



Pandemic Influenza Planning: U.S. Military Efforts

**Public Health Practice Grand Rounds
Johns Hopkins Bloomberg School of Public Health**

**Dr. Jean Otto
Senior Epidemiologist
Department of Defense
Global Emerging Infections Surveillance & Response System (GEIS)**

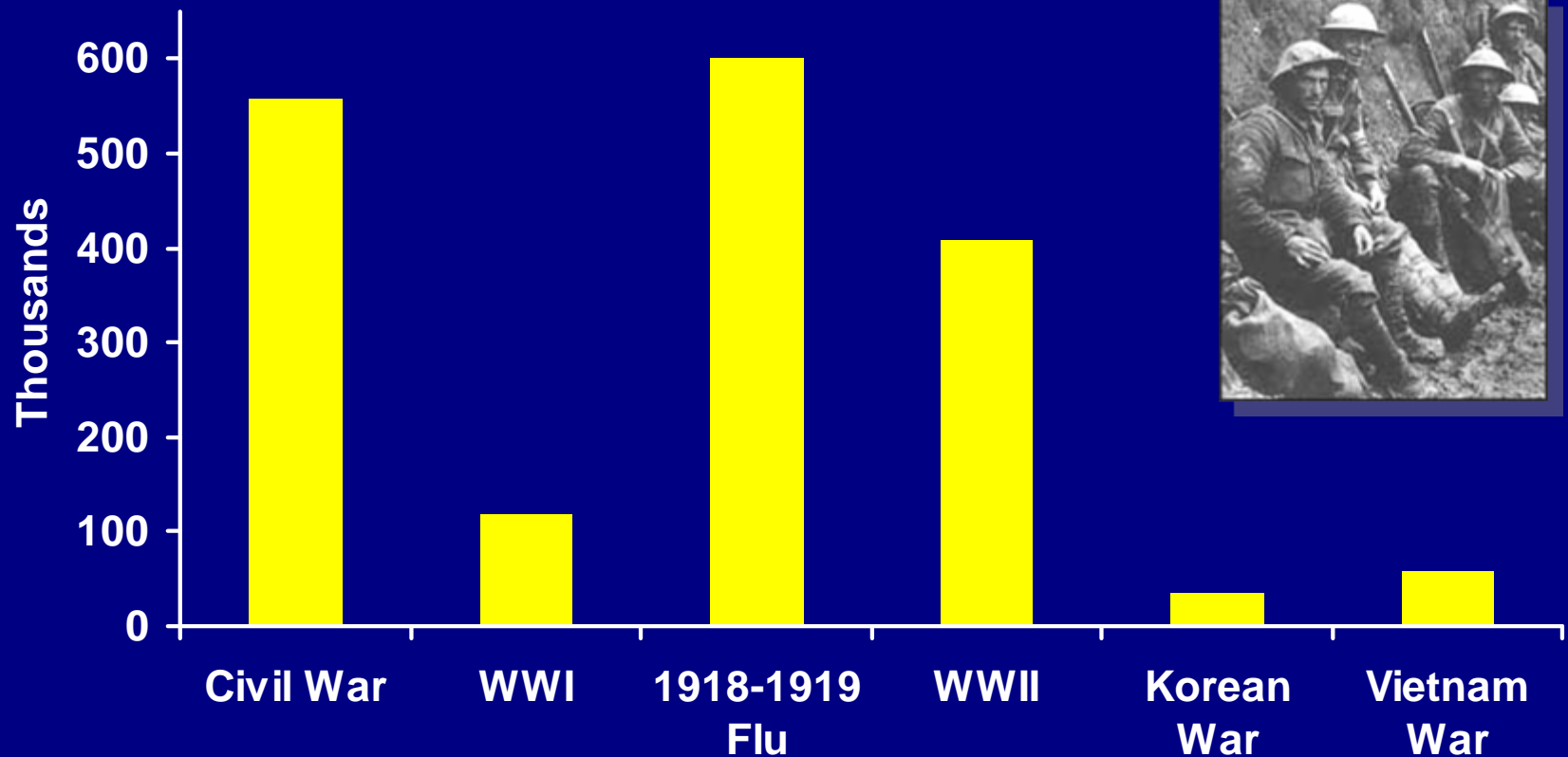
19 September 2007

Outline

- **Pandemic influenza impact**
- **Pandemic influenza threat**
- **Pandemic influenza planning – Department of Defense (DoD)**
 - **Guidance and authority**
 - **Surveillance activities**
 - **Vaccine and antiviral policies**
 - **Non-pharmaceutical Interventions**



America's deaths from 1918 influenza pandemic were greater than the number of U.S. servicemen killed in any war



Impact of Past Influenza Pandemics

Pandemic	Estimated U.S. Deaths	Influenza A Strain	Populations at Greatest Risk
1918-1919	500,000	H1N1	Young, healthy adults
1957-1958	70,000	H2N2	Infants, elderly
1968-1969	34,000	H3N2	Infants, elderly

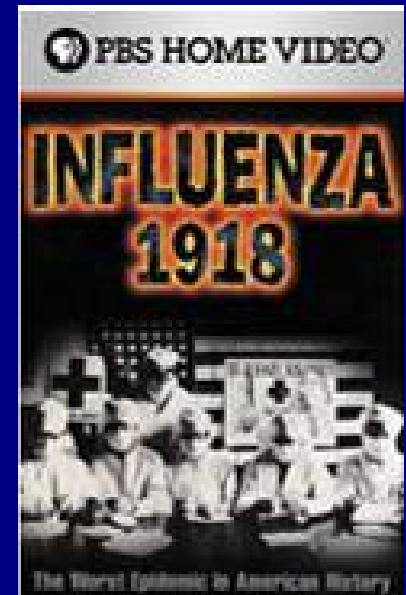
Impact of 1918 Influenza Pandemic on U.S. Military

- Military had a higher mortality rate (5%-10%) than general population
- Influenza killed more than bullets
 - 57,460 U.S. military personnel in WWI died of influenza vs. 50,280 in combat
- Wartime draft cancelled
- War Department estimated that it lost 8,743,102 days among enlisted men



Soldier receives throat spray for Spanish Flu

“The influenza of 1918 showed no bias in its approach to the combatants in World War I: men from all sides were sickened and killed. Great Britain reported 31,000 influenza cases in June alone. The flu proved such a leveler of men that war plans were altered. Attacks that had been painstakingly planned had to be postponed due to a shortage of healthy men.”



