U.S. DEPARTMENT OF DEFENSE
Deployment Health
Support Directorate

POST-DEPLOYMENT HEALTH REASSESMENT (PDHRA) PROGRAM

"HOW ARE WE DOING?"

(b)(6)

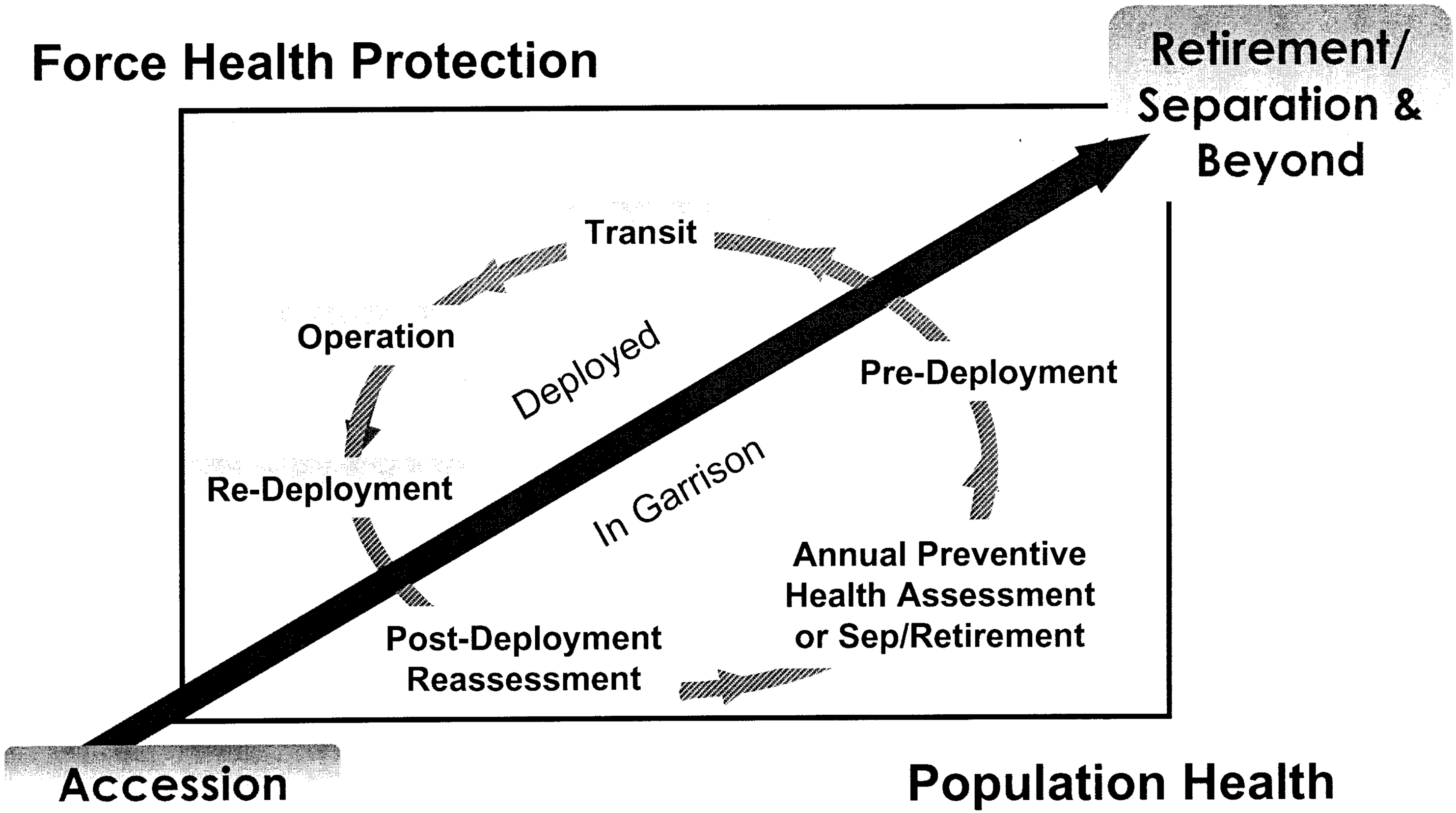
Director, Force Health Readiness
Health Affairs/TMA/Deployment Health Support Directorate

Force Health Protection Conference

10 August 2006

Service Member Life Cycle

Health Assessment Opportunities



Extending the Value of Post-deployment Health Surveillance

- **P**ost-**D**eployment **H**ealth **R**e-**a**ssessment (PDHRA)
  - Physical
  - Psychosocial
  - Environmental Concerns
  - Functional status
  - Referral for further evaluation

PDHRA Process

- WHO: re-deployed service members (Army, Air Force, Navy, & Marines, all components)
  - OCONUS: OIF, OEF, & Other Locations
  - CONUS: Katrina responders
- WHAT: Outreach to re-deployed service members
- WHEN: 90-180 days after re-deployment
- WHERE: PDHRA implemented at the unit level
- WHY: Extend the continuum of outreach and referral for necessary health services following re-deployment

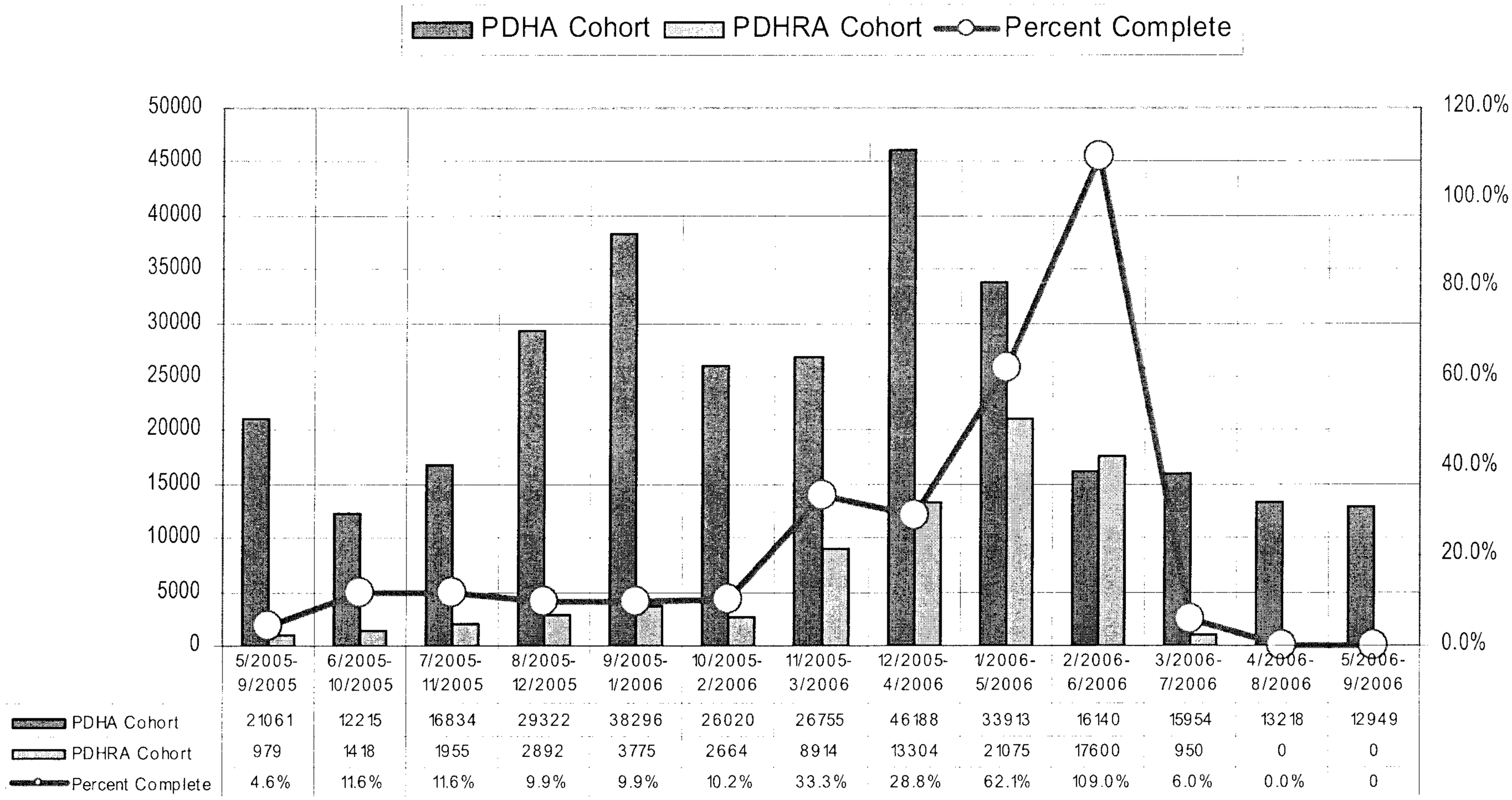
Who is involved in PDHRA?

Agency	Plan/Coordinate Outreach Programming	Report/Evaluate PDHRA Processes	Provide Direct Services to re-deployed member	Conduct follow-up tracking for referred service members	Provide funding to assist in data collection/service member contact
Army, Air Force, Navy/Marines	☑	☑	☑	☑	
TMA			☑	☑	☑
LHI/Feds_Heal			☑	☑	
Force Health Protection & Readiness		☑			
Veterans Administration			☑	☑	

Challenges We Face…

- All re-deployed service members must complete the PDHRA process (about 300,000 eligible in 2006)
- Coordinate healthcare access and benefits for those who need help
- Track outcomes of PDHRA referrals (referral appointments kept, referred to appropriate care, symptoms addressed in a timely way)

PDHRA Cohort: Current Tracking



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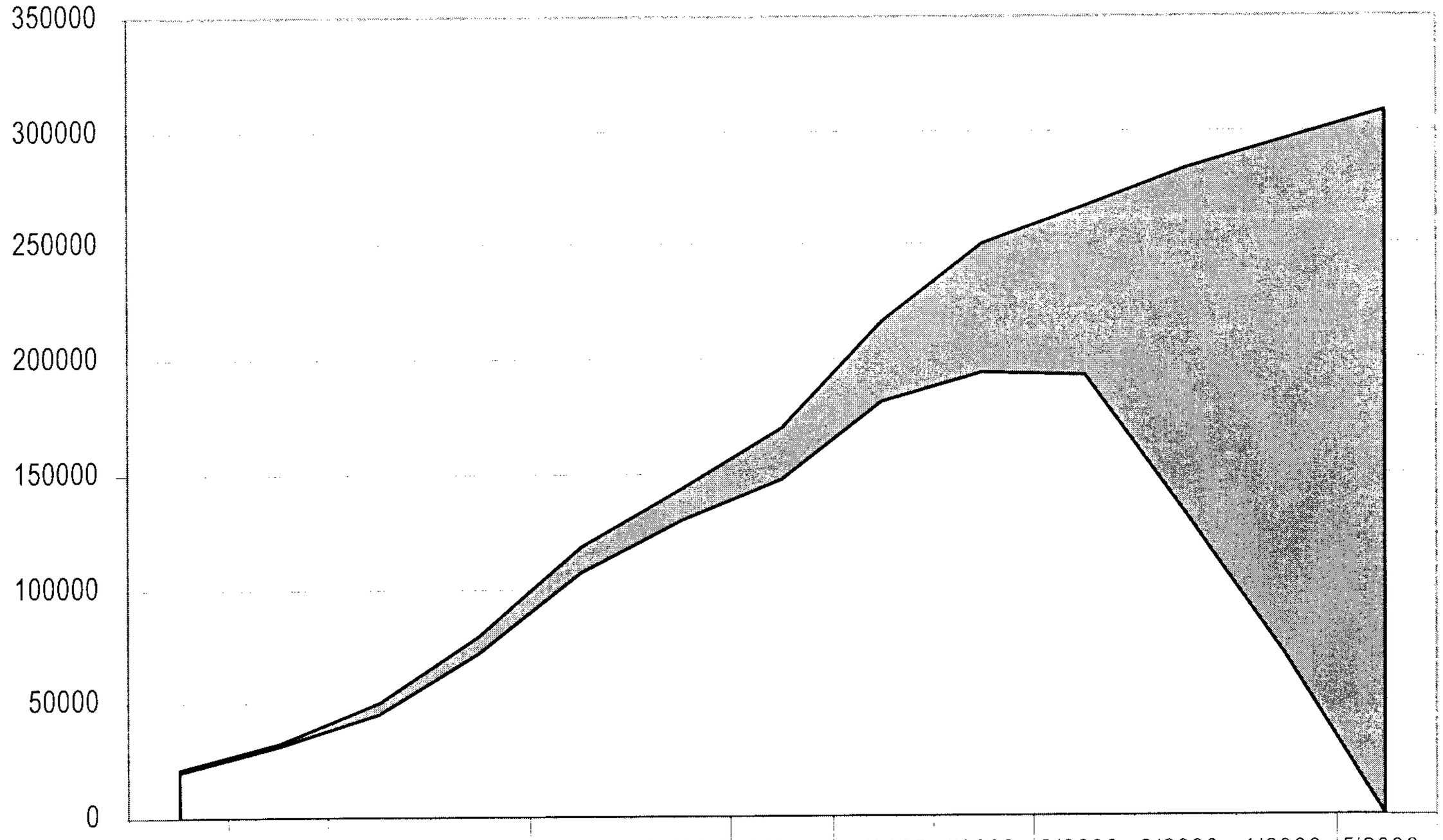
PDHA Cohort	21061	12215	16834	29322	38296	26020	26755	46188	33913	16140	15954	13218	12949
PDHRA Cohort	979	1418	1955	2892	3775	2664	8914	13304	21075	17600	950	0	0
Percent Complete	4.6%	11.6%	11.6%	9.9%	9.9%	10.2%	33.3%	28.8%	62.1%	109.0%	6.0%	0.0%	0

PDHRA Cohort: 'What if?'

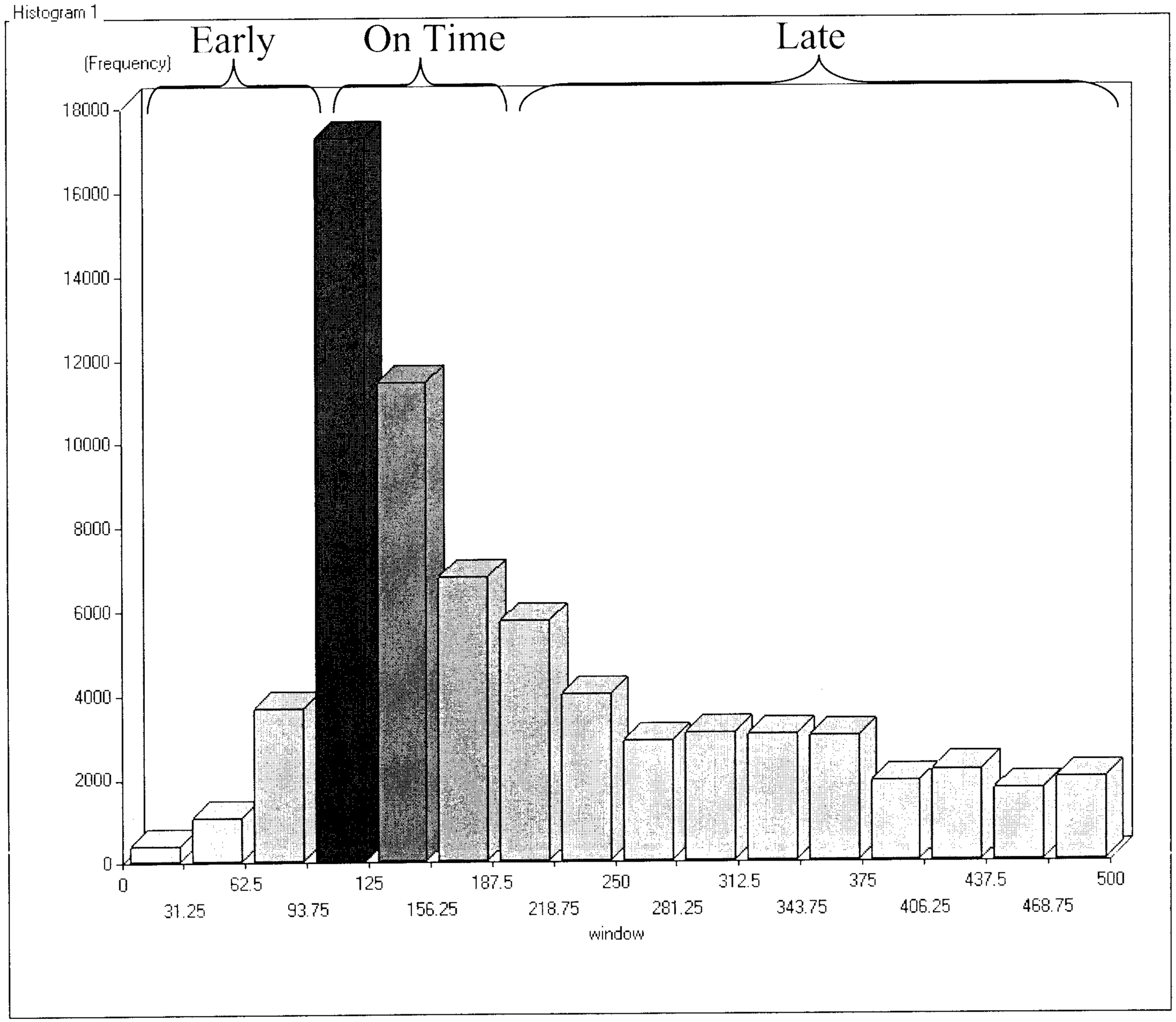
ASSUMPTIONS:

Month and Projected PDHRAs
Jul-06: 75,950
Aug-06: 75,000
Sep-06: 83,339



	5/2005-9/2005	6/2005-10/2005	7/2005-11/2005	8/2005-12/2005	9/2005-1/2006	10/2005-2/2006	11/2005-3/2006	12/2005-4/2006	1/2006-5/2006	2/2006-6/2006	3/2006-7/2006	4/2006-8/2006	5/2006-9/2006
Cumulative Completed PDHRAs	979	2397	4352	7244	11019	13683	22597	35901	56976	74576	150526	225526	308865
To be Completed PDHRAs	20082	30879	45758	72188	106709	130065	147906	180790	193628	192168	132172	70390	0

When are PDHRAs Done?



Early Results

- 75,619 assessments completed as of 11 Jul 06
- Results (rounded)
  - 29,000 (38%) no health concerns
  - 26,000 (34.5%) report a mental health concern
  - 39,000 (52%) report a health or injury concern
  - 26,000 (34%) report both physical and mental health concerns
  - 7,500 (10%) identified alcohol concerns
  - 13,000 (18%) requested a referral

Provider Review Patterns

Symptoms, Concerns, Referrals

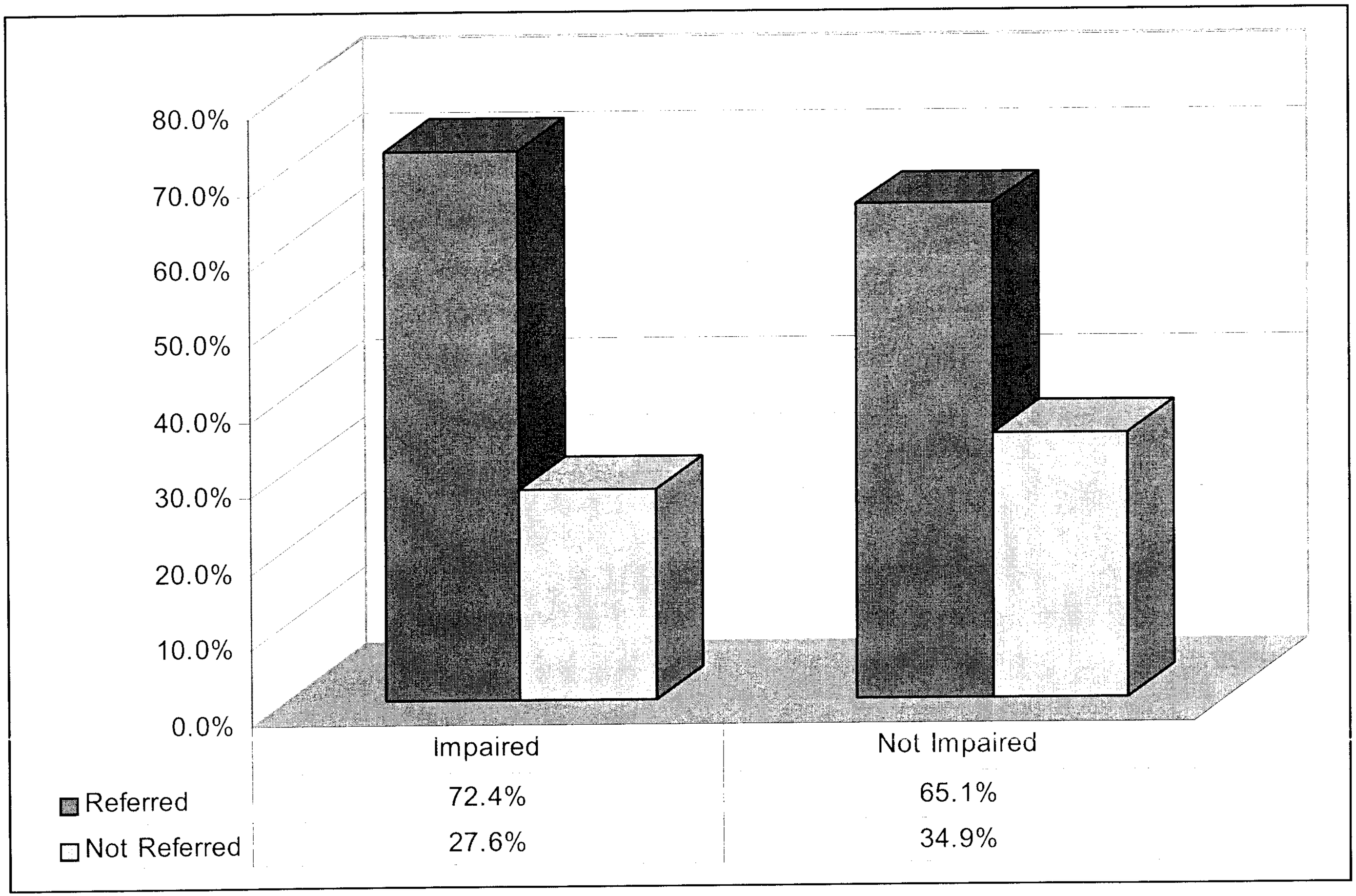
- Health Care provider reviews concerns with service member
- Provides education, guidance, decision support
- Makes referral for further diagnostic evaluation or treatments, as indicated
- 19,974 (26.4%) of total received at least one provider referral
- Most frequent symptoms: 16% sleep/fatigue; 15% back pain; 10% joints
- Of the referrals:

9% Physical health concerns
6% Mental health concerns
Depression symptoms
Interpersonal, family conflict or readjustment concerns
Anger concerns
<1% Alcohol-related concerns

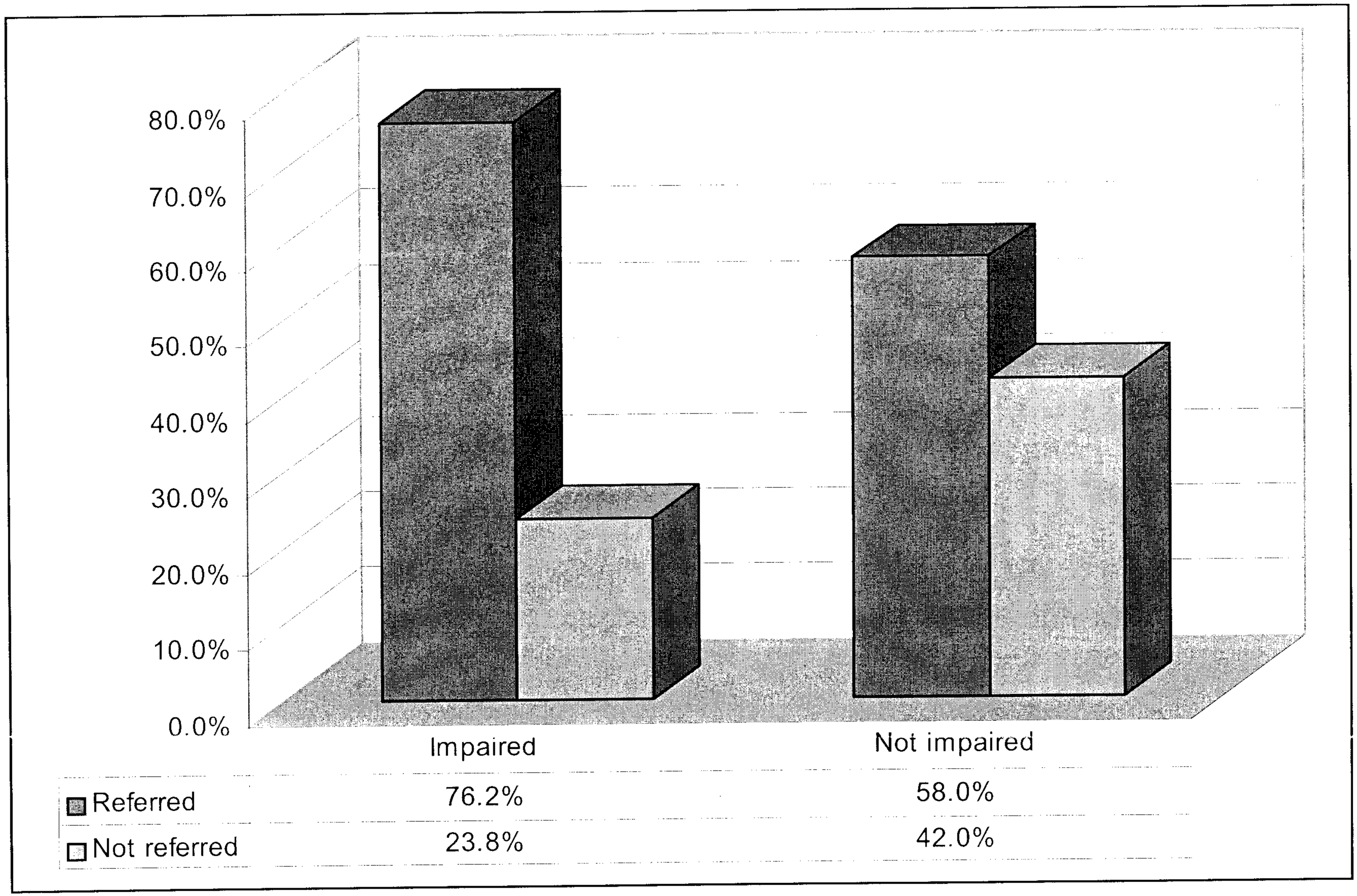
<1% Urgent Care
12.5% Primary Care
8% Mental Health
2.5% Pre-clinical

DMSS Data Jun 05 – July 11, 2006

Effect of Perceived Impairment on Provider Referral
SM endorses 3 or 4 symptoms of PTSD



Effect of Perceived Impairment on Provider Referral
SM endorses 1 or 2 symptoms of alcohol abuse



Where are we going?

- 'Bridge' funding for services in FY06
- Interagency agreement (MOU) with VA
- 'Line of Duty' (LOD) Business Rules
- Identify strategies for contacting 'backlog' and 'pre-backlog' groups
- Evaluate the strength of effectiveness tied to the PDHRA (John Snow, INC)
- Optimize PDHRA processes (referral, follow-up, use of clinical practice guidelines, etc.)

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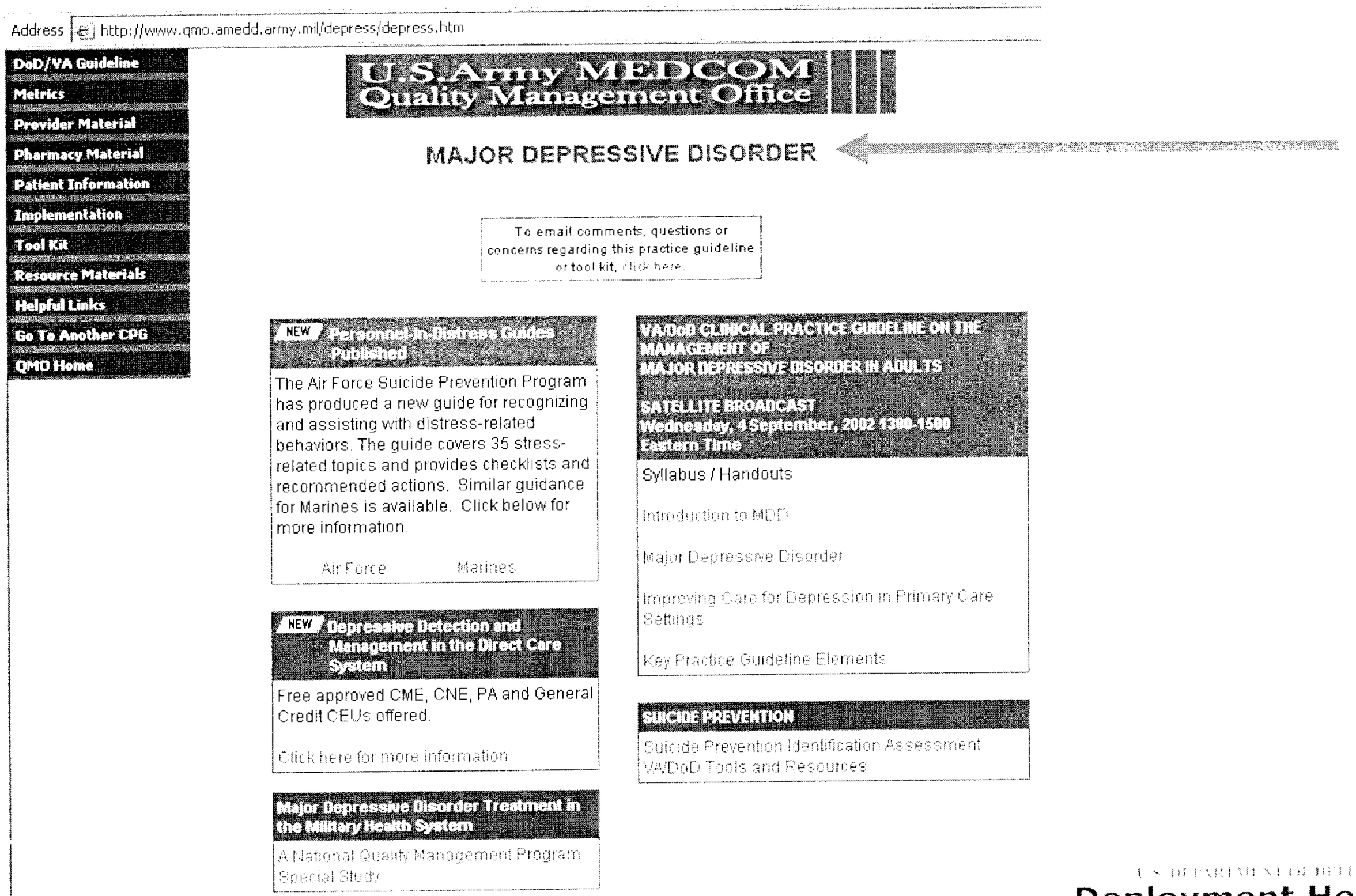
Discussion & Questions

