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Air Force Institute
for
Operational Health

DoD-GEIS Influenza Surveillance and Response Program

Information Only

Defense Health Board
03 May 2007

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Background

- **DoD Global Influenza Surveillance Program**
  - DoD-GEIS Global, Laboratory-Based Influenza Surveillance Program
    - Sentinel site influenza surveillance
      - Managed at AFIOH, Brooks City-Base, TX
    - Population-based febrile respiratory illness surveillance
      - Managed at NHRC, San Diego, CA

Surveillance Sites

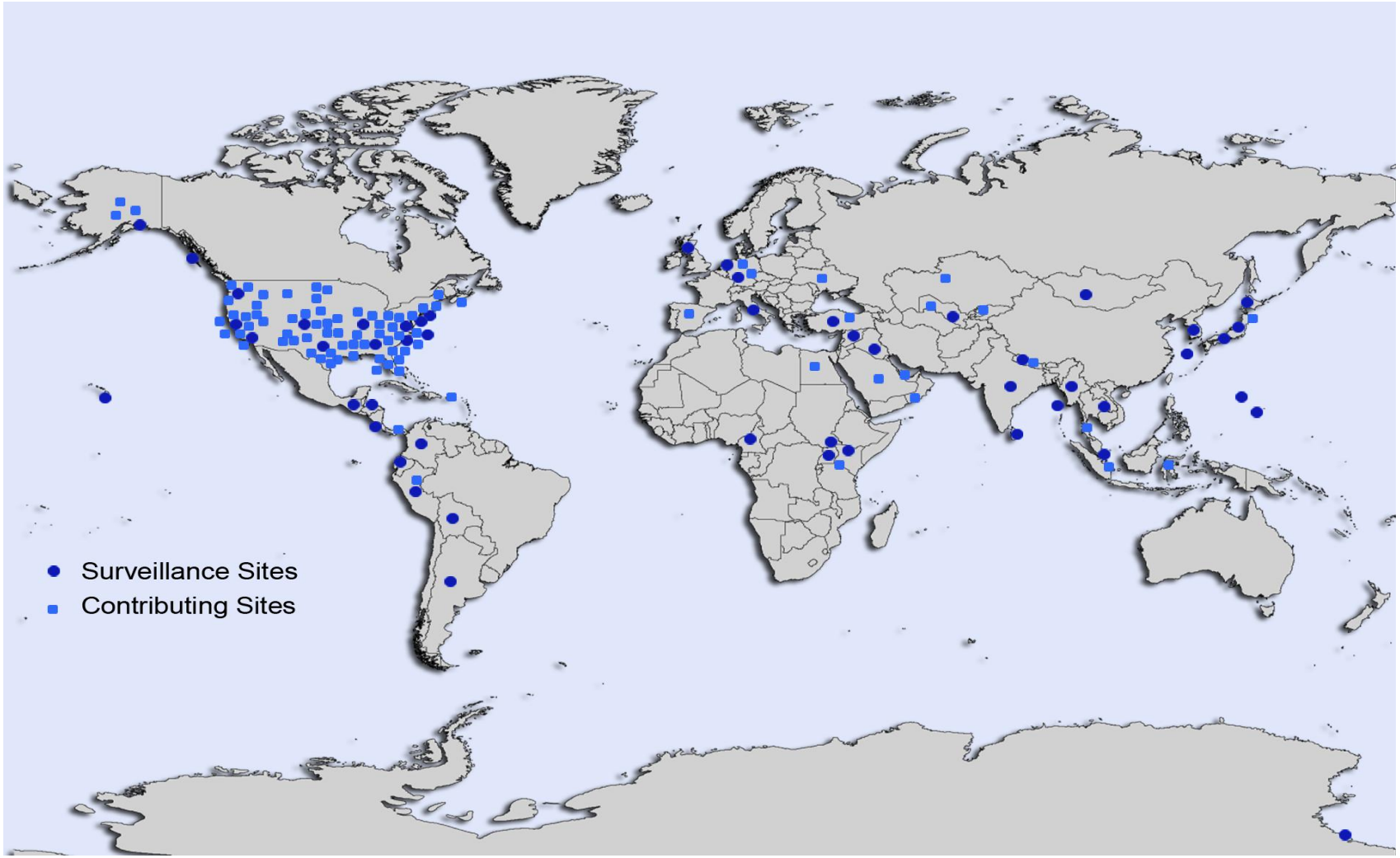
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- **Routine Surveillance**
  - Sentinel sites
    - 65 Global Sites
- **Expansion efforts**
  - Initial discussions for participation
  -

Hungary	Israel
Brazil	Poland
South Africa	Georgia
Romania	Bulgaria

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Participation



Methods

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Public

DoD Global Influenza Surveillance Program
Surveillance at AFIOH

Public Health QUICK SHEET
for the Influenza Surveillance Program

1. Ensure all Primary Care Manager (clinic) teams are supplied with the "Influenza Surveillance Questionnaire" (https://gumbo.brooks.af.mil/pestilence/influenza).
2. Ensure Primary Care Manager (clinic) teams are supplied with collection kits (contact AFIOH lab: Ina Smith @ DSN 240-1680).
3. Pick up questionnaires weekly from Primary Care Manager teams.
4. Ensure 6-10 specimens meeting the ILI case definition are submitted each week. Do not submit specimens unless they meet the ILI case definition.
5. Enter all questionnaires online at (https://gumbo.brooks.af.mil/pestilence/influenza).
6. Enter all lab-confirmed positive influenza specimens into the service-specific Reportable Medical Events System (i.e., AFRESSII).
7. Recommend staff training at least 3 times/yr to ensure importance of influenza surveillance. A training presentation is available at https://gumbo.brooks.af.mil/pestilence/influenza.
8. Notify us at influenza@brooks.af.mil if you suspect an influenza outbreak at your base. It is important that outbreaks among the military communities are tracked so threats to our military forces can be mitigated. If assistance is needed, we are happy to support you as needed-contact Angie Owens or Matt Johns at DSN 240-3471.
9. Contact us at any time!! (210) 536-3471; DSN 240-3471
   E-mail: influenza@brooks.af.mil
   Website: https://gumbo.brooks.af.mil/pestilence/influenza

DoD Global, Laboratory-Based
Influenza Surveillance Program

Program Overview



Air Force Institute for Operational Health
(AFIOH)
Brooks City-Base, TX

AFIOH
Air Force Institute for Operational Health

Methods

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AIR FORCE INSTITUTE FOR OPERATIONAL HEALTH (AFIOH)

BROOKS CITY-BASE, TX

IMPORTANT

Specimen Submission

***5-10 specimens/week

To Participate:

1) This questionnaire MUST be completed (in full) for each specimen submitted.