Impact of Severe Pandemic (1918-like) in U.S. Today

Illness	90 million (30%)
Outpatient medical care	45 million
Hospitalization	9, 900,000
ICU care	1,485,000
Mechanical ventilation	745,500
Deaths	1,903,000 (2%)

Impact of Severe Pandemic on U.S. Military Today

- Significant effect on combat readiness, restricting military operations
- Overwhelmed military healthcare system
- Restriction of individual and unit movements
- Diversion of manpower from military missions to disaster relief missions



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Pandemic Threat

- Unpredictable when next pandemic will occur and what strain may cause it
- H5N1 is greatest current pandemic threat
- Other avian influenza subtypes have also infected people and have potential to give rise to next pandemic
 - H9N2 infections Hong Kong in 1999
 - H7N7 infections in the Netherlands in 2003
 - H7N3 infections in Canada in 2004

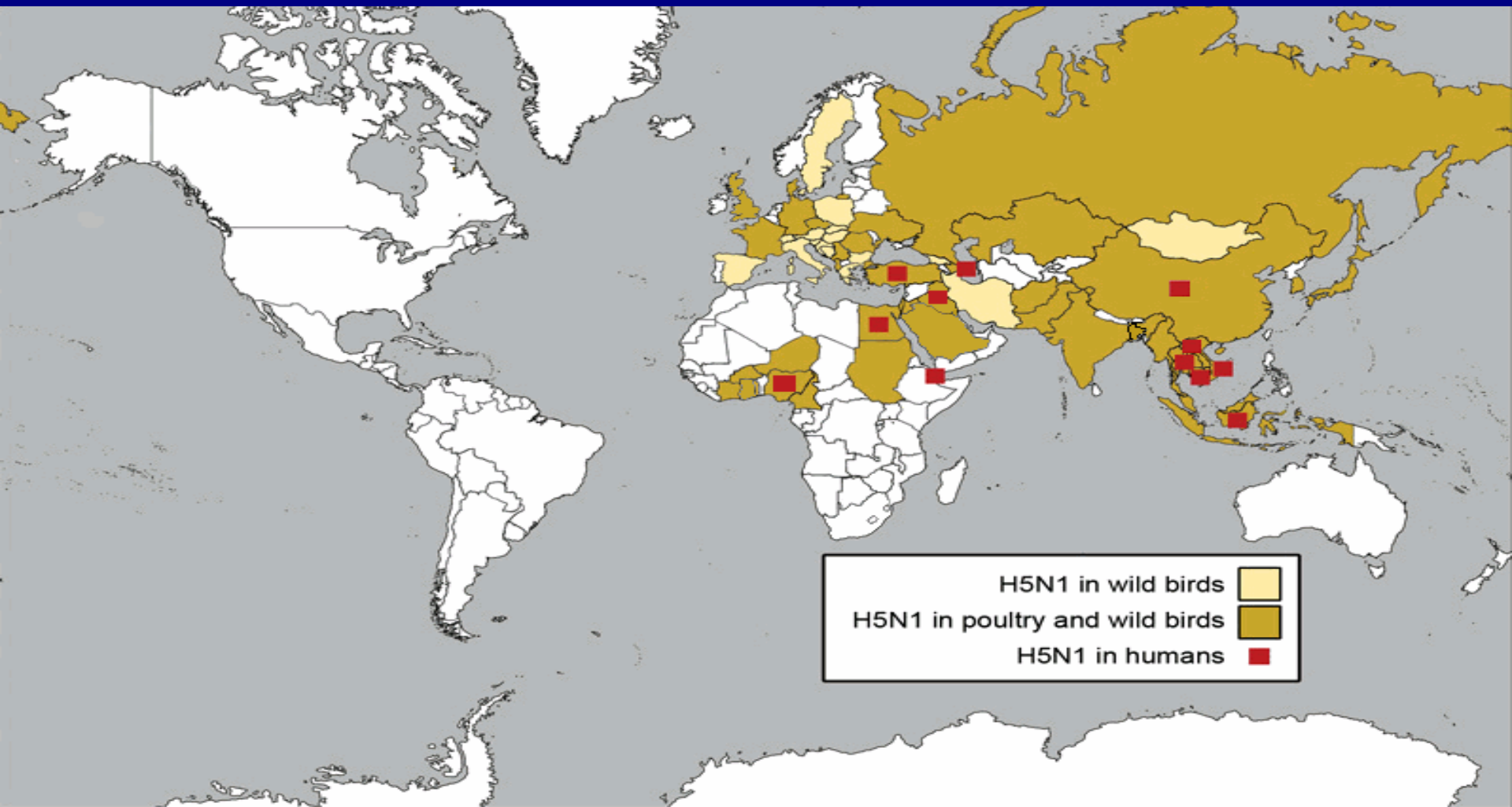
Status of Human H5N1 Infections

- **As of 31 August 2007:**
 - 327 infections, 199 deaths (61%) since 2003
 - 12 countries reported human infections
 - Indonesia remains hot spot this year with total 105 cases and 84 deaths
- **Human infections continue to parallel poultry infections**
- **No change in epidemiology**
 - Clade 2 predominates
 - Clusters still occur
 - Age distribution unchanged



Nations With Confirmed Cases H5N1 Avian Influenza

Status as of 31 August 2007



Status of Human H5N1 Infections

- WHO assessment remains pandemic alert “Phase 3”
 - No sustained human-to-human transmission
 - Very limited human-to-human transmission
- US federal response at “Stage 0”
 - New domestic animal outbreak in at-risk country

Inter-pandemic phase New virus in animals, no human cases	Low risk of human cases	1
	Higher risk of human cases	2
Pandemic alert New virus causes human cases	No or very limited human-to-human transmission	3
	Evidence of increased human-to-human transmission	4
	Evidence of significant human-to-human transmission	5
Pandemic	Efficient and sustained human-to-human transmission	6

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Elements of the Department of Defense