Backup Material

Clinical Practice Guidelines

http:www.qmo.amedd.army.mil/depress/depress.htm



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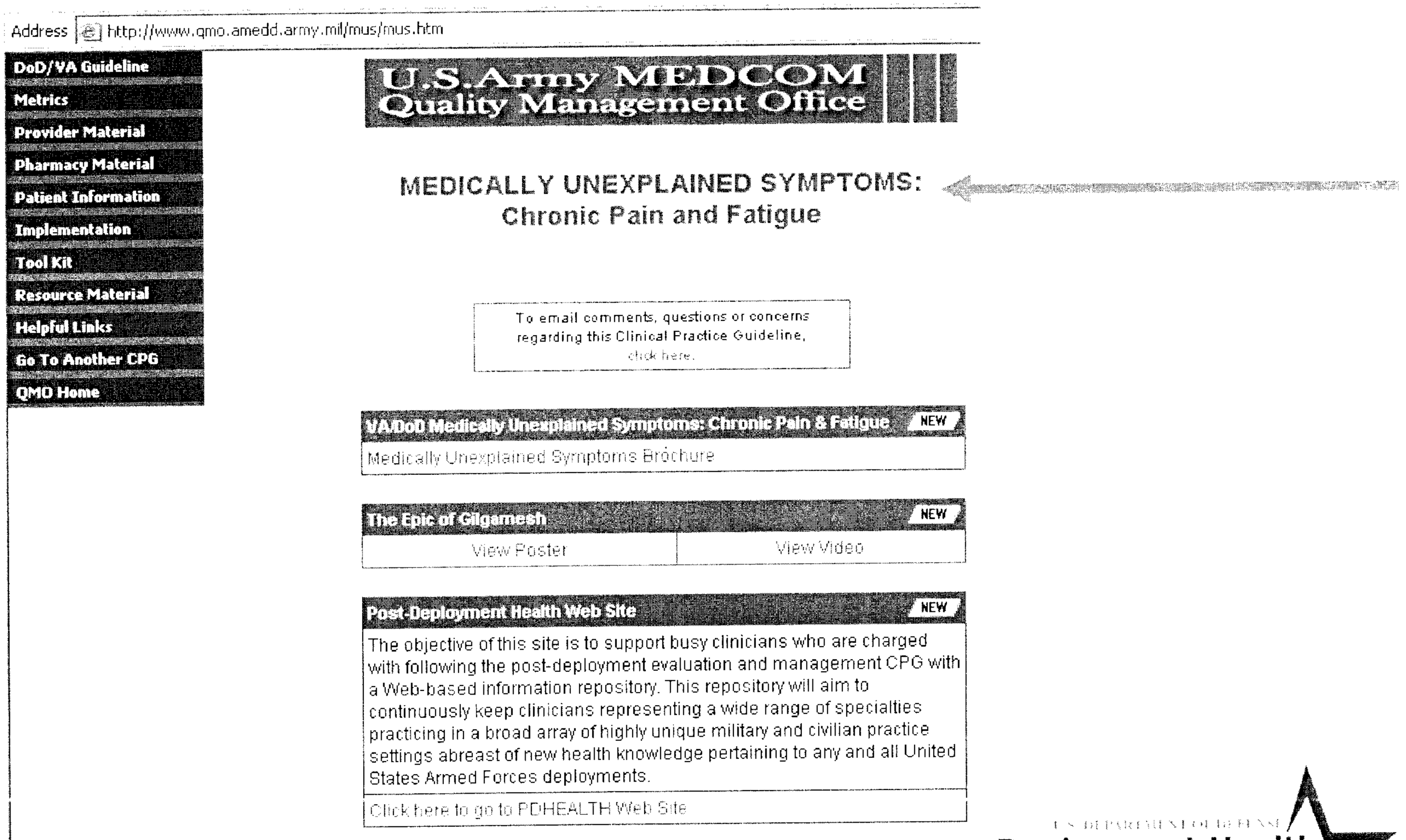
Deployment Health Support Directorate

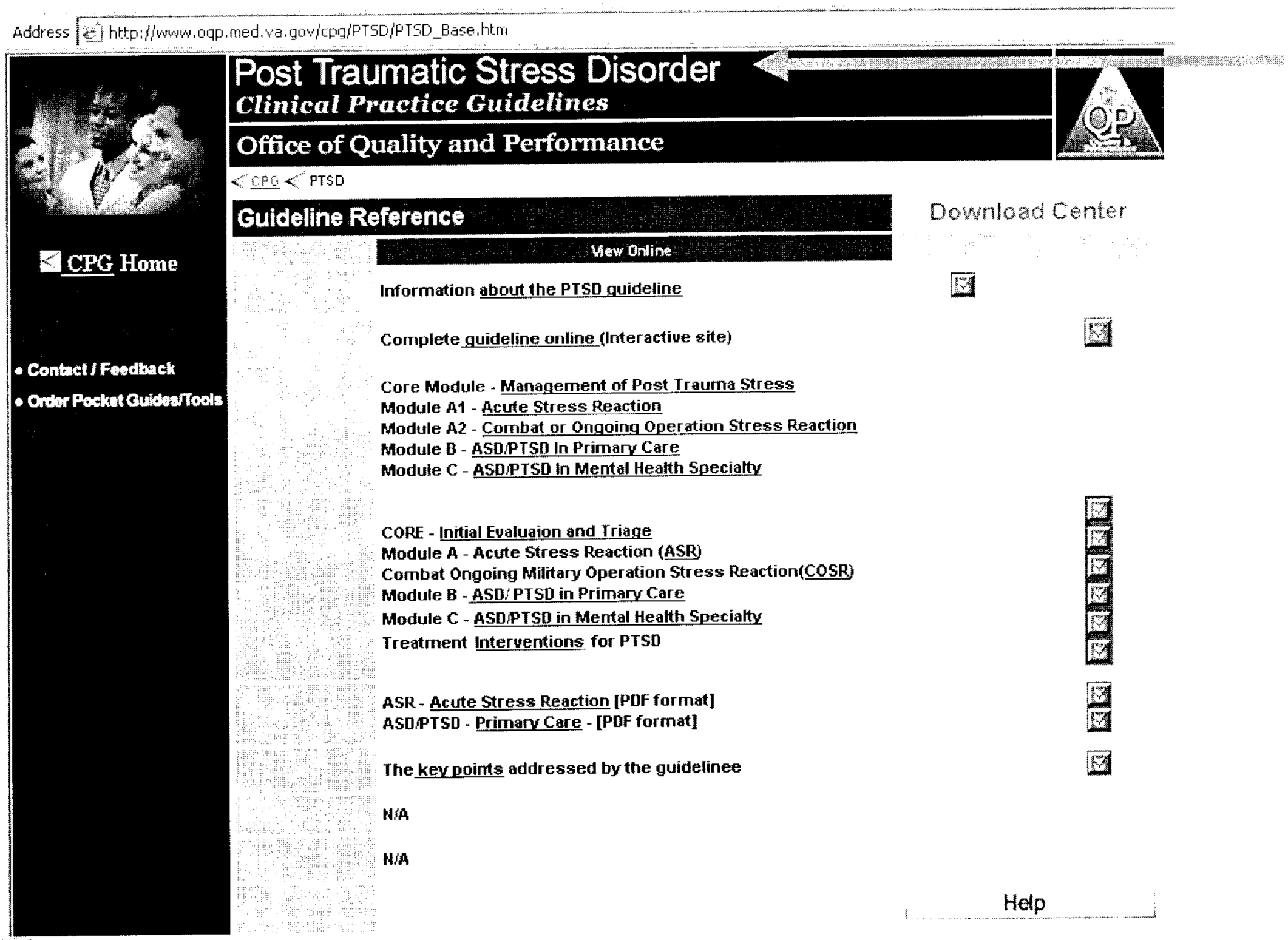
Clinical Practice Guidelines

http://www.qmo.amedd.army.mil/mus/mus.htm



Clinical Practice Guidelines

http://www.oqp.med.va.gov/cpg/PTSD/PTSD_Base.htm



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In-Theater Health Surveillance:

What's Hot, What's Not

Force Health Protection Conference
8 August 2006

(b)(6)

Director, Force Health Readiness
Deployment Health Support Directorate
Office of the Assistant Secretary of Defense
(Health Affairs) Force Health Protection and Readiness

Outline

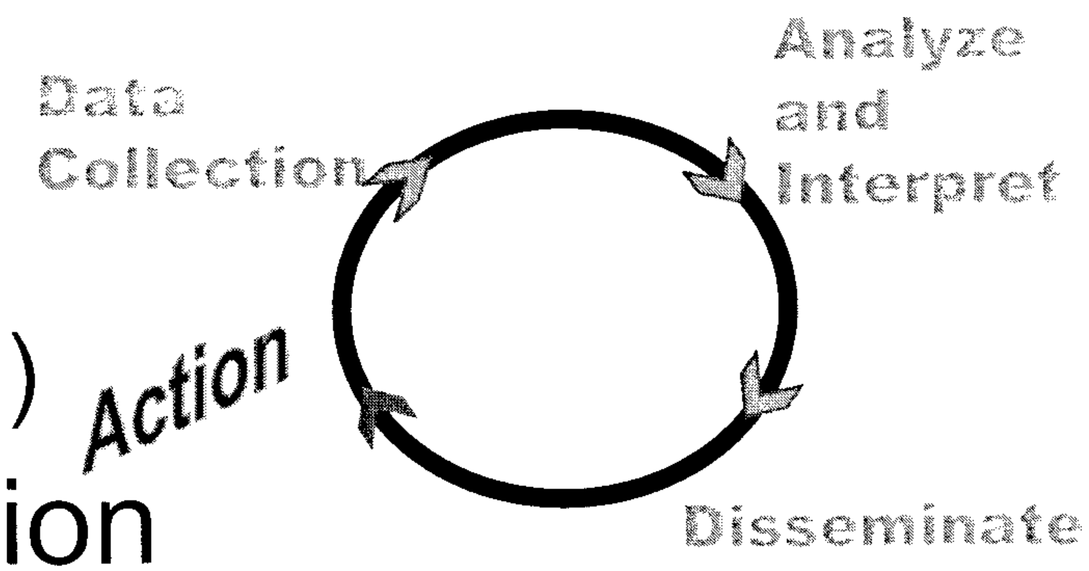
- Background
- In-theater Health Surveillance Systems
- Findings

Health Surveillance

- Timely data flow
- 'Accurate' data

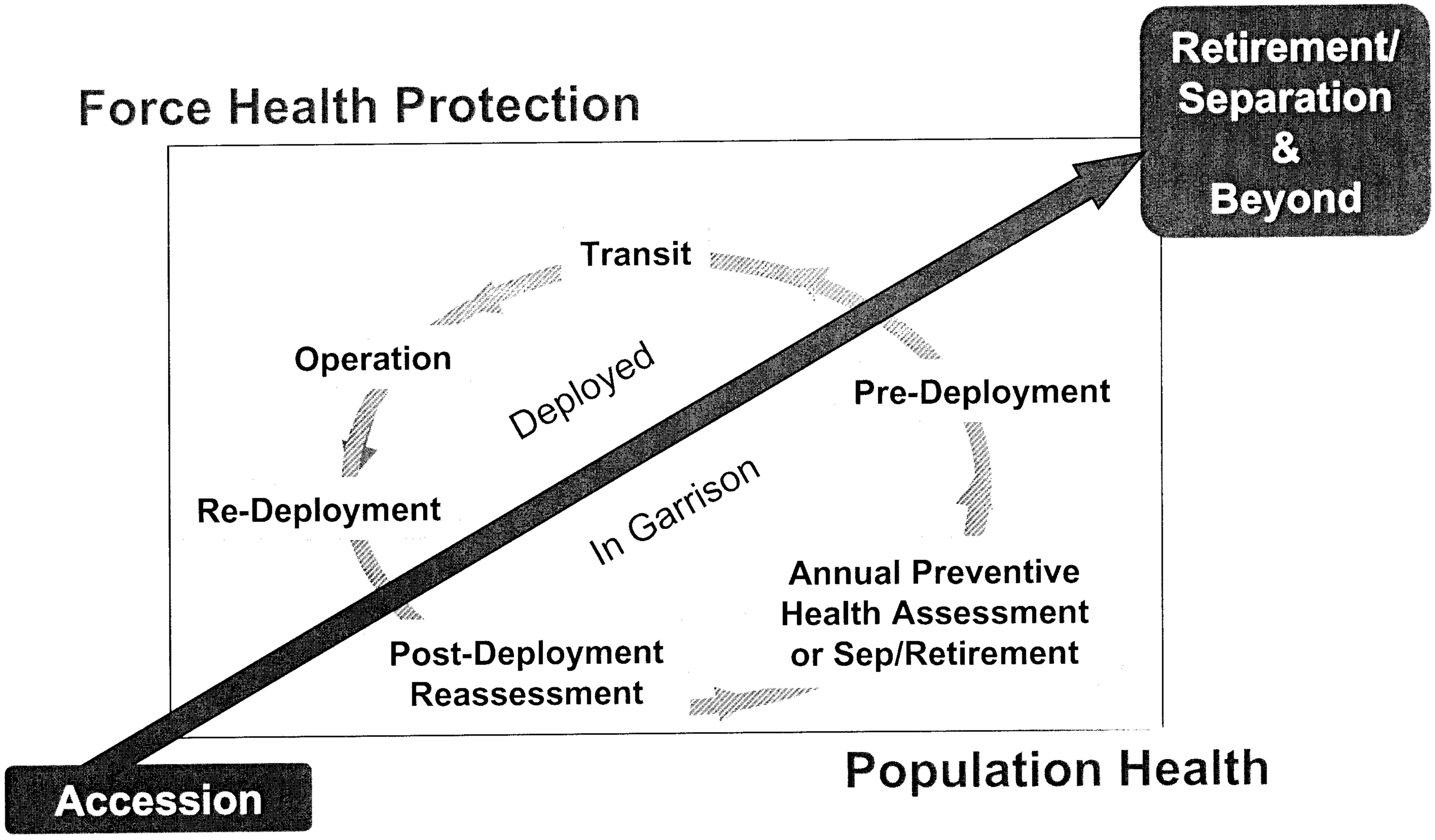
Field Responsibility

- Appropriate analyses and interpretation with a goal of <u>actionable information</u>
- Timely reporting to decision makers
  - Forward field unit
  - Intermediate command levels
  - 'Rear' top-level (AF, DoD, etc.)
- Appropriate action/intervention
- Continuous monitoring for effectiveness



Service Member Life Cycle

Health Assessment Opportunities



Deployment Associated Surveillance

Predeployment	Intradeployment	Postdeployment

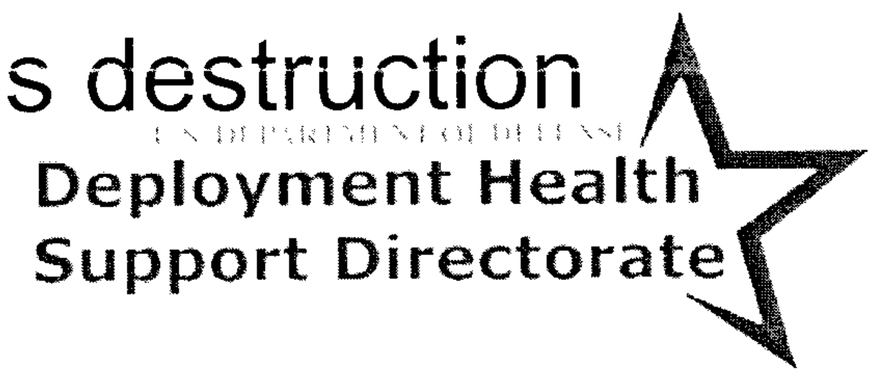
• Self-assessment with DD Form 2795
• Archive pre-deploy serum sample
• Individual medical readiness
• Periodic Health Assessment (PHA)
	• Monitor health events
	• Monitor exposures
	  • Occupational
	  • Environmental
	• Self-assessment with DD Form 2796 prior to leaving operational area
	  • Separation exam
		• Archive post-deploy serum sample (<30d)
		• TB test (risk-based)
		• Postdeploy health reassessment (90-180d) with DD Form 2900
		• Health care utilization
		• Periodic Health Assessment (PHA)

Routine Public Health Surveillance
(communicable dz, mortality, etc.)

Deployment Health Surveillance

- Outbreak detection
  - Health event surveillance
    - Diagnostic
    - Reportable events
    - "Syndromic"
    - Movement out of theater for medical reasons
    - Mortal events
  - Ancillary data, e.g., laboratory
- Occupational health exposure surveillance
- Environmental threat-based surveillance
  - Ambient
  - Operational, e.g., weapons of mass destruction





Existing Systems/Programs

- Casualty Reports (hostile injuries/deaths)
  - Personnel Component
  - Medical Component (AFIP Mortality Surveillance)
- Disease and Non-battle Injury Reports
  - Patient encounter modules (PEM) or web data entry
  - Reportable Medical Events
  - Joint Patient Tracking Application
  - Medical Air Transport Reports (TRAC^{2}ES)
  - Other (Safety Reports, Trauma Registries, etc.)
  - Post-deployment Health Assessments
  - Occupational/Environmental Exposure Reports

Casualty Reports

- Defense Military Data Center (DMDC)
  - KIA, Died of Wounds, WIA, RTD in 72hrs
  - Rapid reporting, but limited cause categories that are assigned by administrative staff
  - "Gold Standard" for public release
- Medical Component (AFIP)
  - DoD Mortality Surveillance
  - Full autopsy on every US service member who dies while on active duty
  - Results inform research, etc.

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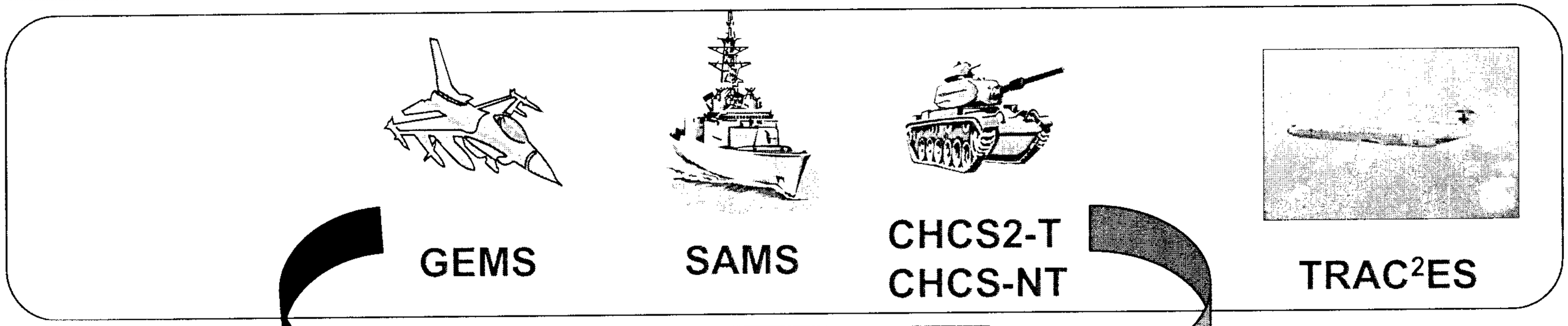
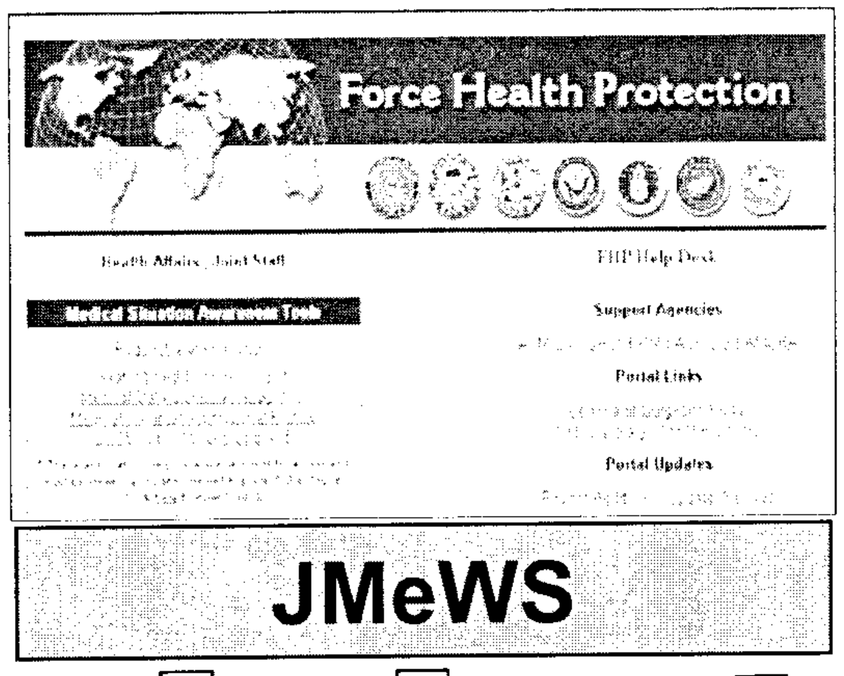
Theater Health Surveillance

Data Sources, Capabilities and Customers

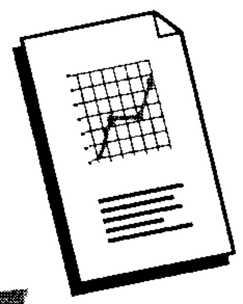




JMeWS



JPTA



Capabilities

- Medical Command & Control
- Medical Surveillance
- Annex Q Reporting
- JCS DNBI Data (weekly)
- Facilities CHS2-T data transfer to CD12

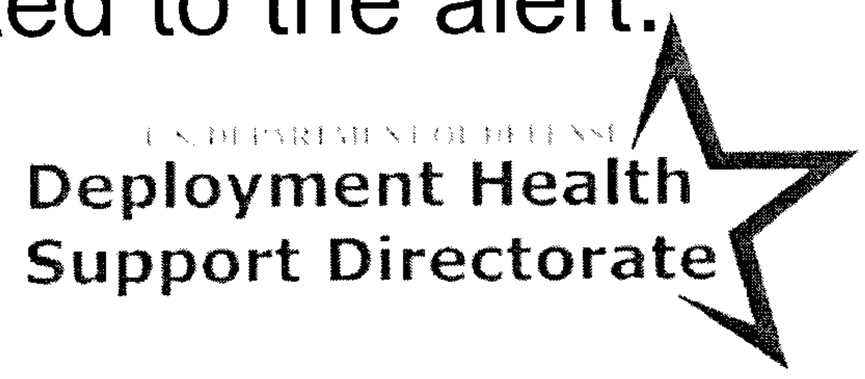
Customers

- SecDef
- CENTCOM and other Combatant Commands
- SGs
- Field units

JMEWS Medical Surveillance

- JMEWS has integrated a surveillance capability that uses Essence and a 2 and 3 z-score algorithm to generate an alert matrix as a point of departure for investigation.
- The data can be seen in the following combinations:
  - Rolled up into DNBI category
  - All MTFs within a specific DNBI category
  - All DNBI categories within a specific MTF
- Users can drill down through an alert and see the mapped encounter data that contributed to the alert.





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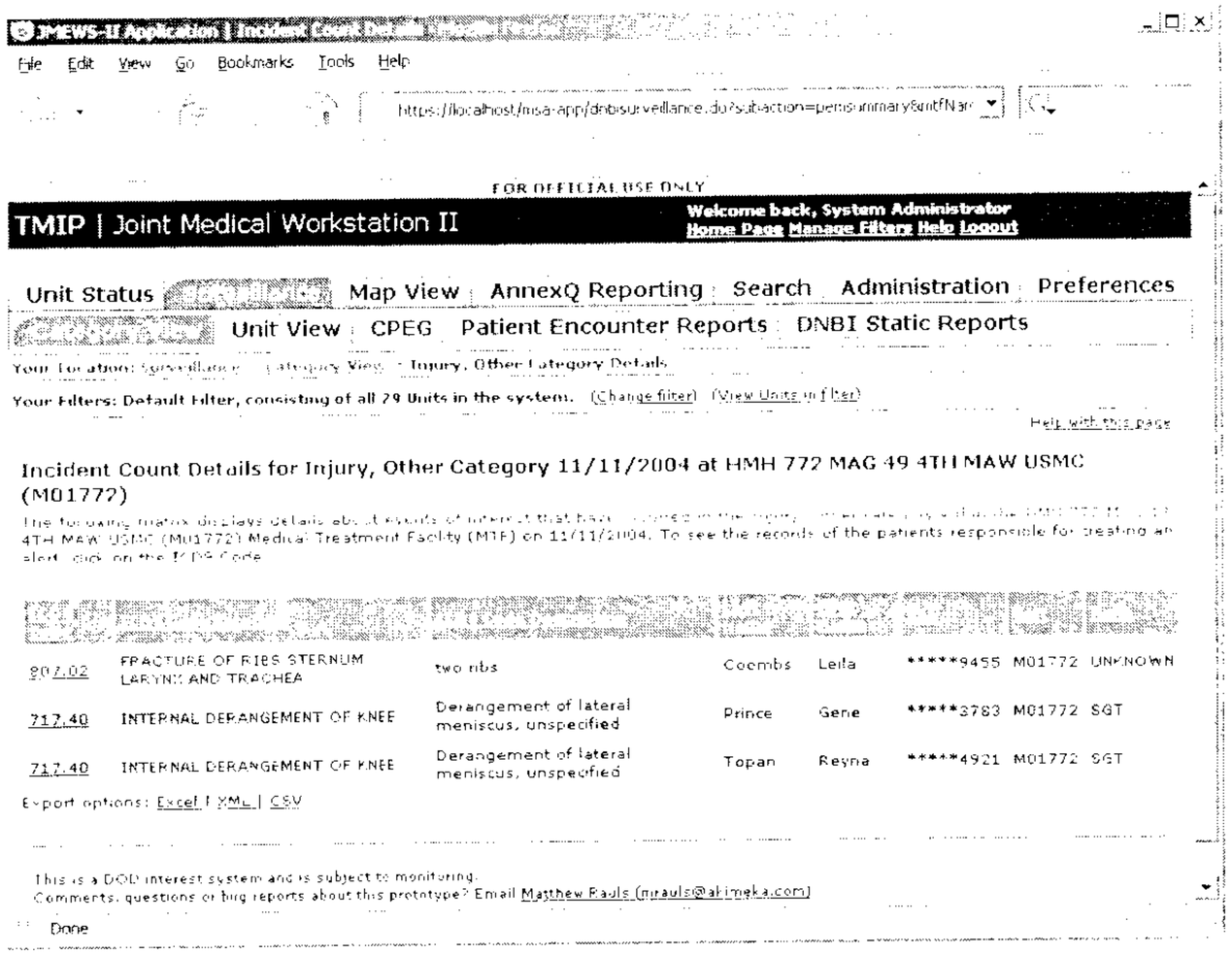
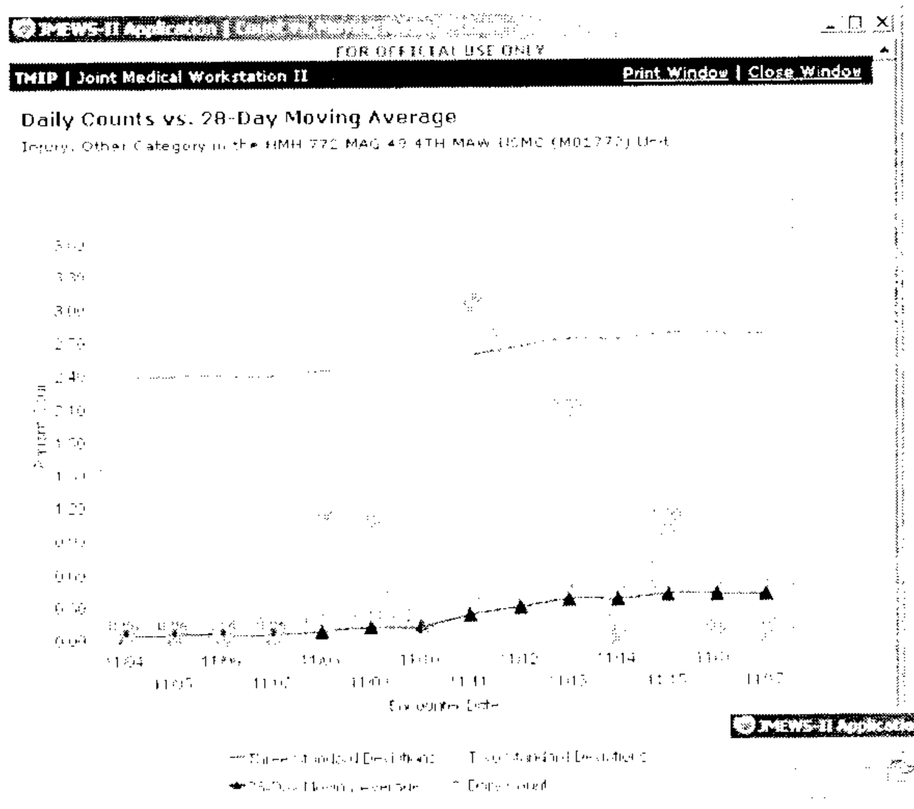
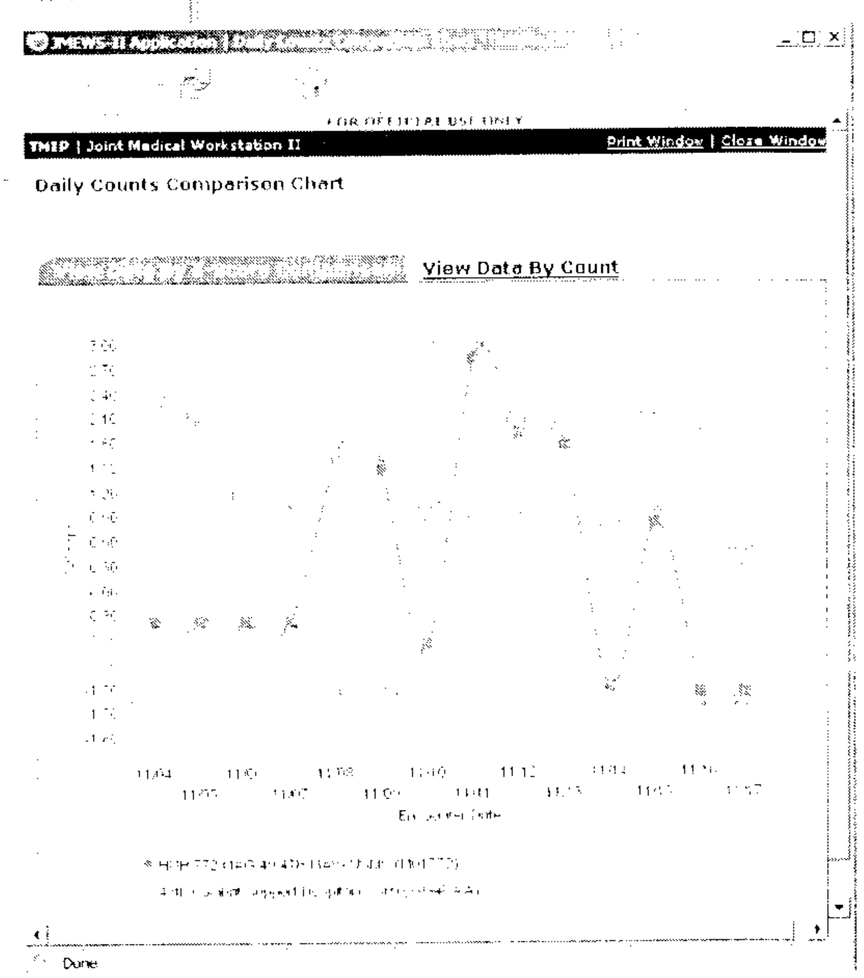
10

JMEWS Medical Surveillance





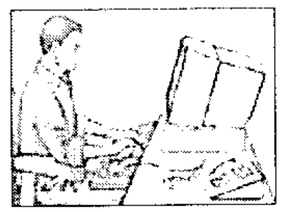


Users can either drill down again to see a list of encounters and then the specifics of each actual encounter...

...or they can view some visual tools that help put the data in context.