2) Patient MUST meet the influenza-like illness (ILI) case definition:

ILI Case Definition

- Fever ≥100.5°F (38°C), oral or equivalent

AND

- Cough and/or Sore Throat

Questionnaire Submission

https://gumbo.brooks.af.mil/pestilence/influenza

1) This questionnaire should be entered and submitted online.

2) Additional questionnaires can be downloaded from the AFIOH Influenza website.

3) When ordering a test in CHCS, annotate in the *Remarks* section "Flu Surveillance".

Make a copy of this questionnaire for administrative purposes:

- *To resolve discrepant information*
- *For cataloging results and entering them into the Reportable Medical Events System (RMES)*

Questions?
Please e-mail:
influenza@brooks.af.mil

DoD Global Influenza Surveillance Program

Influenza Surveillance Questionnaire

Installation/DMIS Code: Fort Bliss Date of Clinic Visit:_____ (DD-MMM-YYYY)

PRIVACY ACT STATEMENT: The social security number is required to facilitate documentation of health care received and patient follow-up. The primary use of this information is to aid in preventive health and communicable disease control programs. The requested information is voluntary.

Patient Information PLEASE PRINT LEGIBLY

Patient Name:_____ (Last Name, First Name) Date of Birth: ____-____-____ (DD-MMM-YYYY)

Patient FMP\Sponsor SSN ____ (FMP) / ___-__-____ (Sponsor SSN) Gender: Male/Female

Sponsor's (military member) Work Phone (____)____-____ DSN #____-____

If taken at home, Highest Temp Recorded:_____ Date Taken____-____-____ (DD-MMM-YYYY)

Symptoms: *Please select NA (Not Applicable) if the presence of symptoms cannot be determined.*

Sore Throat: Yes / No / NA	*Cough:* Yes / No / NA	*Vomiting:* Yes / No / NA
Chest Pain: Yes / No / NA	*Fatigue:* Yes / No / NA	*Conjunctivitis:* Yes / No / NA
Headache: Yes / No / NA	*Chills:* Yes / No / NA	*Ear Ache:* Yes / No / NA
Diarrhea: Yes / No / NA	*Body Aches:* Yes / No / NA	*Stiffness:* Yes / No / NA
Dyspnea: Yes / No / NA	*Runny Nose:* Yes / No / NA	*Sinus Congestion:* Yes / No / NA

Did the patient travel recently (past 14 days)? Yes No Unknown

If YES, Where?_____ (City, State/Province, Country) When?_____

Has the patient received the influenza vaccine this season? Yes No Unknown

If YES, list date _____ (DD-MMM-YYYY) Estimated Date: _____ (Month) & _____ (1st half or 2nd half of Mo.)

Type: ____Injection (Flu Shot) ____Nasal Spray (FluMist)

Location: ____Military facility ____Civilian facility

Clinical Information PRINT LEGIBLY

Fever (≥100.5°F / 38°C, oral or equivalent) Temperature = _____

AND (check the symptom/s) a. ____Cough or b. ____Sore throat (<72 hours duration)

When did symptoms start? Date:____-____-____ (DD-MMM-YYYY)

Hospitalized? Yes / No If YES, how long (hrs)?_____ Hospital Name? _____

Patient put on Quarters? Yes / No If YES, how long (hrs)?_____

Physician (name and number): _____ (Name) (Contact Phone Number)

Surveillance Information *(to be completed by public health staff)* PRINT LEGIBLY

* Entered "Influenza Surveillance" in CHCS *Remarks* section? Yes / No

* Questionnaire entered online (https://gumbo.brooks.af.mil/pestilence/influenza) date: _____ (DD-MMM-YYYY)

Keep questionnaires for assistance in entering information into service's "Reportable Medical Events System" (RMES).

Nasal Wash-Procedural Guidelines

1.) Have patient blow their nose into a tissue to clear excess mucus.

2.) Tuck bib into patient's shirt collar.

3.) Uncap pre-filled saline syringe and specimen collection container. Break the seal on the syringe by gently expressing a small amount of saline into the tip of the hub.

4.) Have patient tilt their head back so they are able to look directly at the ceiling while they hold the specimen collection container up to their chin area.

Steps 4-6





Step 7

5.) Encourage patient to not swallow saline by saying "Ka Ka Ka" while saline is expressed into their nostrils.

6.) Gently express 3-4 mL of sterile saline into the patient's right nostril. Saline will drain back into the back of the nasopharynx.

7.) After a few seconds, have the patient lean their head far enough forward so the saline will drain into the specimen collection container. Repeat for second nostril.

9.) Offer patient a facial tissue or have them use the bib to wipe away excess saline from their face.

10.) Mix the contents with the Viral Transport Medium (VTM) included in the kit. Sanding the rim of the cap will help in pouring the contents into the VTM tube.

Step 10





Step 11

11.) Place specimen in the biohazard bag included in the kit and forward to laboratory for packaging and shipment to AFIOH. In order to maintain optimal quality for diagnostics, please be sure to read the specimen for immediate shipment.

Storage, Packing and Shipping
Specimen stability:
Refrigerated: Up to 4 days in VTM; ship on gel packs.
Frozen (-70°C): Greater than 7E hours; ship on dry ice. Please contact AFIOH if dry ice is not available at your site.
Frozen (-20°C): Not Acceptable
Viral transport supplies may be ordered by emailing our Customer Service department at mil.lab.help@brooks.af.mil or by calling 210-536-6278 (DSN: 240-6278).
Please ship to: FedEx number 1561-6280-0
AFIOH/SIDE, 2728 Louis Bauer Drive, Building 930
San Antonio, TX 78235-5133
For additional packing and shipping details, please see the AFIOH/SIDE Lab website:
https://kx.afrc.af.mil/kxem/default/Pages/default.aspx?PGid=CTX_94852

Please see the video demonstration at http://www.airforcemedicine.afms.mil/flu

For other information please see our website at:
http://gumbo.brooks.af.mil/pestilence/influenza/

-Important-
For Military Treatment Facilities
Please remember to order "Respiratory Viral Culture(EPI)" in CHCS for respiratory surveillance.