OFFICE OF THE SECRETARY OF DEFENSE

DEFENSE AGENCIES

*DOD FIELD
ACTIVITIES*

*JOINT
CHIEFS
OF
STAFF*



*INSPECTOR
GENERAL*

COMBATANT COMMANDS

*MILITARY
DEPARTMENTS*

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GENERAL**

COMBATANT COMMANDS

**MILITARY
DEPARTMENTS**

Military Departments

Department
of the Army



Department
of the Navy



Department
of the Air Force



In wartime only *

Marine Corps



Coast Guard



* Coast Guard is part of the Department of Transportation during peacetime

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Combatant Commands

U.S.
Southern
Command

SOUTHCOM

U.S.
European
Command

EUCOM

U.S.
Northern
Command

NORTHCOM

U.S.
Central
Command

CENTCOM

U.S.
Pacific
Command

PACOM

Geographic Combatant Commands

U.S. Special
Operations
Command

SOCOM

U.S.
Transportation
Command

TRANSCOM

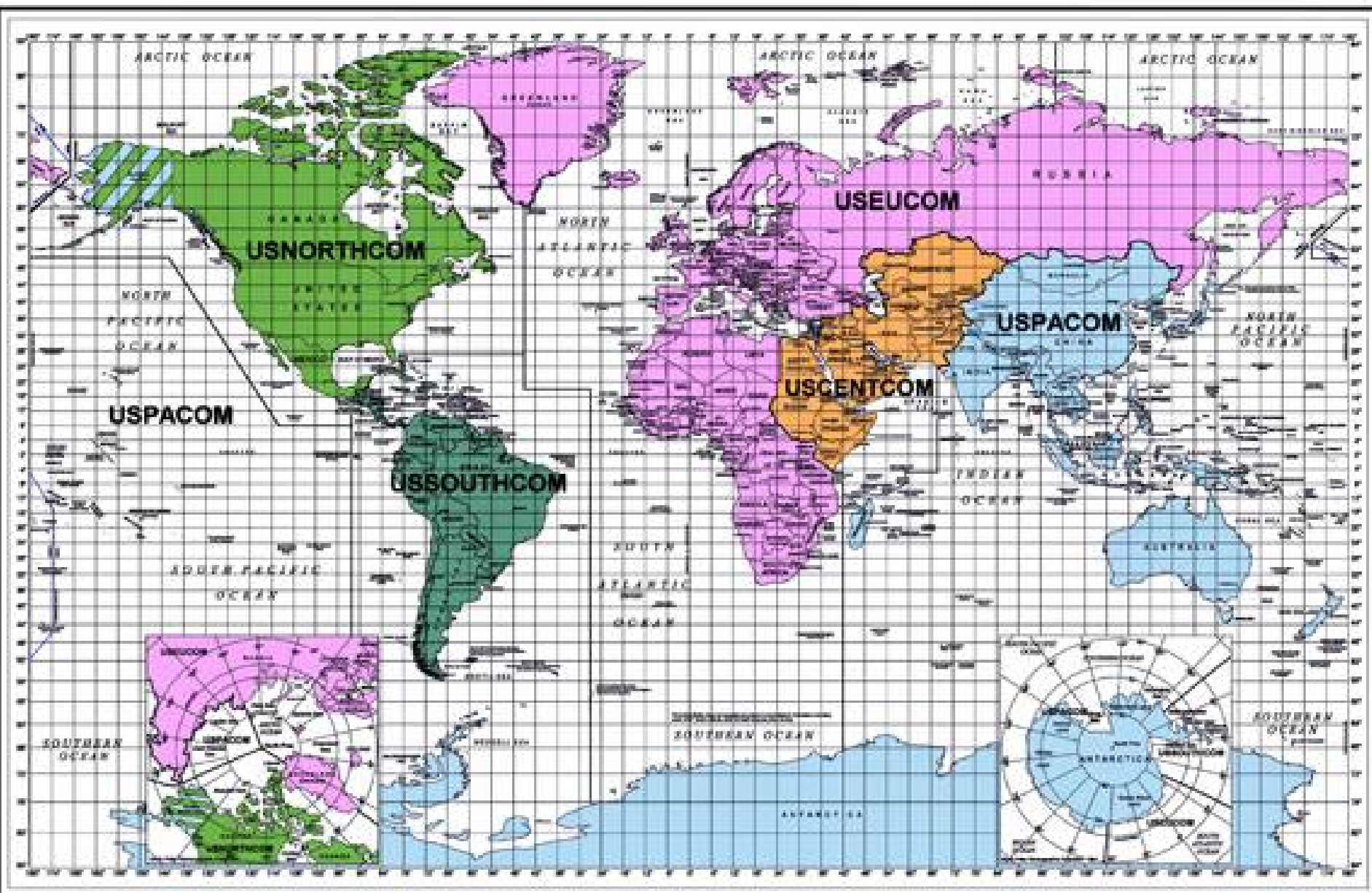
U.S.
Joint Forces
Command

JFCOM

U.S.
Strategic
Command

STRATCOM

Functional Combatant Commands



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NATIONAL GEOSPATIAL INTELLIGENCE AGENCY
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Map Information as of 2004

State of Alaska assigned to USARPAC's
Area of Responsibility. Forces based in Alaska
remain assigned to USNORTHCOM.

1:135,000,000
MILLER CYLINDRICAL PROJECTION

Maritime boundary provisionally applied pending
formal exchange of instruments of ratification.

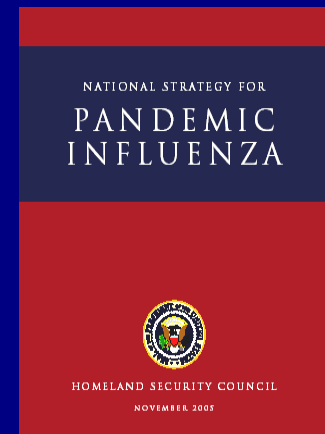
The 1989 border proclamation that
applies to the interior coast is
not recognized by the United States.

"West Bank and Golan Strip" - Israeli occupied with current
status subject to the Israeli - Palestinian Interim Agreement ;
permanent status to be determined through further negotiation.

Guidance and Authority

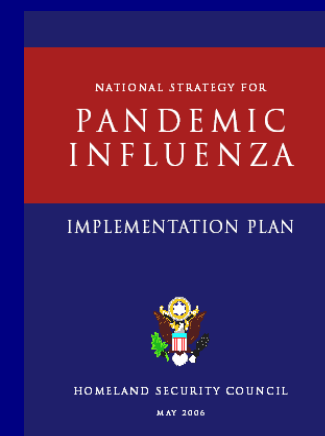
National Strategy (Nov 2005)

- Homeland Security Council oversight
- Establishes 3 pillars:
 - Preparedness and communication
 - Surveillance and detection
 - Response and containment



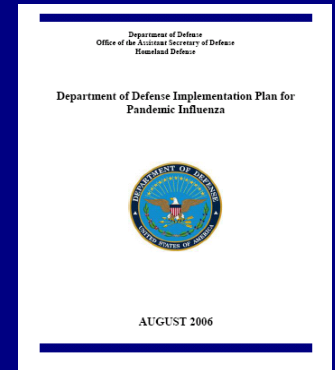
National Implementation Plan (May 2006)

- Homeland Security Council oversight
- Directs Departments and Agencies to develop supporting plans
- Assigns 323 tasks
 - DoD involved in 114 tasks (lead for 31 tasks and support for 83 tasks)