Patient Tracking

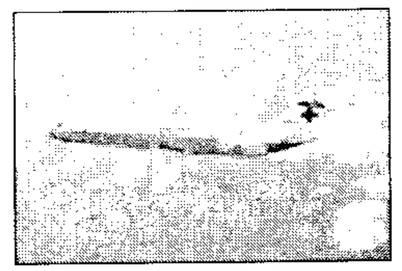
Data Sources, Capabilities and Customers



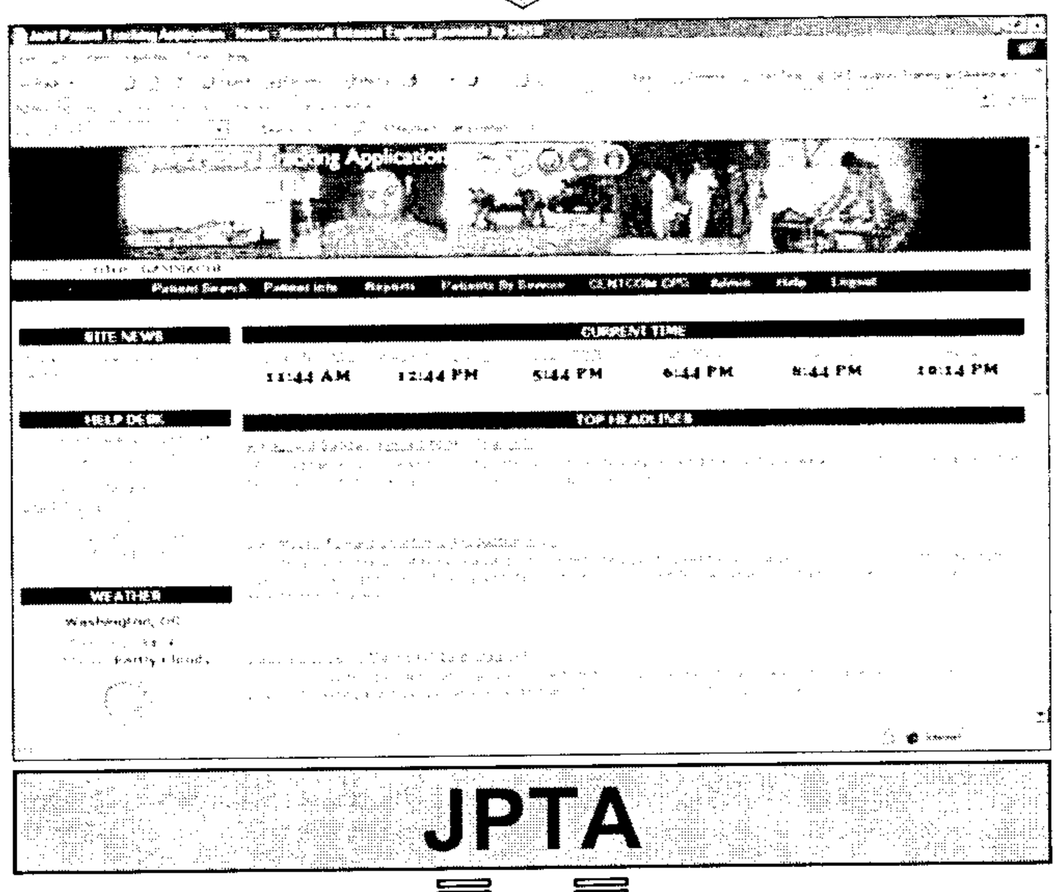
Direct Input at Echelons III-V

Data Transfer from JMeWS

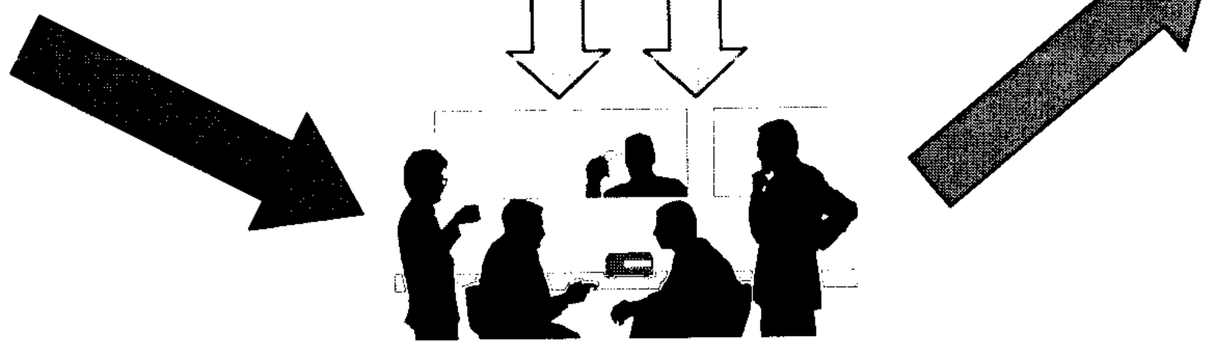
SAMS **CHCS2-T** **CHCS-NT** **GEMS (Near Future)**



TRAC²ES



JPTA



Capabilities

- Patient location and status – from theater to CONUS
- Healthcare provider treatment notes
- Extensive reporting at all levels – from theater, Europe and CONUS, down to unit and individual servicemembers

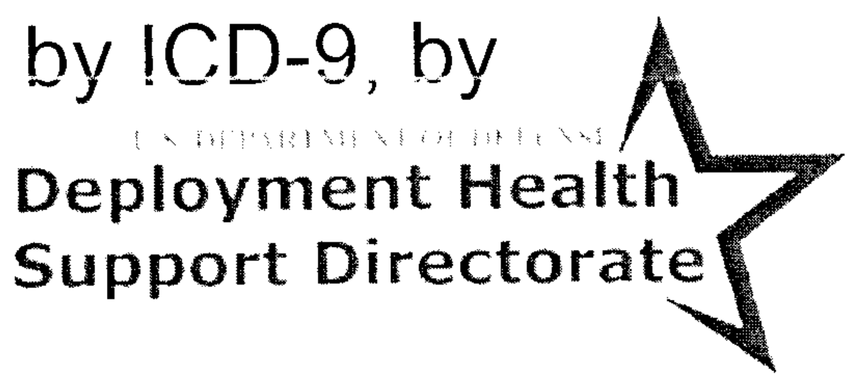
Customers

- Healthcare providers at echelons II-V
- CENTCOM
- Service liaisons
- Field units
- Service personnel offices
- Support to severely injured service-members and their families

JPTA Functionality

- Search for individual patients and see
  - Movement history, includes TRAC^{2}ES data
  - Treatment history
  - Management history
- Routine reports for active and archived patient records
  - Various rosters of current patients – includes or excludes diagnosis information based on user access level
    - **Active Patient Report** – All current patients; view all patients at your facility; does not appear on menu for access levels other than facility access; can be exported into an Excel spreadsheet
    - **Inpatient Report** – All current inpatients at your facility, listed alphabetically; can be exported into an Excel spreadsheet
    - **Outpatient Report** – Current outpatients at your facility; can be filtered by gender, or can display all patients alpha order; can be exported into an Excel spreadsheet
  - Various graphic reports (Top 10 or Top 20 by ICD-9, by Component, etc.





Environmental & Occ Exposure Data

- Does not flow out of theater in real-time
- Most of the original data is hard copy and must be entered into databases manually
  - GEMS has an occ & environmental module
  - DOEHRS-T is the planned long-term solution
- Sampling capabilities and frequency varies from site to site
- Perceived exposure info available from DD Forms 2796 (post-deployment survey)

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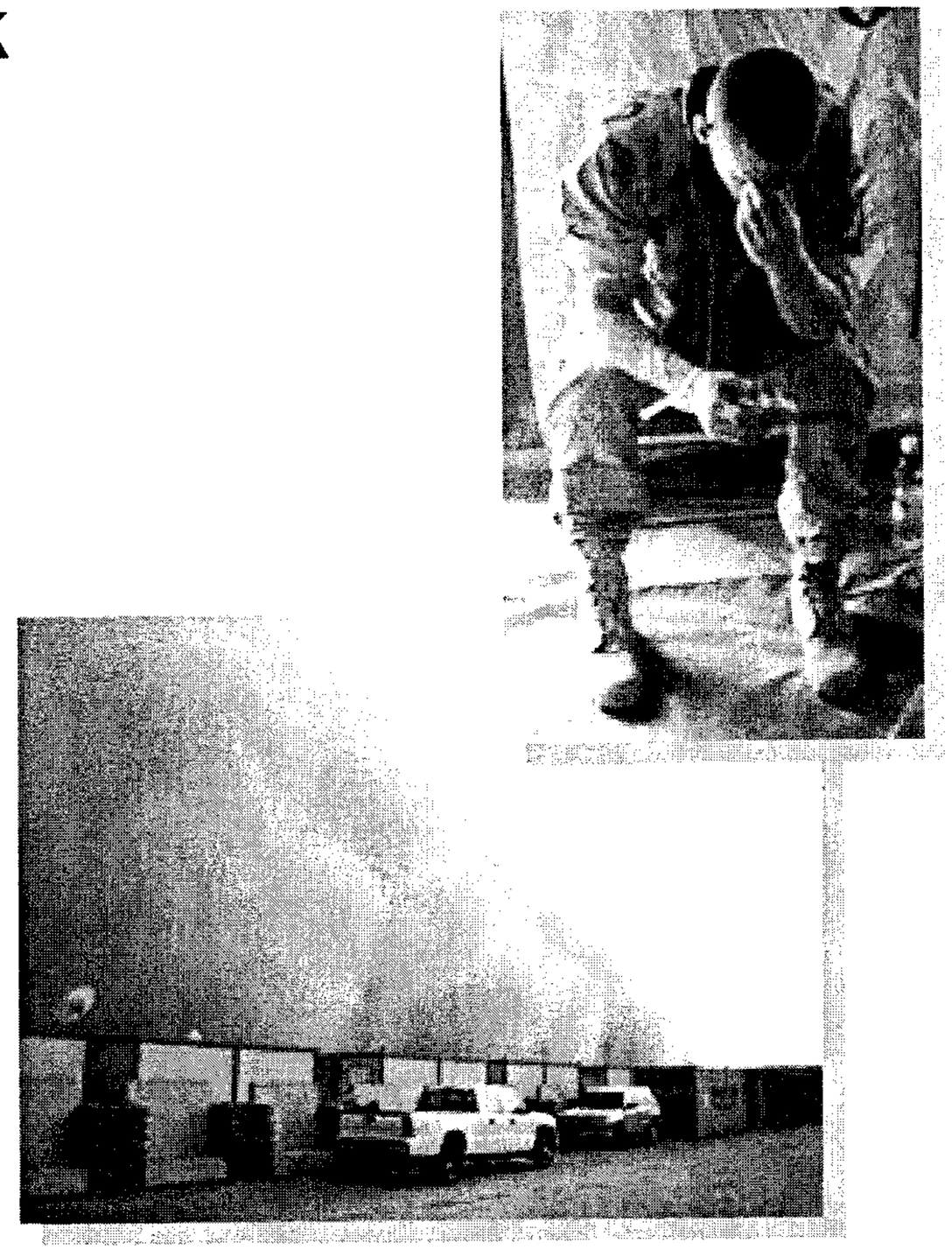
Deployment Surveillance

Sample Reports & Findings

Disease and Non-Battle Injuries (DNBI)
CENTCOM (OEF/OIF) Combined

- **Overall DNBI rate – 4% per week**
  - Injuries, all types 25%
    - Training/Work 44%
    - Sports 16%
    - Heat/Cold 3%
    - Motor Vehicles 2%
    - Other 35%
  - Respiratory 14%
  - Dermatologic 12%
  - Gastrointestinal 7%
  - Mental Health 3%
  - Combat Stress 2%
  - All other categories 37%

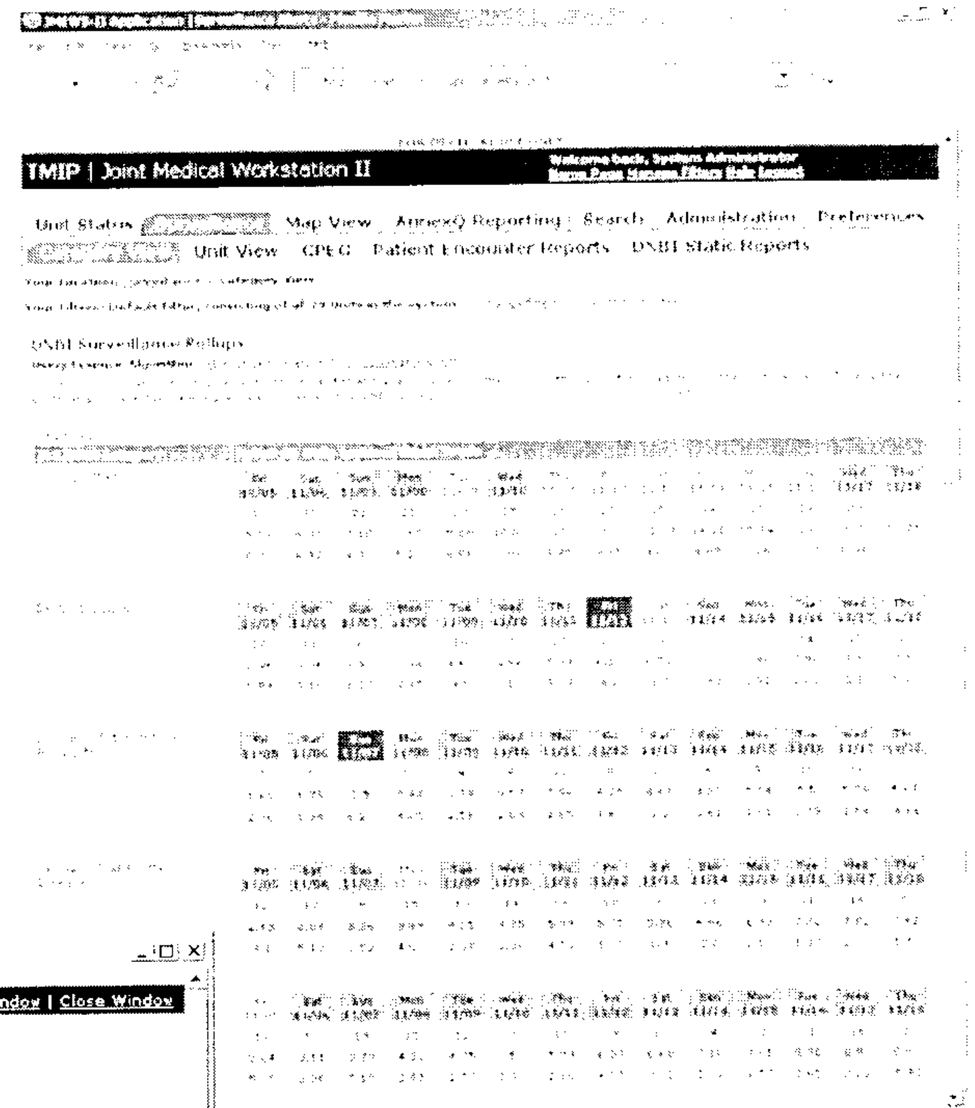


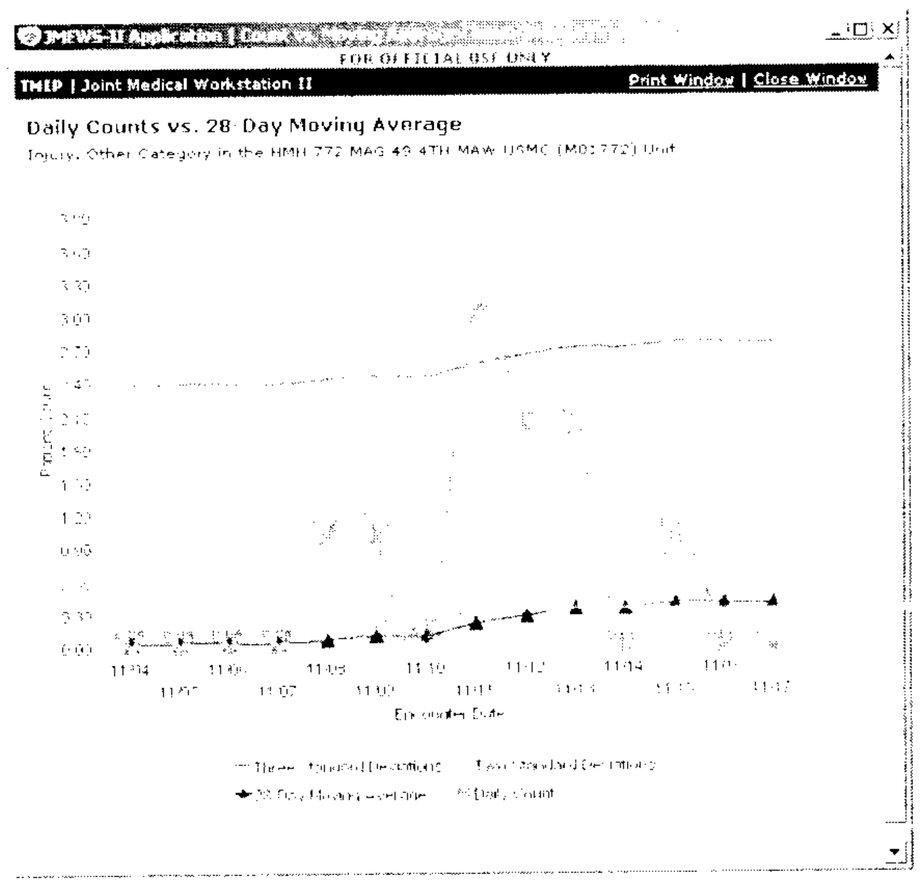
Data Source:
Air Force Institute of Operational Health
As of 17 June 2006

JMEWS Surveillance Reports/Data

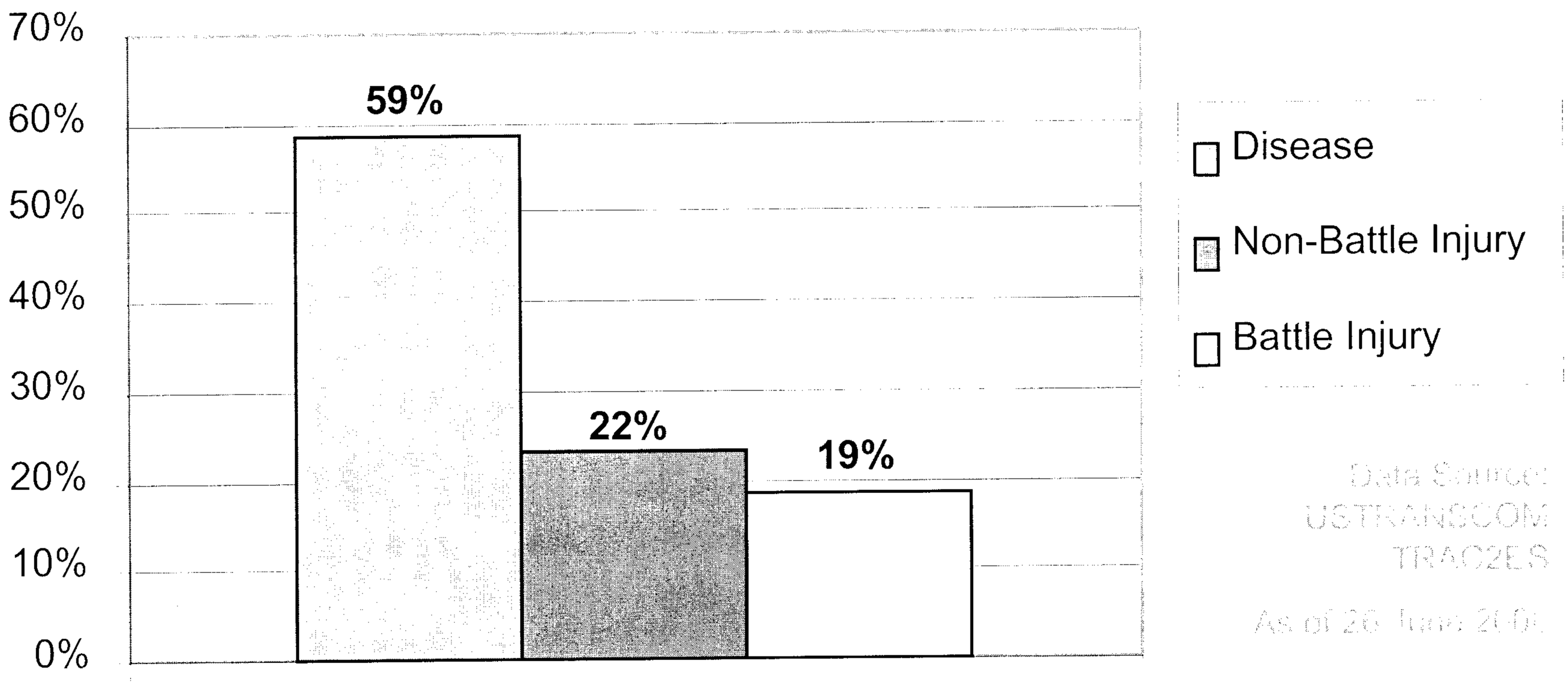
OEF/OIF PEM data from CHCS2-T & GEMS–Top 10 ICD-9

1. Acute upper respiratory infection
2. Back disorders
3. Gastroenteritis
4. Joint disorders
5. Ankle/foot injuries
6. Essential hypertension
7. Exams, miscellaneous
8. Contact dermatitis
9. Tobacco dependence
10. “Common cold”





Medical Air Transports of Individual Servicemembers



From 2001-2006, the total MATs of individual servicemembers = 33,874

DoD AMPUTEES in OEF and OIF

- 686 Total Amputations as of 01 June 2006
- Most Common Causes
  1. *IED (42%)*
  2. *Accident (9%)*
  3. *Blast (8%)*
  4. *Rocket propelled grenade (8%)*
  5. *Gunshot wound (6%)*
- Outcome/Disposition
  1. *As of 19 Apr 06, 195 SMs with limb loss had completed MEB/PEB with 34 (17%) able to continue in military service*
  2. *25 of 34 returned to their original career field*





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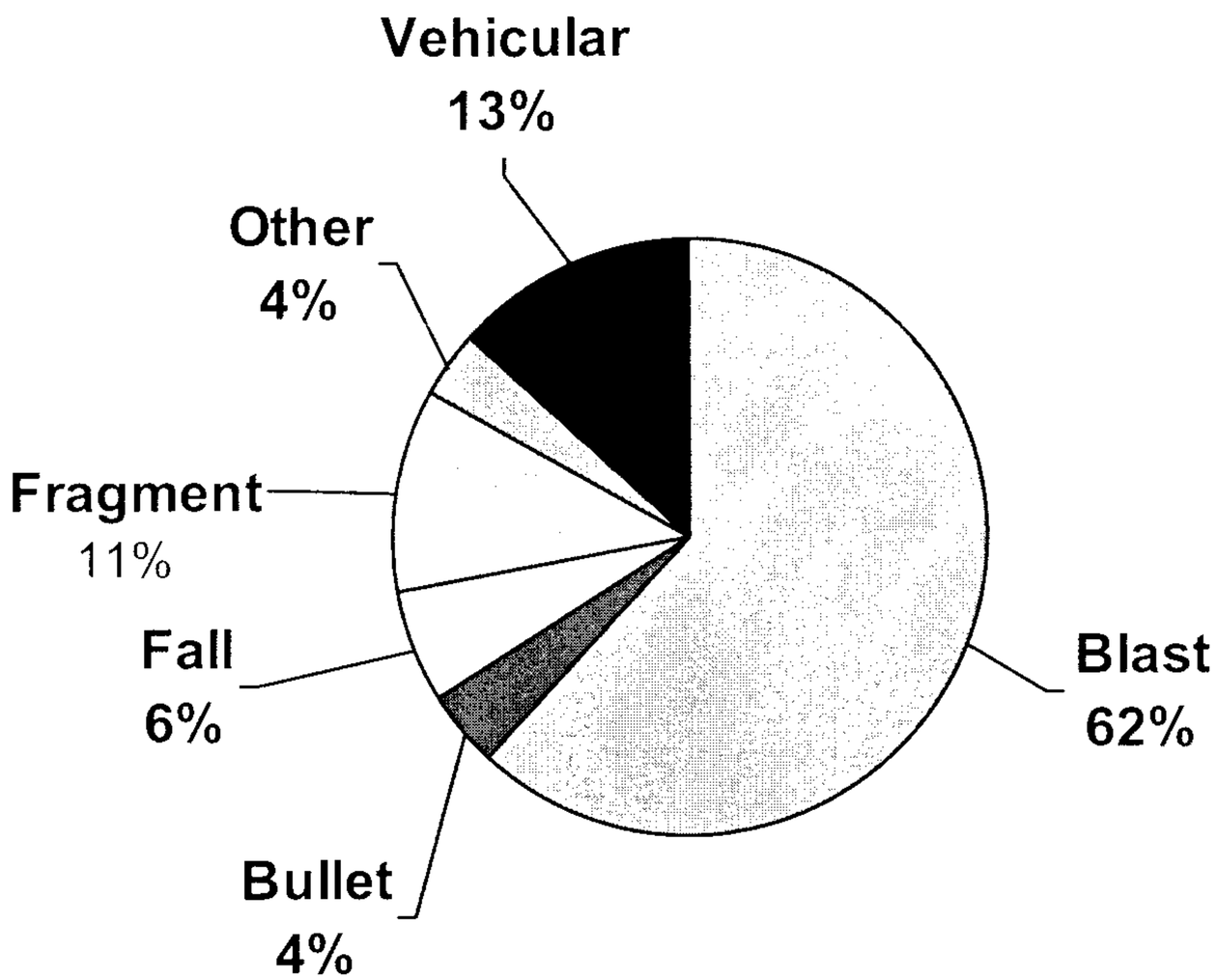
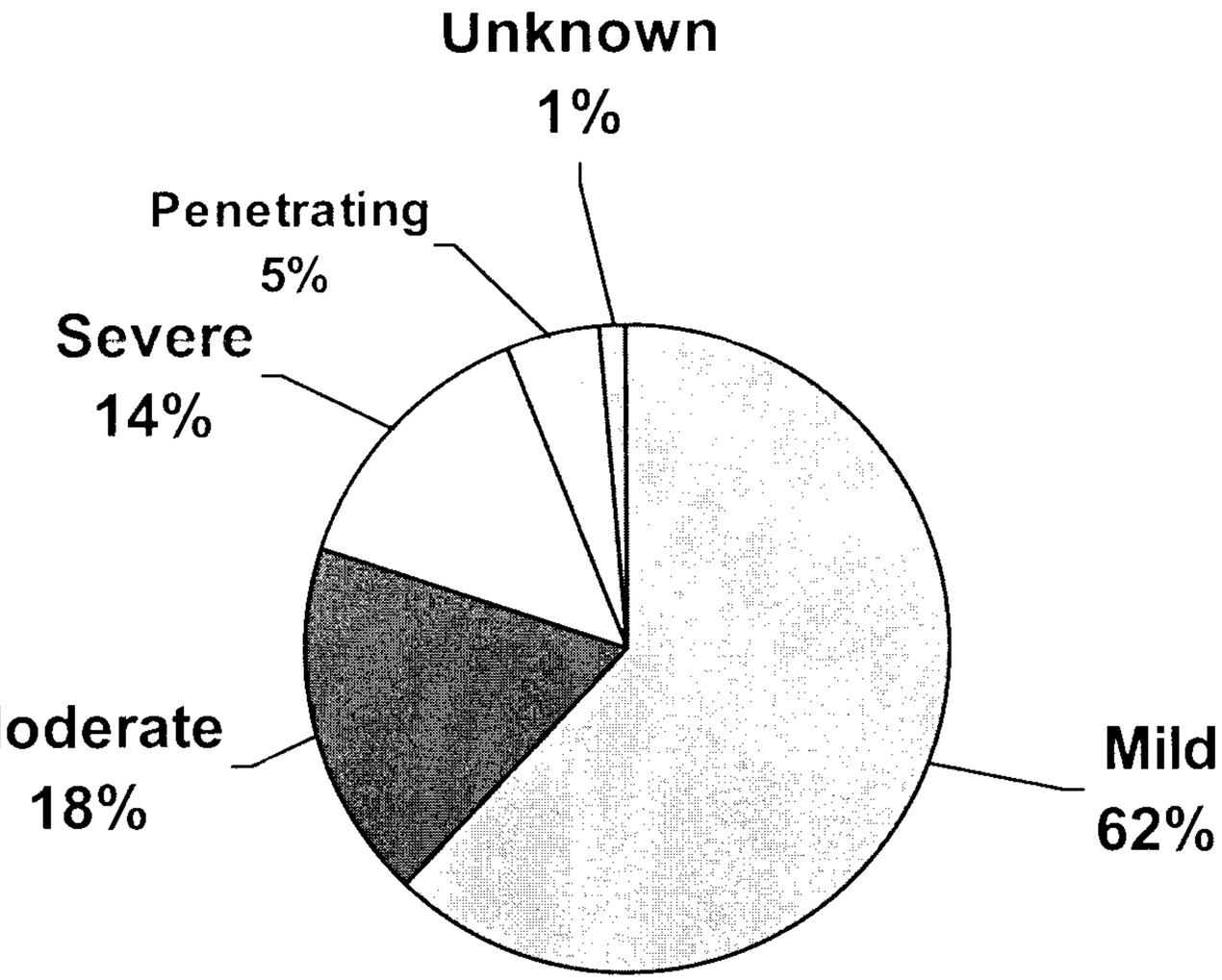
Deployment Health Support Directorate

Traumatic Brain Injury

TBI Injury Mechanism



TBI Severity of Injury



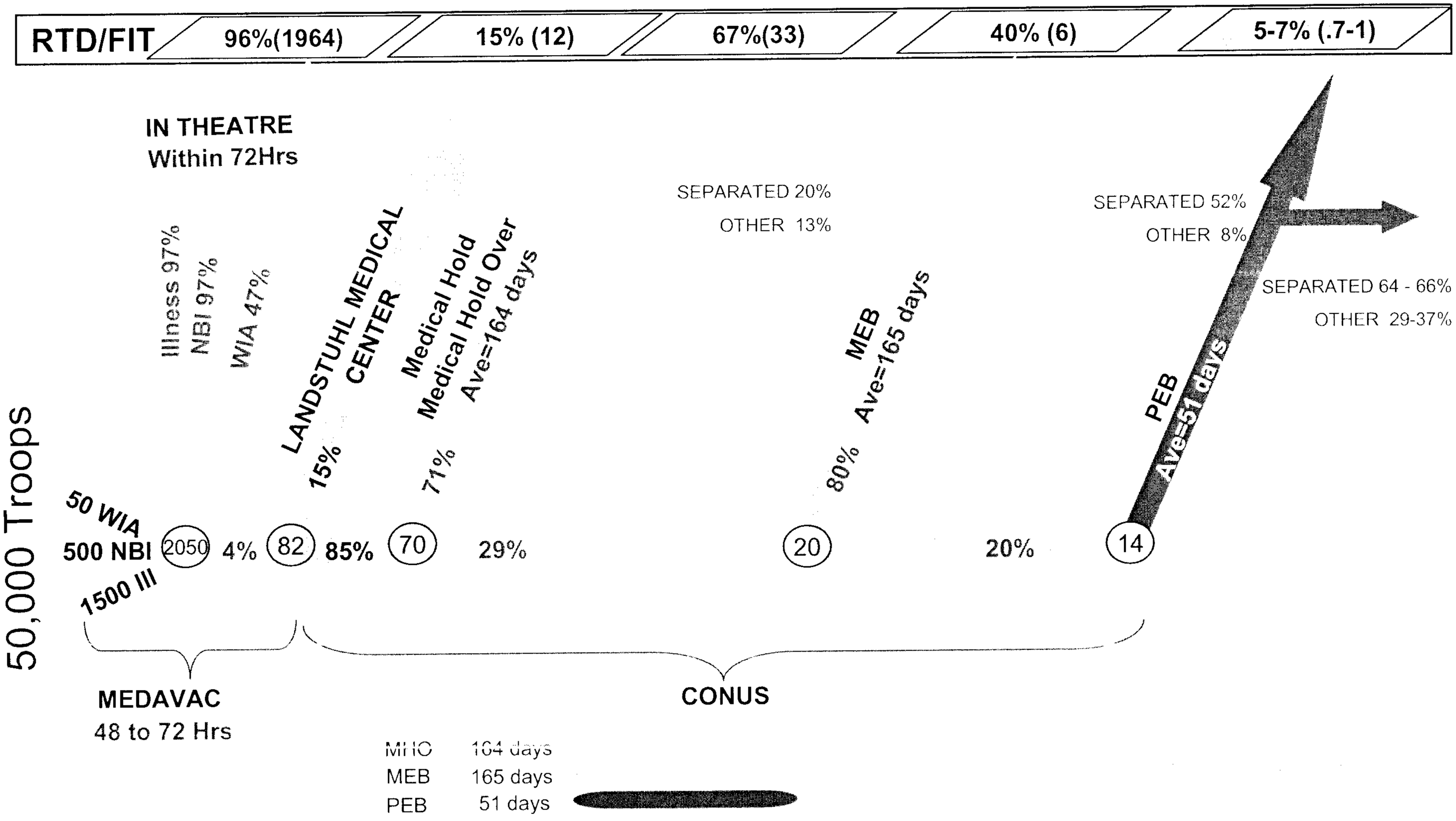
- Spectrum of TBI range from mild to severe, grand total=1,179
  - Most (763 or 62%) are mild
- Operational breakout, OIF (96%), OEF (4%)

Data from Defense Veterans Brain Injury Center, as of 30 Apr 06

Disposition of Ill and/or Injured Soldiers in OIF

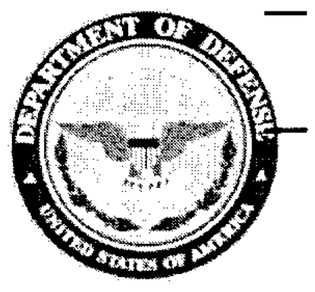
Estimated Based on Historical Data

(1 January 2003—31 January 2005)



Summary of OIF/OEF
Selected Exposure Incidents

- **Al-Samawah, Iraq**
  - Alleged DU contamination (442nd MP)
  - Extensive environmental sampling and medical surveillance (no DU exposures identified)
- **Al Mishraq Sulfur Plant/Mine Fires**
  - Approx 2500-3000 US personnel exposed to sulfur dioxide and hydrogen sulfide
  - Extensive environmental monitoring and medical surveillance
  - Possible long-term effects under investigation
- **Qarmat Ali Water Treatment Plant**
  - Possible sodium dichromate and PCB exposures involving about 250 personnel
  - Extensive environmental sampling and medical surveillance
  - No expected long-term health effects





Bringing it All Together



Deployment Health
Support Directorate

Questions and Discussion

Background Material

Disease Non-battle Injury (DNBI)
JCS-Mandated Categories (Weekly)

Dermatologic
GI, infections
Gynecologic
Ophthalmologic
Psychiatric
Combat stress
Respiratory
Intimate diseases
Fever, >24 hours
Neurologic (new)
All other, med/surg

Injuries, heat/cold
Injuries, sports/recreation
Injuries, motor vehicle
Injuries, work/training
Injuries, other

Problems:
Static since inception (1998)
Data 10-14 days old when analyze
This won't detect WMD attacks
Solution?—Special Surveillance

CENTCOM Special DNBI Surveillance Categories (Daily)