AFIOH

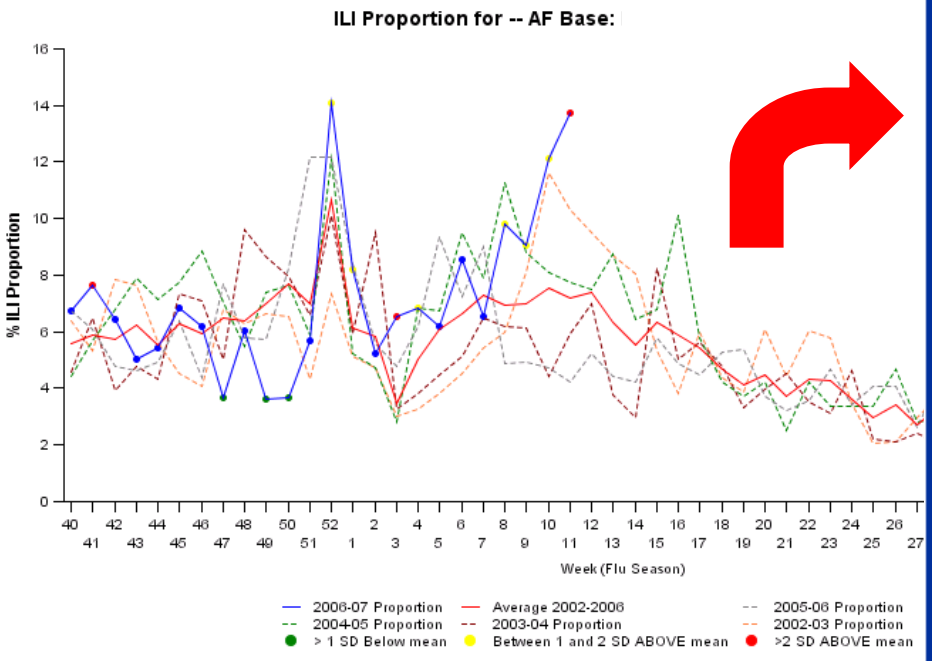
Methods

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Overall | CDC Regions | Installations | US States - Map | Service Charts

Air Force Bases | Army Posts | Coast Guard Installations | Navy/Marine Corps

Installation: [ ] Submit Go to Map



Good Morning,

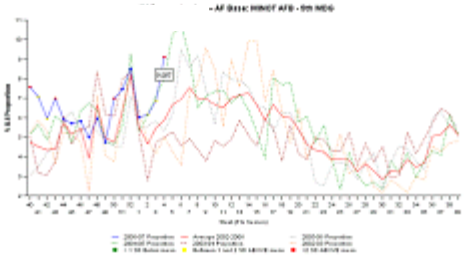
The DoD Global Influenza Surveillance Program at the Air Force Institute for Operational Health (AFIOH) reviews influenza-like illness (ILI) activity at US military sites each week. We noticed an increase in ILI activity at your site (see graph below). This is a significant increase that is notably higher than previous weeks. I understand it is currently the influenza season, but have you been made aware of any other factors that may be the cause for this spike? If so, please respond back to us within the next 8 hours.

Possible action items in response to the spike:

If your site experiences a respiratory spike such as this, we would appreciate if you could have your clinic/hospital staff:

- Contact the AFIOH laboratory at (210) 536-8383; DSN 240 for supplies and/or FedEx account number to ship specimens
- Collect a sample (6-10 per week) of specimens from patients meeting the ILI case definition (fever = 100.5°F and a cough or sore throat)
- Immediately ship to: AFIOH/SDE
  2730 Louis Bauer Drive, Bldg 930
  Brooks City-Base TX 78235-5132

This will help identify the agent if it is a respiratory outbreak and help to mitigate it as soon as possible. We test the specimens for a panel of respiratory viruses and report the results back to both the public health office (via electronic e-mail) and the provider (via CHCS). See the attached material for more information regarding our program. If you have any questions, you can contact us at influenza@brooks.af.mil.



Methods

- **Routine Surveillance**
  - Educate
  - Provide Supplies
  - Monitor influenza-like illness (ILI)
  - Routine communication
    - ILI status
    - Issues





