FY18 Epi-Tech Surveillance Training

Sunday, October 01, 2017 - Sunday, September 30, 2018
DCS, APG, MD

Provided By
U.S. Army Medical Command

Activity ID	Course Director	CME Planner
2017-1636	John Ambrose	Mimi C. Eng

Accreditation Statement
This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of U.S. Army Medical Command and ARMY PUBLIC HEALTH CENTER. The U.S. Army Medical Command is accredited by the ACCME to provide continuing medical education for physicians.

Credit Designation
The U.S. Army Medical Command designates this Live Activity for a maximum of 5 *AMA PRA Category 1 Credit (s)*^{TM}. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Statement of Need/Gap Analysis

The purpose of this CME activity is to address the identified gap(s):

1. Surveillance techniques - Surveillance of common communicable diseases continues to be a problem among local MTFs. In fact, cases of campylobacter were not investigated in 2015 for PACOM MTFS, while 2016 cases of salmonella were not investigated. Civilian public health agencies are required to conduct investigations into all reportable medical events. However, DoD facilities often do not take initiative to conduct this investigation.
2. Disease identification - verification of disease by established case definitions have been utilized by the local health departments, Centers for Disease Control and Prevention, World Health Organization, and the Department of Defense. With the every changing list of reportable medical events and new emerging infections, case definitions change rapidly. Army epidemiologist conduct verification studies that monitor the efficiency of reporting by local public health experts and have concluded that completeness percentages for reportable medical events range as low as 35% for select diseases.
3. Outbreak reporting - Recent evidence have demonstrated that outbreak reporting and communication between public health agencies is poor. In fact, the Army failed to report six outbreaks in the DRSi between June 2016 and September 2016.

Learning Objectives

1. Based on case presentation, enhance your ability to improve case finding and surveillance practices within your local MTF.

Target Audience / Scope of Practice

Target Audience:	The intended audience for this educational activity includes preventive medicine physicians, community health nurses, public health nurses, and epidemiology technicians.
Scope of Practice:	This activity will improve the performance of preventive medicine personnel who conduct surveillance activities in inpatient and outpatient settings.

Disclosure of Faculty/Committee Member Relationships

It is the policy of the U.S. Army Medical Command that all CME planning committee/faculty/authors disclose relationships with commercial entities upon invitation of participation. Disclosure documents are reviewed for potential conflicts of interest and, if identified, they are resolved prior to confirmation of participation.

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Federinko, Susan	- No information to disclose.
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Committee Members	
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Gibson, Kelly	- No information to disclose.
Graham-glover, Bria	- No information to disclose.
Holbrook, Victoria	- No information to disclose.
Riegodedios, Asha	- No information to disclose.
Rudiger, Courtney	- No information to disclose.

Acknowledgement of Commercial Support

There is no commercial support associated with this educational activity.

Announcements

- **All participants MUST register for the Monthly Disease Surveillance Trainings:**
  - Log-on or request log-on ID/password: https://tiny.army.mil/r/zB8A/CME
  - Register at: https://tiny.army.mil/r/EQk1/EpiTechFY19
- **Confirm attendance:**
  - Enter your full name/location/email into the DCS chat box to the right or email your service hub
  - If you are attending as a group, please list all attendees
  - You will receive a confirmation email within 48 hours with your attendance record; if you do not receive this email, please contact your service hub
- **Reminder:**
  - Mute your phones by pressing the mute button or pressing *6
  - DO NOT press the “hold” button as the rest of the conference will hear the hold music
- **Contact:**
  - Communicate with your service hub to ensure you get information on future trainings and past recordings

Influenza and 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 (DoDGRS)
Lt Col Robbins, MD, MPH; Jeffrey Thervil, MPH; Gregory Wolff, MPH; Geeta Kersellius, MPH, MBS
DSN: 798-3196 (Comm: 937 938-3196)
24 September 2019

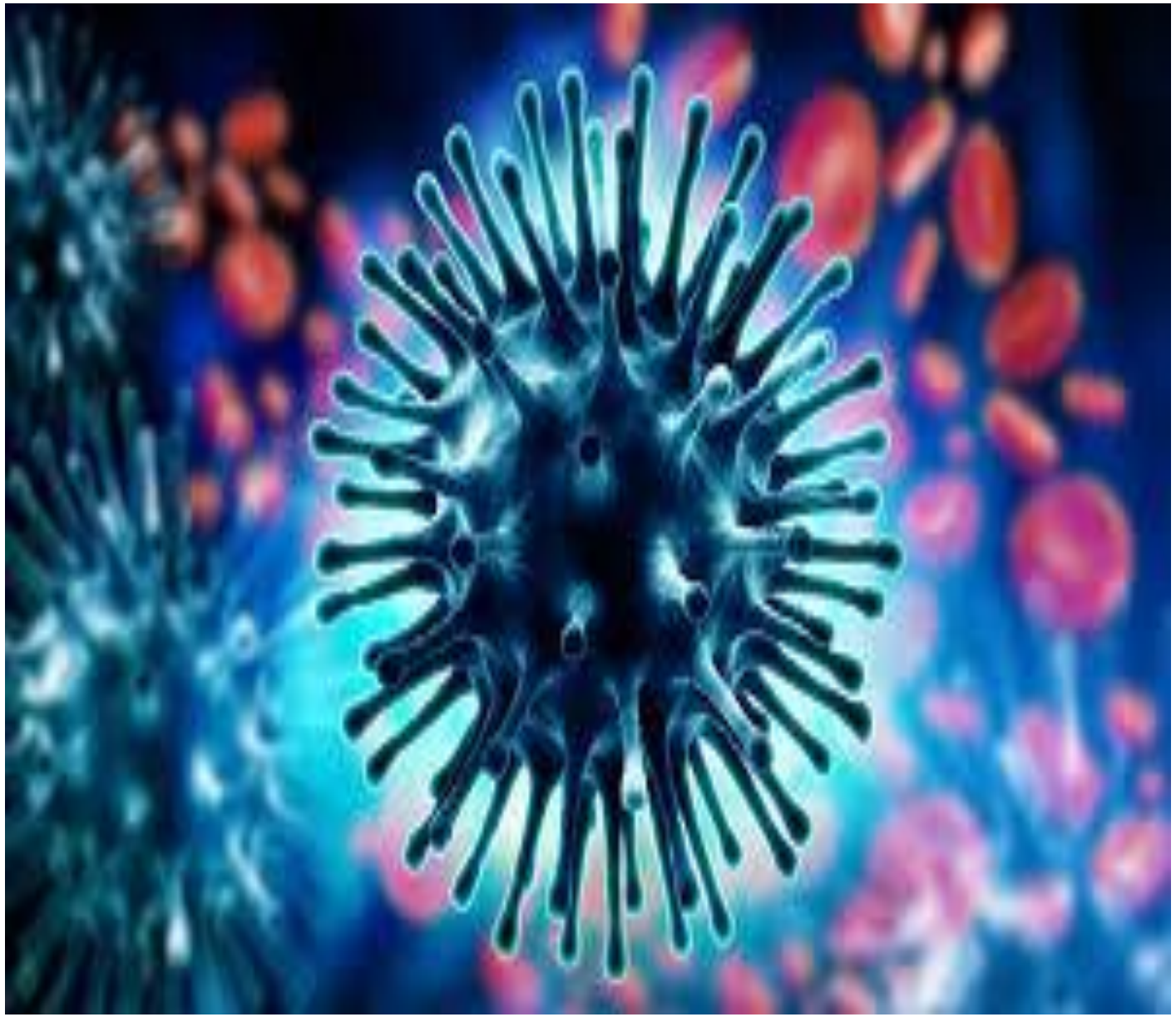
Outline

1. **Influenza Background**
   a. Influenza Characteristics
   b. Subtypes and Strains
   c. Antigenic Drift/Shift
   d. Influenza Vaccine
2. **Military Impact**
   a. Historical Impact on the Military
   b. Military Connection to Pandemics
   c. Military Environment & Flu
   d. DoD 2018-2019 Influenza Vaccine Effectiveness (VE)
3. **Lab Testing and Surveillance**
   a. Laboratory Testing Capabilities
   b. Surveillance Programs
   c. Surveillance Coverage Maps
   d. Surveillance Process and Vaccine Development