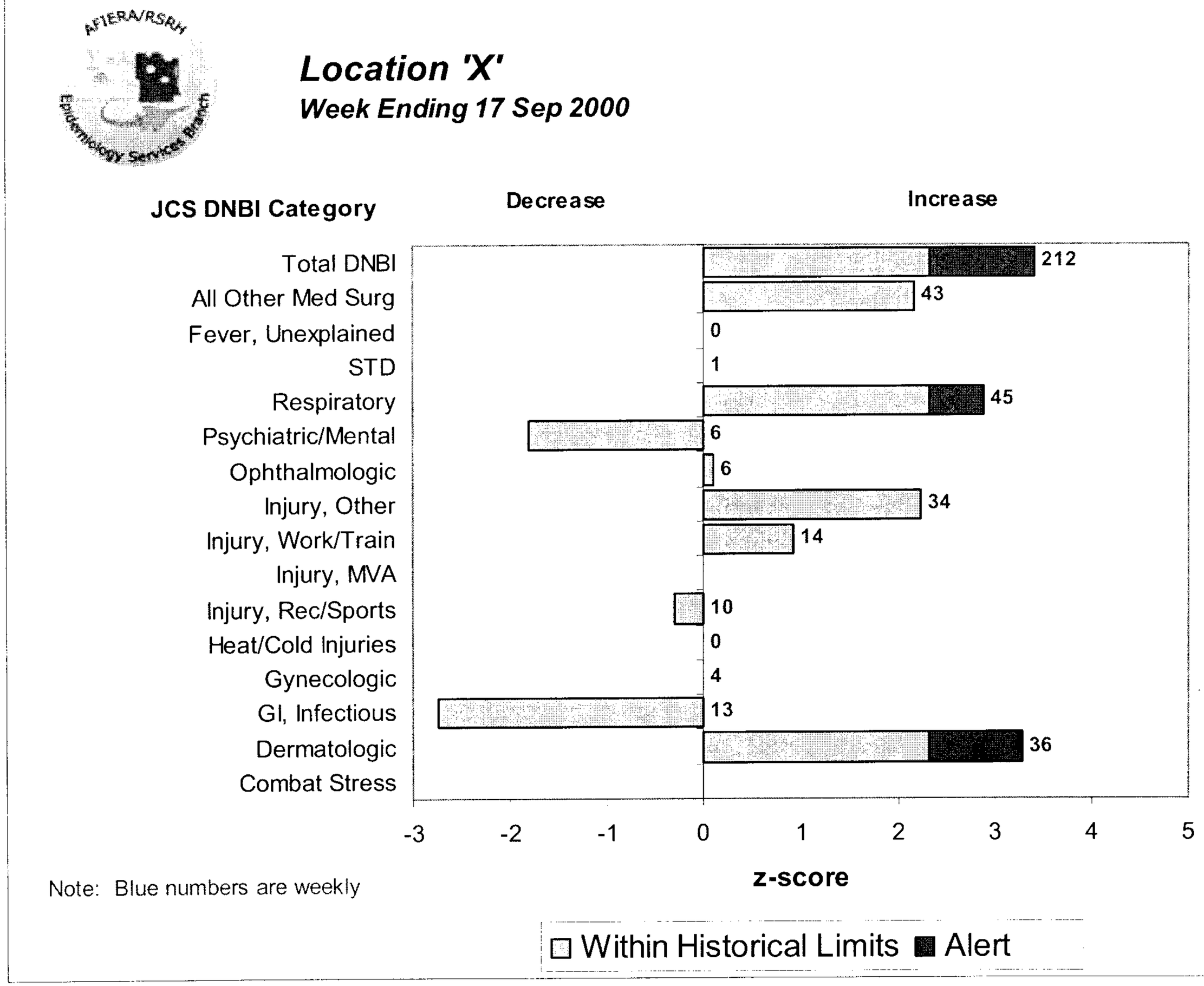
Category	Definition
Systemic Fever	Unexplained temp > 38C (100.5F) for 24 hours or a history of chills and fever without a clear diagnosis. Includes flu-like illnesses with fever and multiple systemic complaints (such as cough).
Lower Respiratory Illness	Bronchitis, pneumonia, new onset reactive airway disease, pleurisy, or respiratory difficulty of unclear etiology
Infectious GI	Any infection primarily manifested by vomiting and/or diarrhea.
Dermatologic Unclear Cause	Skin infections, blisters, ulcers, etc.
Unexplained Neuro	Cases of altered levels of consciousness, cranial nerve dysfunction, muscle weakness

AFIOH DNBI Analyses for CENTCOM

https://brooks.af.smil.mil/AFIERA/Default.htm

Location 'X'

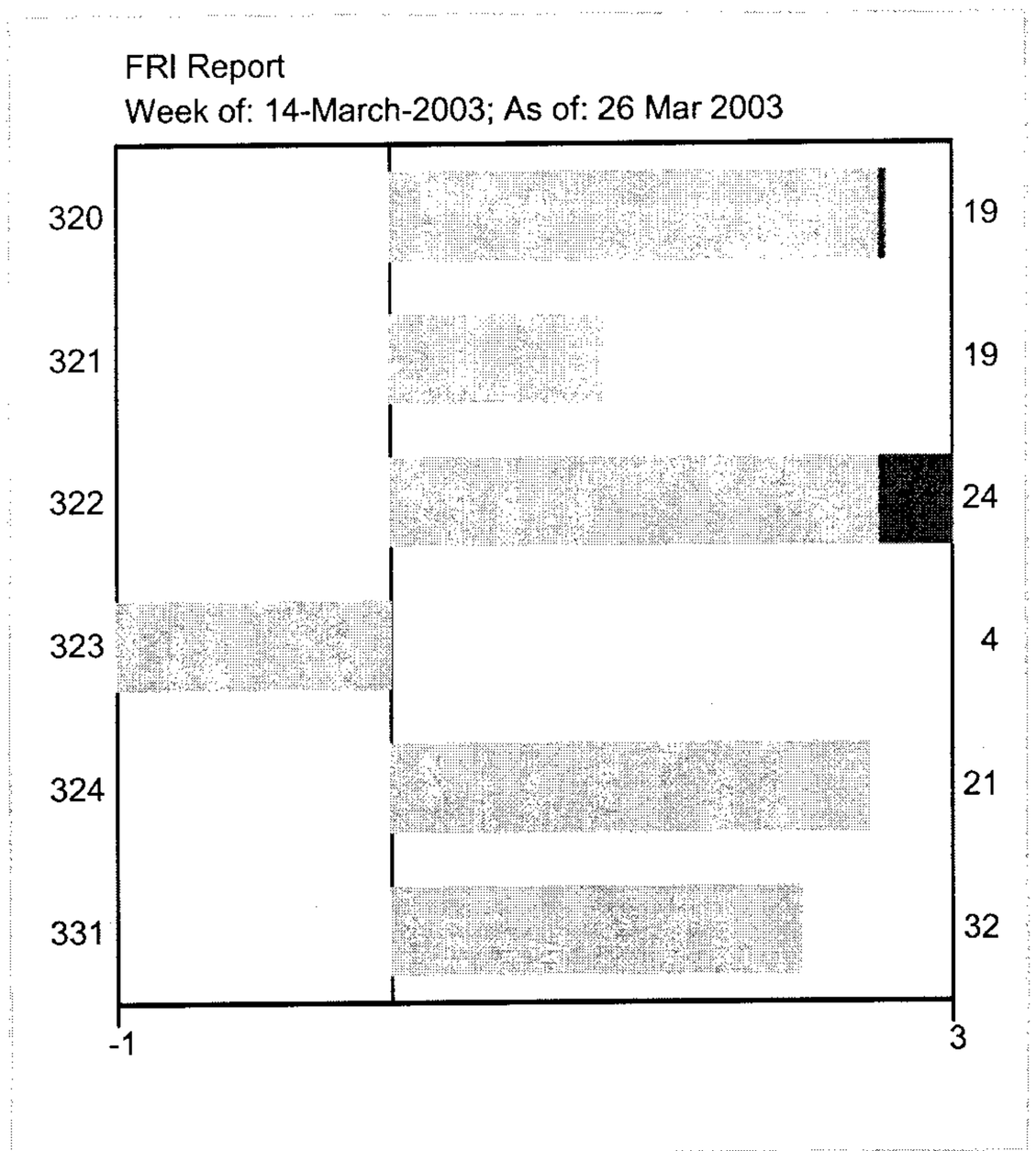
Week Ending 17 Sep 2000



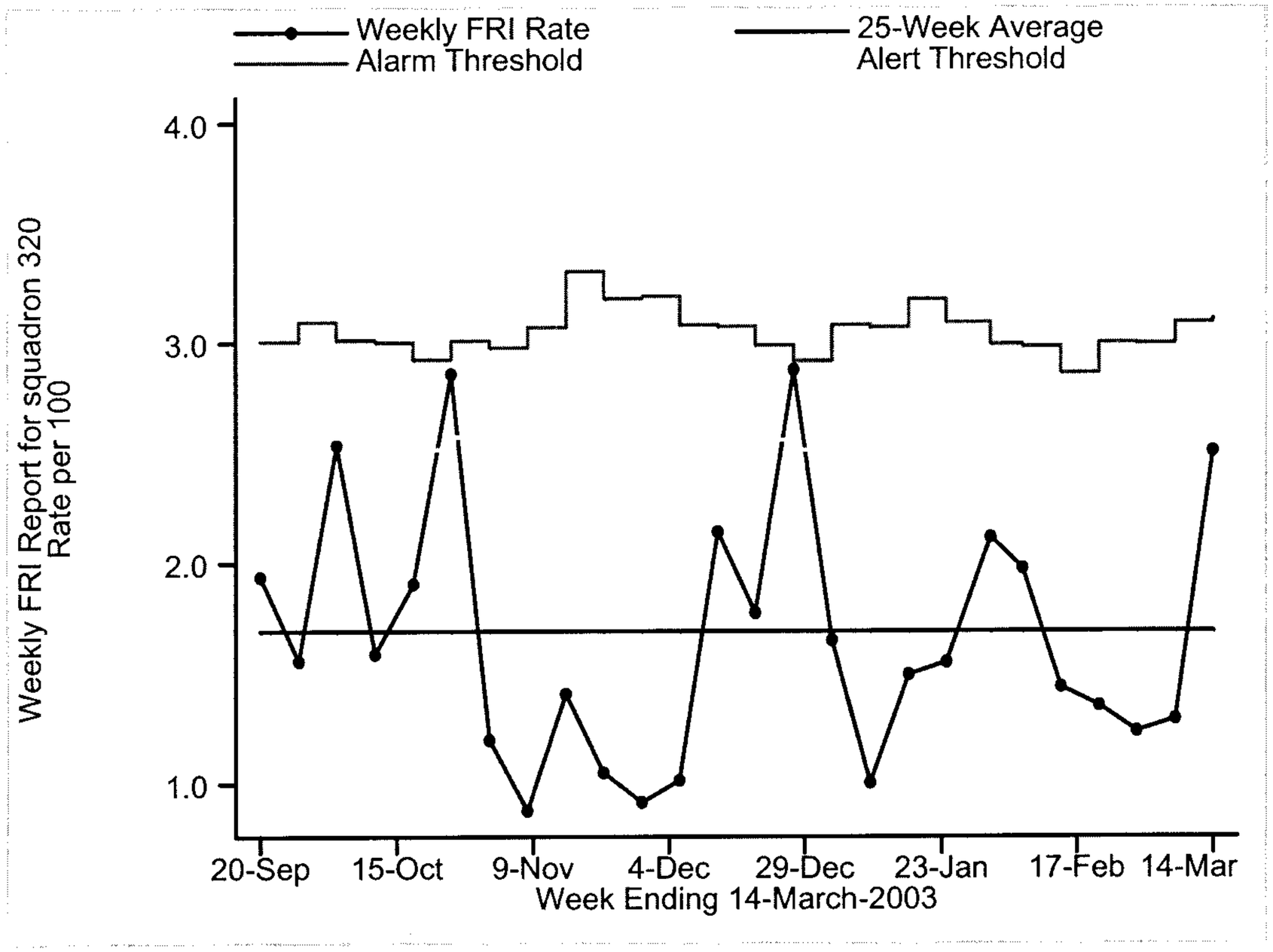
Note: Blue numbers are weekly

Data Interpretation
Complementary Chart Use

CPEG Chart



Process Control Chart



Joint Theater Trauma Registry (JTTR)

- On-site and downstream data collection on in-theater inpatients with traumatic injuries
- Collects all available data from first evaluation through definitive treatment
- Requires validation with medical records
- Goal is to determine primary cause
- Best suited to inform traditional research, best practices, etc.

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Summary of OIF/OEF Selected Exposure Incidents

- **Acinetobacter Infections – CENTCOM**
  - Excess morbidity and mortality
  - Extensive environmental sampling in medical treatment facilities and medical surveillance
  - More stringent infection control measures implemented
- **Al Tuwaitha Nuclear Research Center, Iraq**
  - Possible excessive radiation exposures
  - Extensive environmental monitoring; radiation doses to US personnel within acceptable doses
  - No long-term health effects expected
- **Camp Lemonier, Djibouti, Africa**
  - Possible exposure to PM^{10} and to acrolein from burning at landfill
  - Extensive environmental sampling and medical surveillance
  - No long-term health effects expected

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Summary of OIF/OEF
Selected Exposure Incidents

- **Severe Pneumonia-USCENTCOM**
  - Throughout theater; epidemiologic assessment and extensive clinical work ups
  - No cause identified though seemed to be associated with smokers
- **Camp War Eagle, Iraq**
  - Possible airborne lead exposures
  - Extensive environmental sampling and medical surveillance (blood leads) – no excessive exposures identified
- **Ash Shuaiba Port, Kuwait**
  - Exposures to industrial pollutants such as particulate matter, sulfur dioxide, and carbon monoxide
  - Extensive environmental monitoring. No expected long term health effects.



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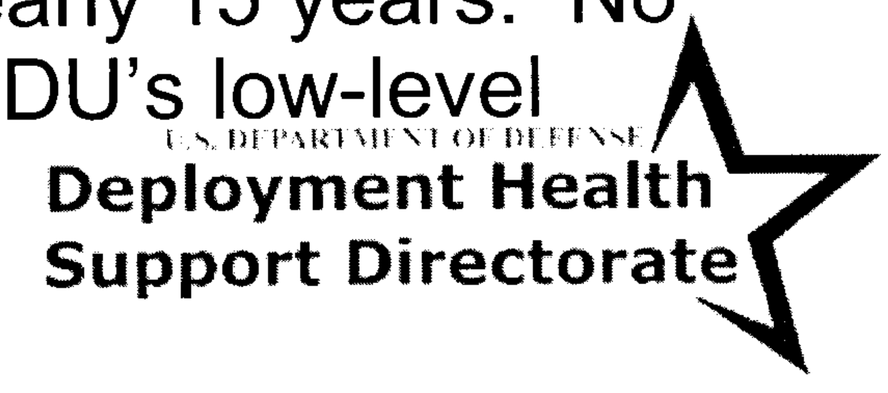
Summary of OIF/OEF Selected Exposure Incidents

- **Depleted uranium exposures from close-in fire incidents – Iraq**
  - Extensive, on-going DU medical surveillance program with over 2100 personnel assessed with a DU urine bioassay
  - Identified only eight servicemembers with confirmed DU exposures and one which is unconfirmed; all are known or suspected of having retained DU fragments
  - Veterans Affairs DU Medical Follow-up Program (Baltimore, MD)
    - Followed 80 Gulf War veterans with inhalational and/or retained DU fragment exposures for nearly 15 years. No adverse health effects detected due to DU's low-level radioactivity or chemical toxicity





U.S. DEPARTMENT OF DEFENSE
Deployment Health Support Directorate

Reserve Component Medical and Dental Readiness

11 August 2006

(b)(6)

Director, Force Health Readiness
Deployment Health Support Directorate

Force Health Protection Conference

Outline

- Driving Forces
- What is Medical Readiness?
- Inhibitory Forces
- Solutions
- Discussion

U.S. DEPARTMENT OF DEFENSE
Deployment Health
Support Directorate

Driving Forces

Readiness Challenge

- Increased operating and personnel tempo associated with the Global War on Terrorism and Operations Iraqi Freedom, Enduring Freedom and Noble Eagle put intense pressure on strength levels
- Our transformation from strategic to operational level organizations further reduced our organic manpower and equipment assets

National Defense Authorization Act of 2005

- **Goal: Improve medical readiness and ability to monitor the health status of the Total Force**
  - Requires DoD to develop and implement a comprehensive strategic medical readiness plan
  - Apply FHP tenets and principles
    - Throughout service in the Armed Forces
    - Before, during, and after deployment overseas
- **Established Joint Medical Readiness & Oversight Committee (JMROC) to monitor success and report to SECDEF/Congress**
  - **Has authority to define and/or modify standards**

National Defense Authorization Act of 2006

- HR 2528, House Report 109-95
  - " . . . majority of soldiers in MHO status were reservists who were not medically ready to serve, many due to poor dental hygiene."
  - Requires a study on incorporating dental examinations into the routine annual reserve medical readiness examinations
- Revised earlier Congressional language to read "medical and dental readiness"

Unfunded Lessons Learned

JROCM 083-05 Reserve Mobilization & Deployment

Standardize/maintain pre-activation Reserve Component (RC) medical readiness by developing individual medical readiness (IMR) improvement strategy (including ROM costs) . . . should ensure the Services meet established IMR standards through an evaluation of current legislative, OSD, and Service policies and resourcing practices to include:

1) screening policies and enforcement tools

2) active Component (AC)/RC disparities; and

3) tracking/private medical information

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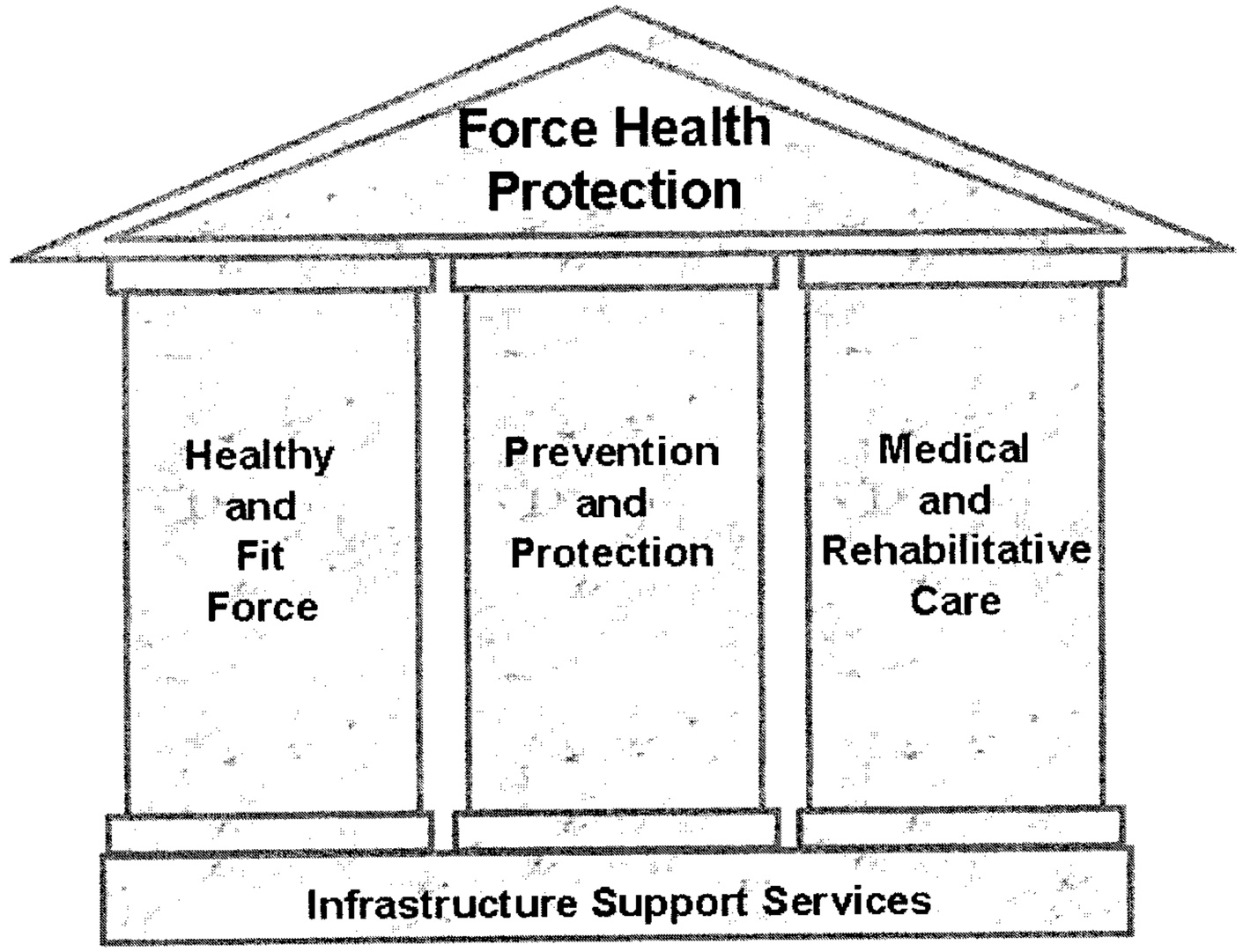
What is Medical Readiness?

Force Health Protection

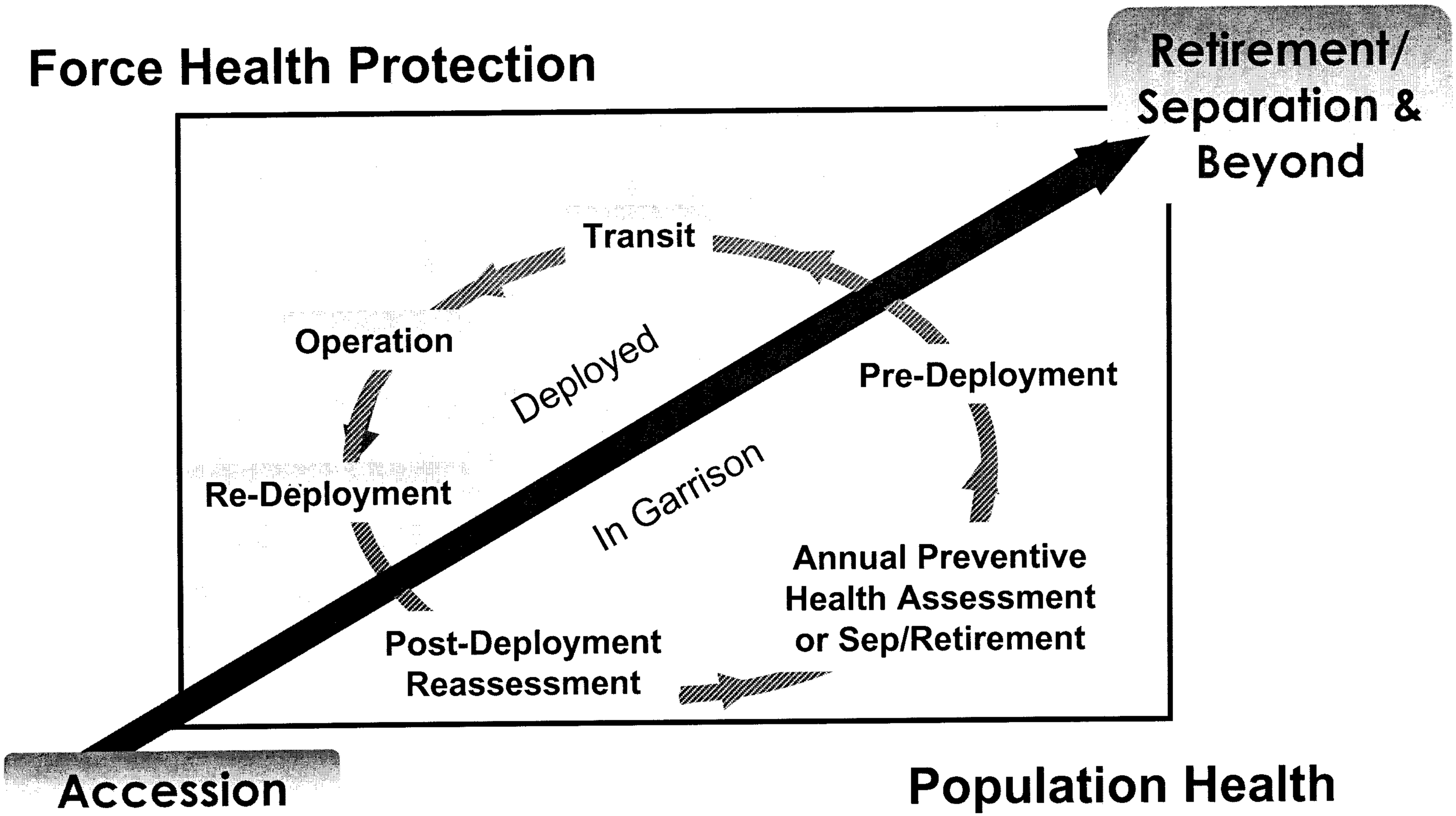
- Recruit and maintain a **healthy and fit force**
- **Prevent** disease and injury
- **Treatment and care** for those ill or injured

PRD-5 set the stage for "Cradle to Grave Surveillance…"

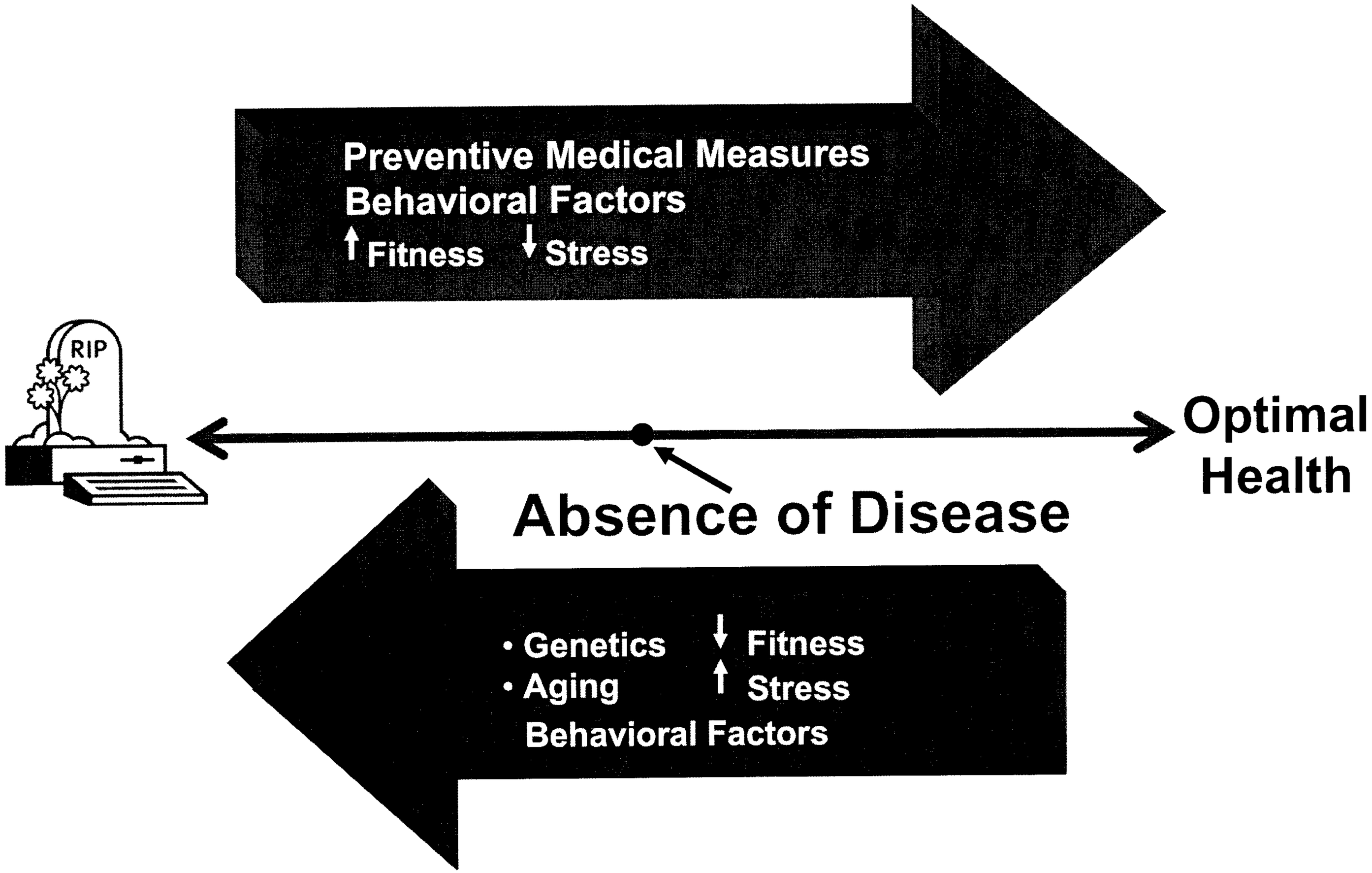


Service Member Life Cycle

Health Assessment Opportunities

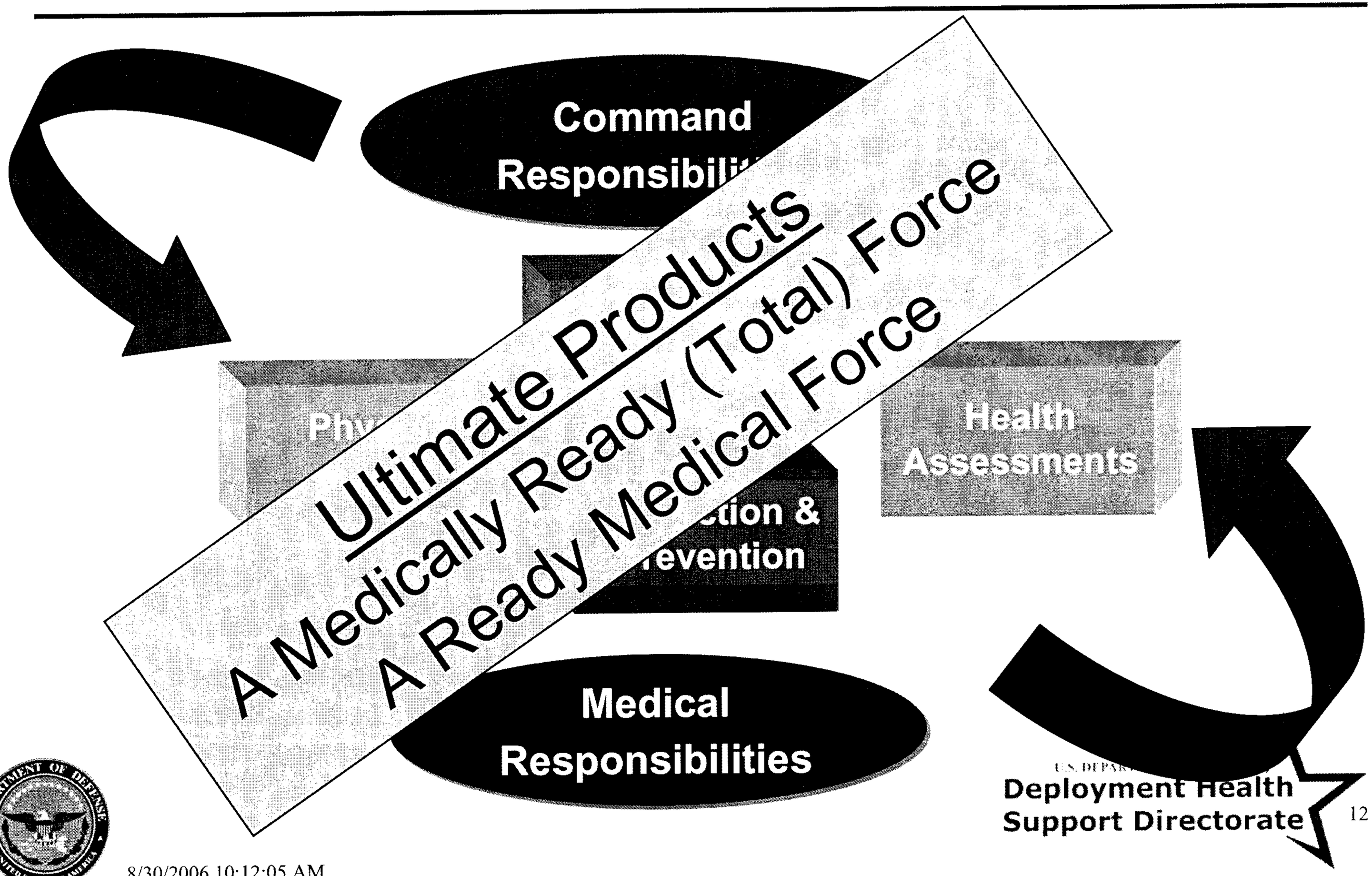


Continuum of Health



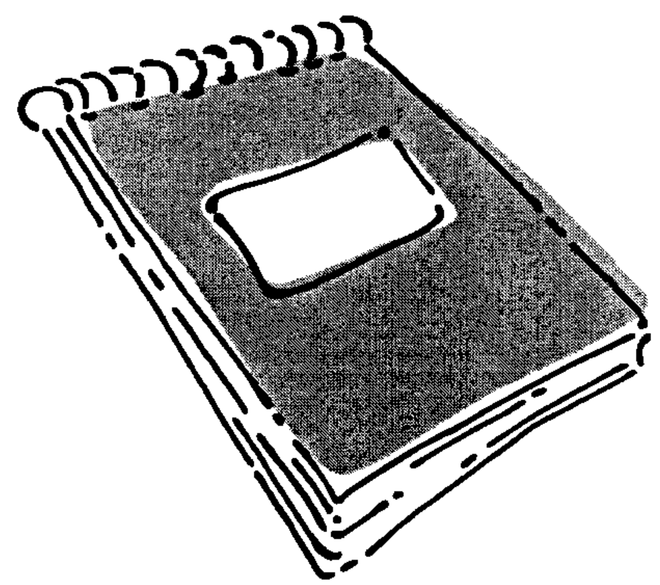
The Line and Medics

Mutual Support, Shared Responsibilities



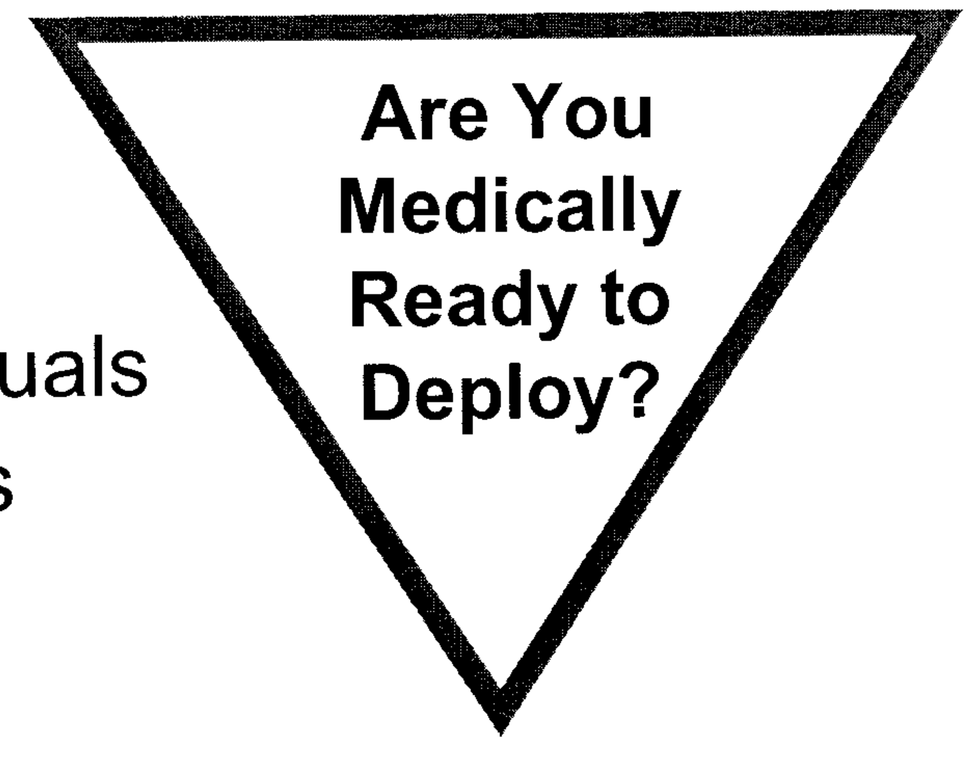
Operational vs. Medical Readiness

- Use the term ***"medically ready"***, not ***"deployable"***
  - Operational deployability is not a medical decision
  - May be deployable and not medically ready, but all medically ready are medically deployable
  - Deployability may be dependent on location, duration, Service doctrine, nature of condition, etc.
  - Medical readiness is consistent (sort of)