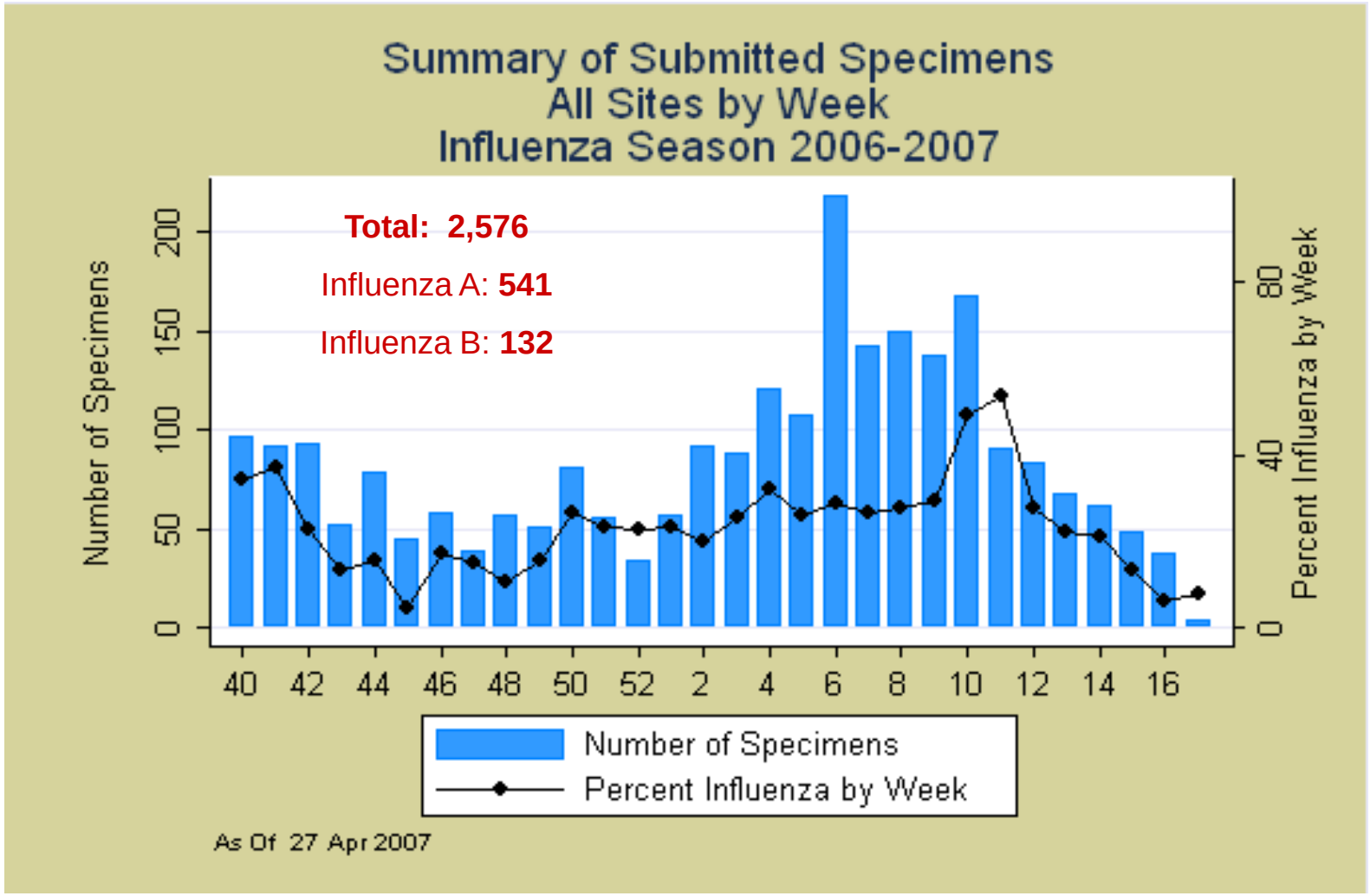
Influenza A





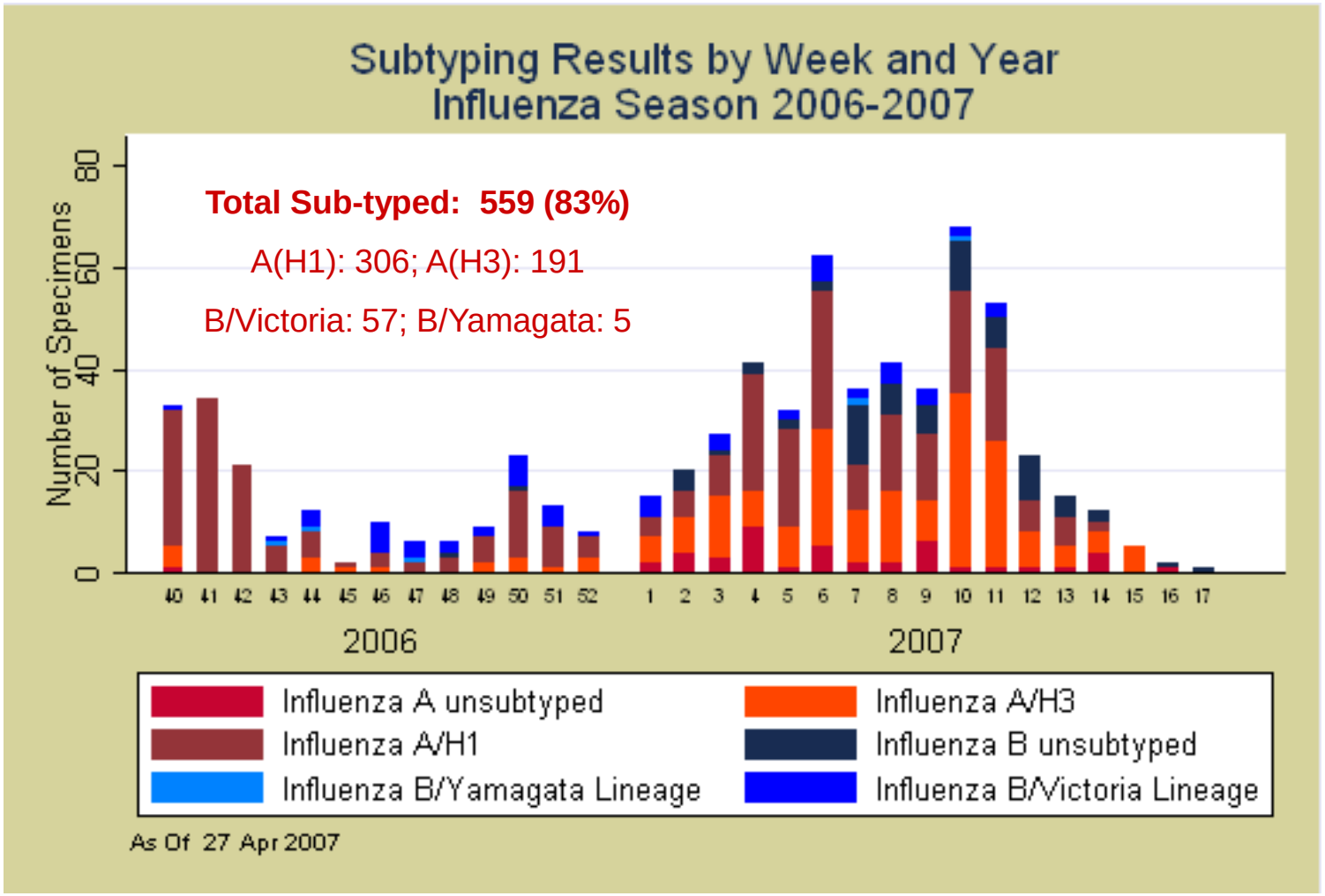
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Results



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PREVENT ANALYZE RESPOND AFIOH



Department of Health and Human Services
Centers for Disease Control and Prevention
CDC en Español
Search: GO

Influenza (Flu)

Flu Activity >

Weekly Report: Influenza Summary Update

Week ending March 17, 2007-Week 11

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Synopsis:

: During week 11 (March 11 – March 17, 2007)*, influenza activity continued to decrease in the United States. Data from the U.S. World Health Organization (WHO) and National Respiratory and Enteric Virus Surveillance System (NREVSS) collaborating laboratories indicated a decline in activity for the fifth consecutive week; 17.0% of specimens tested positive for influenza this week. ILI data was similar to the previous week and above baseline for the thirteenth week this season. Fifteen states reported widespread influenza activity; 22 states reported regional influenza activity; nine states, New York City, and the District of Columbia reported local influenza activity; and four states reported sporadic influenza activity. The reporting of widespread or regional influenza activity decreased from 42 for week 10 to 37 for week 11. The percent of deaths due to pneumonia and influenza remained below baseline level.