Learning Objectives

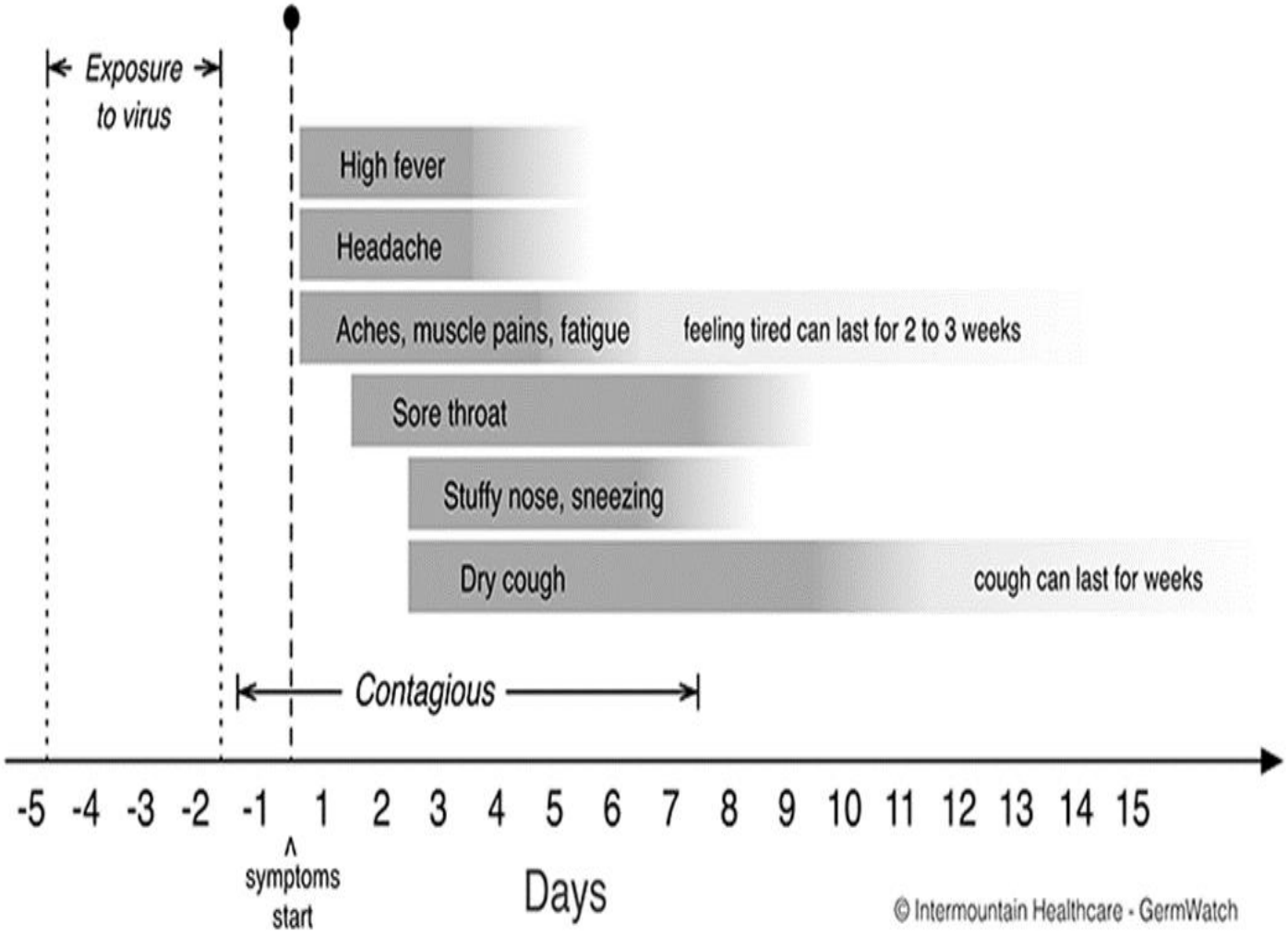
1. Recognize influenza characteristics, define influenza subtypes and strains, explain antigenic changes, define the components of the influenza vaccine, and increase knowledge to improve influenza prevention and mitigation strategies.
2. Discuss the impact of influenza on the DoD and describe the past, present, and future military connection to influenza which directly impacts force health protection and readiness
3. List influenza testing and reporting capabilities available in the military, recognize the importance of global influenza surveillance, and explain influenza surveillance at the local level, increasing awareness, participation, and collaboration for influenza surveillance between DoD public health partners

1. Influenza Background



1a. Influenza Characteristics

Infection Timeline

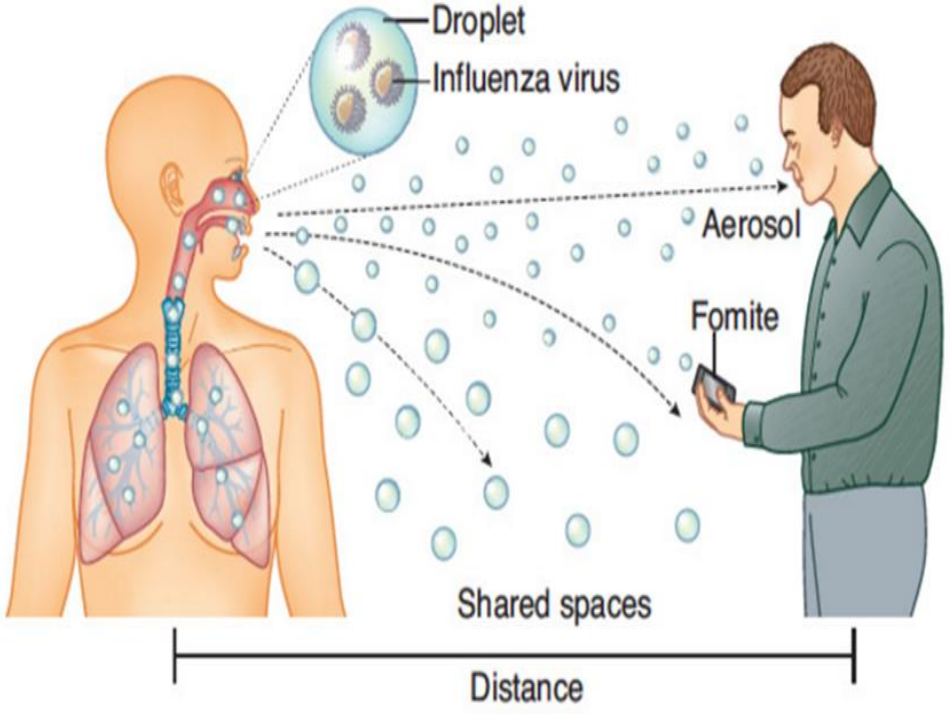


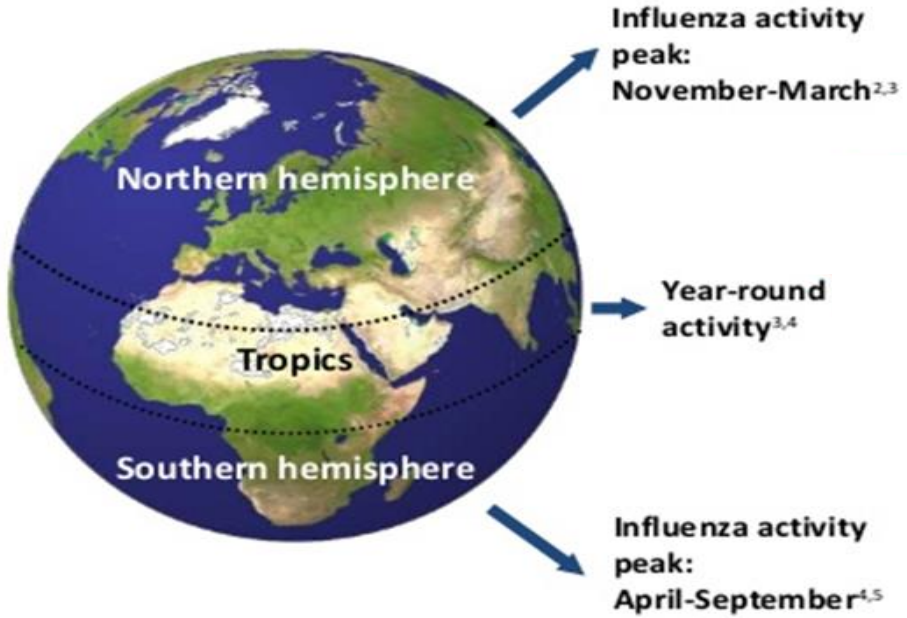
Severity Factors

- Age
- Health
- Vaccination Status
- Prior Exposure
- Specific Virus Strain
- Pregnancy

