Announcements

- Register for the Epi-Tech Trainings:
  1. Log-on or Request log-on ID/password: https://tiny.army.mil/r/zB8A/CME
  2. Register for Epi-Tech Surveillance Training: https://tiny.army.mil/r/4TgNE/EpiTechFY17

- Please enter your name/service and e-mail into the chat box to the left or email the disease epidemiology program at: usarmy.apg.medcom-phc.mbx.disease-epidemiologyprogram13@mail.mil
  - You will receive a confirmation email within the next 48 hours with your attendance record

- Please mute your phones and DO NOT place us on hold. Press *6 to mute/unmute your phone.
Influenza in the DoD

Defense Health Agency, Public Health Division, Armed Forces Health Surveillance Branch, AF Satellite and USAF School of Aerospace Medicine, Department of Public Health
Presented by: DoD Global Respiratory Pathogen Surveillance Program
Lt Col Federinko, MD, MPH; Lisa Shoubaki, MPH; Gregory Wolff, MPH
DSN: 798-3196 (Comm: 937 938-3196)
26 September 2017
Clinical Information

- Symptoms - Fever, cough, sore throat, runny nose, headache, fatigue, and body aches
- Spread by droplets or touching contaminated surfaces
- Incubation period is 1-4 days (2 days on average)
- Severity depends on flu virus, vaccination status, and health status
- Recovery: few days to two weeks (1 week on average)
Subtypes and Strains

• Evolves rapidly
  • Responsible for most epidemics and all pandemics
• Divided into subtypes based on surface proteins:
  • Hemagglutinin (HA)
  • Neuraminidase (NA)
• Immunity-related changes
  • Changes to regions of the HA surface protein (called antigenic shift & drift) can affect human antibody responses to the virus

• Gradually changing virus
  • Can cause epidemics but Pandemics do not occur
• Classified by strains based on their lineage:
  • Yamagata
  • Victoria
• Only known to infect humans

Influenza A

Influenza B
• Small gradual changes that occur over time and create a new strain that may not be recognized by immune system

• Reason that new influenza vaccine is manufactured/distributed each year

USAFSAM monitors these changes through molecular sequencing

• Abrupt major change that produces a novel virus (Not previously encountered in humans)

• Caused by direct animal-to-human transmission or mixing of human and animal genes within the same individual or animal
Vaccine Effectiveness (VE) 2016-2017 season

- Population: DoD healthcare beneficiaries (excluding Active Duty members)
- Analyses by influenza type and subtype and beneficiary group (children, adults)
- Cases: confirmed by RT-PCR, viral culture, or FilmArray®

- Controls: test-negative for influenza
- Odds ratio (OR) and 95% confidence intervals (CI) were calculated using multivariable logistic regression adjusted for age, month of illness, and region
  - VE= (1-OR) x 100%

<table>
<thead>
<tr>
<th>Flu Type</th>
<th>Population</th>
<th>Cases</th>
<th>Controls</th>
<th>VE [95% CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>Children</td>
<td>703</td>
<td>822</td>
<td>51 [39, 61]</td>
</tr>
<tr>
<td>Overall</td>
<td>Adults/Retirees</td>
<td>366</td>
<td>452</td>
<td>42 [22, 56]</td>
</tr>
<tr>
<td>Overall</td>
<td>All Dependents</td>
<td>1069</td>
<td>1274</td>
<td>47 [37, 56]</td>
</tr>
<tr>
<td>Influenza A(H3N2)</td>
<td>All Dependents</td>
<td>769</td>
<td>1274</td>
<td>45 [33, 54]</td>
</tr>
<tr>
<td>Influenza B</td>
<td>All Dependents</td>
<td>290</td>
<td>1274</td>
<td>55 [39, 66]</td>
</tr>
</tbody>
</table>
Recommended 2017-2018 Northern Hemisphere influenza vaccine:

**Trivalent (three strains):**
- *A/Michigan/45/2015 2009 H1N1-like virus*
- A/Hong Kong/4801/2014 H3N2-like virus
- B/Brisbane/60/2008-like virus (B/Victoria lineage)

**Quadrivalent (four strains):**
- B/Phuket/3073/2013-like virus (B/Yamagata lineage)

*Switched from 2016-17 to 2017-18 in the Trivalent vaccine*
Respiratory Highlights of 2016-2017

- Outbreak of avian lineage influenza A H7N2 among cats in an animal shelter in New York City in December 2016
  - One person was infected during prolonged unprotected exposure to the respiratory secretions of infected cats
  - No person-to-person spread of the virus was identified
- Highly pathogenic avian influenza (HPAI) A (H5N1) in U.S.
  - Occurs mainly in birds and is highly contagious among birds
  - HPAI detected for the first time this year in Tennessee in March
  - 700 birds died from the avian flu and 72,800 were destroyed
  - Severe economic losses for the agricultural industry
- Eleven human infections with novel influenza A in Ohio from swine at fair
  - These cases brought the total number of H3N2v infections during 2017 to 12
  - No Hospitalizations
Acute Respiratory Diseases accounts for 25% to 30% of infectious disease-related hospitalizations