Laboratory Surveillance*:

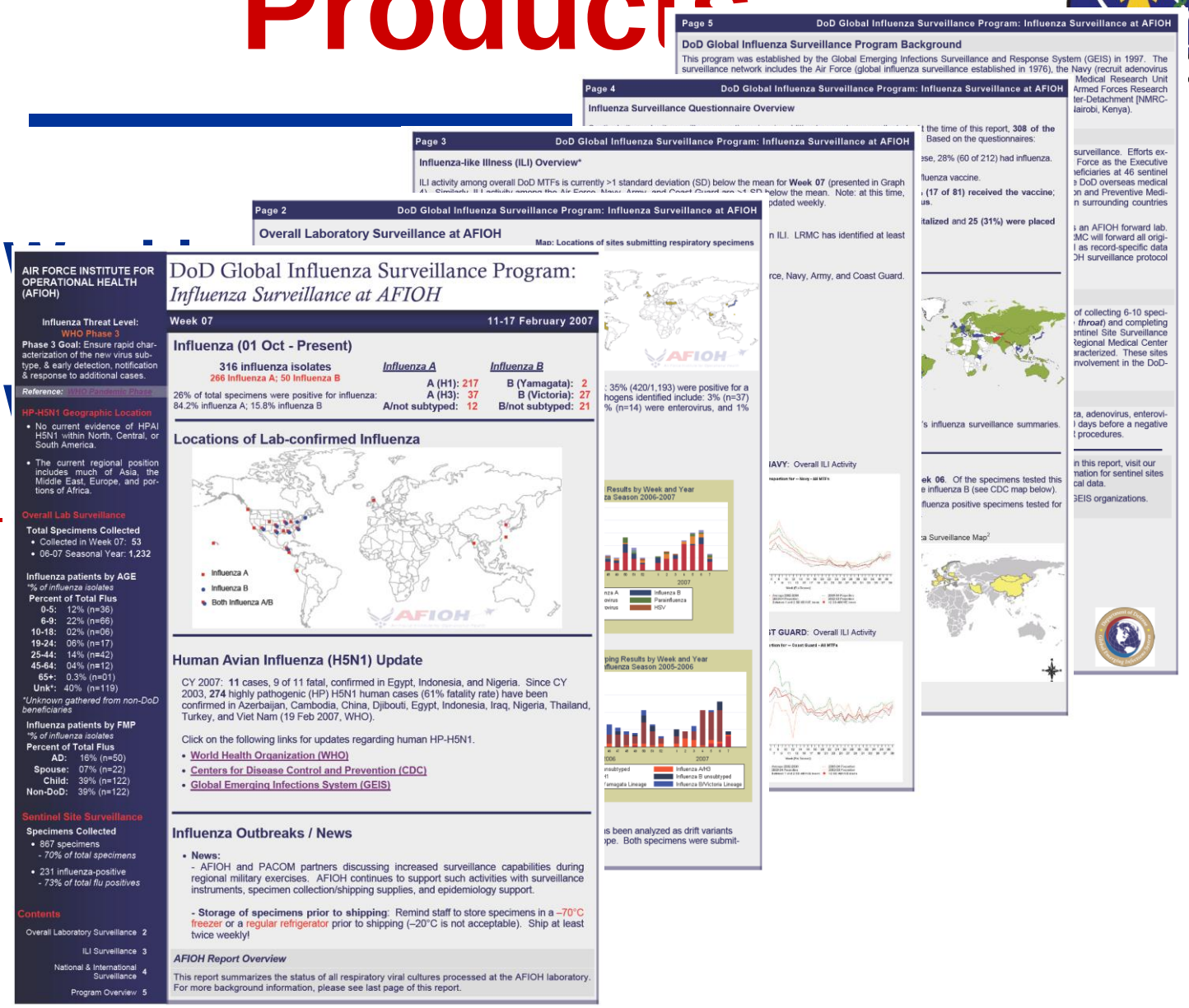
During week 11, WHO and NREVSS laboratories reported 3,632 specimens tested for influenza viruses, 615 (17.0%) of which were positive: 92 influenza A (H1) viruses, 58 influenza A (H3) viruses, 271 influenza A viruses that were not subtyped, and 194 influenza B viruses.

Since October 1, 2006, WHO and NREVSS laboratories have tested a total of 137,755 specimens for influenza viruses and 18,246 (13.2%) were positive. Among the 18,246 influenza viruses, 14,795 (81.1%)

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Products

PREVENT ANALYZE RESPOND



AIR FORCE INSTITUTE FOR OPERATIONAL HEALTH (AFIOH)

Influenza Threat Level: WHO Phase 3

Phase 3 Goal: Ensure rapid characterization of the new virus subtype, & early detection, notification & response to additional cases.

Reference: WHO Pandemic Phase

HP-H5N1 Geographic Location

- No current evidence of HPAI H5N1 within North, Central, or South America.
- The current regional position includes much of Asia, the Middle East, Europe, and portions of Africa.