1a. Influenza Characteristics

Global cycle of avian influenza viruses in animals.





1b. Subtypes and Strains

Influenza Strains (A, B, C, D)

Influenza A

-Multiple Species

-Pandemics

Hemagglutinin

Subtypes

Neuraminidase

Influenza B

-Humans & Seals

-No Pandemics

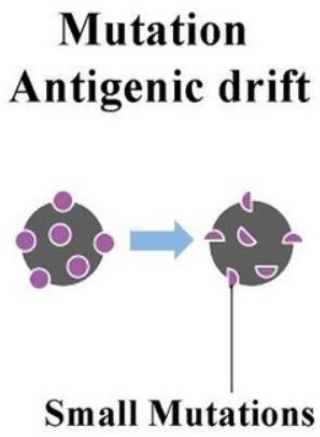
Victoria

Lineages

Yamagata

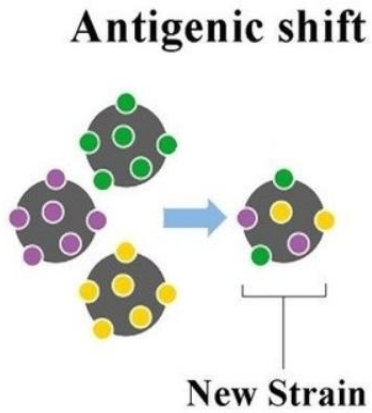
1c. Antigenic Drift/Shift

Antigenic Drift



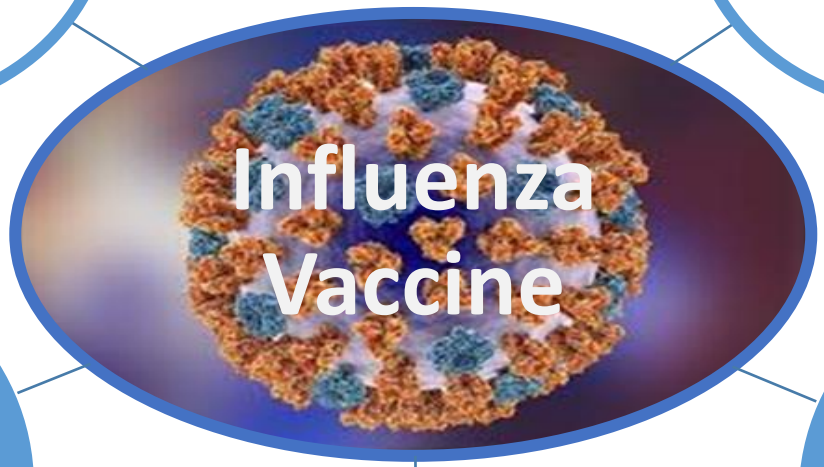
- Small gradual changes that occur over time and create a new strain that may not be recognized by immune system
- New influenza vaccine is manufactured & distributed each year

Antigenic Shift



- Abrupt major change that produces a novel virus (not previously encountered in humans)
- Direct animal-to-human transmission or mixing of human and animal genes

1d. Influenza Vaccine



Helps protect against influenza by triggering immune response

Immunity takes about two weeks to develop

Influenza vaccine cannot give you influenza

Can reduce the risk of medically attended influenza by approximately 40-60%

Recommended that anyone over six months be vaccinated

1d. Influenza Vaccine

Food and Drug Administration (FDA) Vaccine and Related Biological Products Advisory Committee (VRBPAC)

Recommended 2019-2020 Northern Hemisphere influenza vaccine:

Trivalent (three strains)

- *A/Brisbane/02/2018 2009 H1N1-like virus
- *A/Kansas/14/2017 H3N2-like virus
- B/Colorado/06/2017-like virus (B/Victoria lineage)

Quadrivalent (four strains)**

- B/Phuket/3073/2013-like virus (B/Yamagata lineage)