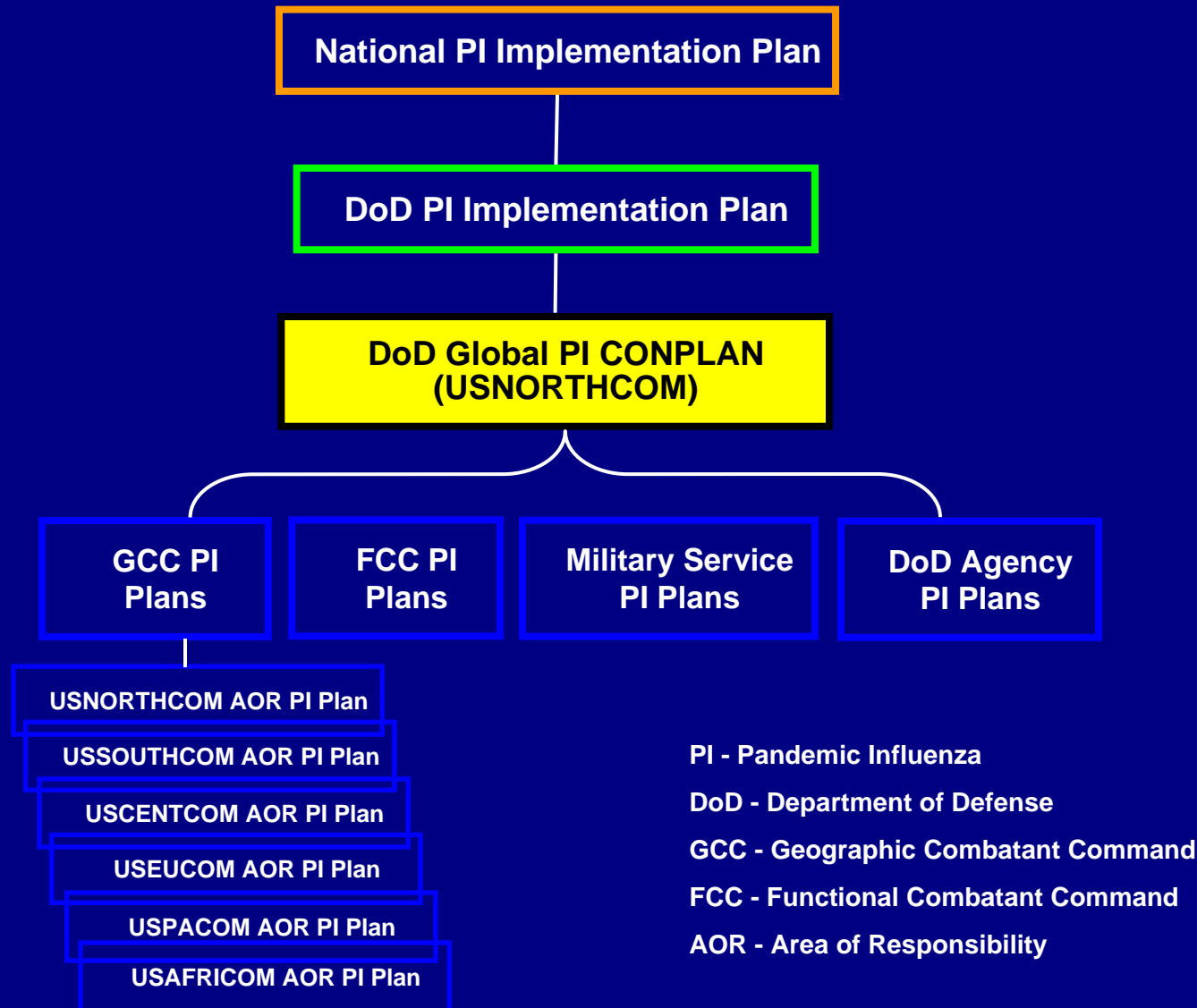


DoD Implementation Plan

- Signed Aug 2006
- Aligns with National Strategy pillars and priorities
- Assigns roles and responsibilities across DoD – domestic and international
- Adds fifth planning priority to four identified in National Implementation Plan
 1. Protection of health and safety of personnel and resources
 2. Determination and maintenance of essential functions and services
 3. Support to Federal, State, and local government
 4. Effective communications
 5. Support to international partners and international stability and security



Pandemic Influenza Plans Hierarchy



DoD Mission in an Influenza Pandemic

- Preserve U.S. combat capabilities and readiness
- Support U.S. government efforts to save lives, reduce human suffering and slow the spread of infection



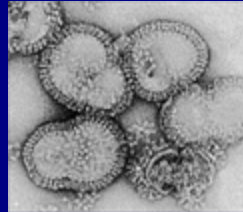
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Influenza Surveillance System

Virologic Surveillance



- Rapidly detect introduction and early cases of a pandemic influenza virus in U.S.
- Track virus' introduction into local areas
- Monitor changes in virus, including antiviral resistance

Disease Surveillance



- Serve as early warning system for influenza-like illness (ILI) in community
- Monitor the pandemic's impact on health
- Track trends in disease activity and identify populations that are severely affected

DoD Global Influenza Surveillance System



- Began in 1976 as Air Force program
- In 1997, Department of Defense Global Emerging Infections Surveillance and Response System (DoD-GEIS) expanded program to include all Military Services

“The mission of the DoD will be expanded to include support of global surveillance, training, research, and response to emerging infectious disease threats. . . DoD will strengthen its global disease reduction efforts through: centralized coordination; improved preventive health programs and epidemiological capabilities; and enhanced involvement with military treatment facilities and United States and overseas laboratories.”

Presidential Decision Directive NSTC-7 (1996)

“A Global Network”