Overall Lab Surveillance

Total Specimens Collected
- Collected in Week 07: 53
- 06-07 Seasonal Year: 1,232

Influenza patients by AGE
% of influenza isolates
Percent of Total Flus
0-5: 12% (n=36)
6-9: 22% (n=66)
10-18: 02% (n=06)
19-24: 06% (n=17)
25-44: 14% (n=42)
45-64: 04% (n=12)
65+: 0.3% (n=01)
Unk*: 40% (n=119)
*Unknown gathered from non-DoD beneficiaries

Influenza patients by FMP
% of influenza isolates
Percent of Total Flus
AD: 16% (n=50)
Spouse: 07% (n=22)
Child: 39% (n=122)
Non-DoD: 39% (n=122)

Sentinel Site Surveillance

Specimens Collected
- 867 specimens
  - *70% of total specimens*
- 231 influenza-positive
  - *73% of total flu positives*

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ILI Surveillance 3
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Program Overview 5

DoD Global Influenza Surveillance Program: *Influenza Surveillance at AFIOH*

Week 07 — 11-17 February 2007

Influenza (01 Oct - Present)

316 influenza isolates
266 Influenza A; 50 Influenza B

26% of total specimens were positive for influenza:
84.2% influenza A; 15.8% influenza B

Influenza A		*Influenza B*	
A (H1):	217	B (Yamagata):	2
A (H3):	37	B (Victoria):	27
A/not subtyped:	12	B/not subtyped:	21

Locations of Lab-confirmed Influenza

Influenza A
Influenza B
Both Influenza A/B

Human Avian Influenza (H5N1) Update

CY 2007: **11** cases, 9 of 11 fatal, confirmed in Egypt, Indonesia, and Nigeria. Since CY 2003, **274** highly pathogenic (HP) H5N1 human cases (61% fatality rate) have been confirmed in Azerbaijan, Cambodia, China, Djibouti, Egypt, Indonesia, Iraq, Nigeria, Thailand, Turkey, and Viet Nam (19 Feb 2007, WHO).

Click on the following links for updates regarding human HP-H5N1.
- World Health Organization (WHO)
- Centers for Disease Control and Prevention (CDC)
- Global Emerging Infections System (GEIS)

Influenza Outbreaks / News

- **News:**
  - AFIOH and PACOM partners discussing increased surveillance capabilities during regional military exercises. AFIOH continues to support such activities with surveillance instruments, specimen collection/shipping supplies, and epidemiology support.

- Storage of specimens prior to shipping: Remind staff to store specimens in a –70°C freezer or a regular refrigerator prior to shipping (–20°C is not acceptable). Ship at least twice weekly!

AFIOH Report Overview

This report summarizes the status of all respiratory viral cultures processed at the AFIOH laboratory. For more background information, please see last page of this report.

Page 2 — DoD Global Influenza Surveillance Program: Influenza Surveillance at AFIOH

Overall Laboratory Surveillance at AFIOH

Map: Locations of sites submitting respiratory specimens

Page 3 — DoD Global Influenza Surveillance Program: Influenza Surveillance at AFIOH

Influenza-like Illness (ILI) Overview*

Page 4 — DoD Global Influenza Surveillance Program: Influenza Surveillance at AFIOH

Influenza Surveillance Questionnaire Overview

Page 5 — DoD Global Influenza Surveillance Program: Influenza Surveillance at AFIOH

DoD Global Influenza Surveillance Program Background

This program was established by the Global Emerging Infections Surveillance and Response System (GEIS) in 1997. The surveillance network includes the Air Force (global influenza surveillance established in 1976), the Navy (recruit adenovirus

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Active Duty Influenza Immunization Status

Immunization Data collected by AFCITA

Data Status as of: **23 Mar 2007 06:36**

Notes: # Required counts the active duty AF personnel assigned to each base - excluding IMAs; If someone is both a student and in a GSU, they are counted only once in the student category; # Current only considers shots given on or after 1 July 2006

		Regular					Student					GSU					Total				
MAJCOM	Base	Req	Imm	Exempt	Nbr Curr	% Curr	Req	Imm	Exempt	Nbr Curr	% Curr	Req	Imm	Exempt	Nbr Curr	% Curr	Req	Imm	Exempt	Nbr Curr	% Curr
ACC	BARK	5,332	5,296	17	5,313	99.6%	207	201	1	202	97.6%	130	118	0	118	90.8%	5,669	5,615	18	5,633	99.4%
ACC	BEAL	3,225	3,180	8	3,188	98.9%	16	16	0	16	100.0%	9	3	0	3	33.3%	3,250	3,199	8	3,207	98.7%
ACC	CANN	2,839	2,802	7	2,809	98.9%	16	13	0	13	81.3%	7	0	0	0	0.0%	2,862	2,815	7	2,822	98.6%
ACC	DAVI	5,950	5,855	11	5,866	98.6%	72	69	0	69	95.8%	305	241	0	241	79.0%	6,327	6,165	11	6,176	97.6%
ACC	DYES	4,863	4,744	11	4,755	97.8%	83	74	0	74	89.2%	327	183	0	183	56.0%	5,273	5,001	11	5,012	95.1%
ACC	ELLS	3,027	2,970	3	2,973	98.2%	16	14	0	14	87.5%	0	0	0	0		3,043	2,984	3	2,987	98.2%
ACC	HOLL	3,243	3,187	9	3,196	98.6%	7	7	0	7	100.0%	65	54	0	54	83.1%	3,315	3,248	9	3,257	98.3%
ACC	LANG	8,072	7,832	30	7,862	97.4%	71	41	0	41	57.7%	453	212	1	213	47.0%	8,596	8,085	31	8,116	94.4%
ACC	MEAD	2,088	2,045	10	2,055	98.4%	40	40	0	40	100.0%	24	16	0	16	66.7%	2,152	2,101	10	2,111	98.1%
ACC	MINO	4,425	4,377	17	4,394	99.3%	13	13	0	13	100.0%	0	0	0	0		4,438	4,390	17	4,407	99.3%
ACC	MOOD	3,367	3,312	10	3,322	98.7%	54	43	0	43	79.6%	94	69	0	69	73.4%	3,515	3,424	10	3,434	97.7%
ACC	MOUN	4,068	3,988	12	4,000	98.3%	11	11	0	11	100.0%	25	8	0	8	32.0%	4,104	4,007	12	4,019	97.9%
ACC	NELL	7,057	6,833	20	6,853	97.1%	49	39	0	39	79.6%	1,003	941	4	945	94.2%	8,109	7,813	24	7,837	96.6%
ACC	OFFU	5,646	5,503	7	5,510	97.6%	337	307	0	307	91.1%	116	69	0	69	59.5%	6,099	5,879	7	5,886	96.5%
ACC	SEYM	4,050	3,944	9	3,953	97.6%	125	97	0	97	77.6%	46	22	0	22	47.8%	4,221	4,063	9	4,072	96.5%
ACC	SHAW	4,850	4,779	8	4,787	98.7%	102	76	0	76	74.5%	999	921	3	924	92.5%	5,951	5,776	11	5,787	97.2%
ACC	WHIT	3,232	3,224	3	3,227	99.8%	116	115	0	115	99.1%	50	48	0	48	96.0%	3,398	3,387	3	3,390	99.8%
		75,334	73,871	192	74,063	98.3%	1,335	1,176	1	1,177	88.2%	3,653	2,905	8	2,913	79.7%	80,322	77,952	201	78,153	97.3%
AETC	ALTU	1,470	1,445	13	1,458	99.2%	131	131	0	131	100.0%	4	3	0	3	75.0%	1,605	1,579	13	1,592	99.2%
AETC	COLU	845	829	11	840	99.4%	429	419	0	419	97.7%	147	104	1	105	71.4%	1,421	1,352	12	1,364	96.0%
AETC	GOOD	1,139	1,123	4	1,127	98.9%	715	690	1	691	96.6%	85	35	2	37	43.5%	1,939	1,848	7	1,855	95.7%
AETC	KEES	2,806	2,772	26	2,798	99.7%	1,415	1,383	1	1,384	97.8%	57	34	1	35	61.4%	4,278	4,189	28	4,217	98.6%
AETC	LACK	8,388	8,118	26	8,144	97.1%	2,663	2,349	0	2,349	88.2%	434	295	5	300	69.1%	11,485	10,762	31	10,793	94.0%
AETC	LAUG	853	844	1	845	99.1%	493	489	1	490	99.4%	0	0	0	0		1,346	1,333	2	1,335	99.2%