Increased risk of spreading a respiratory pathogens through global travel

Training environments are well suited for the spread of emerging respiratory pathogens

Increased risk of novel respiratory diseases in deployed settings

“The flu is very unpredictable when it begins and in how it takes off” – Harvey V. Fineberg
“A reportable event may represent an inherent, significant threat to public health and military operation. These events have the potential to affect large numbers of people, to be widely transmitted within a population, to have severe/life threatening clinical manifestations, and to disrupt military training and deployment. Timely accurate reporting of probable, suspected or confirmed cases ensures proper identification, treatment, control, and follow-up of cases”

- AFI 48-105, DA PAM 40-11 & AR 40-50, BUMED INST 6220.12C

- DRSi
  - Web-based application
  - Identify, collect, document, manage, and track information on RMEs
  - Completeness/timeliness of data is user-driven
2017 Influenza Case Definition for reporting

<table>
<thead>
<tr>
<th>Influenza-associated Hospitalization</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Criteria</strong></td>
</tr>
<tr>
<td>Included population</td>
</tr>
<tr>
<td>&lt; 65 years of age</td>
</tr>
<tr>
<td>Anything beneficiary type/mandate status</td>
</tr>
<tr>
<td>Patient status</td>
</tr>
<tr>
<td>Influenza-associated hospitalization</td>
</tr>
<tr>
<td>Fever ≥ 100.5°F with cough or sore throat in absence of other diagnosis</td>
</tr>
<tr>
<td>Laboratory</td>
</tr>
<tr>
<td>Positive confirmatory test (culture, DFA, IFA, rapid, PCR)</td>
</tr>
<tr>
<td>AND</td>
</tr>
<tr>
<td>-Hospital admission date was ≤ 14 days after a positive influenza test or</td>
</tr>
<tr>
<td>-Hospital admission date was ≤ 3 days before a positive influenza test</td>
</tr>
</tbody>
</table>

**Case Classification**

<table>
<thead>
<tr>
<th>Confirmed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meet population and patient status criteria with positive confirmatory lab test</td>
</tr>
</tbody>
</table>

**Notes**

For all confirmed cases, a nasal wash specimen should be submitted to an appropriate lab for further influenza lab testing (i.e. sequencing)
• Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE)
  • Designed by Johns Hopkins University Applied Physics Laboratory and DoD
  • Internet-based syndromic disease surveillance system
  • Used by DoD and many civilian health departments
• Useful for early detection with maximum sensitivity
  • Often at the cost of specificity (false alerts)
ILI Syndromic Surveillance

- ILI
  - Includes ICD and Chief Complaint data
- Influenza Specific
  - Influenza specific ICD codes only
- For more information on ESSENCE, please refer to
  - ESSENCE
Service Specific Influenza Surveillance
Air Force Influenza Surveillance Activities

DoD Global, Respiratory Pathogen Surveillance Program

Air Force: Instruction 48-105, Surveillance, Prevention, and Control of Diseases and Conditions of Public Health or Military Significance (15 July 2014)


Navy and Marine Corps: BUMED POLICY Aug 2015, Policy for Influenza Vaccine Use for the 2015-2016 Influenza Season, and BUMEDINST 6230.15B Immunization for the Prevention of Infectious Disease
CONUS Sites: 46
- Air Force: 31
- Army: 8
- Navy & Marine Corps: 4
- Coast Guard: 2
- DHA: 1

OCONUS Sites: 33
- Air Force: 17
- Army: 8
- Navy & Marine Corps: 7
- Coast Guard: 1
Types of tests performed

1. **Multiplex PCR using a Respiratory Pathogen Panel**
   - Detects up to 20 respiratory pathogens
   - Higher throughput of all respiratory pathogens, 96 specimens in 5 hours

2. **Next Generation Sequencing**
   - Whole genome sequencing
   - Higher throughput & low turnaround time

3. **Viral culture (up to 10 days for negative result)**
   - Detects flu and other respiratory viruses

4. **Influenza A/B and subtyping PCR**
   - CDC assay

* New testing capabilities for 2017-18 season
Surveillance Process and Vaccine Development

Sentinel Sites

Participating Non-Sentinel Sites

National Respiratory & Enteric Virus Surveillance System Labs (U.S.)