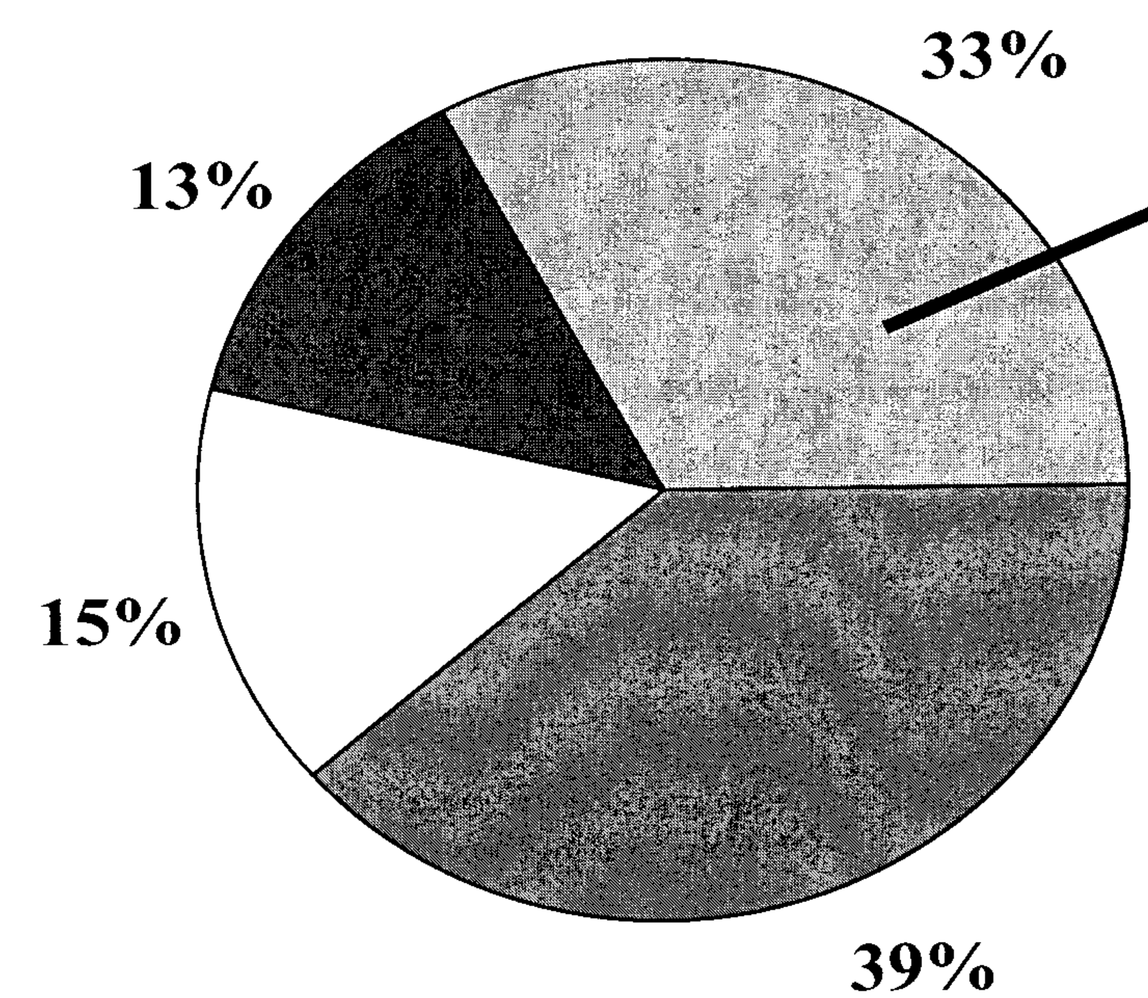
Individual Medical Readiness (IMR)

- Key FHP concept
  - Monitoring & optimization of vital health protection parameters
- Purpose: ensure healthy, fit fighting force
- Definition: the extent to which an individual service member is free from health-related conditions that could limit their ability to participate in military operations in austere settings
- Technique:
  - Monitor key IMR indicators
  - Assign overall IMR classification to individuals
  - Provide actionable reports to commanders
  - Follow DoD-level metrics



DoD Total Force IMR Instrument Panel "Dial"

Q3 FY2006 (Army, Navy, Air Force, Marine Corps, USCG)



Indeterminate Breakout

Total=671,763

Overdue PHA =417,607

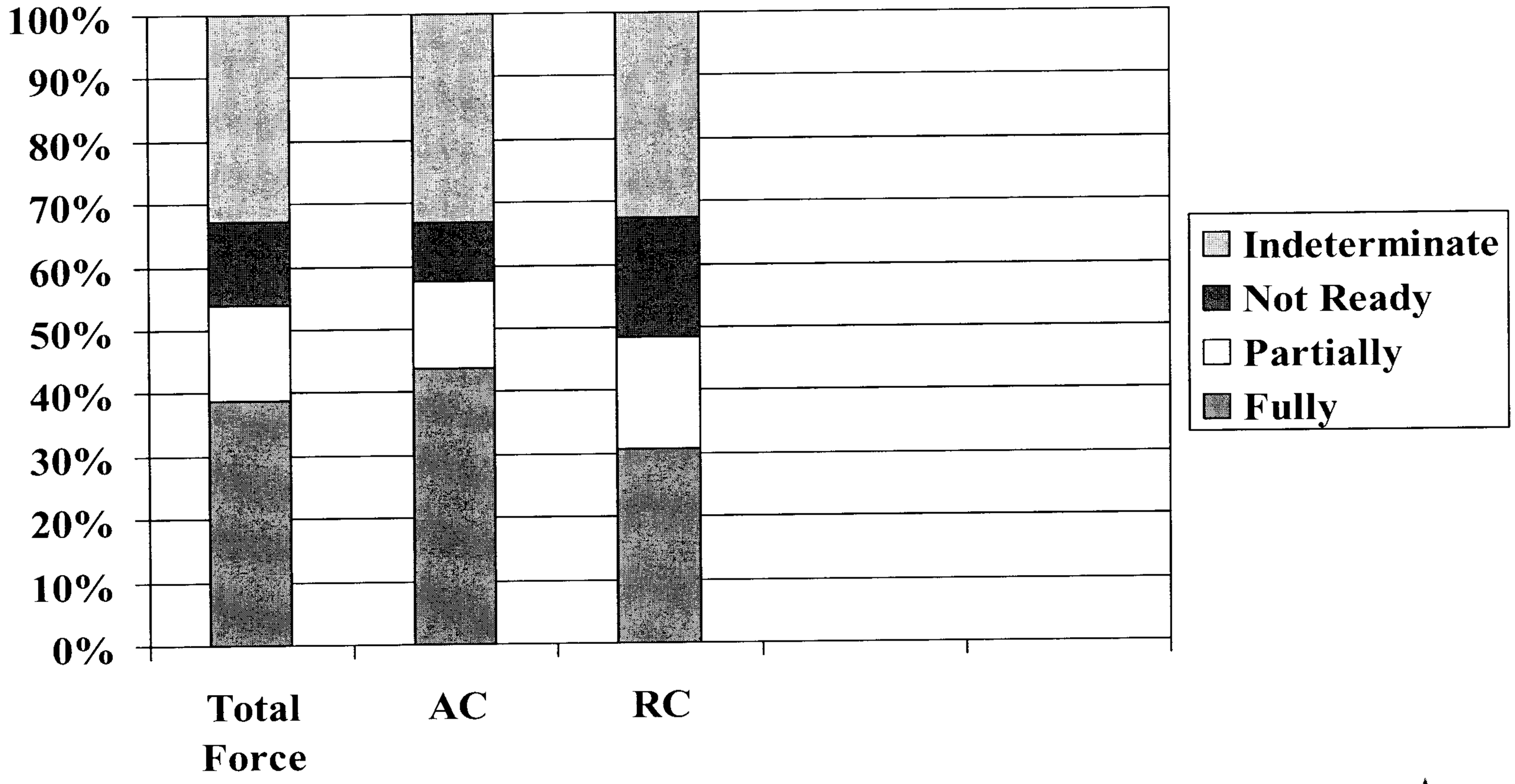
Dental Class 4=480,719

Note: there is overlap between these two causes of indeterminate status

■ Fully Ready □ Partially Ready ■ Not Ready □ Indeterminate

Overall IMR Status

Q3 FY2006 (Army, Navy, Air Force, Marine Corps, USCG)



RC IMR Status, By Element

Q3 FY2006 (Army, Navy, Air Force, Marine Corps, USCG)

Element	Army	Navy	AF	USMC	Air Guard	Army Guard	USCG
Dental Class 1 or 2	45.5%	90.3%	95.5%	71.5%	86.9%	49.5%	67%
Immunizations	50.1%	73.3%	92.8%	40.8%	96.5%	52.6%	34%
Medical Readiness Labs	86.4%	92.3%	71.7%[2]	81.4%	92.2%	90.2%	84%
No Deployment Limiting Conditions	83.1%	95.1%	95%	96.5%	93.5%	81.6%	98%
Health Assessment	88.7%[1]	89.7%	93.6%	57.1%	90.5%	81.3%[1]	88%[1]
Medical Equipment[3]	62.2%	67.5%	18.7%	65.7%	83.8%	51.8%	91%

[1] Currently assessed against a 5-yr exam standard.

[2] AFRC currently has waiver to check HIV every 3 yrs, but the reported value reflects compliance measured against the 2 yr DoD standard.

[3] Variable denominator based on individual requirement for GMI. USCG data includes only deployed personnel.

Periodic Health Assessment (PHA)

- Annual requirement
  - Replaces the outmoded every 5 years, one size fits all, exam with a tailored, prevention-oriented health assessment
- Individually-tailored based on individual risk factors
- Consists of:
  - Self-assessment Health Assessment Review Tool (HART)-R/F/P
  - Medical record review (difficult to access civilian medical records)
  - Focused additional history, physical, labs, etc.
  - Review all IMR requirements, correct any deficiencies
- Assess world-wide qualification
- Identify personal health risks (occupational, lifestyle, etc.), educate, and provide a blueprint for improved health (manage &/or prevent)

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Support Directorate

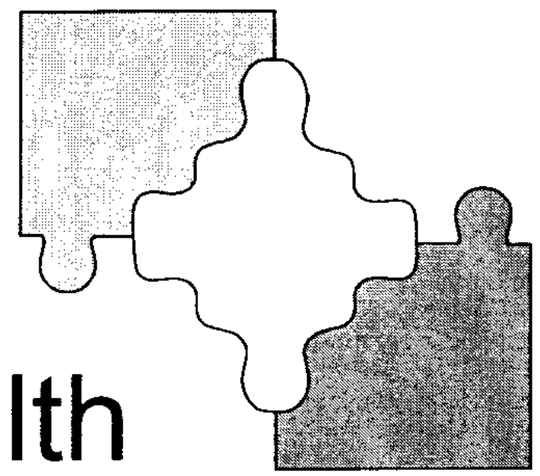
Inhibitory Factors

What is Holding us Back?

Disparities between AC & RC

Finding the Missing Pieces

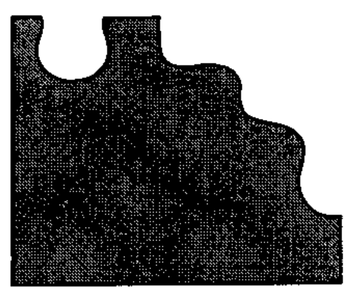
- No dedicated source of funding for RC medical/dental readiness
  - Line O&M funds support RC vs. DHP for AC
- RC members must (usually) pay private healthcare providers to meet IMR
- No direct, easy access to RC private health records or other critical medical data
- No RC-wide enterprise IM/IT system (AHLTA)
- Under resourced for many services AD take for granted, e.g., annual PHA, spectacles



Disparities between AC & RC, cont'd

Finding the Missing Pieces

- RC members required to report significant changes in health status
- AC members have more flexibility for IMR, RC members must balance against already compressed training schedules
- RC members often must travel to accomplish medical readiness requirements as providers are not available at training sites to provide medical and dental readiness support



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Support Directorate

Solutions

The Way Ahead

Common Themes

Assorted Suggestions from the Services

- Unified Legislation and Budgeting proposal to modify 10 USC and allow RC members to receive IMR services through the active MHS
- Expand funding authorization to include medical/dental examinations and provide clinical preventive services
- Fund additional drill for RC PHA/IMR completion
- Ensure new accessions are Dental Class 1/2 prior to completing initial training (provide treatment)
- Fund and support Dental Class 3 treatment for RC members, e.g., TRICARE Prime Remote Dental Program

Reserve Component Medical and Dental Readiness Objectives

1. Identify ways to incorporate dental examinations into annual reserve medical readiness assessments
2. Identify alternatives to support the dental and physical assessments while at home station
3. Identify available physicians and dentists to handle the workload in the reservists' home towns

Reserve Component Medical and Dental Readiness
Objective # 1

- Incorporating dental examinations into routine annual health readiness examinations was directed by Health Affairs in 1998
- All Reserve Components are complying with the requirement, but with limited resources and funding
- The impact of complying with limited resources has resulted in using a larger number of contracted personnel and services

Reserve Component Medical and Dental Readiness
Objective # 2

- Identify alternatives to support the dental and physical examinations while at home station and without easy access to Military Treatment Facilities (MTF)
- To date outside resources used in lieu of home station activities include:
  - FEDS_HEAL,
  - TRICARE Dental Remote, and
  - RC members personal dental care provider

Reserve Component Medical and Dental Readiness
Objective # 3

- Identify available physicians and dentists to handle the workload in the reservists' home towns
- RC units do not have enough physicians and dentist assigned to handle the necessary workload at home stations
- Physicians and dentists are qualified, but have to train on military equipment and war fighting skills

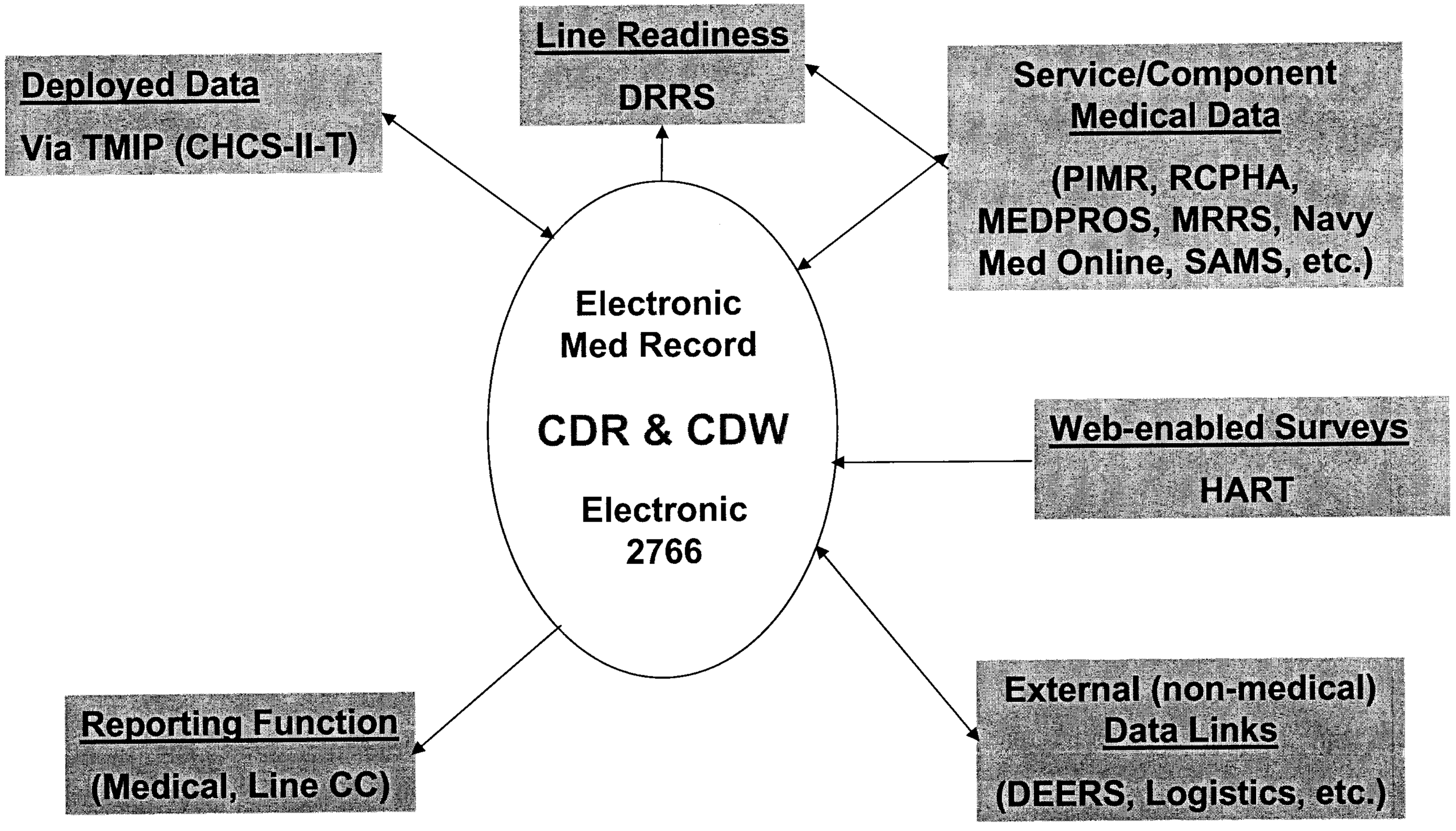
Reserve Component Medical and Dental Readiness
The Way Ahead

- More Line and/or DHP funds
  - FY08-13 POM proposal
- Policy changes
- Legislative proposals to enhance RC recruiting and retention
- TRICARE Reserve Select (TRS)

Reserve Component Medical and Dental Readiness
The Way Ahead, cont'd

- Establish an RC component Health Care package paid by DHP funds
  - An approved dental plan to include restorative care
  - Funding for diagnostic procedures and clinical preventive services
  - Medical Management Infrastructure
  - Physical conditioning and health promotion

Improve IM/IT Interconnectivity



New Health Assessment Review Tool

HART-R (Readiness)

- Improved self-reporting tool adopted by all Reserve Components to use with PHA
  - Covers diverse domains and lifestyle choices
- Interrelates with other health assessment forms (HART-Accession and DD Forms 2795, 2796, and 2900)
- Includes questions that fill RC data gaps
  - Interval deployment history
  - Medications
  - Surgical history
  - Disability compensation (VA, Workmen's Comp, etc.)

HRR

Health Readiness Record

>> LOGIN TO HRR <<
AKO Account Required

- What is HRR?
- How do I register for an AKO account?
- How do I reset my AKO password?
- Register for HRR



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ARNG Medical System Integration Plan

PERMS

DA 2-1, Personnel
Qualification Record

MND

PULHES
MMRB Result
DA Profile
SF 513 Consult
Commander's Letter

AERO

DD 2808 Record of Exam
DD 2807 Report of Medical History
DA 4186 Recommendation for Flying Duty

PDCAPS

DA Form 5983, PEBLO Counseling Checklist
DA Form 199, Physical Evaluation Board Proceedings

LOD

DA 2173, Line of Duty Medical Documentation

MEBITT

DA Form 3947, Medical Evaluation Board Proceedings

DENCLASS

SF 603, Dental Exam
DA 5570 Health History
DD 2813 Record of Civilian Exam
Dental Classification
Treatment Plan
Workload Data& Financial Status

HRR

AHLTA

Laboratory Results
Radiology Results
SF 513 Consults
Discharge Summary
Operative Report

AVS OH

PULHES
Physical Exam Date
Immunization Data
Workload Data
Financial Status

MEDPROS

PULHES
Physical Exam Date
Immunization Data
Dental Classification

GEMR

Initial Entry Physical Exam
Medical Waiver

AVS Med Det

PULHES
Physical Exam Date
Immunization Data
Workload Data
Financial Status

ARNG Health Readiness Record

System Objectives

The Health Readiness Record (HRR) is designed to be a data interface and repository for medical, dental and personnel actions which have protected health information as part of the process. HRR module functions being designed are:

- to capture, sort, store and retrieve paper and radiographic images
- to archive, transfer and receive Soldier dental and health records
- to limit and control access to protected health information (HIPAA Security and Privacy Rules)

Improve Access to Civilian Medical Records

- ARNG pilot program
- New medical condition identified by Soldier or as part of PHA
- Soldier signs release of information form
- Request and form sent to Soldier's healthcare provider
- Pertinent documents faxed to military
- Scanned and incorporated in HRR

The Final Picture



U.S. DEPARTMENT OF DEFENSE
Deployment Health
Support Directorate

Discussion & Questions

Backup Material

Standarized DoD IMR Definitions

Element	Definition
PHA	Current PHA
Dental	Class 1 or 2 (fail if Class 3 or 4)
Immunizations	Current for all total force required vaccines
Med Equip	1 pair gas mask inserts (if needed)
Med Readiness Labs	DNA on file, HIV current (within 24 months) G6PD for Navy & AF (Army planning policy)
No Deployment Limiting Conditions	Per Service-specific standards guidelines

IMR Classification Scheme

	Fully medically ready	Immunizations current
		Dental Class 1 or 2
		Current med readiness labs
		No deployment limiting condition
		Current Health Assessment
		Medical Equipment Current
	Partially Medically Ready	Needs immunization
		Needs medical readiness lab
		Needs medical equipment
	Indeterminate	Health Assessment overdue
		Dental Class 4
	Not Medically Ready	Dental Class 3
		Deployment prohibiting condition
		Hospital inpatient or convalescing

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Deployment Health
Support Directorate

Armed Forces
Health Surveillance Center

Force Health Protection Conference
8 August 2006

(b)(6)

Director, Force Health Readiness
Deployment Health Support Directorate
Office of the Assistant Secretary of Defense
(Health Affairs) Force Health Protection and Readiness

Outline

- Background
- Details
  - Vision and Mission
  - Relationships and Functions
  - Command & Control
  - CONOPS Overview
  - Provisional vs. Initial Operating Capabilities
  - Advantages and Benefits
- FHP Council Decision and Directions

Background

- Health surveillance is critical to medical readiness and force health protection
- Current Situation: Services have separate surveillance programs/standards/philosophies, limited sharing, and many available programs optimized to address Service-specific needs
- MHS and DoD needs:
  - Single, central official source for health surveillance information
  - Integrated DoD population, health event, and exposure data
  - Standardized, reproducible analytical methods

U.S. DEPARTMENT OF DEFENSE
Deployment Health Support Directorate

Armed Forces Health Surveillance Center
Vision and Mission

- Vision: to provide relevant, timely, actionable, comprehensive health surveillance information and support to the Armed Forces on military and military-associated populations
- Mission: to promote, maintain, or enhance the health of military and military-associated populations
  - Acquire, analyze & interpret, recommend, and disseminate
  - Develop, refine and improve standardized surveillance methods
  - Serve as focal point for sharing health surveillance products, expertise and information
  - Delineate roles, responsibilities, and mutually supporting relationships among the Armed Forces health surveillance activities

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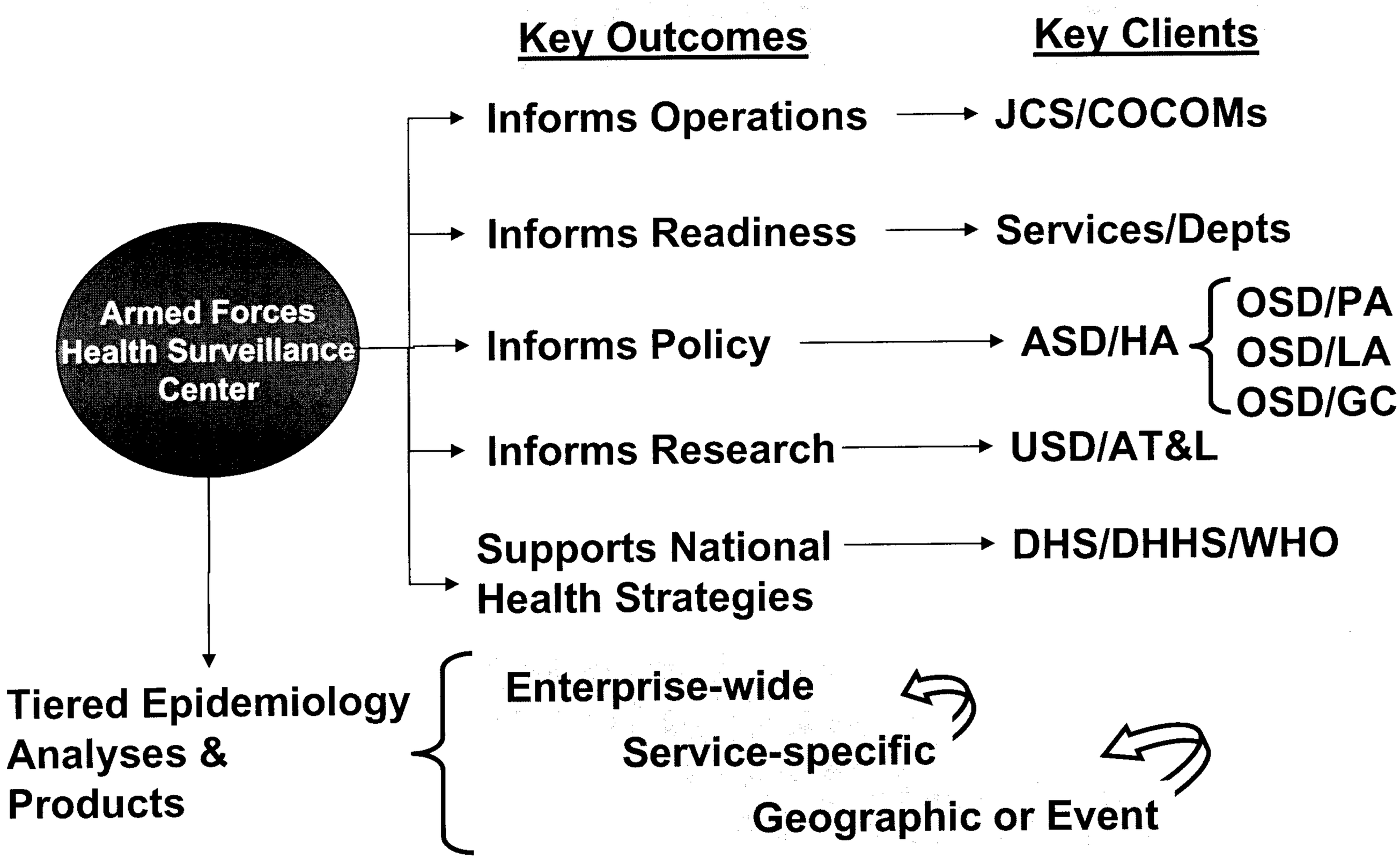
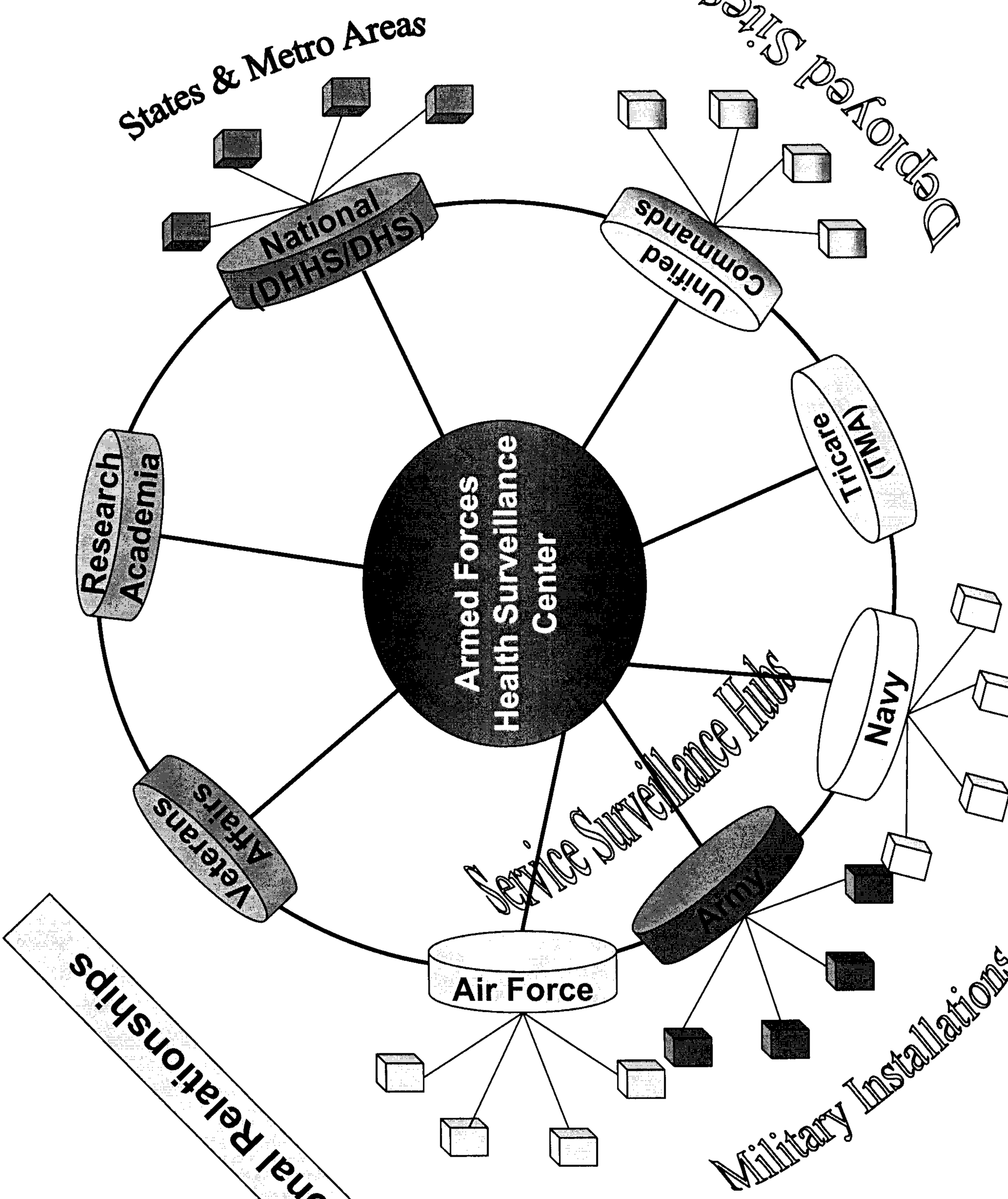
Deployment Health Support Directorate