Vaccine Coverage Overview

- **Period of Review:**

  01 October 2006 – 13 April 2007

- **Fully Vaccinated**

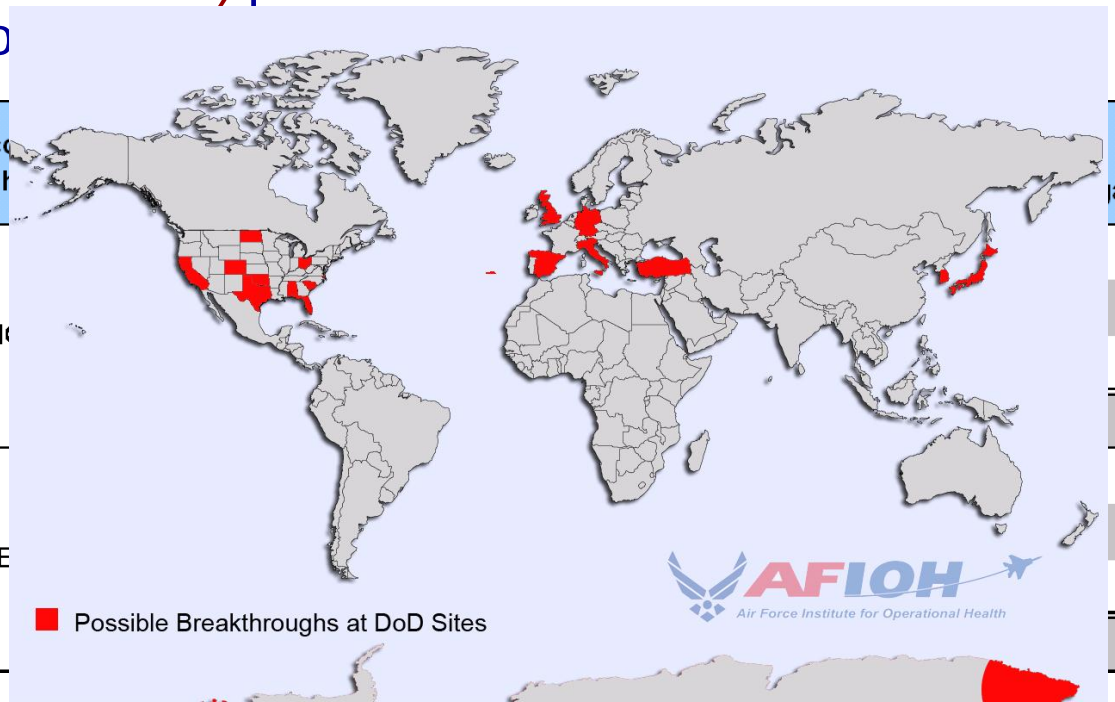
  Vaccination date >14 days prior to clinic visit date

  - Patients with vaccination date prior to August classified as unvaccinated
  - Vaccination data gathered from Defense Enrollment Eligibility Reporting System (DEERS) and Influenza surveillance questionnaire

Vaccine Coverage Overview

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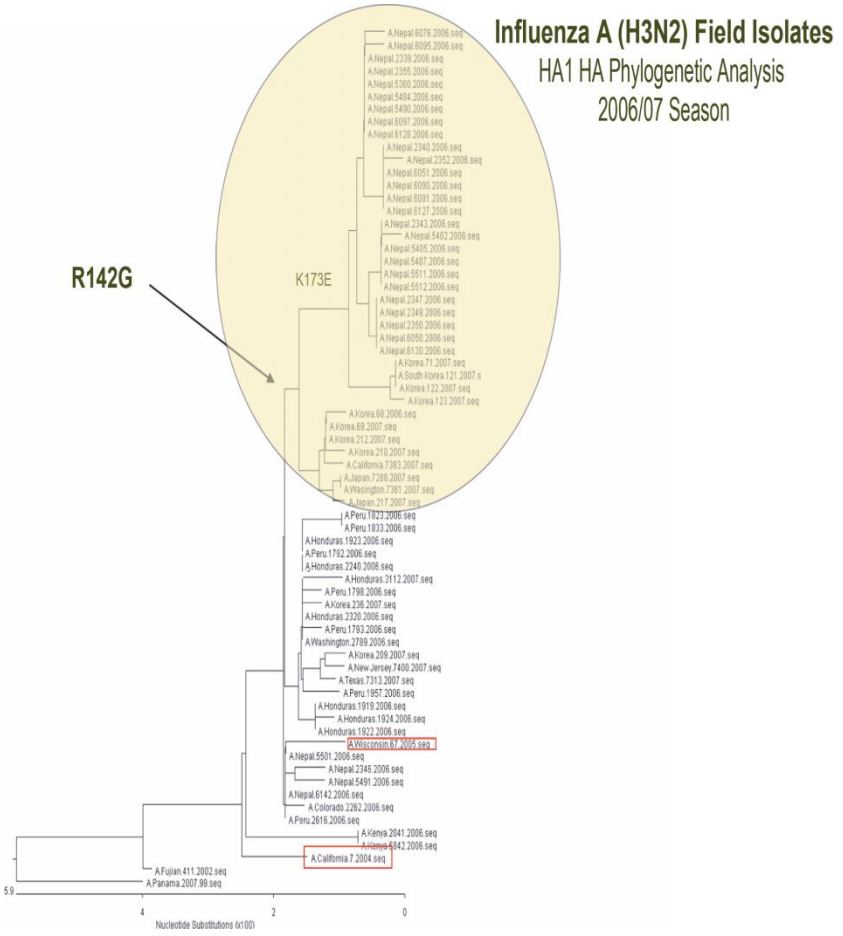
- Culture and/or PCR-confirmed influenza was observed in 19.4% (540 of 2,784) of the total respiratory samples submitted.
- Of these, 21.7% (117 of 540) had history of influenza vaccination during the 2006-2007 season.
- 64.1% (75 of 117) patients received the vaccine >14 days prior to the co