AFIP



WRAIR / NMRC



Navy Hub

Air Force Hub



Peru



Germany

Egypt



Kenya



Korea



Thailand

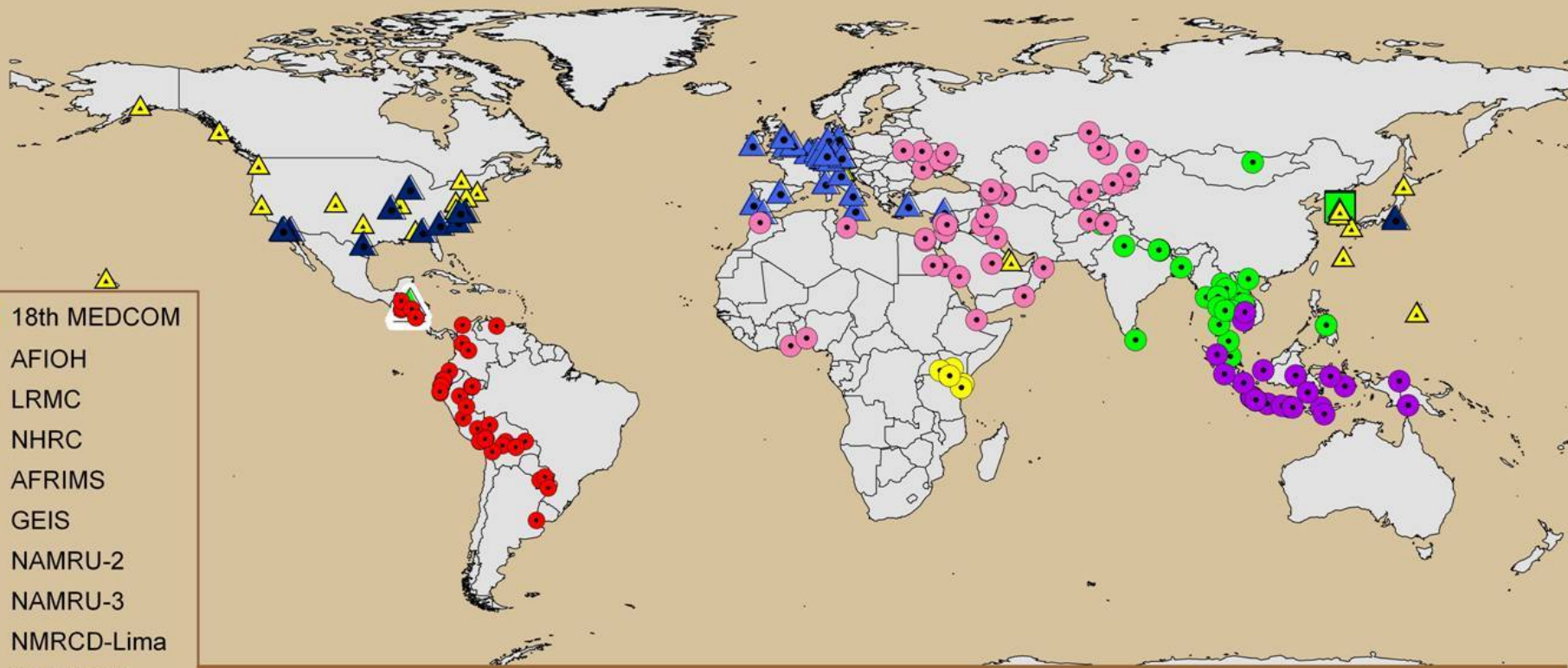


Indonesia

Major Elements of DoD Global Influenza Surveillance

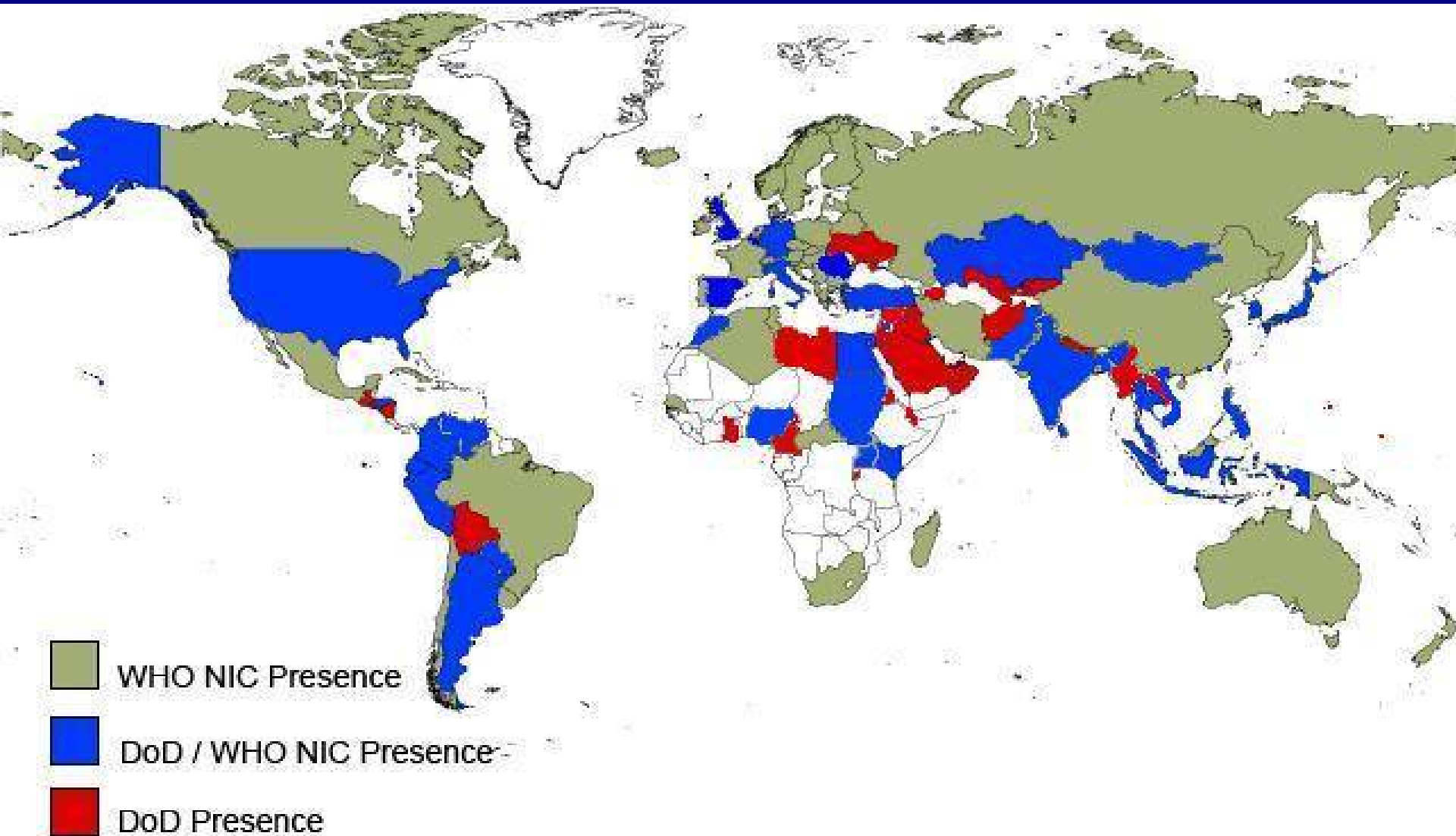
Type of Surveillance	Managing Entity	Virologic Surveillance	Disease Surveillance	Surveillance Population
Sentinel	Air Force Institute of Operational Health (AFIOH)	Yes	Yes	Primarily DoD beneficiaries; also foreign nationals through DoD overseas medical research labs
Sentinel	U.S. military overseas research labs	Yes	Yes	Host country populations
Population-based	Naval Health Research Center (NHRC)	Yes	Yes	Recruits at basic training centers; deployed shipboard populations; U.S.-Mexico border populations
Tri-service Reportable Events	Army Medical Surveillance Activities (AMSA)	No	Yes	DoD beneficiaries