Key Outcomes and Clients

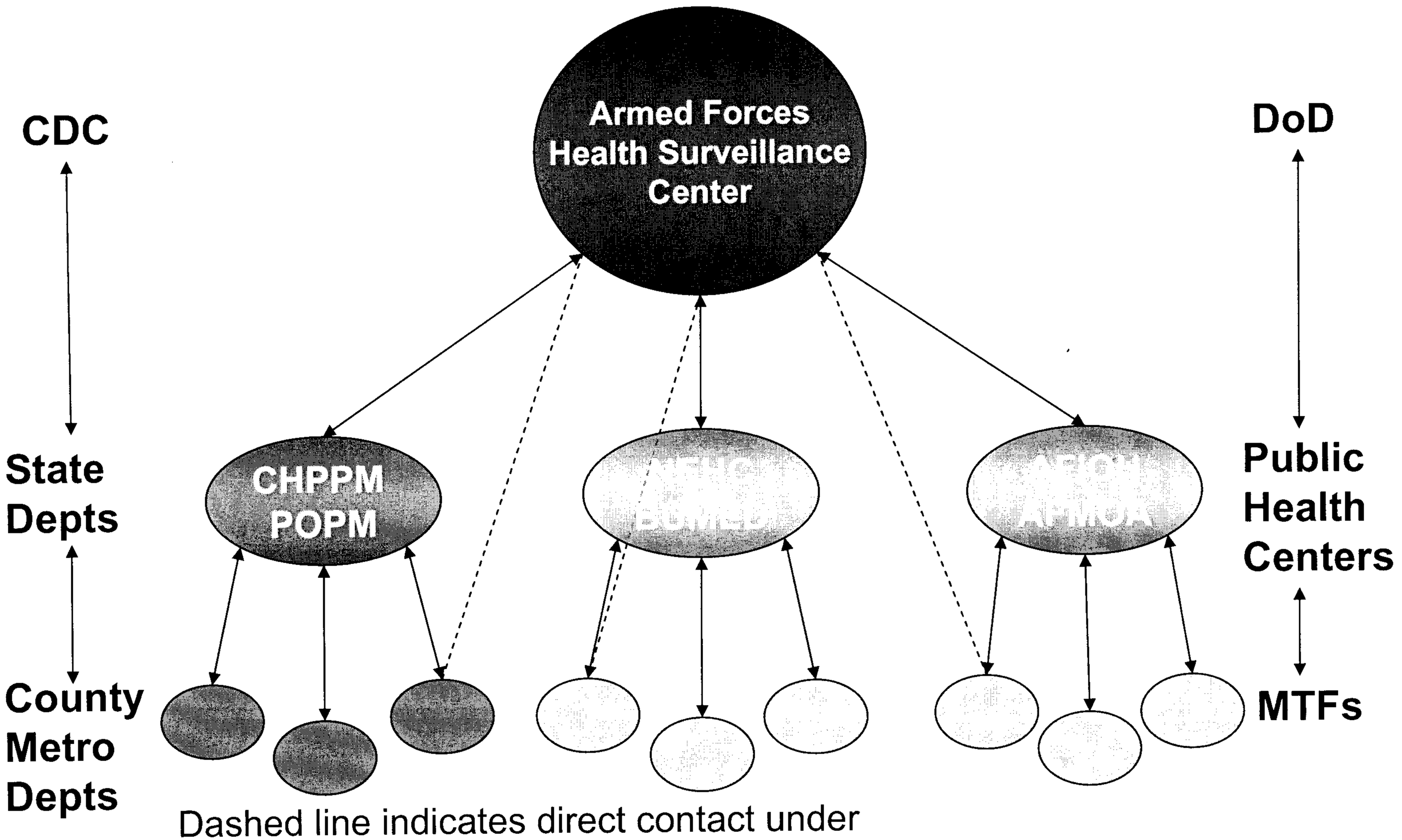
Who the Center Serves and How




States & Metro Areas
Deployed Sites
National (DHHS/DHS)
Unified Commands
Tricare (TMA)
Navy
Army
Air Force
Veterans Affairs
Research Academia
Armed Forces Health Surveillance Center
Service Surveillance Hubs
Military Installations
Functional Relationships

AFHSC Relationships

Applying the CDC Model



Service Public Health Centers and AFHSC
Functions and Relationships

- AFHSC will
  - Provide a 24/7 Ops Center and Help Desk
  - Monitor DoD-level trends, outbreaks, other anomalies
  - Support Service PH Centers with Service-specific analyses/reports/recommendations and comparisons with other Services' results
  - Coordinate inter-Service/interagency investigations
    - *Augment on-site investigations on request*
  - Facilitate access to archived data for Service-level use
  - Maintain DoD-level registries, repositories
  - Perform and coordinate focused studies/research



U.S. DEPARTMENT OF DEFENSE
Deployment Health
Support Directorate

Service Public Health Centers and AFHSC
Functions and Relationships, cont'd

- Service Public Health (PH) Centers
  - Execute health surveillance activities for their respective populations
  - Directly support installations, deployed units and HQs
    - *Consultative, investigative, formal deployments, staff assistance*
    - *Both medical and environmental disciplines*
  - Provides Service-level response (investigations) to outbreaks, clusters, etc.
  - Provides outbreak detection monitoring for their Service installations
    - *Example, backup installation-level monitoring of ESSENCE*
  - Service-unique analyses that complement AFHSC products
  - Special programs based on expertise or as assigned
    - *Example, DoD laboratory-based influenza surveillance*
  - Facilitate data/info collection/flow between MTFs/units/installations/agencies and the AFHSC

U.S. DEPARTMENT OF DEFENSE
Deployment Health Support Directorate

AFHSC and other Organizations
Functions and Relationships, cont'd

- AFMIC—intelligence mission, mutual customer relationship, producing integrated intelligence/surveillance products
- AFIP—DoD mortality program, DNA repository, provide data to AFHSC
- USUHS—teaching mission, based on requirements, no resources for transfer to AFHSC, academic collaborative relationship, students/interns welcome at the Center, evaluate programs/systems
- TMA—coordinated surveillance for all Public Health and Population Health needs, without duplication
- VA—integrated longitudinal cohort tracking
- JPMPG and AFEB—ad hoc advice & recommendations
- CDC—collaboration in outbreak detection, epi methods/systems development, etc.



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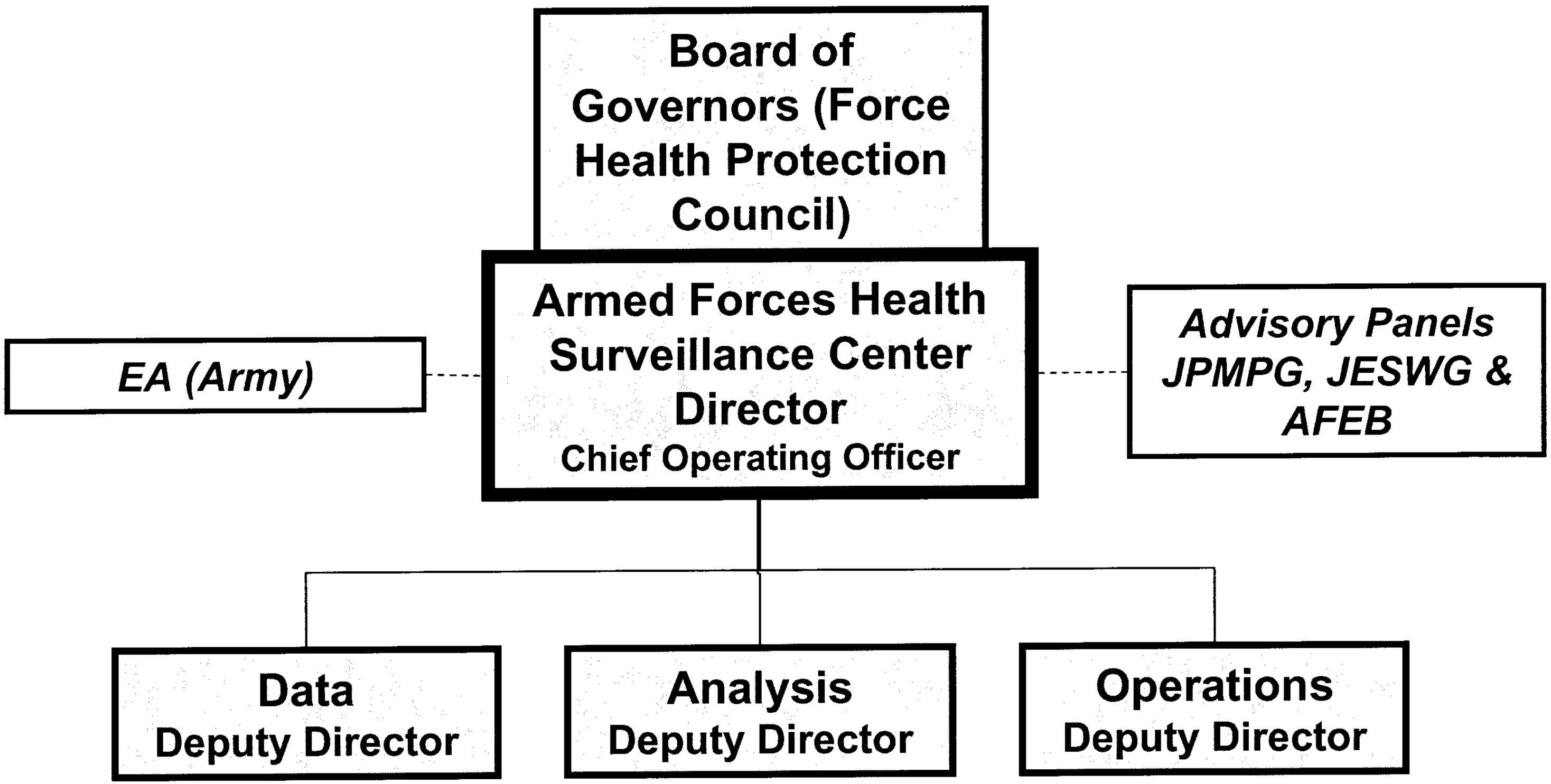
Deployment Health
Support Directorate

Command & Control

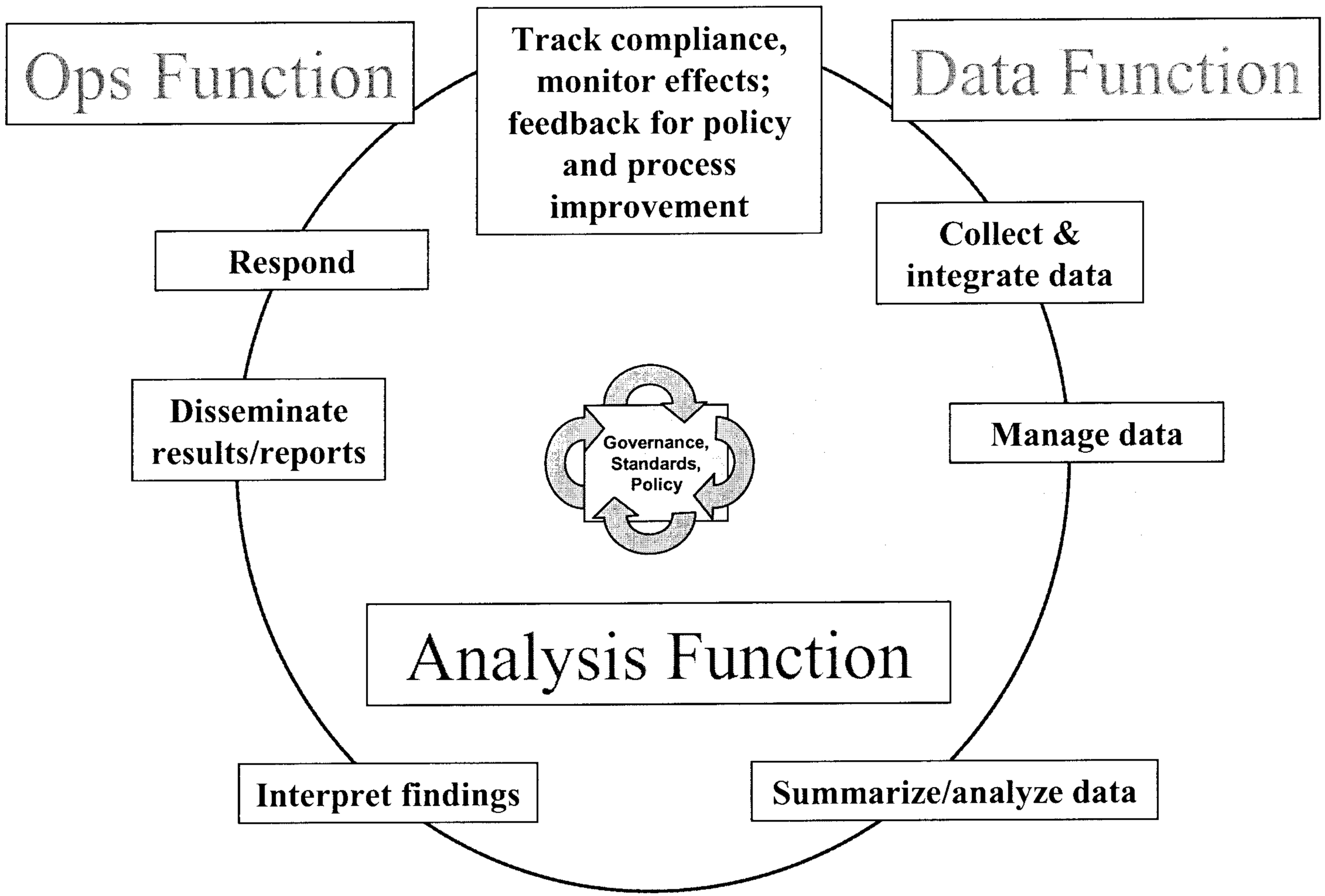
- Establish an EA FOA (under Army) via DoDD
  - Responsible for "joint" health surveillance mission
- Policy authority lies with FHP&R
  - Promulgates policies recommended by AFHSC
- Board of Governors to provide executive oversight, approval annual work plan and long-term goals/objectives, Force Health Protection Council
- Scientific Advisory Board for technical questions
  - JPMPG (military operational preventive medicine issues)
  - AFEB (national-level, independent source for consultation)
- Directorship selected from Tri-Service candidates
  - EA provides order of merit, ASD/HA selects
  - Senior rater for organization, 2-3 year term
- Direct DHP funding

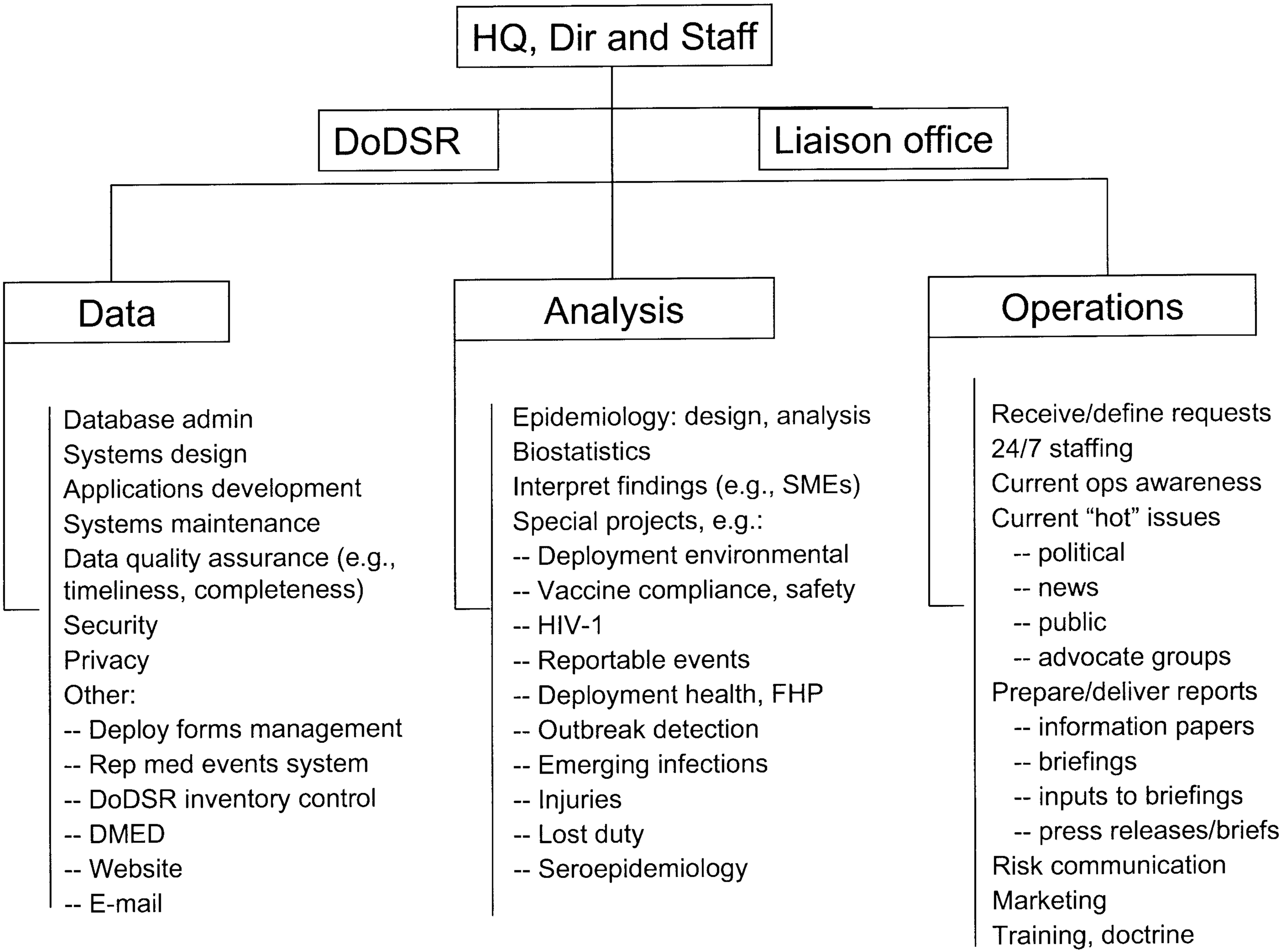
U.S. DEPARTMENT OF DEFENSE
Deployment Health Support Directorate

Governance


Board of Governors (Force Health Protection Council)
Armed Forces Health Surveillance Center Director
Chief Operating Officer
EA (Army)
Advisory Panels JPMPG, JESWG & AFEB
Data
Deputy Director
Analysis
Deputy Director
Operations
Deputy Director

Center Concept of Operations
Organizational Structure




HQ, Dir and Staff
DoDSR
Liaison office
Data
Database admin
Systems design
Applications development
Systems maintenance
Data quality assurance (e.g., timeliness, completeness)
Security
Privacy
Other:
-- Deploy forms management
-- Rep med events system
-- DoDSR inventory control
-- DMED
-- Website
-- E-mail
Analysis
Epidemiology: design, analysis
Biostatistics
Interpret findings (e.g., SMEs)
Special projects, e.g.:
-- Deployment environmental
-- Vaccine compliance, safety
-- HIV-1
-- Reportable events
-- Deployment health, FHP
-- Outbreak detection
-- Emerging infections
-- Injuries
-- Lost duty
-- Seroepidemiology
Operations
Receive/define requests
24/7 staffing
Current ops awareness
Current "hot" issues
-- political
-- news
-- public
-- advocate groups
Prepare/deliver reports
-- information papers
-- briefings
-- inputs to briefings
-- press releases/briefs
Risk communication
Marketing
Training, doctrine

Provisional Operating Capabilities
Key Characteristics

- Enterprise-wide surveillance (AMSA/DHSD)
  - Defense Medical Surveillance System
  - Reportable med events
  - Real-time outbreak
  - DoD Serum Repository
  - Deployment DNBI (JMEWS) & med movement (TRAC^{2}ES)
  - Open source monitoring
- Central phone number and integrated web site (DHSD)
- Central response coordination (GEIS)
- Set stage for IOC
  - Appoint director
  - Find site for collocation

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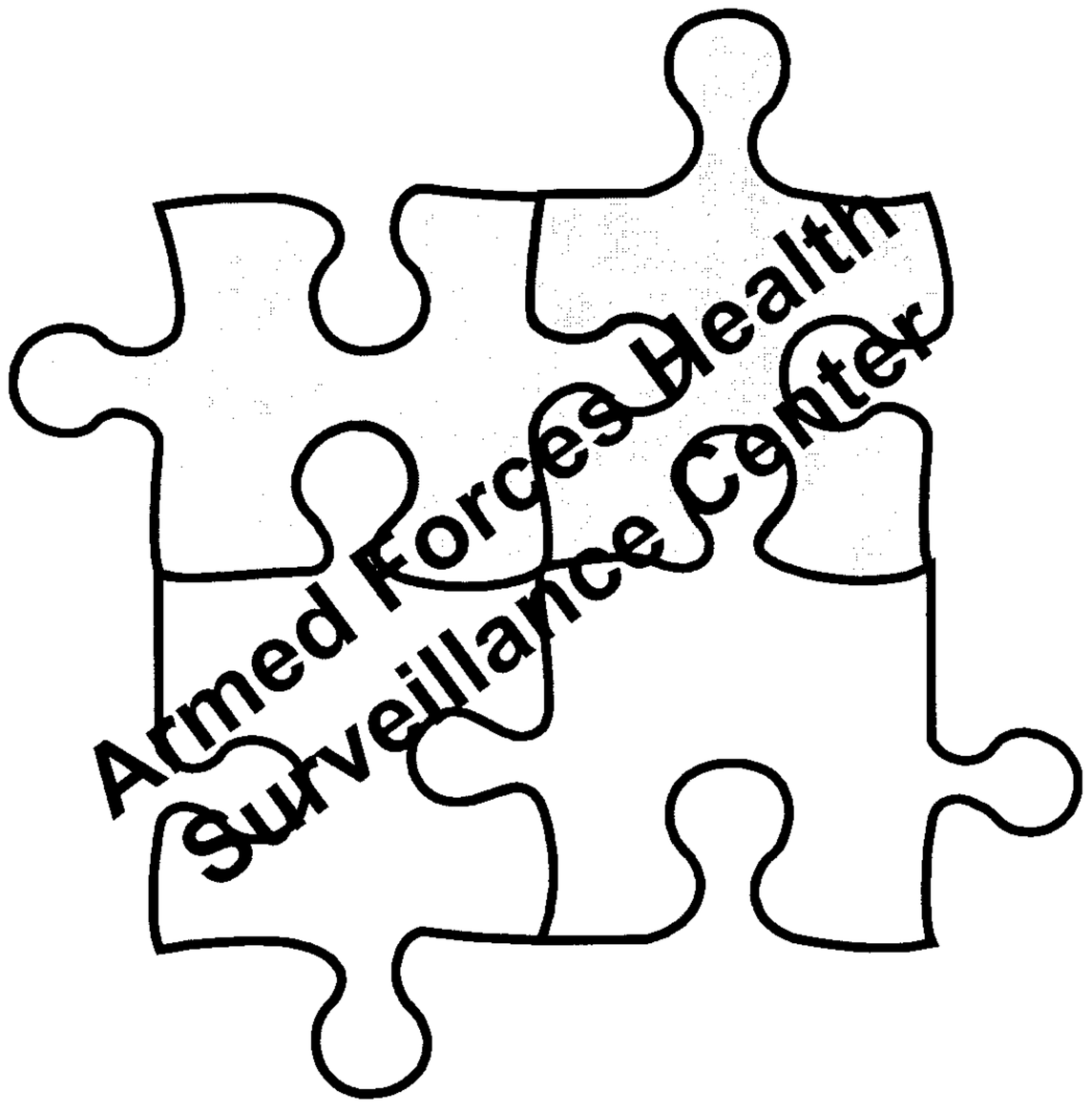
Deployment Health Support Directorate

Initial Operating Capability
Collocated Resources With Unity of Command



Characteristics, POC plus:

- Collocated operations
- 24/7 on-site coverage
- Align in joint/unified MEDCOM
- Classified data onsite
- Expand monitoring
  - Injury & cancer clusters
- External research support
- PH surveillance assess
- Expand data and analysis
  - Retiree, seps, families

U.S. DEPARTMENT OF DEFENSE
Deployment Health
Support Directorate

Advantages and Benefits of AFHSC
What You Get That You Don't Have Now

- Synchronize health surveillance for the Armed Forces
- 24-hr Health Surveillance Ops Center
- Easy, quick access to expert analysts
- Enterprise-level integrated analyses
  - Coordinated with DHS, DHHS, AFMIC, COCOMs, etc.
- More efficient central data archive with decentralized data access by Services
- DoD-level consolidation of surveillance programs
  - Example, DNBI for all COCOMs, freeing resources for other work
- Consolidated IM/IT (with collocation), freeing resources
- Formal, credible surveillance program evals/validation

Advantages and Benefits of AFHSC
New Products and Projected Requirements

- Linked and integrated analyses/summaries of data
  - Pathogen drug resistance reports
  - Radiation (TLD) exposure trends
  - Pharmacy data, e.g., linking mefloquine use with health outcomes
  - Lab data
  - Longitudinal eval of pre-/post-/post- deployment reassessment tools
- Cancer morbidity/mortality surveillance
- Recruit health events, comprehensive surveillance
- Fitness: performance, illness/injury relationships, mortality, cost
- Dental health events



U.S. DEPARTMENT OF DEFENSE
Deployment Health
Support Directorate

FHP Council Decision & Directions

- Establish an Armed Forces Health Surveillance Center
- Implementation Steps
  - Establish MOAs for provisional operating capability
  - Modify DoDD 6490.2 to identify AFHSC as Army Executive Agency
  - Create AFHSC DoDI, ensuring an organization that fully recognizes and supports the needs and capabilities of all the Services
  - Write charters for Board of Governors and advisor panels
    - *Special attention to fiscal accountability and cost growth*
  - Establish resource requirements for the Initial and Final Operating Capability for the FY 08-13 Program

U.S. DEPARTMENT OF DEFENSE
Deployment Health
Support Directorate

Backup Material



Definitions

- **Public Health**: the science and practice of protecting and improving the health of a community, as by preventive medicine, health education, control of communicable diseases, application of sanitary measures, and monitoring of environmental hazards.

- **Epidemiology**: study of the distribution and determinants of health related states and events in specified populations and the application of this study to the control of health problems.

- **Population Health**: the balancing of awareness, education, prevention and intervention activities required to improve the health of a specified population.

Task Force Membership

Organization	Role
US Army Center for Health Promotion and Preventive Medicine (CHPPM)	Co-Chair
TMA - Deployment Health Support Directorate	Co-chair
Office of the Deputy Assistant Secretary of Defense-Health Affairs (Clinical & Program Policy)	Member
US Army Surgeon General (SG) Policy (POPM)	Member
U.S. Air Force SG Policy (AFMSA)	Member
Air Force Institute for Operational Health (AFIOH)	Member
U.S. Navy SG Policy (BUMED)	Member
Navy Environmental Health Center (NEHC)	Member
U.S. Coast Guard (USCG)	Member
DoD Global Emerging Infection Surveillance and Response System (DoD-GEIS)	Member
Joint Staff (J-4/HSSD)	Member

Points of Contact

- DHSD-Co-Chair: (b)(6)
- USACHPPM-Co-Chair: (b)(6)
- ODASD-HA/C&PP: (b)(6)
- US Air Force-Office of the Surgeon General: (b)(6)
(b)(6)
- US Navy – Office of the Surgeon General: (b)(6)
(b)(6)
- GEIS: (b)(6)
- USACHPPM-AMSA: (b)(6)
(b)(6)
- AFIOH: (b)(6)
- NEHC: (b)(6)
- J-4/HSSD: (b)(6)
- USCG: (b)(6)

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Deployment Health
Support Directorate

HEALTH SURVEILLANCE:
Across the Continuum of Care

(b)(6)

Director, Force Health Readiness
Deployment Health Support Directorate

Force Health Protection Conference

8 August 2006

Outline

- Background
- Service Member Life Cycle
- Recruit Health Assessment
- Annual Health Assessment
- Individual Medical Readiness
- Deployment Associated Assessments
- Medical Evaluation Board Findings
- Challenges

The President's Directive (PRD-5)

"***The Departments of Defense and Veterans' Affairs are*** *directed to create a Force Health Protection Program. Every soldier, sailor, airman, and marine* ***will have a*** *comprehensive, life-long, medical record* ***of all illnesses and injuries they suffer, the care and inoculations they receive, and their exposures to different hazards. These records will help us*** *prevent illness, and identify and cure those that occur.*"

DoD Policy Guidance

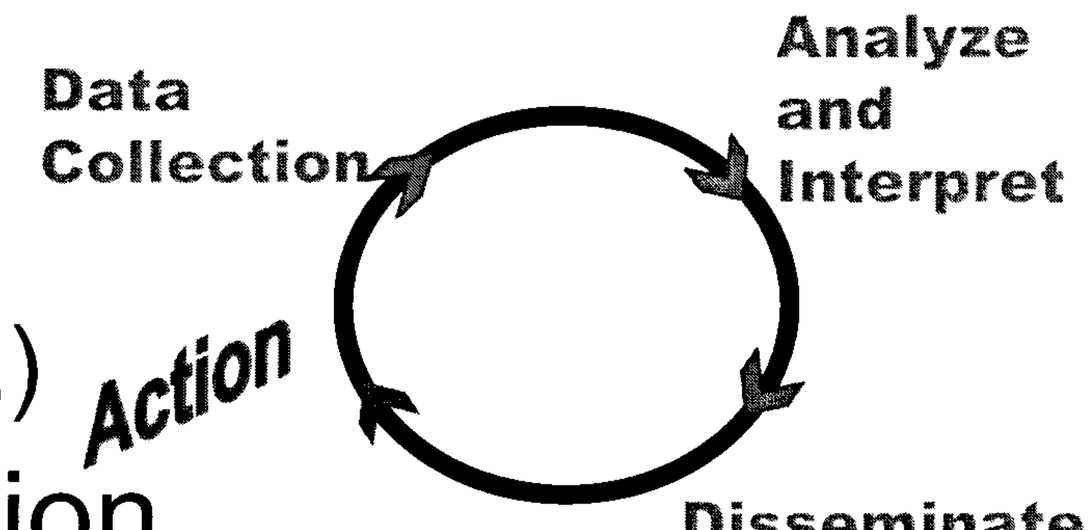
- DoDD 6200.4, *Force Health Protection*
  - Measures to promote healthy and fit armed forces ready for all activities and operations
- DoDI 6490.2, *Comprehensive Health Surveillance*
  - Conducted throughout military careers, across all duty locations and encompassing risk, intervention, and outcome data
- DoDI 6025.19, *Individual Medical Readiness*
  - *Six core elements*

Comprehensive Health Surveillance

- Timely data flow
- 'Accurate' data
- Appropriate analyses and interpretation with a goal of actionable information

Field Responsibility

- Timely reporting to decision makers
  - Forward field unit
  - Intermediate command levels
  - 'Rear' top-level (AF, DoD, etc.)
- Appropriate action/intervention
- Continuous monitoring for effectiveness



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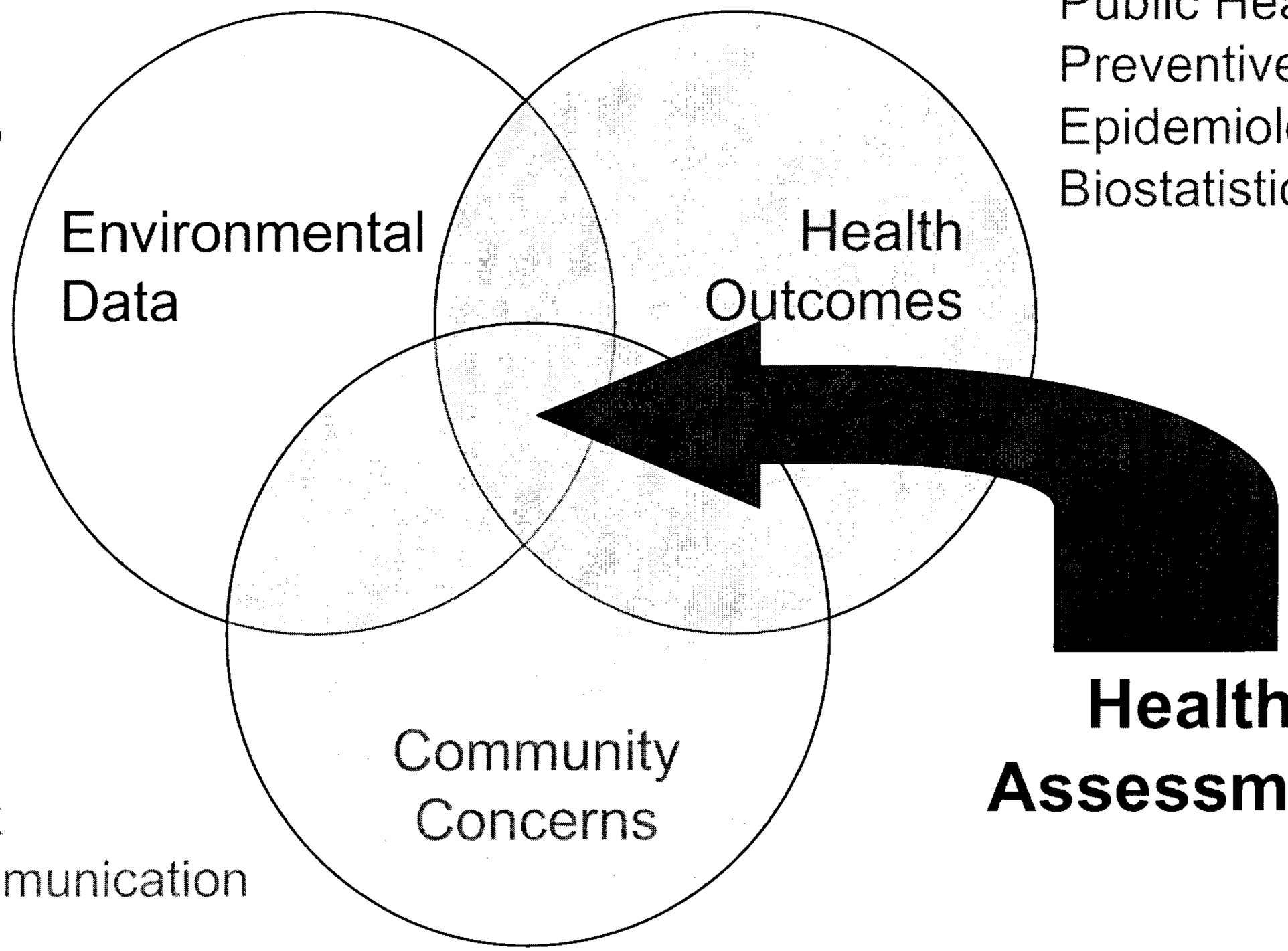
Deployment Health Support Directorate

Health Assessment Process

Environ Science,
Industrial Hygiene,
Entomology, etc.