Vacc Breakth	ata	Total
N		34
		3
		5
		42
YE		29
		34
		12
		75

Vaccine Coverage Overview

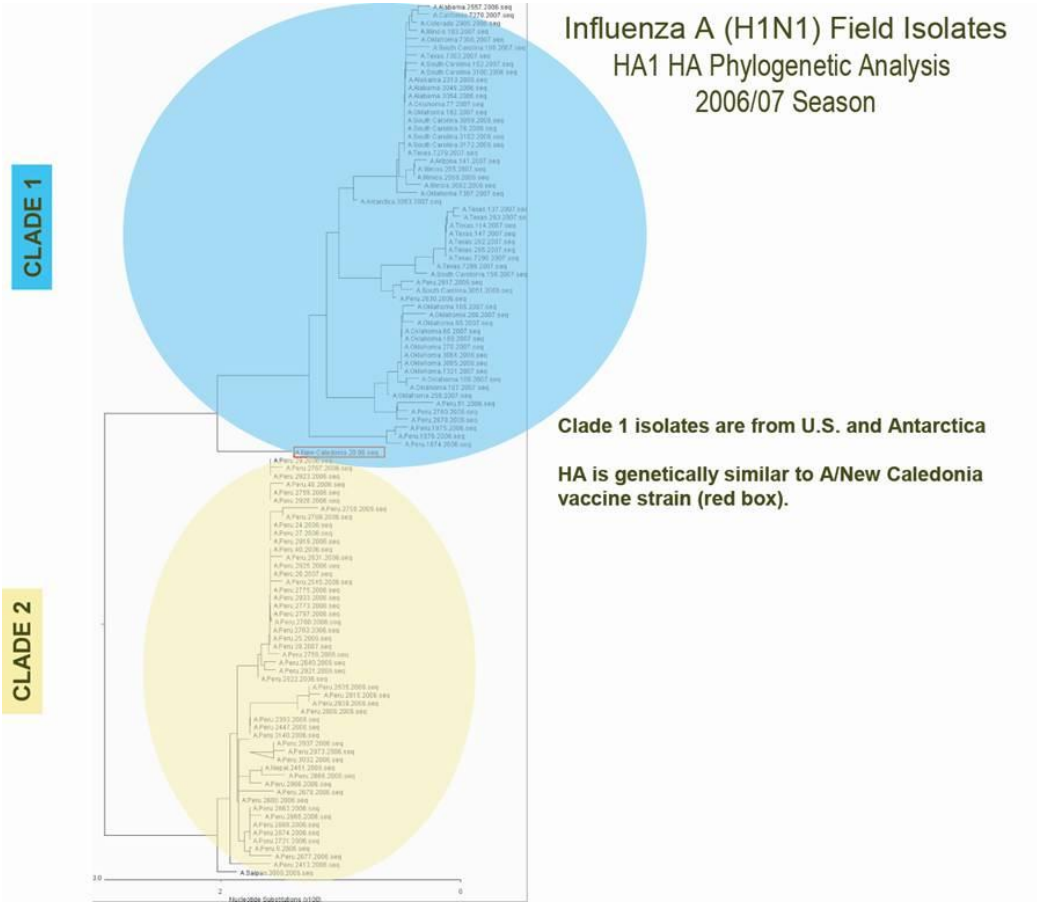
- Key influenza A/H3 isolates exhibited a R142G mutation, which has been characterized as a potential key contributor to the antigenicity of these strains.
- A small percentage of the isolates conferred mutations at several other of the reported antigenic sites.



Vaccine Coverage Overview

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Based on sequence analysis, a vast majority of the A/H1 isolates were homologous to the vaccine's New Caledonia component. However, there were a few divergent strains (Clade 2-like). Isolates from Clade 2 were obtained from CONUS.



Vaccine Coverage Overview

- **Conclusions**:

  Of patients participating in the DoD Influenza Surveillance Program, 64% who had a history of influenza vaccination contracted an influenza infection >14 days post-vaccination.

  Numerous influenza A isolates appeared to show certain genetic changes.

  These changes have been of interest to the Centers for Disease Control and Prevention, where further characterization showed reduced hemagglutinin inhibition titers in some isolates.

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Future

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- **Molecular Characterization**
  - ID Tag (Luminex)
  - Neuraminidase sequencing
    - Potential antiviral resistance characterization
  - Hemagglutinin inhibition

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Collaborators

PREVENT ANALYZE RESPOND AFIOH

Global Emerging Infections Surveillance and Response System (GEIS)

Naval Health Research Center (NHRC)

Armed Forces Research Institute for Medical Sciences (AFRIMS)

Naval Medical Research Center-Detachment (NMRC-D)

US Army Medical Research Unit-Kenya (USAMRU-K)

Center for Health Promotion and Preventive Medicine-West (CHPPM-W)

Health Affairs

Combatant Commands (COCOM)

Military Surveillance sites

Centers for Disease Control and Prevention (CDC)

World Health Organization (WHO)

AFIOH Contacts

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