institute for Operational Health (AFIOH)

Birthplace, Home, and Future of Aerospace Medicine

Global Influenza Surveillance at AFIOH

19 Dec 2006
Institute of Medicine

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Overview

Birthplace, Home and Future of Aerospace Medicine

• Overview of AFIOH
• Brief historical background
• Current surveillance process
• Resources and capacity
• Historical successes
• Questions
• Backup slides
  • Lab PI processes
  • Results summary
  • Weekly Report
The mission of the AFIOH is to provide world class occupational, environmental, and public health expertise to operational decision- and policy-makers.

- Resources:
  - ~400 personnel: 152 military, 117 civil service, ~140 contractors
  - FY06 operating budget: $12.7M + $18.0M one-times
  - Facilities: ~180K ft$^2$: 3 main and 6 smaller buildings
- Operations:
  - Labs: ~2M analyses/yr (clinical and environmental)
  - Consultants: ~200 formal technical reports/yr; 1000s of phone calls; scores of site visits; reps on ~98 external/professional organizations
  - Business operations: centralized contracting for relevant services
- Unique deployable teams
  - AF Radiation Assessment Team
  - Theater Epidemiology teams
Brief Historical Background

“Project Gargle” began in 1976
- USAF’s systematic annual collection of FRI specimens from clinics and hospitals around the world

Expanded efforts in 1997
- DoD Global Laboratory-Based Influenza Surveillance Program
- AF designated as the Executive Agent for lab-based program
- Funding & professional guidance from DoD-GEIS

Components of the Lab-Based Surveillance Program
- Sentinel site influenza surveillance
  - Managed at AFIOH, Brooks City-Base, TX
- Population-based respiratory surveillance
  - Managed at NHRC, San Diego, CA
Surveillance Process (current)

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AFMC

ASC

Chain of Command

311 HSW

DoD GEIS

Coordination, resourcing

AFIOH

Laboratory

Epi Services Branch

Sentinel Sites

Provides supplies & shipping costs

Coordination, analysis & reports

Collect & ship specimens

Clinical Results

Collect & submit patient questionnaires

Results

CDC

Public Health Action

Vaccine Decisions

Weekly, submit de-identified, record-specific data & weekly reports

Influenza data and isolates
Surveillance Process (cont’d)

- 56 Global Sentinel Sites
  - 43 US MTFs located worldwide
    - DoD beneficiaries
    - Hospitals, health clinics, Emergency clinics, Pediatric clinics
  - 2 MTFs serving foreign military beneficiaries
    - 2 military hospitals in Hungary
  - Multiple treatment facilities in 13 allied countries
    - Civilian patients in allied countries
    - Via DoD overseas labs

- Future Countries (in the negotiation process now)
  - Brazil
  - Israel
  - Caribbean states (through SOUTHCOM)
  - South Africa, Georgia, Romania, Bulgaria (through EUCOM)
Sentinel Sites
2006-2007 Seasonal Year
Birthplace, Home and Future of Aerospace Medicine

- Sentinel Sites
- Clinics and Hospitals Associated with Overseas Labs
A/New Caledonia/H1N1 isolated from Peruvian military cadets. First time seen in Americas. Selected for vaccine component.

A/Panama/2007/H3N2 isolated from How ard AFB. Selected as vaccine component.

Variant A/H3N2/A/Fujian isolated from Korea

Influenza B outbreak in Virginia

B/Malaysia identified at Luke AFB & Nepal. Selected as vaccine component.

All continents affected by Influenza A/H3N2/Fujian Variant, not included in the vaccine components.