Public Health,
Preventive Med,
Epidemiology,
Biostatistics, etc.

Health Assessment

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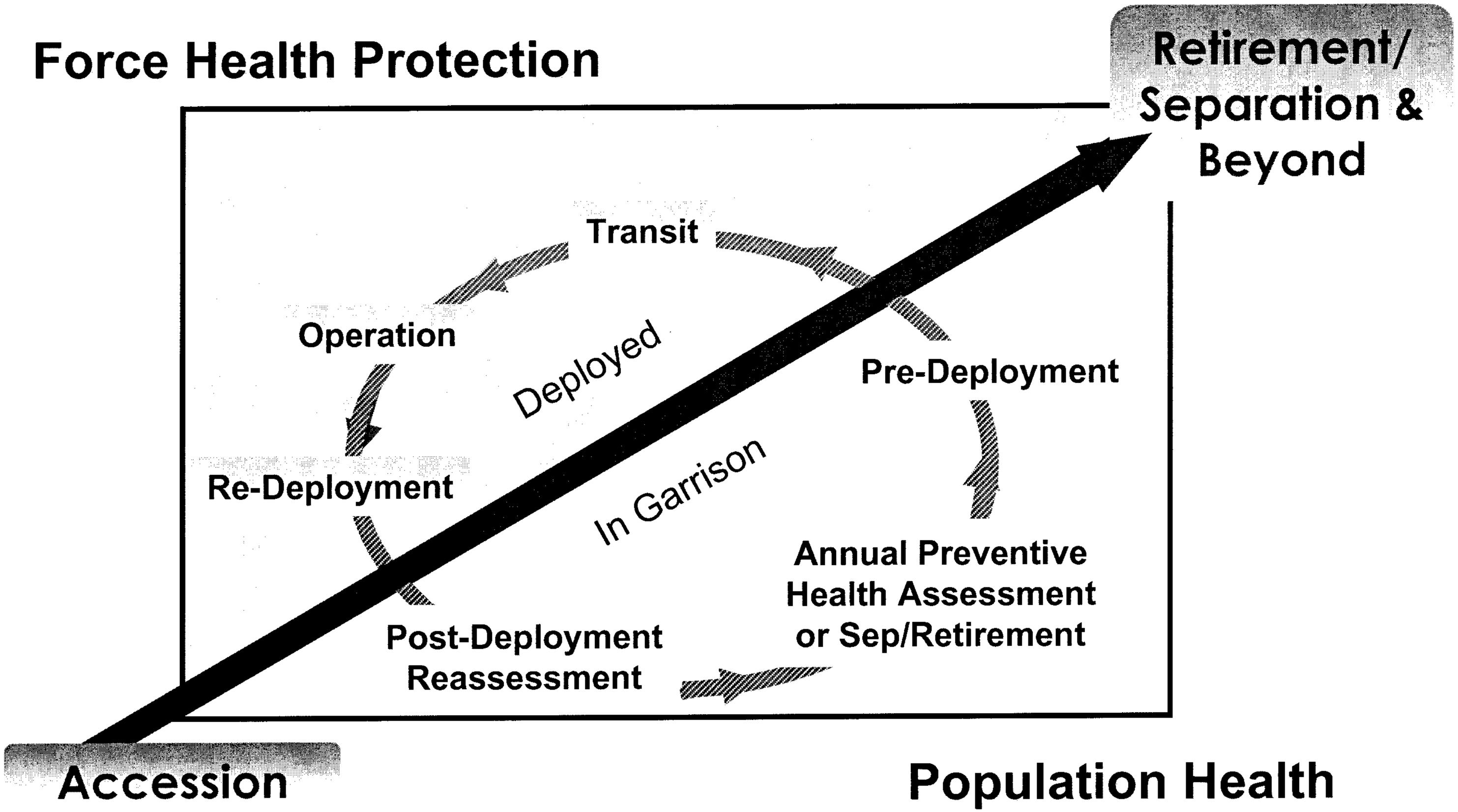
Deployment Health Support Directorate

Service Member Life Cycle

Health Assessment Opportunities



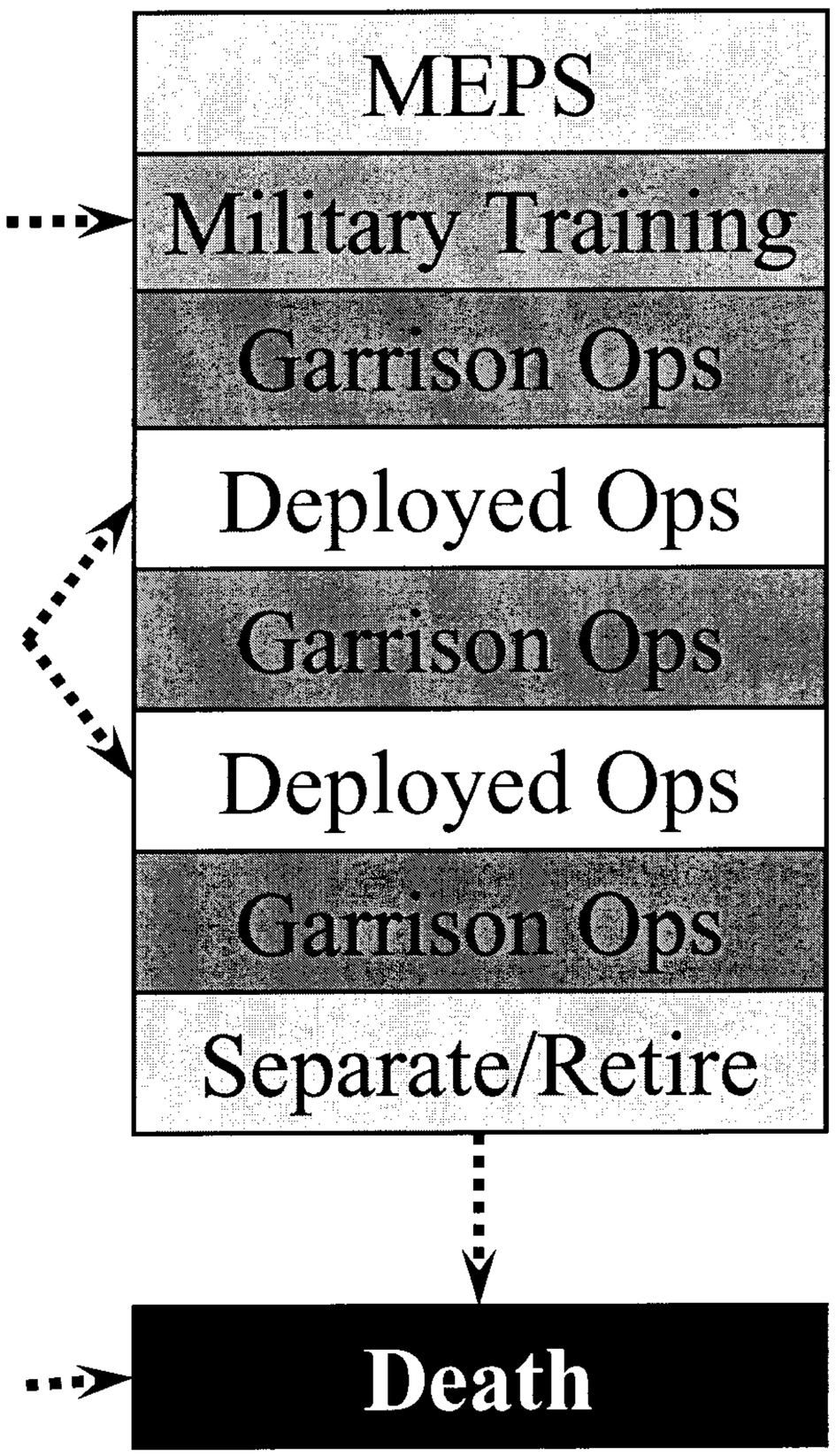
Surveillance Programs for the Military Life Cycle

Episodic
Surveillance

Recruit health

Deployment health
and environment

Mortality Registry



Continuous
Surveillance

Febrile Resp Illness
Reportable events
Influenza
Self-injurious events
Alcohol & drug use
Vaccine events
Chronic diseases
Outpatient diagnoses
Inpatient diagnoses
Job-related illnesses
Injuries

Recruit Health Assessment

Health Assessment Review Tool-A

- Collect and maintain electronic baseline demographic, medical, psychosocial, occupational, and other health risk data on all recruits and officer accessions at the time of initial military training
  - Takes 20-30 minutes to complete
- Purpose
  - Improve understanding of the health status and risk factor profiles of service members at the time of entry into the military
  - Enhance development of optimal individual and population-level intervention and prevention programs to enhance Force Health Protection and readiness.
- Web-based and stand-alone versions
  - Data becomes part of electronic health record

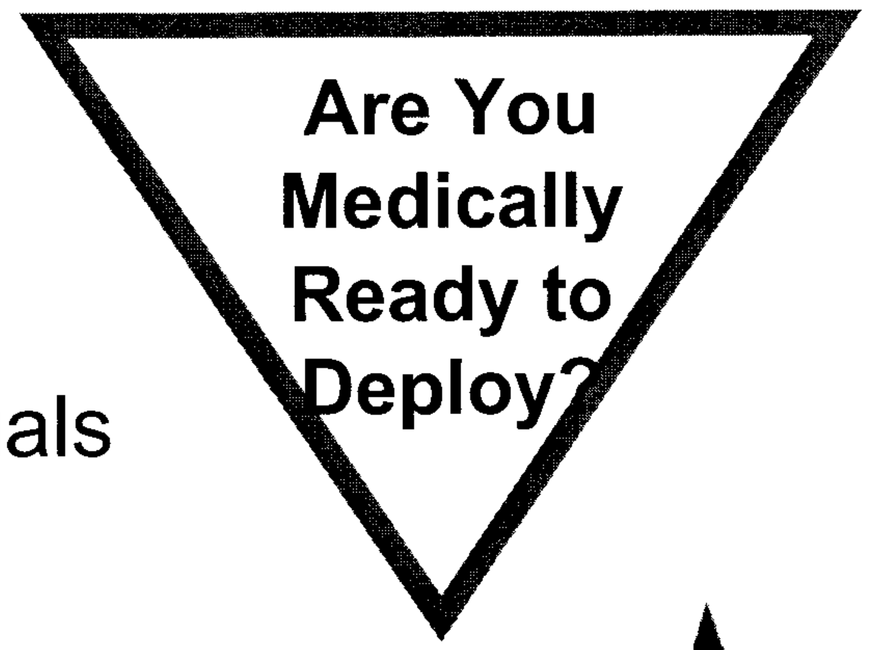
Annual Health Assessments

Periodic/Preventive Health Assessment (PHA)

- Replaces outmoded every 5-yr physical with tailored annual assessment
  - Self-report using Health Assessment Review Tool (HART)-R/F/P
  - Review medical records and DD Form 2766
  - Review all IMR requirements, correct gaps
- Identify personal health risks (occ, lifestyle, etc.), educate, and provide a blueprint for improved health (manage &/or prevent)

Individual Medical Readiness (IMR)

- Key FHP concept
  - Monitoring & optimization of vital health protection parameters
- Purpose: ensure healthy, fit fighting force
- Definition: the extent to which an individual service member is free from health-related conditions that could limit their ability to participate in military operations in austere settings
- Technique:
  - Monitor key IMR indicators
  - Assign overall IMR classification to individuals
  - Provide actionable reports to commanders
  - Follow DoD-level metrics



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Deployment Associated Surveillance

Predeployment	Intradeployment	Postdeployment
• Self-assessment with DD Form 2795 • Archive pre-deploy serum sample • Individual medical readiness • Periodic Health Assessment (PHA)	• Monitor health events • Monitor exposures • Occupational • Environmental • Self-assessment with DD Form 2796 prior to leaving operational area •Separation exam	• Archive post-deploy serum sample (<30d) • TB test (risk-based) • Postdeploy health reassessment (90-180d) with DD Form 2900 • Health care utilization • Periodic Health Assessment (PHA)

Routine Public Health Surveillance
(communicable dz, mortality, etc.)

In-theater Continuous Surveillance

- Casualty Reports (hostile injuries/deaths)
  - Personnel Component
  - Medical Component (AFIP Mortality Surveillance)
- Disease and Non-battle Injury Reports
  - Patient encounter modules (PEM) or web data entry
- Reportable Medical Events
- Joint Patient Tracking Application
- Medical Air Transport Reports (TRAC^{2}ES)
- Other (Safety Reports, Trauma Registries, etc.)
- Occupational/Environmental Exposure Reports

Post-deployment Health Assessment Key Results

January 1, 2006 – July 24, 2006

	Health (Excellent, Very Good, Good)	Medical/ Dental Problems	Currently on Profile	Mental Health Concerns	Referral Indicated for any reason
Active Duty (N=89,336)	92%	22%	7%	5%	18%
Reserve Components (N=40,830)	91%	42%	11%	7%	26%

NOTE: Service members' responses on DD Forms 2796 submitted since 01 Jan 06, all operations/deployments.

Data Source: Defense Medical Surveillance System, Army Medical Surveillance Activity

As of 24 July 2006

Most common reasons for referral:

- Dental (annual exam, cleaning, caries)
- Musculoskeletal (orthopedics)
- Mental health

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Deployment Health Support Directorate

Post-deployment Health Re-Assessment Key Results

September 1, 2005 – July 11, 2006

	Health (Excellent, Very Good, Good)	Medical/ Dental Concerns	Environ-mental Concerns	Mental Health Concerns	Referral Indicated for any reason
Active Duty (N=62,613)	87%	48%	17%	31%	21%
Reserve Components (N=12,973)	77%	73%	43%	52%	54%

NOTE: Service members' responses on DD Forms 2900 submitted since 01 Sep 05, all operations/deployments.

Data Source: Defense Medical Surveillance System, Army Medical Surveillance Activity

As of 11 July 2006

Most common concerns reported:

- Sleep / fatigue problems
- Back pain

Medical Evaluation Boards (MEB)

Snapshot of Diagnoses Among Service Members Completing MEBs (8 June – 7 July 2006)

		Number of Members	% of Total
Musculoskeletal System		**630**	**46%**
Mental Disorders		**140**	**10%**
PTSD	43		
Depression	31		
Bipolar disorder	19		
Schizophrenia	13		
Other	34		
Injury and Poisoning		**102**	**7%**
Respiratory System		**88**	**6%**
Asthma	76		
Other	12		
Nervous System and Sense Organs		**85**	**6%**
Symptoms, Signs, Ill-Defined Conditions		**74**	**5%**
All 14 Other Major Categories		**253**	**18%**

Remaining Challenges
Closing the Gaps

- Integrating exposure data with heath event surveillance
  - Particulate matter exposure cohorts
- Extending continuous surveillance systems, e.g. recruit health
- Monitoring variations over time for individual health assessments, i.e., linking HART-A, HART-R, DD 2795/2796/2900
  - Validating self-assessment tools, timing, and processes
- Reserve Component health event data
- Integrating VA and other external sources to monitor health events and mortality in retirees and those who have separated from military service

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Deployment Health
Support Directorate

Discussion & Questions

Backup Material

HART-A Domains

- General Information
- Overall Health
- Dental
- Chronic Disease
- Exercise and Fitness
- Nutrition
- Tobacco Use
- Alcohol
- Family History
- Clinical Preventive Services
- Reproductive Health
- Injuries
- Mental Health
- Other
  - Seat belts-Anger-Financial

Standarized DoD IMR Definitions

Element	Definition
PHA	Current PHA (overdue if not done by last duty day of month following due month).
Dental	Class 1 or 2 (fail if Class 3 or 4).
Immunizations	Current for all total force required vax.
Med Equip	1 pair gas mask inserts (if needed)
Med Readiness Labs	DNA on file, HIV current (within 24 months). G6PD for Navy & AF (Army planning policy).
Deployment Limiting Conditions	Per Service-specific standards guidelines.

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Deployment Health
Support Directorate

DoD Pandemic Influenza Surveillance and Detection Activities

Force Health Protection Conference
7 August 2006

(b)(6)

Director, Force Health Readiness
Deployment Health Support Directorate
Office of the Assistant Secretary of Defense
(Health Affairs) Force Health Protection and Readiness

Outline

- U.S. National PI Surveillance Plan
- DoD General Contributions to National PI Surveillance
  - Virologic Surveillance
  - Disease Surveillance
- Integrating Diverse Information Sources
  - Sample DoD PI Surveillance Report
- Questions/Discussion

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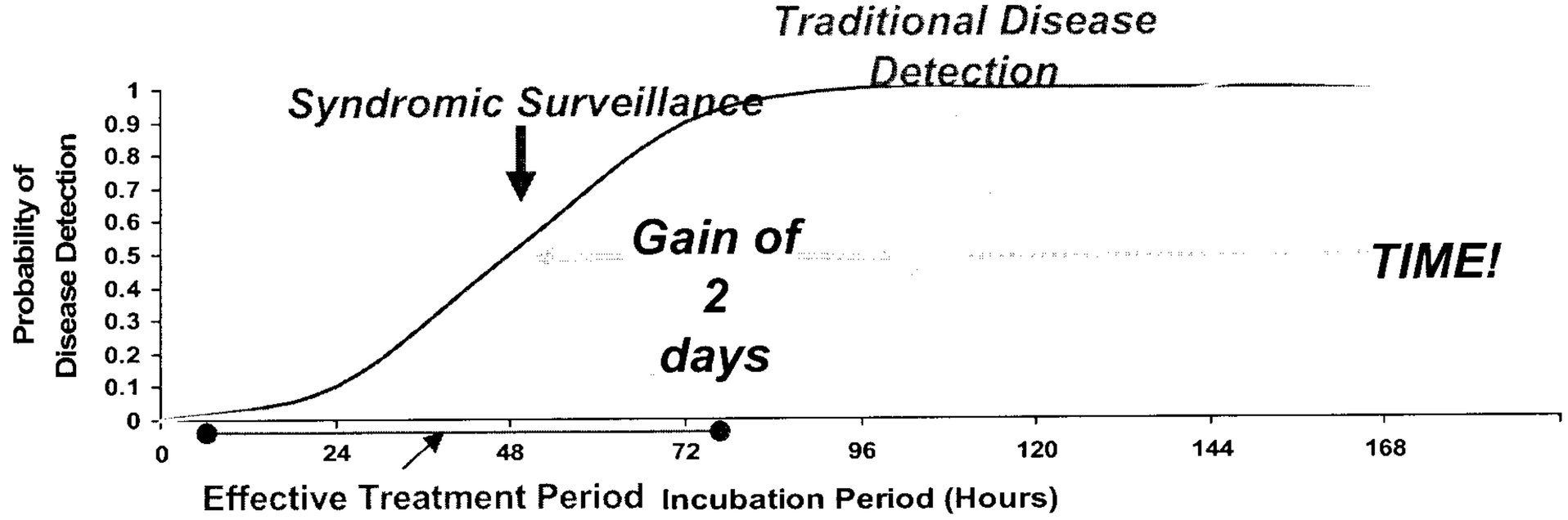
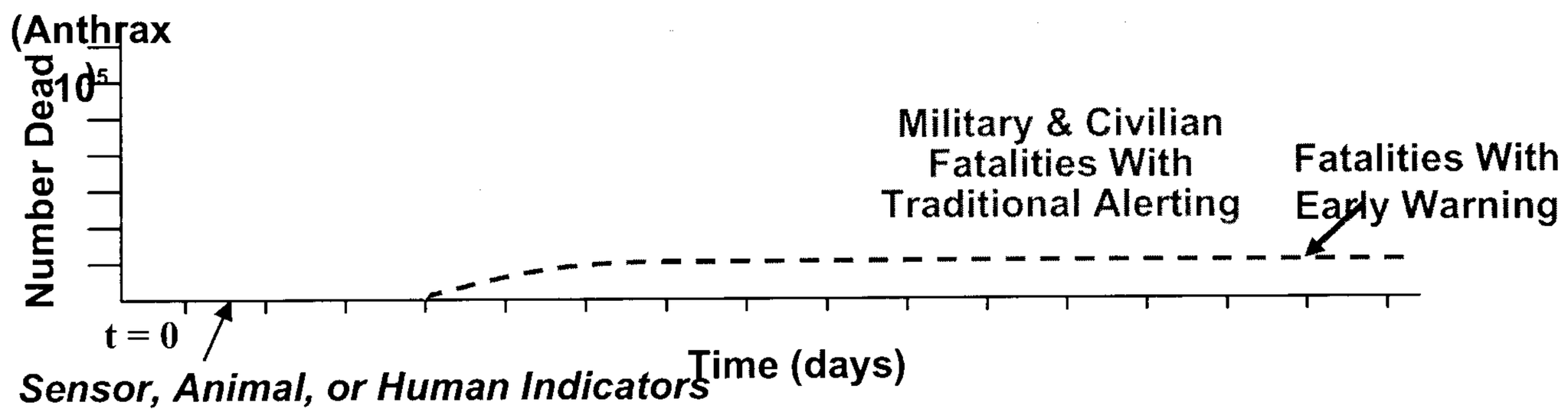
Deployment Health Support Directorate

Definition

- Surveillance and Detection: domestic and international systems that provide continuous "situational awareness," to ensure the earliest warning possible to protect the population.





HHS PI Surveillance Plan
PH Roles & Responsibilities

- Virologic Surveillance
  - Rapidly detect early cases of a PI virus in U.S.
  - Track the virus' introduction into local areas
  - Monitor changes in the pandemic virus, including development of antiviral resistance
- Disease Surveillance
  - Serve as an early warning system to detect increases in influenza-like illness (ILI) in the community.
  - Monitor the pandemic's impact on health (e.g., by tracking outpatient visits, hospitalizations, and deaths).
  - Track trends in influenza disease activity and identify populations that are severely affected.
- **http://www.hhs.gov/pandemicflu/plan/sup1.html**

DoD Value to National Medical Surveillance Efforts

- Worldwide presence in more than 140 countries
  - Approx 475,000 military personnel overseas at any given time
- Large 9.2 million beneficiary population including vulnerable groups such as children and aging retirees
  - 1.8 million outpatient encounters and 19,500 inpatient admissions per week, on average
- Robust public health surveillance programs & systems
  - 70 military hospitals and 411 medical clinics
  - 129,500 military healthcare workers world-wide

U.S. DEPARTMENT OF DEFENSE
Deployment Health Support Directorate

DOD Military Health System Surveillance Activities

- Epidemiology, Public Health, and Preventive Medicine:
  - Installation level, variable capabilities across Services
  - Service Public Health Centers: USACHPPM, NEHC/NEPMU, and AFIOH
- CONUS Lab/Research Network
- OCONUS Medical Research Network
- Clinical:
  - Human: MTFs, COCOM deployed medical units
  - Animal: VETCOM
- Coordination, planning, training, investigation, and response: GEIS, JS/SG, COCOM SGs



U.S. DEPARTMENT OF DEFENSE
Deployment Health Support Directorate

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Deployment Health
Support Directorate

Virologic Surveillance

Laboratory Capabilities

Lab-based Influenza Surveillance

- Specimens for identification & culture of influenza viruses are collected from:
  - DoD beneficiaries in the Military Health System (MHS) worldwide, including ships at sea
  - DoD infectious diseases research laboratories located in Bangkok, Jakarta, Cairo, and Peru collect and analyze influenza specimens from American & local national patients in more than 30 countries
  - Central America in collaboration with SOUTHCOM and the US Army Center for Health Promotion & Preventive Medicine-West (CHPPM-W)



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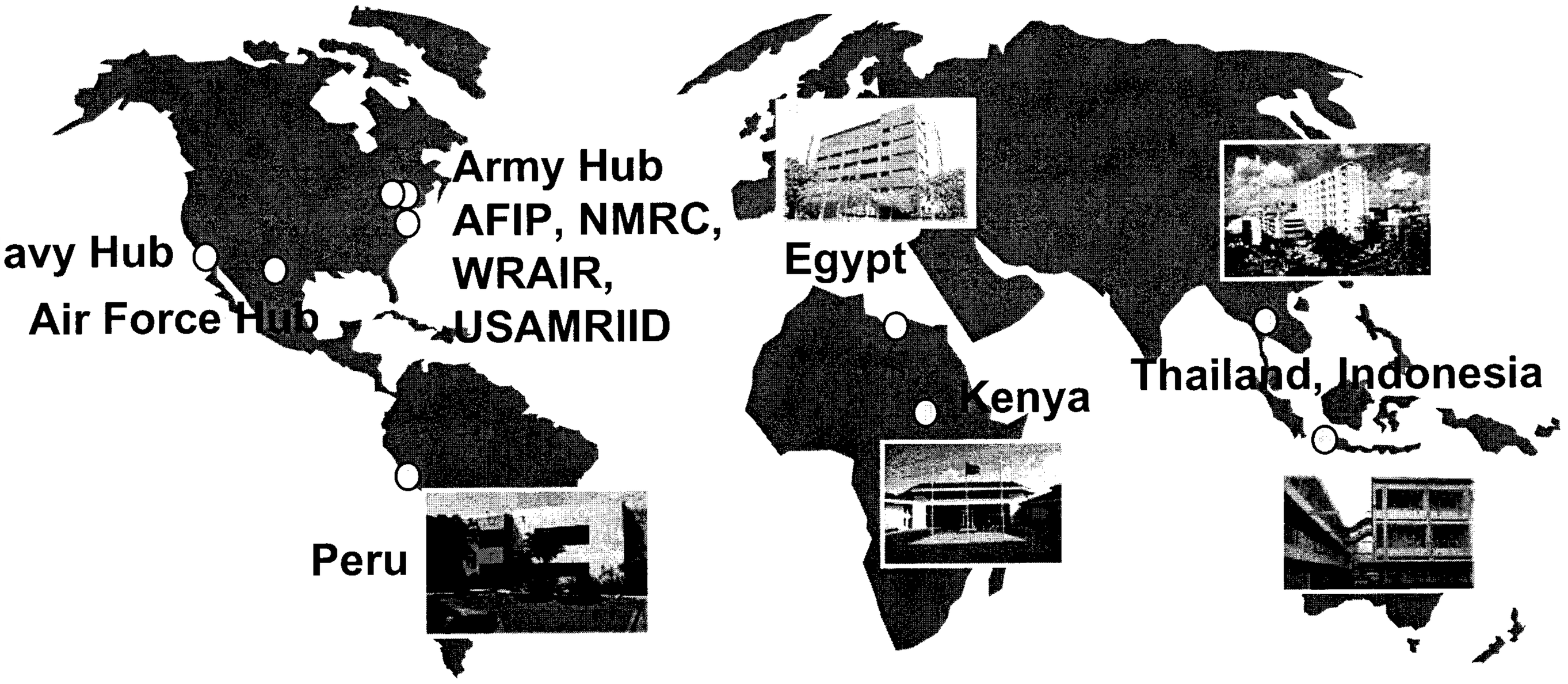
Deployment Health Support Directorate

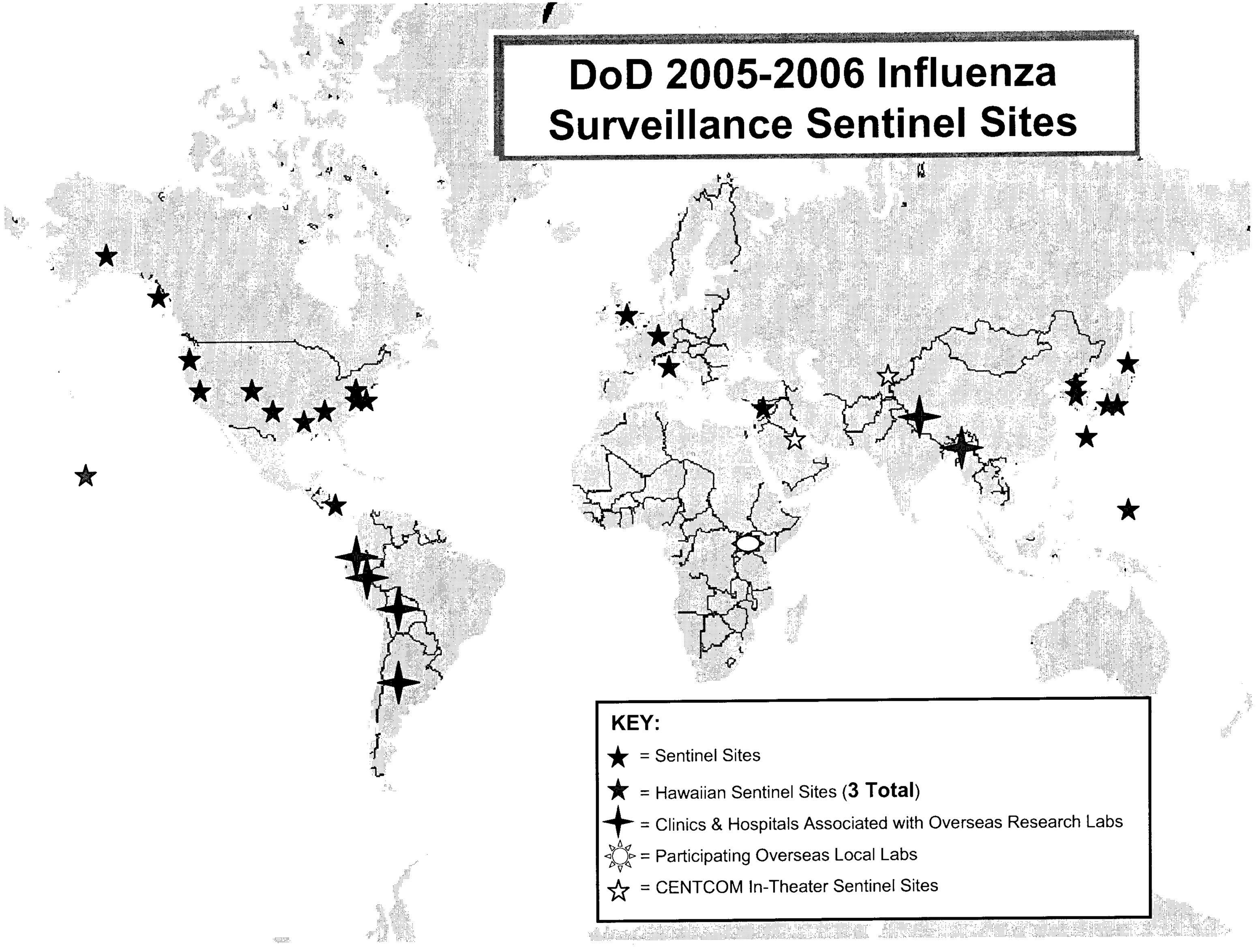
DoD International Network



DoD Influenza Surveillance (Lab-based)