*Vaccine components from 2018-19 changed for the 2019-2020 vaccine

**Includes three strains in the 2019-2020 Trivalent vaccine

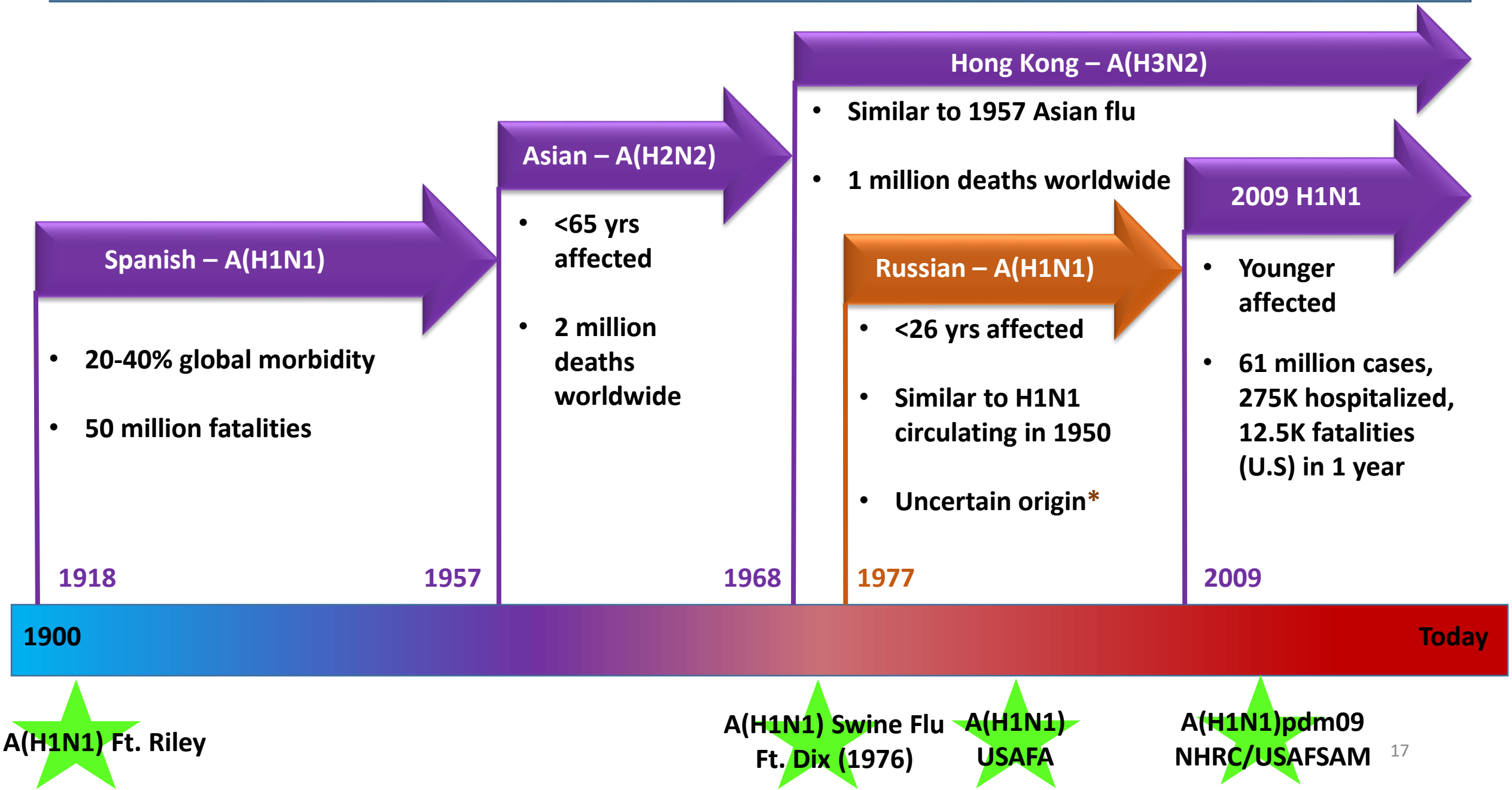
2. Military Impact

2a. Historical Impact on the Military

- War and disease are linked all throughout history:
  - For every soldier that was killed in the US Civil War, two died of disease
  - The Conquistadores brought diseases that devastated the New World, such as smallpox and syphilis
  - Typhus plagued Napoleon's armies
  - Of 171,000 US military personnel of the Spanish-American War, 20,700 contracted typhoid fever and more than 1,500 died
- **1918 Spanish Influenza**
  - 500 million infections and 50-100 million deaths (more than all the combat deaths in WWI from 1914-1918)
  - During Sept – Nov 1918, 20-40% of US Army and Navy personnel contracted influenza or pneumonia
  - High morbidity interfered with training and induction schedules in the US and left hundreds of thousands of military personnel non-effective
  - More American soldiers and sailors were killed by influenza and pneumonia than by enemy weapons in WWI

- (Source: Office of the Historian and Navy Medicine Magazine; Byerly, CR. The US Military and the Influenza Pandemic of 1918-1919. Public Health Reports 2010; 125(Suppl 3)).

2b. Military Connection to Pandemics

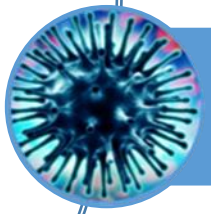


2c. Military Environment & Flu

“The flu is very unpredictable when it begins and in how it takes off” – Harvey V. Fineberg

Potentially significant breakthrough cases for highly vaccinated population

Increased risk of spreading respiratory pathogens through global travel



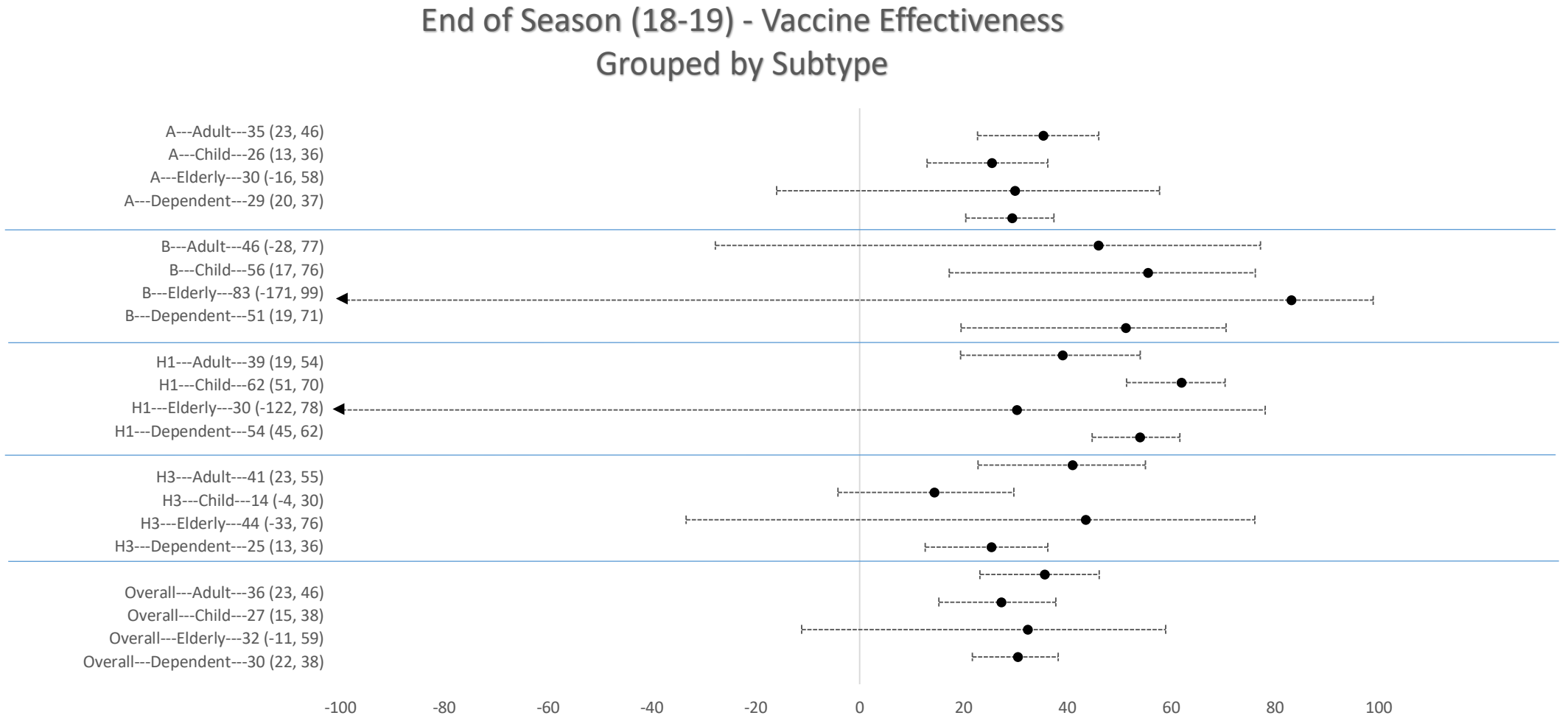
Training environments and deployed settings increase the risk and are well suited for the spread of emerging and novel respiratory pathogens

Surveillance network covers areas not monitored by CDC and WHO

2d. Vaccine Effectiveness (VE) 2018-2019 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 multiplex respiratory panel
- Controls: test-negative for influenza
- Odds ratio (OR) and 95% confidence intervals (CI) were calculated using multivariable logistic regression adjusted for age group, month of collection, sex and geographic location
    - VE= (1-OR) x 100%

2d. AFHSB-AF Satellite end of season influenza vaccine effectiveness (VE) estimates, 2018-2019