DoD Global Influenza Surveillance



Over 275 sites in 56 countries

Influenza Surveillance: WHO and DoD Presence



Some DoD Contributions

- **Provided > 900 isolates to CDC (1998-2006)**
- **Identified genetic drifts/shifts through sequencing**
 - H1N1 in Japan, South Korea, Thailand and Kuwait (2006)
- **Contributed to vaccine formulation (years used):**
 - A/Panama/H3N2 (2000-04)
 - A/New Caledonia/H1N1 (2000-07)
 - A/California/H3N2 (2005-06)
 - B/Malaysia (2006-07)
- **Provided laboratory support and outbreak investigation assistance**



North Sumatra, May 2006

Karo District, N. Sumatra, Indonesia



Home of Index Case

**U.S. Naval Medical
Research Unit-2
(NAMRU-2) team in
Indonesia
supporting poultry
investigation
around human
H5N1 case
investigation**



**NAMRU-2 team collecting
samples from a suspected
human H5N1 case in an
intensive care unit**



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Influenza Vaccine Limitations

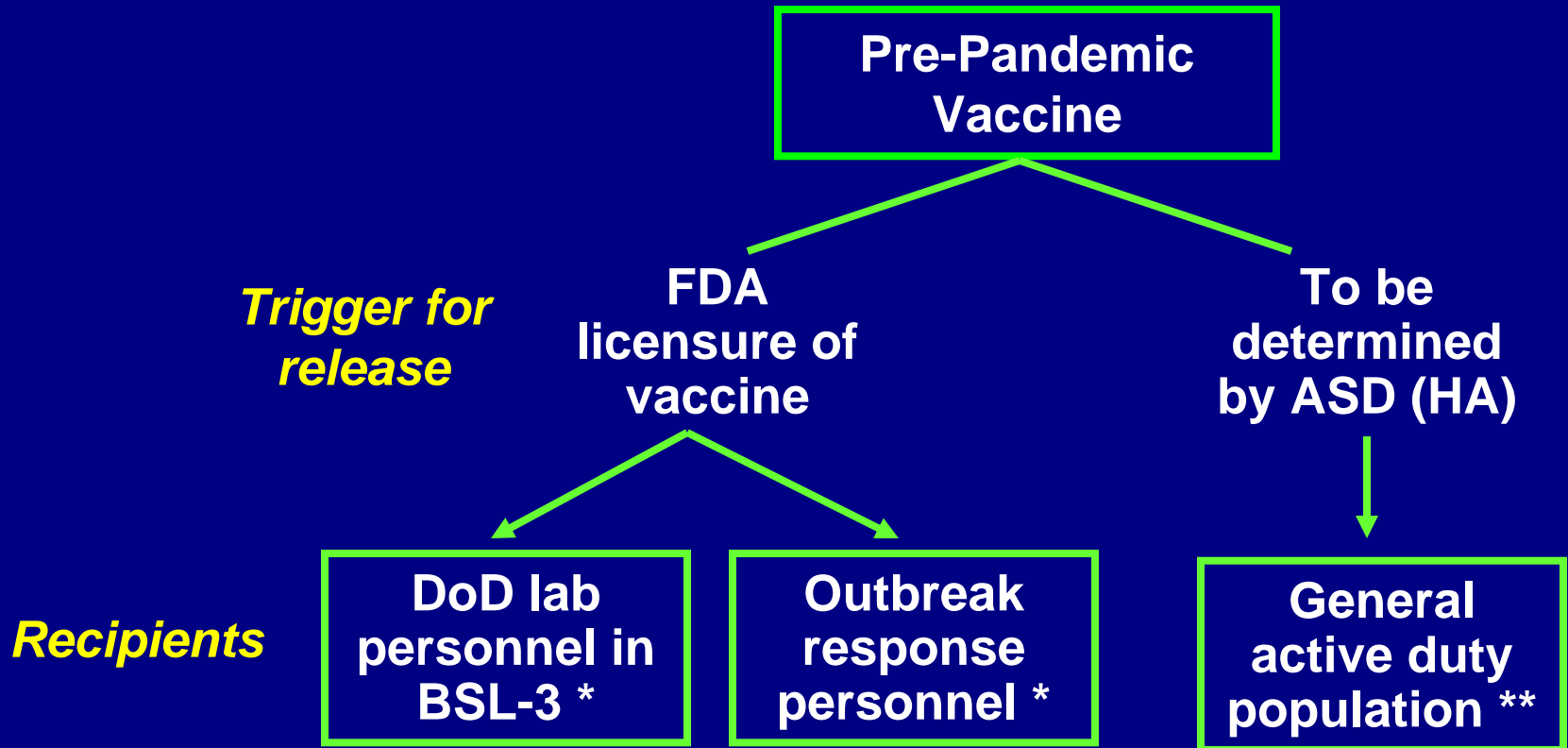
- **Seasonal vaccines not likely to be effective for a pandemic**
- **A vaccine that fully matches pandemic strain not available until 6 months after pandemic emerges**
- **Manufacturing capacity for pandemic vaccine will likely be less than optimal resulting in shortages**
- **Once produced, efficacy of pandemic vaccine is uncertain**



Pre-Pandemic Influenza Vaccine

- **New pre-pandemic influenza vaccine program**
 - Annual procurement of pre-pandemic vaccine is new requirement
 - DoD has 1.6 M doses in hand; 2.7 M doses is requirement per National Implementation Plan
- **Current FDA approved pre-pandemic vaccine based on clade 1 Vietnam 1203/04 strain**
- **Protective effect of vaccine unknown**
 - May confer some protection or serve as suitable primer for a pandemic-specific vaccine
 - Current pre-pandemic vaccine requires two injections to achieve some immunity
- **Shelf life of pre-pandemic vaccine is 18 months**

DoD Pre-Pandemic Influenza Vaccine Policy



* DoD lab personnel in BSL-3 who have direct contact with influenza strains with pandemic potential and personnel engaged in outbreak evaluation and containment missions involving strains with pandemic potential

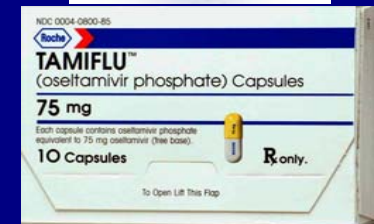
** The Joint Staff to designate prioritization based on risk, critical role, and ability to receive two doses