WHO Influenza Labs

DoD System

Civilian System

DoD Influenza Surveillance

CDC/Viral Surveillance

*FDA’s VRBPAC annual flu vaccine strain selection

*Food and Drug Administration (FDA), Vaccines and Related Biological Products Advisory Committee (VRBPAC)
Navy Influenza Surveillance Activities

- Participate in USAFSAM sentinel surveillance program
- Shipboard and Recruit ILI surveillance
  - Fleet Disease and Injury Surveillance (D&I)
  - Naval Health Research Center (NHRC) FRI program
  - Navy Environmental Preventive Medicine Unit (NEPMU) ILI project
- NMCPHC Epi Data Center Weekly Influenza Situation Reports
- NMCPHC Influenza Advisory
  - Guidance on surveillance and reporting for local medical departments
Navy Influenza Surveillance Activities

• Fleet D&I Surveillance
  • Tracking of electronic AHLTA-T/SAMS encounters in TMDS data
    • Develop D&I report, including Fever and Respiratory categories
    • Identify ships having increased illness and reach out to them
    • Work to improve compliance
  • Units who wish to continue to report via xls spreadsheet - templates and reporting guidance can be found at: website http://www.med.navy.mil/sites/nmcphc/program-and-policy-support/disease-and-injury-reports
Navy Influenza Surveillance Activities

• NHRC FRI program
  • Includes recruit training centers and participating ships
  • Describe circulating respiratory pathogens, including influenza
  • Identify pathogens in support of outbreaks
  • Contributes to FDA’s VRBPAC discussion for development of next year’s influenza vaccine
  • Contact NHRC at usn.point-loma.navhlthrschcensan.list.nhrc-fri-surveillance@mail.mil for more information and to receive routine reports

• Regional NEPMU ILI project – target smaller vessels
• Can describe ILI outbreaks, anticipate duration of illness, describe extent of outbreak, and identify patterns to curtail disease spread
Navy Influenza Surveillance Activities

• Weekly SITREP including:
  – Vaccination rates
  – Overall flu burden
  – Active Duty/recruit burden
  – Description of hospitalized and outpatient cases and trends
  – Noteworthy information in the open source media

• Other reports to track vaccine use and disease burden for BUMED

• To access the SITREP: https://www.med.navy.mil/sites/nmcphec/epi-data-center/influenza/Pages/default.aspx

• For more information, email: usn.hampton-roads.navmcpubhlthcenpors.list.nmcphec-epi@mail.mil
NMCPHC Seasonal Influenza Advisory:
- Navy flu reporting requirements in DRSi
- Surveillance recommendations for upcoming season including syndromic surveillance using ESSENCE or D&I processes
- Contact area NEPMU for outbreak investigation, risk assessment, and lab testing support
- [http://www.med.navy.mil/sites/nmcphc/program-and-policy-support/Pages/Influenza.aspx](http://www.med.navy.mil/sites/nmcphc/program-and-policy-support/Pages/Influenza.aspx) for more information
Army Influenza Surveillance

- Uses a combination of CHCS Ad Hoc Reporting, DRSi and ESSENCE
- CHCS flat files are sent from each Army lab on a weekly basis to APHC containing all positive and negative results of PCRs, cultures and rapid antigen testing
- Army influenza reports can be found at:
Resources

USAFSAM/PHR Epidemiology Consult Service: Influenza Surveillance
https://gumbo2.area52.afnoapps.usaf.mil/epi-consult/influenza/

Navy and Marine Corps Public Health Center: Influenza homepage
http://www.med.navy.mil/sites/nmcphc/program-and-policy-support/Pages/Influenza.aspx

Navy and Marine Corps Weekly Influenza SITREP

Army Public Health Center: Influenza Reports
https://tiny.army.mil/r/GwOFk/APHCInfluenzaReport

DHA Public Health Division, Immunization Healthcare Branch, Influenza – Seasonal vaccine information:
http://www.vaccines.mil/Influenza_-_Seasonal

FLU.GOV “Know what to do about the flu”
http://www.flu.gov/

CDC Influenza Home Page
http://www.cdc.gov/flu/

WHO Global Influenza Surveillance Network: Manual for the laboratory diagnosis and virological surveillance of influenza
Contact Information

**Army:** APHC – Disease Epidemiology Program
Aberdeen Proving Ground – MD
Comm: (410) 436-7605  DSN: 584-7605
usarmy.apg.medcom-aphc.mbx.disease-epidemiologyprogram13@mail.mil

**Navy:** Contact your cognizant NEPMU
NEPMU2: COMM: (757) 950-6600; DSN: (312) 377-6600
Email: usn.hampton-roads.navhospporsva.list.nepmu2norfolk-threatassess@mail.mil
NEPMU5: COMM: (619) 556-7070; DSN (312) 526-7070
Email: usn.san-diego.navenpvntmedufive.list.nepmu5-health-surveillance@mail.mil
NEPMU6: COMM: (808) 471-0237; DSN: (315) 471-0237
Email: usn.jbphh.navenpvntmedusixhi.list.nepmu6@mail.mil
Email: NEPMU7@eu.navy.mil

**Air Force:** Contact your MAJCOM PH or USAFSAM/PHR
USAFSAM / PHR / Epidemiology Consult Service
Wright-Patterson AFB, Ohio
Comm: (937) 938-3207  DSN: 798-3207
episervices@us.af.mil
QUESTIONS?