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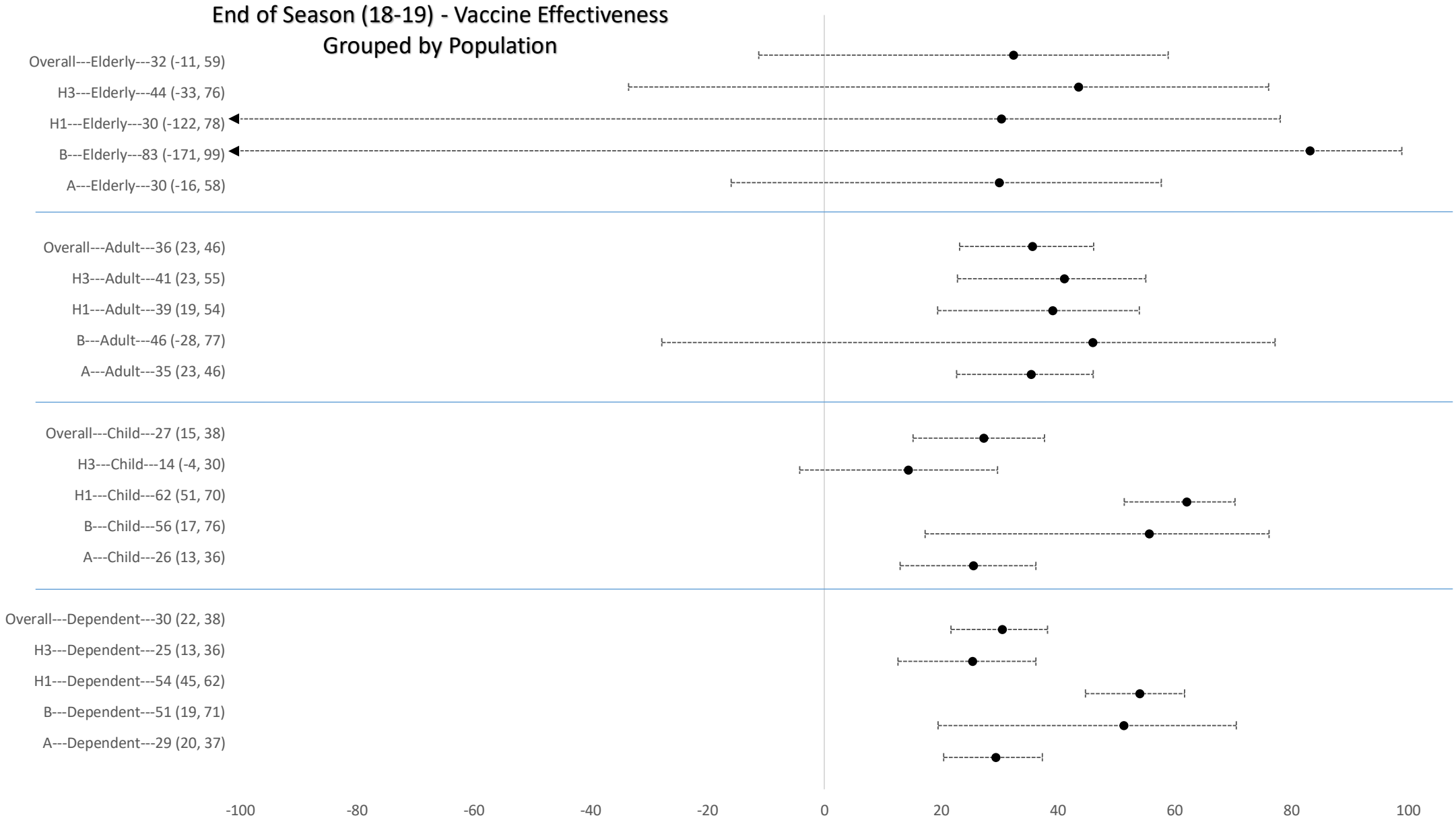


3. Laboratory Testing Capabilities

3a. Laboratory Testing Capabilities

Tests performed by AFHSB-AF Satellite

1. Multiplex PCR using a Respiratory Pathogen Panel
   - Detects up to 20 respiratory pathogens
   - Higher throughput of all respiratory pathogens, 96 specimens
2. Viral culture (up to 10 days for negative result)
   - Detects flu and other respiratory viruses
3. Next Generation Sequencing
   - Higher throughput & low turnaround time
4. Influenza A/B and subtyping PCR
   - CDC assay for additional classification

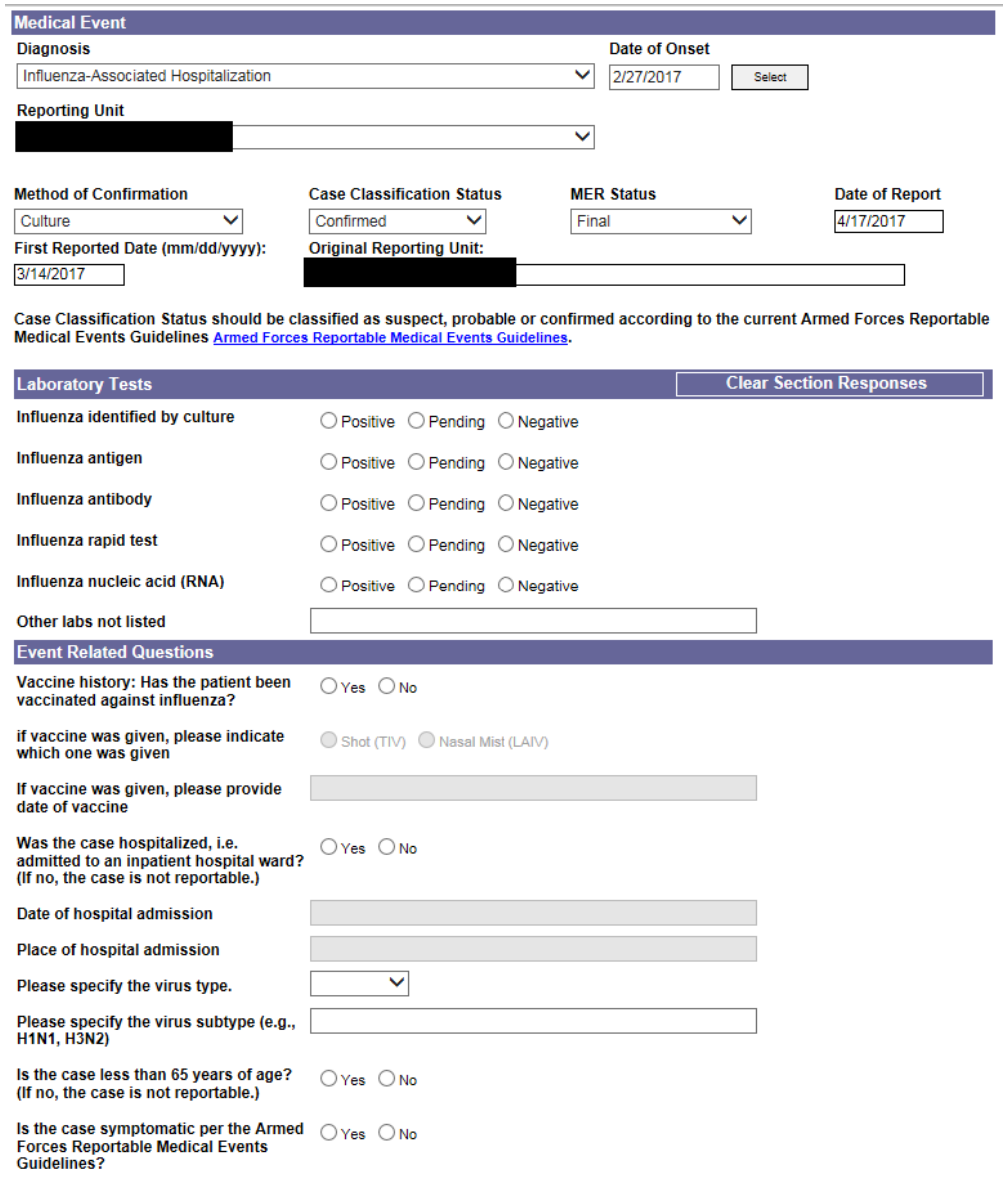
Tests performed by other sites

- Rapid Antigen Testing Assay
- FilmArray Respiratory Panel
- Immunofluorescence Antigen Assay
- Direct fluorescence Antigen Assay

3b. Reportable Medical Events (RMEs)

- "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



3b. 2017 Influenza-Associated Hospitalization Case Definition for Reporting

Background

Causative Agent	Influenza virus
Travel Risks	Present worldwide
Clinical Description	An acute viral disease of the respiratory tract characterized by fever, chills, cough, sore throat, runny or stuffy nose, muscle or body aches, headache, and fatigue.