Antiviral Agents

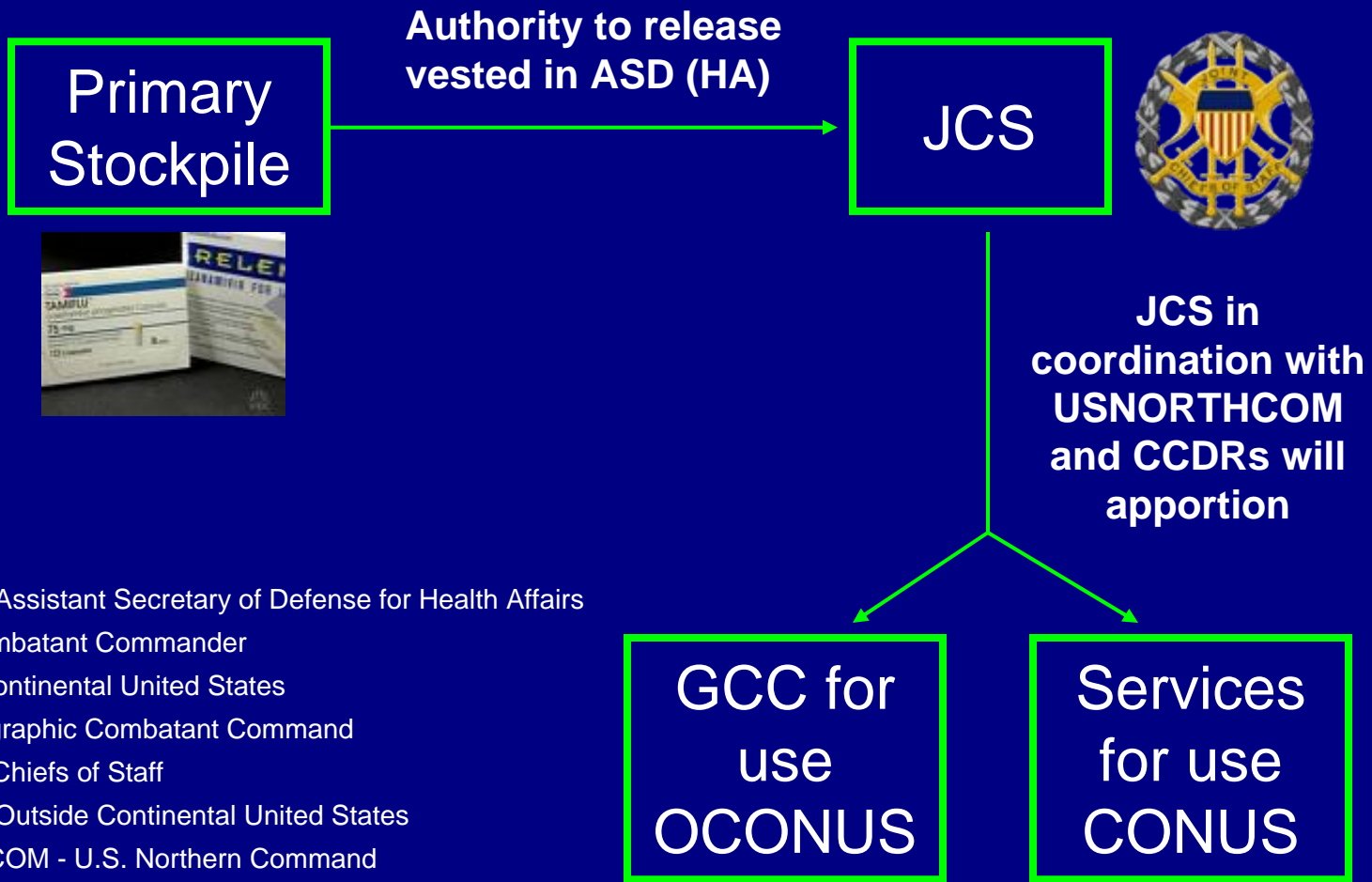
- **Used for both treatment and prophylaxis but widespread outbreak prophylaxis use not practical**
- **Limited supply**
- **Resistance may develop**
- **Dosage and duration of treatment vary from strain to strain**
- **Time to treatment is critical**

DoD Antiviral Stockpile

- Primary stockpile of Tamiflu® and Relenza® pre-positioned in Pacific Rim, Europe, and continental United States (CONUS)
- Additional stockpile of Tamiflu® at military treatment facilities (MTF)
- Primary use is for treatment with limited, targeted use for prophylaxis
- Use prioritization based on pandemic severity and supply of antiviral agents



Policy for Release of DoD Antiviral Stockpile



Policy for Release of DoD Antiviral Stockpile



CONUS - Continental United States
GCC - Geographic Combatant Command
OCONUS - Outside Continental United States
MTF - Military Treatment Facility

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Non-pharmaceutical Interventions

- Isolation and treatment of ill persons
- Voluntary home quarantine of household contacts
- Dismissal of students from school and social distancing
- Workplace/community social distancing
- All interventions should be used in combination with other infection control measures including handwashing, cough etiquette, and personal protective equipment such as face masks

Community Mitigation Strategy by Pandemic Severity

Interventions* by Setting	Pandemic Severity Index		
	1	2 and 3	4 and 5
Home Voluntary isolation of ill at home (adults and children); combine with use of antiviral treatment as available and indicated	Recommended †§	Recommend †§	Recommend †§
Voluntary quarantine of household members in homes with ill persons †† (adults and children); consider combining with antiviral prophylaxis if effective, feasible, and quantities sufficient	Generally not recommended	Consider **	Recommend **
School Child social distancing -dismissal of students from schools and school based activities, and closure of child care programs -reduce out-of school social contacts and community mixing	Generally not recommended Generally not recommended	Consider: ≤4 weeks †† Consider: ≤4 weeks ††	Recommend: ≤12 weeks §§ Recommend: ≤12 weeks §§
Workplace / Community Adult social distancing -decrease number of social contacts (e.g., encourage teleconferences, alternatives to face-to-face meetings) -increase distance between persons (e.g., reduce density in public transit, workplace) -modify, postpone, or cancel selected public gatherings to promote social distance (e.g., stadium events, theater performances) -modify work place schedules and practices (e.g., telework, staggered shifts)	Generally not recommended Generally not recommended Generally not recommended Generally not recommended	Consider Consider Consider Consider	Recommend Recommend Recommend Recommend

Websites

- DoD GEIS
www.geis.fhp.osd.mil
- DoD Pandemic Influenza Watchboard
www.dod.mil/pandemicflu



DoD - GEISWeb
Global Emerging Infections System

Official Web Site of the DoD-GEIS Central Hub

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Partners in Prevention Fact Sheets Annual Report Historical Documents

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US Department of Defense
Global Emerging Infections Surveillance and Response System (DoD-GEIS)



DEPARTMENT OF DEFENSE
PANDEMIC INFLUENZA WATCHBOARD

CURRENT PHASE 3

Servicemembers, Civilians and Families | Health Care Planners and Providers | DoD Leadership | History | FAQs | Glossary | Links

NEW ► Evacuation Payments During A Pandemic Health Crisis (15 August 2007)

Welcome to the Department of Defense Pandemic Influenza Watchboard

In an influenza pandemic, the DoD's mission is to preserve the U.S. combat capabilities and readiness and to support U.S. government efforts to save lives, reduce human suffering and slow the spread of infection.