*As of 12 June 2005-06*
Impact

• CDC has received > 900 isolates (1998-2006)
• Growing number of sites internationally
• Identify genetic drifts/shifts through sequencing
• Vaccine contributions in the past:
  • A/Panama/H3N2, 1998: Seed virus for vaccine 4 yrs
  • A/New Caledonia/H1N1: Peruvian cadets, 1999 (led to component decision)
  • A/California/H3N2: Nepal, 2004
  • B/Malaysia: Arizona and Nepal, 2005
• Continuously verify changes or similarities in circulating viruses identified by CDC & WHO.
Influenza Program

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BACKUP SLIDES
AFIOH Laboratory Workload
2005-2006 Seasonal Year

- Current Week
- Cumulative

- # of specimens in current week vs. Week Entered
- Cumulative # of specimens vs. Week Entered
AFIOH Laboratory Workload
2006-2007 Seasonal Year

- Current Week
- Cumulative

Week Entered

# of specimens in current week

Cumulative # of specimens

0 500 1000 1500 2000 2500 3000 3500 4000 4500

0 100 200 300 400 500

40 42 44 46 48 50 52 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38
Laboratory Workload, 05-06

Laboratory Processing by Week and Year
Influenza Season 2005-2006

As Of 12 Dec 2006
Laboratory Workload, 06-07

Laboratory Processing by Week and Year
Influenza Season 2006-2007

As Of 12 Dec 2006
DoD Global Influenza Surveillance Program: Influenza Surveillance at AFIOH

Week 44
06-11 November 2006

Influenza (01 Oct - Present)

Influenza A

<table>
<thead>
<tr>
<th>Subtype</th>
<th>Percent</th>
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<tbody>
<tr>
<td>A/H1N1</td>
<td>65%</td>
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<tr>
<td>A/H3N2</td>
<td>35%</td>
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Influenza B

<table>
<thead>
<tr>
<th>Subtype</th>
<th>Percent</th>
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</thead>
<tbody>
<tr>
<td>B/Victoria</td>
<td>50%</td>
</tr>
<tr>
<td>B/lambda</td>
<td>50%</td>
</tr>
</tbody>
</table>

Locations of Lab-confirmed Influenza

Human Avian Influenza (H5N1) Update

In CY 2006, a total of 109 highly pathogenic human H5N1 cases (among non-DoD personnel) have been WHO-confirmed in Azerbaijan, Cambodia, China, Djibouti, Egypt, Indonesia, Iraq, Thailand, and Turkey (data as of 31 Oct 2006, WHO).

DoD installations are located in Turkey. Incidents 4D and 5B are considered one of our sentinel surveillance areas.

AFIOH Sentinel Surveillance Program

Weekly Report

Source: CDC

Week 62
16 December 2006 - 22 December 2006

Global Impact of Bird Flu

Confirmed H5N1 strain.

Human cases: Laboratory-confirmed since Dec 2003

Current as of January 13, 2006

Confirmed Human Cases of H5N1 in Turkey

Source: CDC

Contents

1. Surveillance of Influenza A (H5N1) Reported to WHO (as of 1/10/06)

<table>
<thead>
<tr>
<th>Country</th>
<th>Cases</th>
<th>Deaths</th>
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<tbody>
<tr>
<td>Cambodia</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>China</td>
<td>2,732</td>
<td>46</td>
</tr>
<tr>
<td>Indonesia</td>
<td>147</td>
<td>10</td>
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<tr>
<td>Thailand</td>
<td>100</td>
<td>17</td>
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<tr>
<td>Turkey</td>
<td>96</td>
<td>28</td>
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<tr>
<td>Vietnam</td>
<td>14</td>
<td>3</td>
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<tr>
<td>Total</td>
<td>2,991</td>
<td>92</td>
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</table>

HEADLINES: AVIAN INFLUENZA

China Reports Ninth Bird Flu Death

Turkey Bird Flu Fatality Rate Low

Iraq Tests Dead Girl for Bird Flu

Turkey Races to Curb Mutated Bird Flu Virus

World Bank Approves First Bird Flu Funding

EU Pledges 168M to Bird Flu Fight

3.3 Billion Needed to Prepare for Bird Flu

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