Case Classification

Confirmed:

A case that meets the clinical description as described above with **ALL** of the following:

- Younger than 65 years of age and
- Any positive influenza laboratory test (example: culture, DFA, IFA, rapid, PCR)

AND

- Hospital admission date was ≤ 14 days *after* a positive influenza test or
- Hospital admission date was ≤ 3 days *before* a positive influenza test

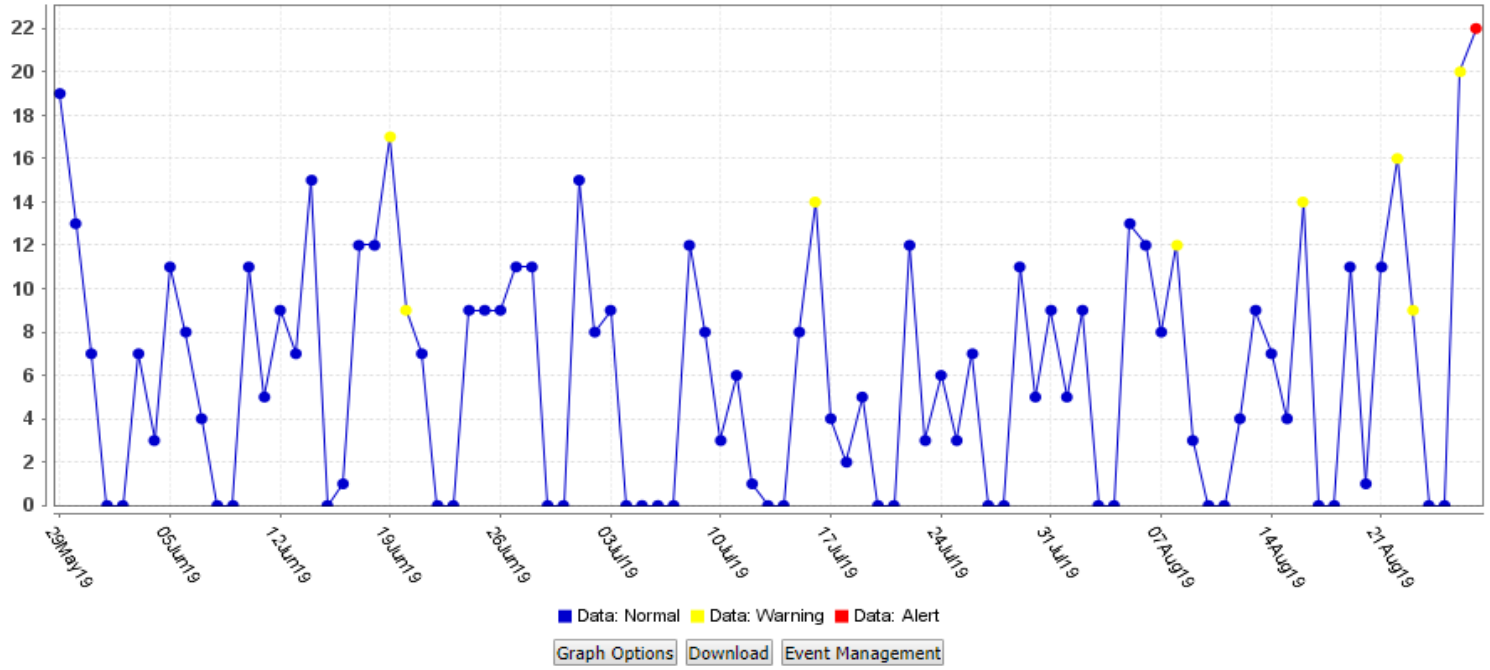
Critical Reporting Elements

Specify the virus type (A or B) and subtype (example: H3N2, H1N1) if available.

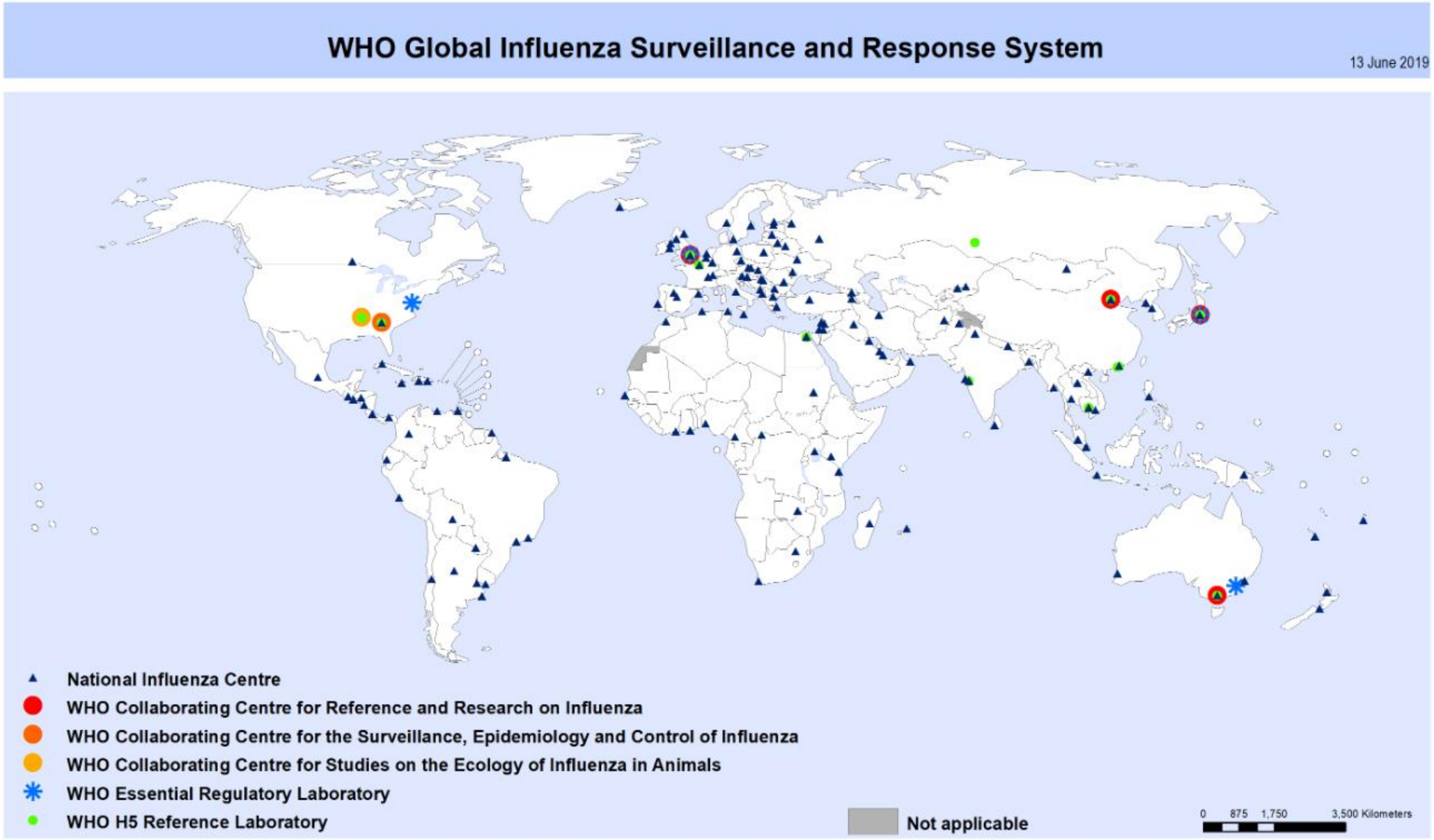
Note the patient's influenza immunization history.