Service members, Civilians and Families | Health Care Planners And Providers | DoD Leadership

Search: GO

PANDEMIC FLU AVIAN FLU
PREPARATION IS POWER

News and Information

At FHP, Public Health Planning Focuses on Pandemic Flu
Prevention Is Key to Health of Soldiers, Mission, Nation
Simulated Flu Outbreak Teaches Real Lessons

Conclusion

- **Vigilance and flexibility are needed in pandemic influenza planning given unpredictable nature of pandemics**
- **An effective pandemic influenza response will require well coordinated efforts by military and civilian officials**
- **Planners need to have realistic expectations of DoD's level of civil support in a pandemic**

“No prior generation has ever anticipated and prepared for a pandemic. We have the opportunity to be the first generation to use our collective knowledge, determination, and resources to take on this task.”

*U.S. National Strategy for Pandemic Influenza
Implementation Plan: One Year Summary*

Contacts

COL Ralph L. Erickson MC USA
Director, DoD-GEIS

Tel: 301-319-9423, E-mail: Ralph.Erickson@us.army.mil

LTC Kelly Vest, VC USA
Deputy, Influenza and Zoonoses, DoD-GEIS

Tel: 301-319-7579, E-mail: Kelly.Vest@us.army.mil

Jose L. Sanchez, MD, MPH
Influenza Team Leader, DoD-GEIS

Tel: 301-319-9116, E-mail: Toti.Sanchez@us.army.mil

Jean Lin Otto, DrPH
Senior Epidemiologist, DoD-GEIS

Tel: 301-319-3287, E-mail: Jean.Otto@us.army.mil

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Ms. Jennifer Bondarenko

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Dr. Joel C. Gaydos

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Dr. Luther Lindler

Mr. Jay L. Mansfield

LtCol Victor H. MacIntosh

Ms. Robin Miliner

Dr. Jose L. Sanchez

Mr. J. Jeremy Sueker

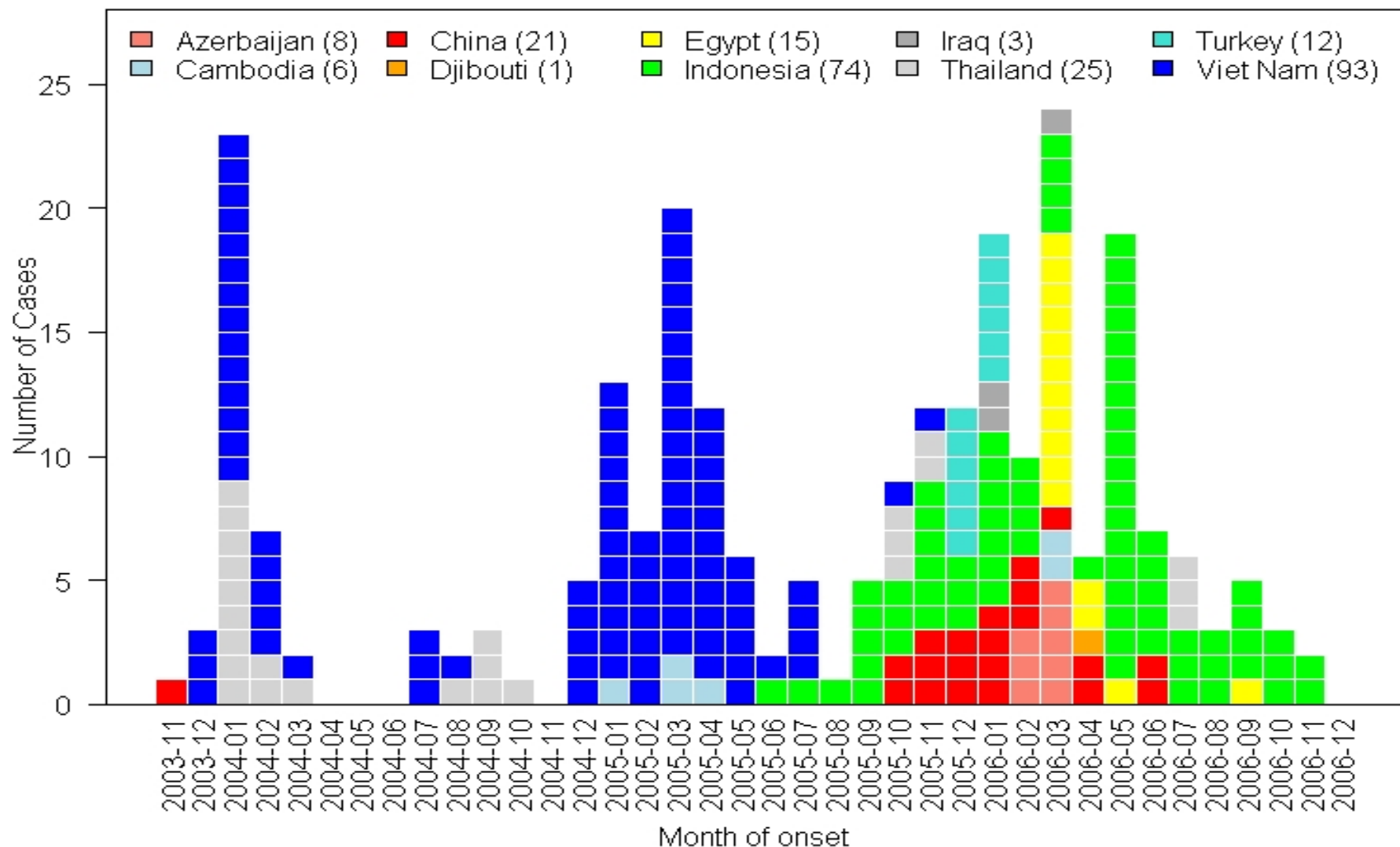
LTC Kelly Vest

OASD Health Affairs

LTC Wayne Hachey

Additional Slides

Number of Confirmed Human H5N1 Cases by month of onset as of 2006-12-18



H5N1 Current Concerns

- **Continued genetic and antigenic evolution of H5N1 viruses**
 - Increasing numbers of clades
 - Need to closely monitor for significant changes and to develop new vaccine candidate strains
 - Potential to acquire greater transmissibility among humans
- **Ongoing avian activity**
 - Risk of human infections while viruses circulate in poultry
- **Need to maintain (long term) effort to strengthen preparedness and response capabilities among countries**