3b. ILI Syndromic Surveillance

- Electronic Surveillance System for the Early Notification of Community-based Epidemics (**ESSENCE**)
  - Internet-based syndromic disease surveillance system
- Useful for early detection with maximum sensitivity
  - Often at the cost of specificity (false alerts)
- ILI
  - Includes ICD and Chief Complaint data
- Influenza Specific
  - Influenza specific ICD codes only

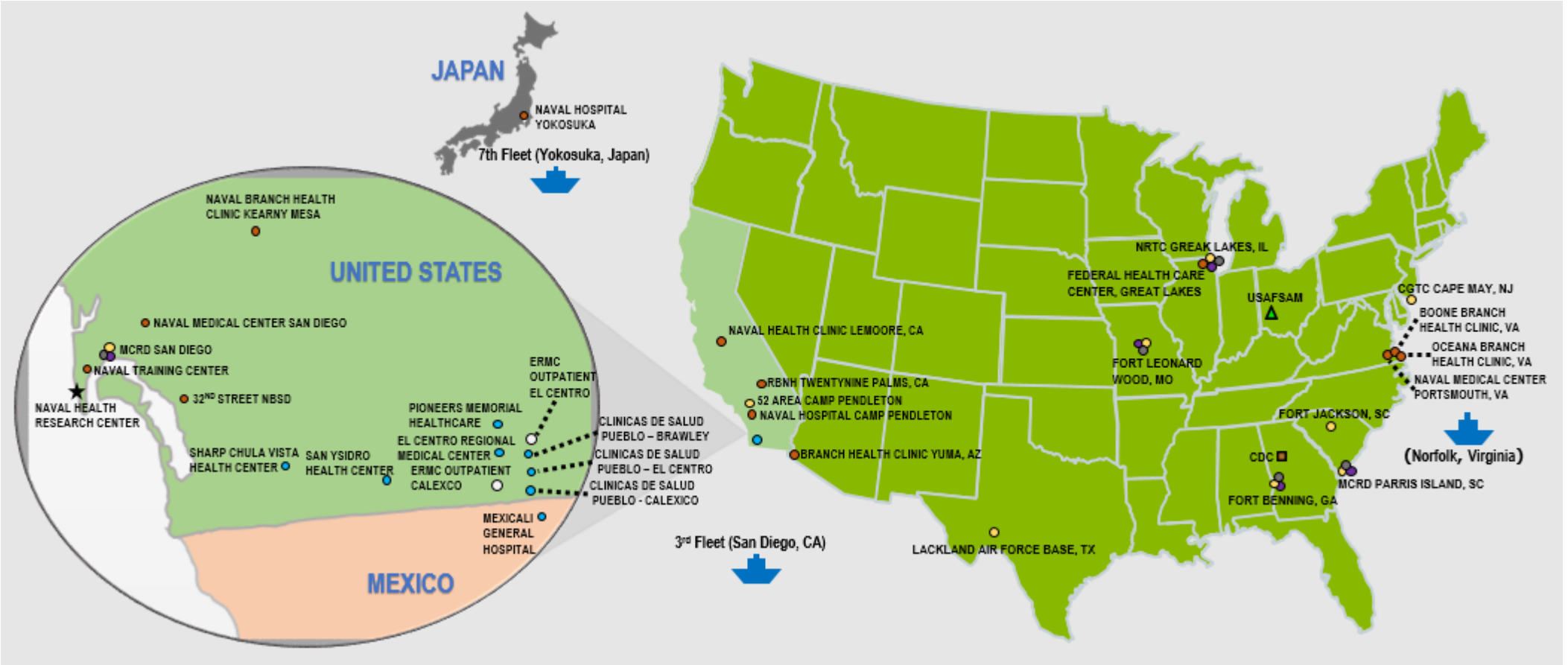


3c. Surveillance Coverage - WHO



3c. Surveillance Coverage - APHL

3c. Surveillance Coverage - Navy



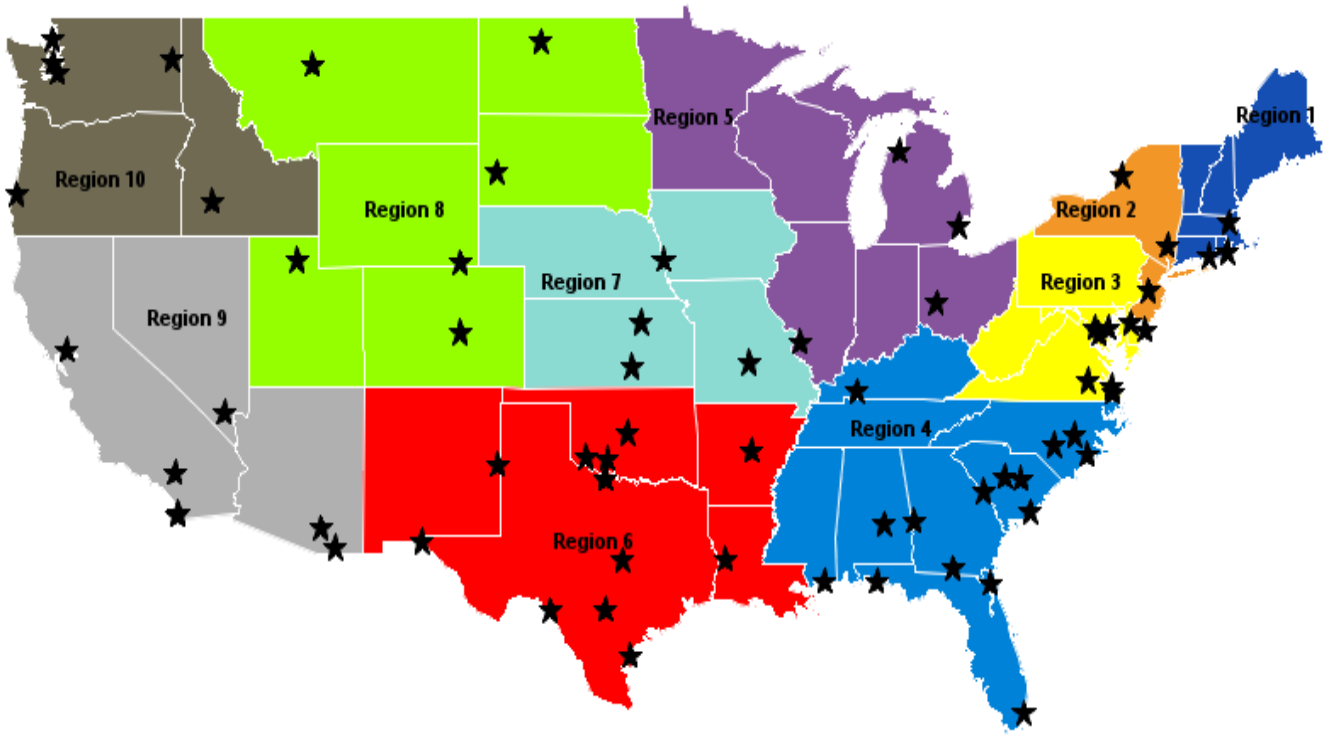
Surveillance Sites:

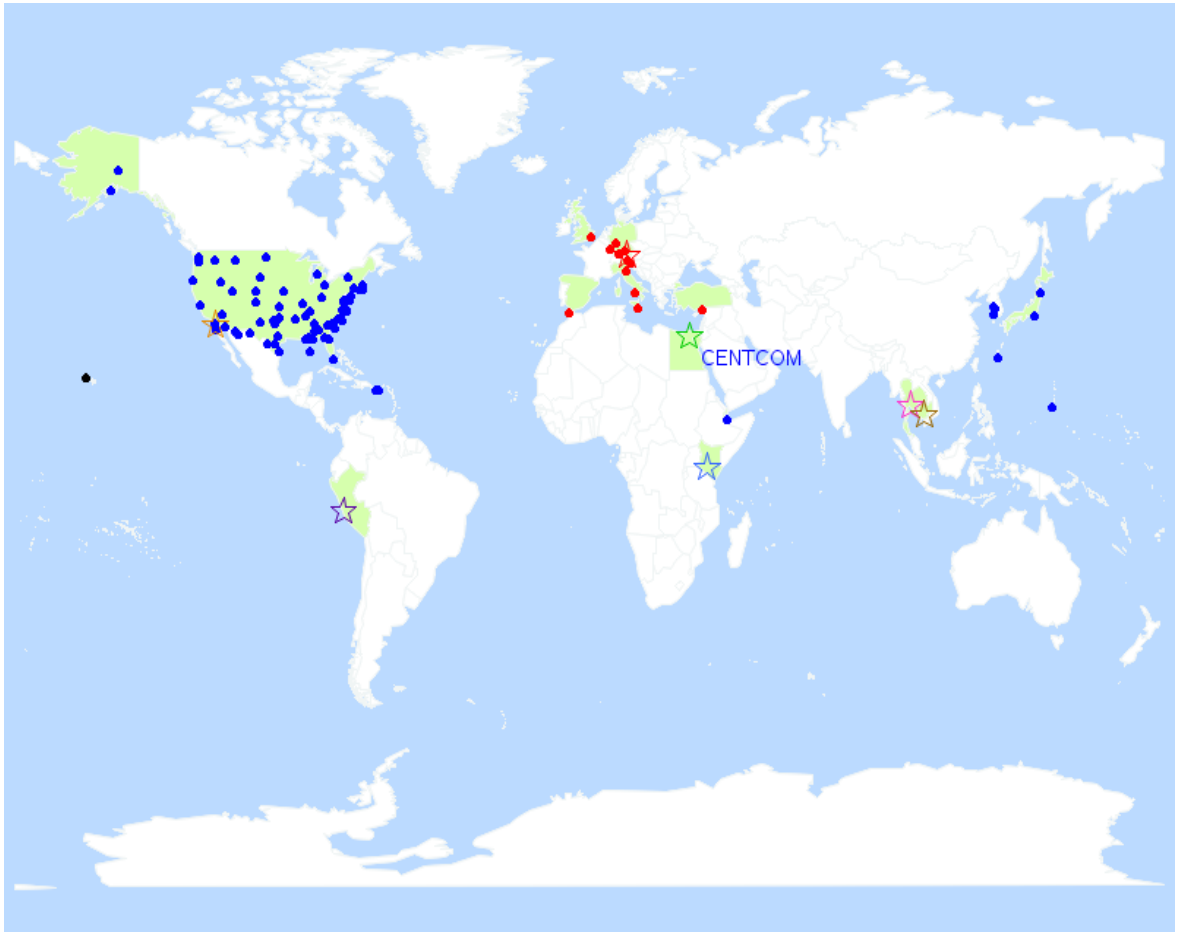
- Recruit Febrile Respiratory Illness (FRI) Surveillance
- Recruit Acute Gastroenteritis (AGE) Surveillance
- Recruit Group A Streptococcus (GAS) Surveillance
- Beneficiaries Febrile Respiratory Illness (FRI) Surveillance
- Border FRI Surveillance at the U.S.-Mexico Border
- Border AGE Surveillance at the U.S.-Mexico Border
- Shipboard FRI Surveillance

Influenza Diagnostic Collaborators:

- Center for Disease Control and Prevention (CDC)
- U.S. Air Force School of Aerospace Medicine (USAFSAM)

3c. Surveillance Coverage - DoDGRS

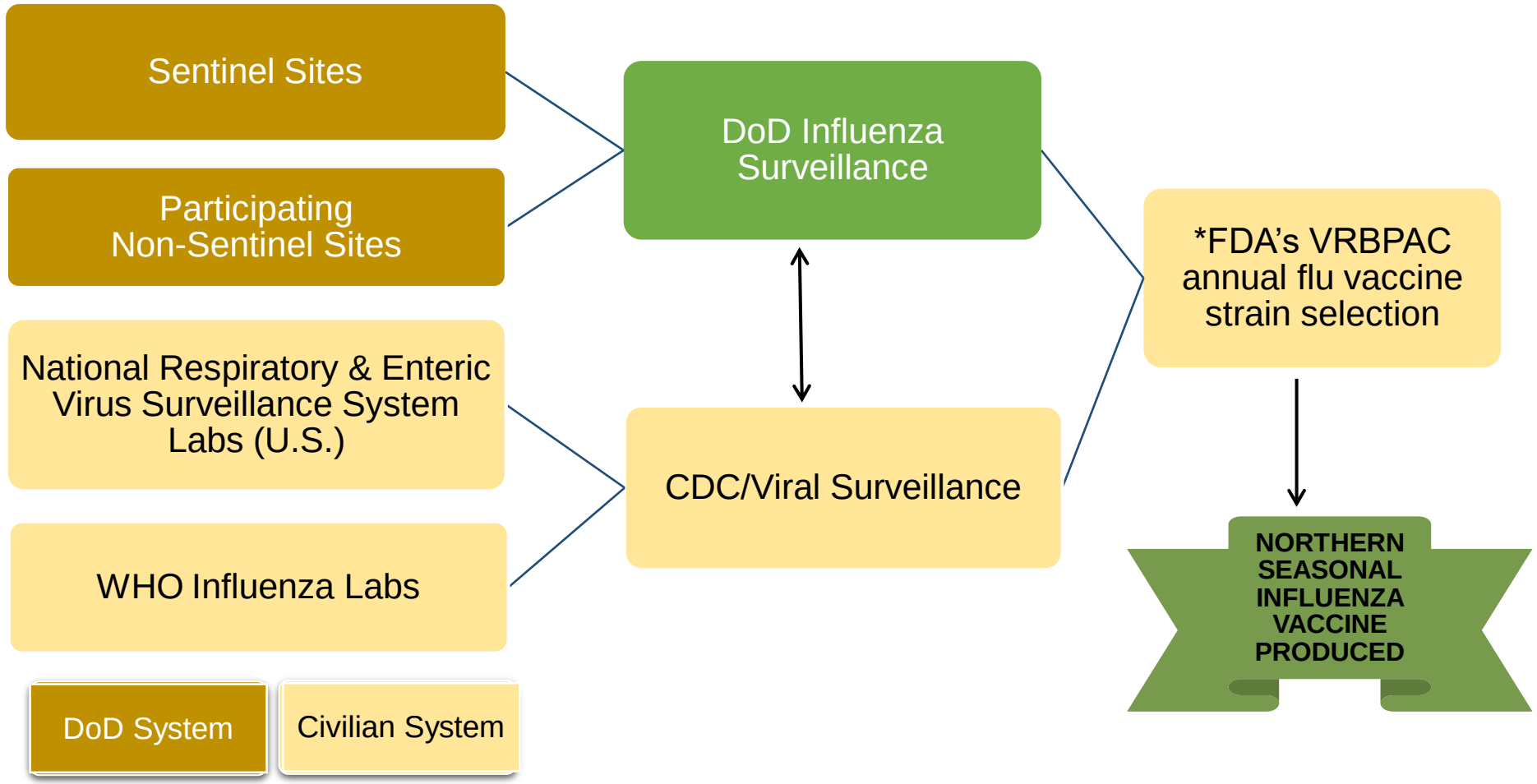




Partner Laboratories

- LRMC
- NHRC
- NAMRU-6
- NAMRU-3
- NAMRU-2
- AFRIMS
- USAMRU-K

3d. Surveillance Process and Vaccine Development



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

Resources

USAFSAM/PHR Epidemiology Consult Service: Influenza Surveillance
https://hpws.afrl.af.mil/epi-consult/influenza/dashboard/index.cfm

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

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
https://www.med.navy.mil/sites/nmcphc/epi-data-center/influenza/Pages/default.aspx

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

DHA Public Health Division, Immunization Healthcare Branch, Influenza – Seasonal vaccine information:
https://www.health.mil/vaccines

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

WHO Global Influenza Surveillance Network: Manual for the laboratory diagnosis and virological surveillance of influenza
http://whqlibdoc.who.int/publications/2011/9789241548090_eng.pdf

QUESTIONS ?

U.S. AIR FORCE

Contact Information

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  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
  NEPMU7: COMM (int): 011-34-956-82-2230 (local): 727-2230; DSN: 94-314-727-2230
  Email: NEPMU7@eu.navy.mil

- **Air Force:** Contact your MAJCOM PH or USAFSAM/PHR
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