- Air Force Institute for Operational Health is DoD lead
  - Avg workload of 3-4K specimens/yr (approx 15% Flu A, 5% Flu B)
- Integrated surveillance of inpatient and outpatient respiratory disease health events
- Vaccine effectiveness studies
- Lab: BSL-3 (small capacity), full BSL-2/2+, rapid RT-PCR (including H5), serologic subtyping by hemagglutination inhibition or PCR, molecular sequencing, and cell culture
  - Subset of positive isolates shared with CDC for confirmation and further testing, has provided seed material for vaccine production
- **https://afioh.brooks.af.mil/pestilence/influenza/default.csm**

DoD 2005-2006 Influenza Surveillance Sentinel Sites



KEY:

★ = Sentinel Sites

★ = Hawaiian Sentinel Sites (**3 Total**)

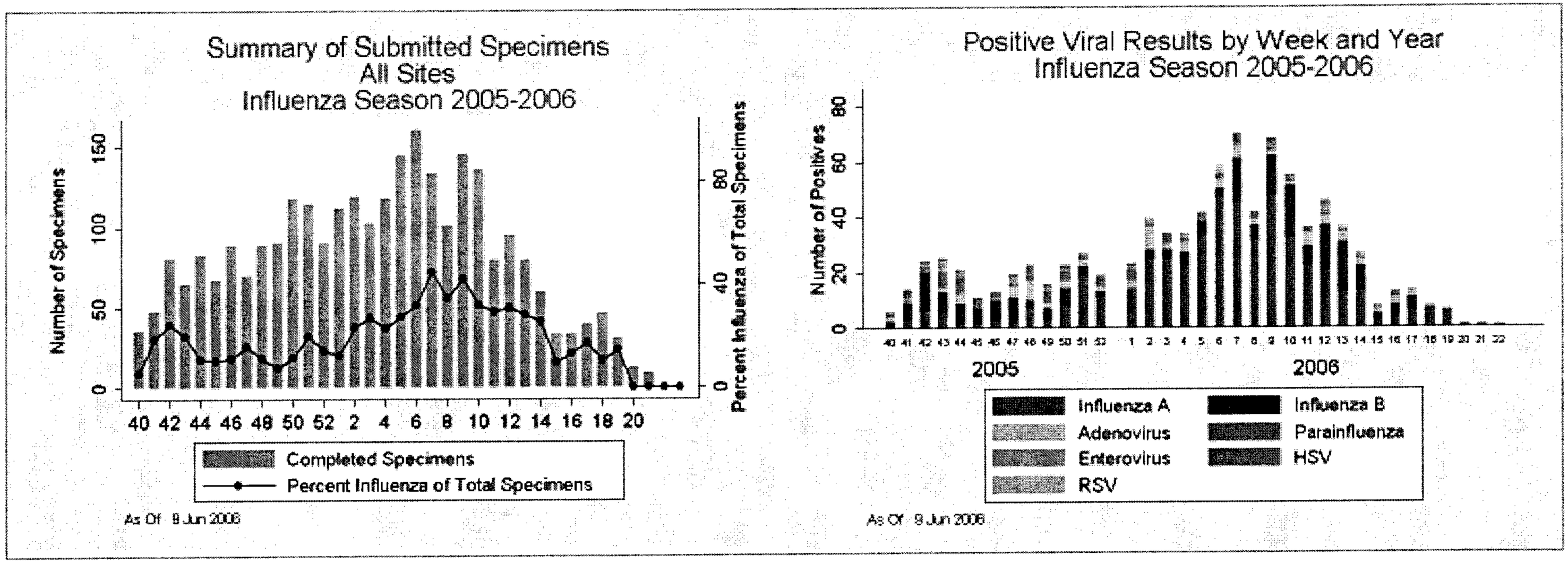
✦ = Clinics & Hospitals Associated with Overseas Research Labs

✺ = Participating Overseas Local Labs

☆ = CENTCOM In-Theater Sentinel Sites

Total Viral Specimens

Sentinel & Nonsentinel

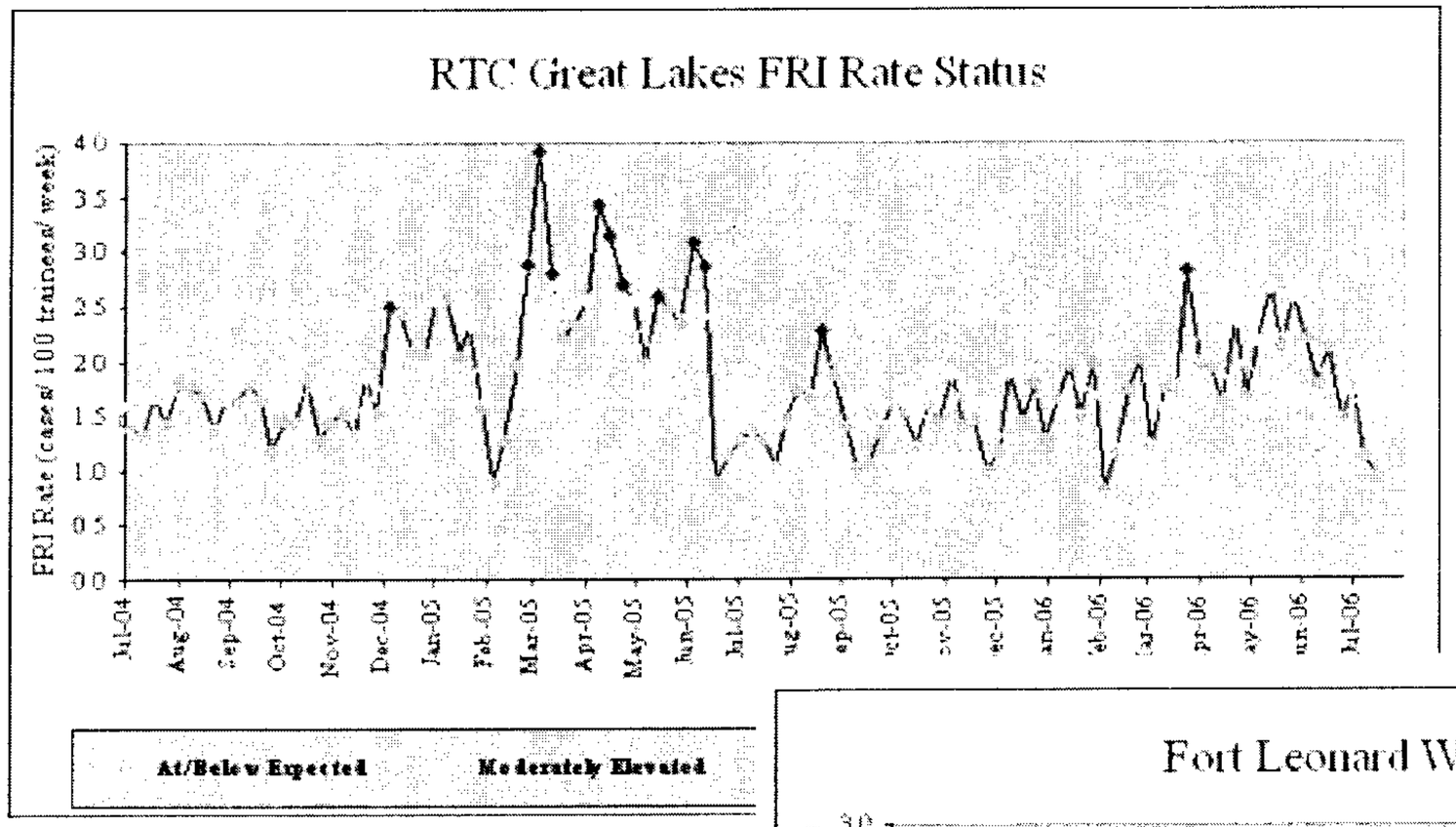


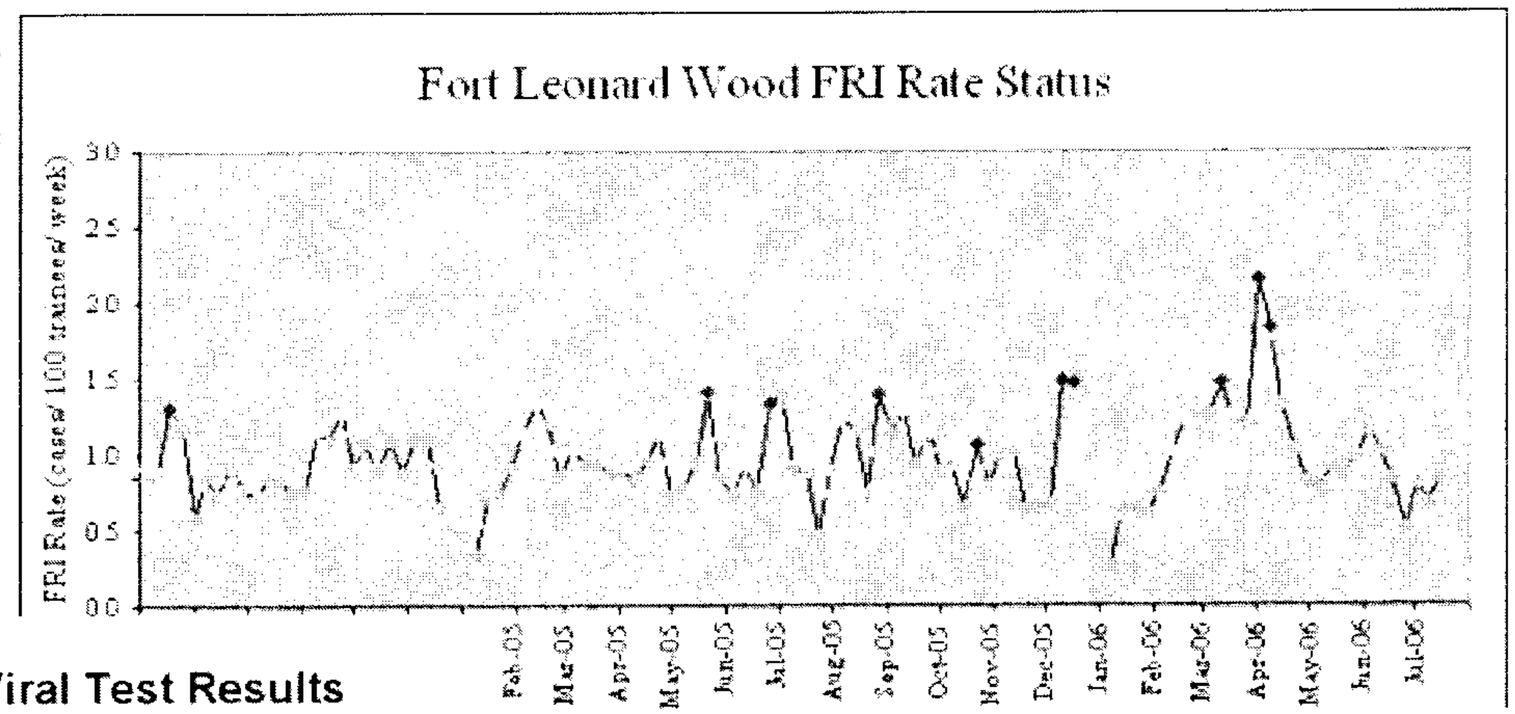
U.S. DEPARTMENT OF DEFENSE
Deployment Health Support Directorate

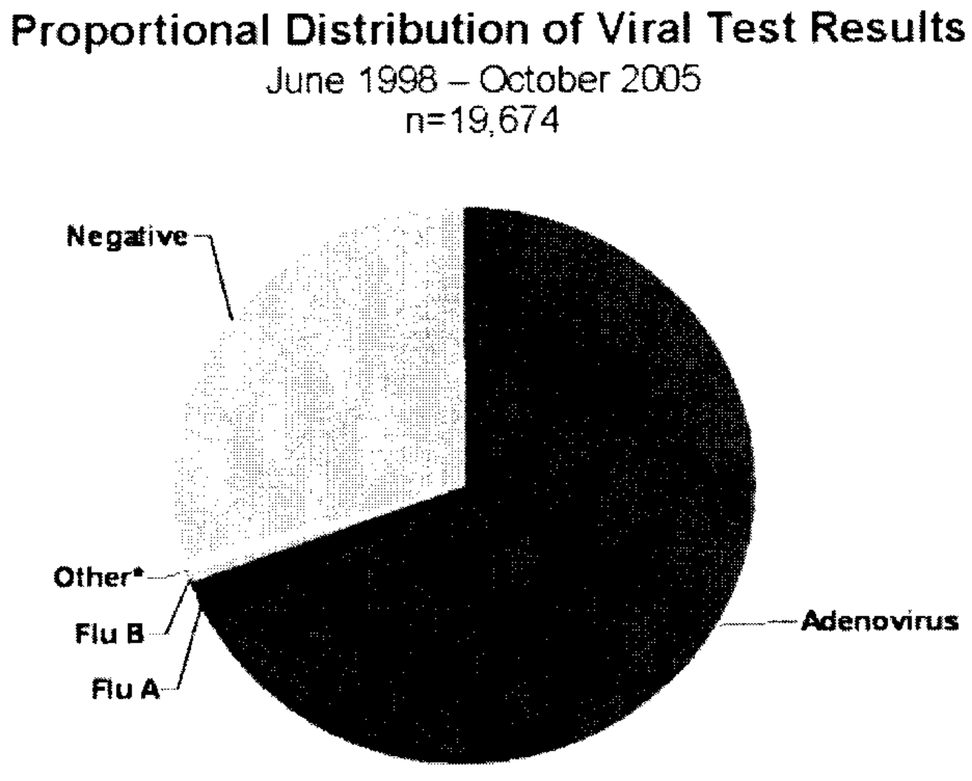
DoD Febrile Respiratory Illness Surveillance (Population-based)

- Naval Health Research Center is DoD lead
- Pacific Fleet shipboard surveillance (7 platforms)
  - Identifies influenza clusters after international port stops prior to US seasonal epidemics making specimens valuable
- Febrile respiratory pathogen surveillance at 8 military recruit training centers
- Avg workload of 2,300 specimens/yr
  - 61% adenovirus, 3% flu A, 1% flu B
- Lab: BSL-3, rapid RT-PCR (including H5), serologic subtyping by hemagglutination inhibition or PCR, molecular sequencing, and cell culture
- http://www.nhrc.navy.mil/geis/studies/Fabrile%20Respiratory%20Illness%20Surveillance.htm#Current%20Findings

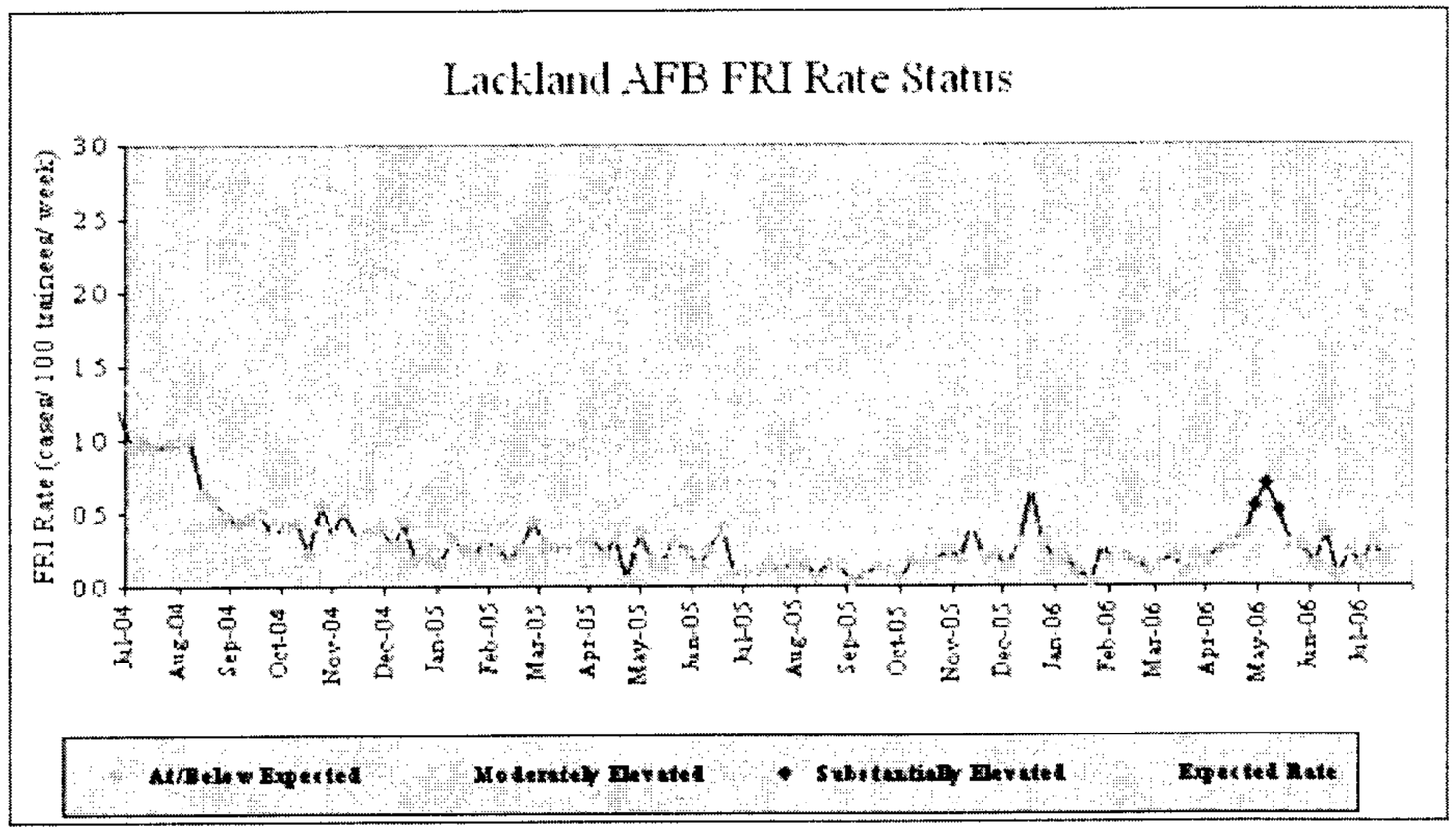
Surveillance is a Local Phenomenon







*RSV and parainfluenza 1, 2, and 3



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Disease Surveillance

Health Events/Encounters

DoD Disease Surveillance

- Outpatient
  - Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE), daily garrison monitoring
  - Joint Medical Work Station (JMeWS), for deployed forces
  - Reportable Medical Events systems (not real-time across DoD)
- Inpatient
  - Standard Inpatient Data Record (SIDR), usually lags 30-60 days
  - Patient Accounting and Realtime Tracking Application (PARRTS)
    - Preliminary data usually entered within 24-48 hours of admission
    - Army facilities only
  - Joint Patient Tracking Application (JPTA), for deployed operations
- Medical Movement Data (TRAC^{2}ES), domestic & deployed

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DoD Disease Surveillance, cont'd

- Mortality Surveillance
  - Armed Forces Institute of Pathology
  - Medical Examiner program
    - Full autopsies and investigations on all active duty service member deaths
  - Special emphasis on identifying sentinel infectious deaths
- Veterinary Surveillance
  - Existing animal/vector disease surveillance programs
    - Primary responsibility with USDA
    - DOD VETCOM provides surge support
  - No DoD-wide integrated electronic data sources
- Open Source Monitoring (Medical Intelligence)
  - Domestic (Dept of Homeland Security, National Biosurveillance Integration System)
  - International (Armed Force Medical Intelligence Center)

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Putting it All Together

Sample PI Surveillance Report

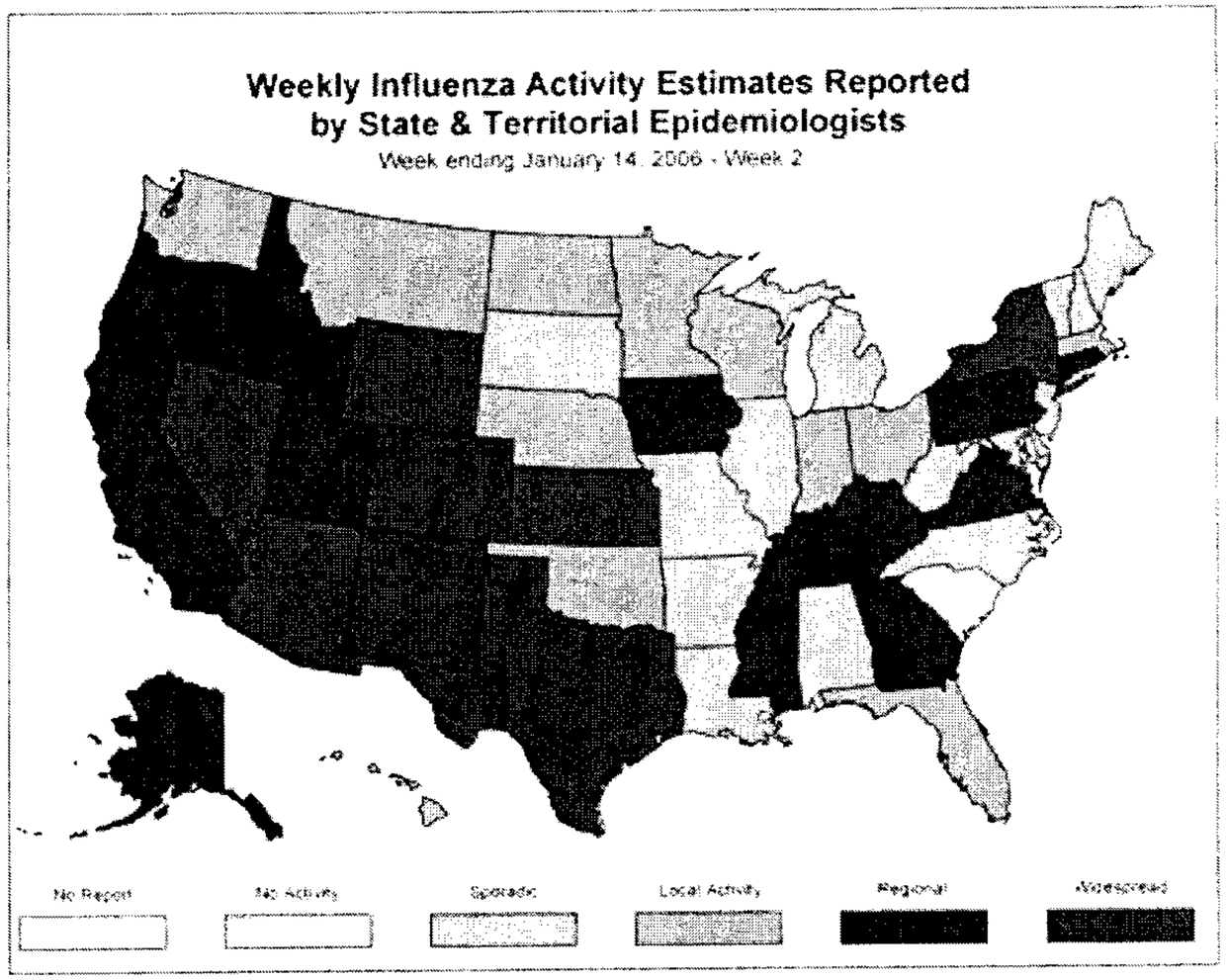
Flu Surveillance and Detection
26 Jan 06 Report to ASD/HA

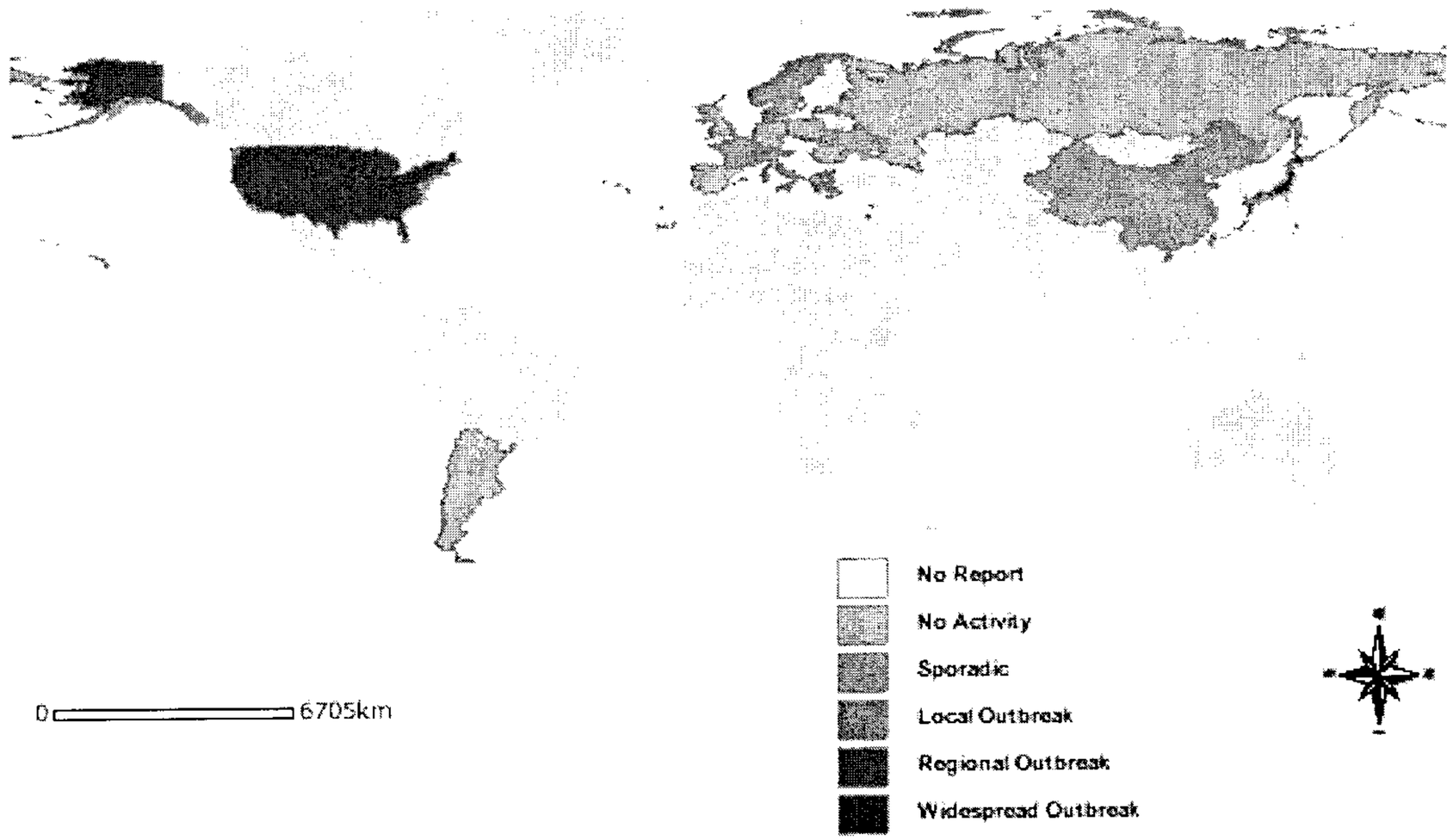
- Turkey human H5N1situation
  - WHO reports 21 confirmed cases with 4 deaths, as of 18 Jan
  - All confirmed cases had close contact with poultry
  - ILI disease counts rising at Incirlik AB over the past week, but less than same period last year, ILI 16% of outpatient visits
  - USAFE expanding surveillance capability at Incirlik AB
    - Lab hood ordered for BSL-2 capability
    - Lab already has rapid flu test kits (determines A vs. B)
    - Incirlik AB is a DoD flu sentinel site, no positive specimens to date
    - Local public health staff routinely monitor ESSENCE
    - Enhanced surveillance will start with the confirmation of H5N1 in local poultry or with human-to-human transmission anywhere in Turkey
  - H5N1 AI currently poses a low health risk to US forces in Turkey
- Media reports of suspected cases (Iraq, Lebanon, Syria, Moldova, Russia) remain unconfirmed by WHO, AFMIC, or other authorities

Current WHO Phase of Pandemic Alert=Phase 3: a new influenza virus subtype is causing disease in humans, but is not yet spreading efficiently and sustainably among humans.

Surveillance and Detection

U.S and World Influenza Activity Maps (WHO, as of 21 Jan 06)





1. National Influenza Activity (**CDC**): http://www.cdc.gov/ncidod/diseases/flu/weeklychoice.htm
2. International Influenza-like Illness Activity (**WHO**): http://gamapserver.who.int/GlobalAtlas/home.asp

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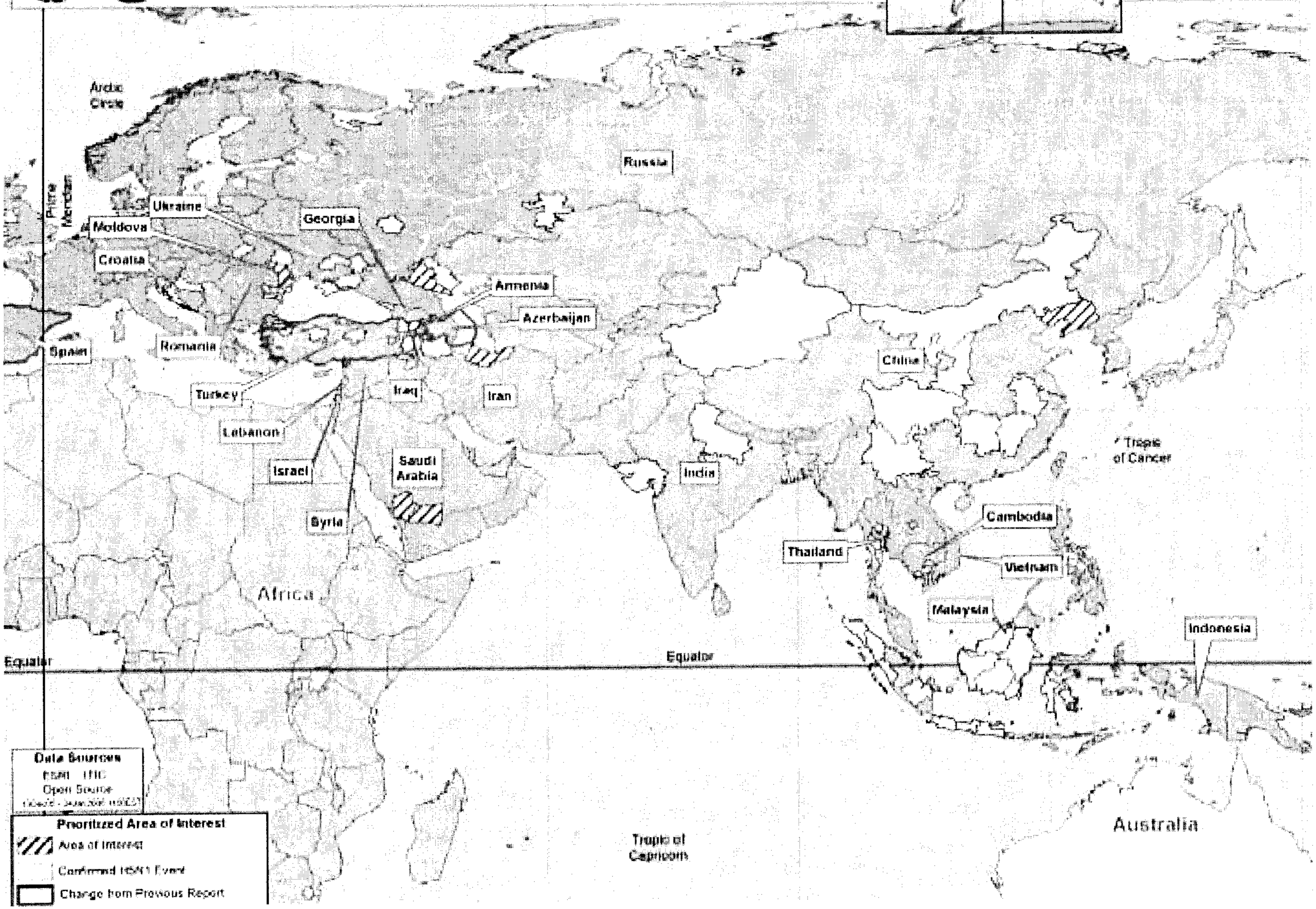
NBIC BioStatus
Avian Influenza in Birds

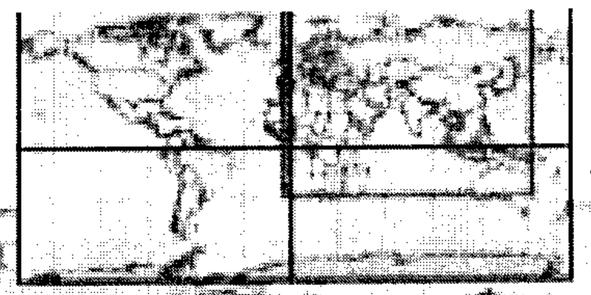
UNCLASSIFIED
As of 24 Jan 06



NBIC BioStatus
Avian Influenza in Humans

UNCLASSIFIED

As of 24 Jan 06



Arctic Circle

Prime Meridian

Russia

Moldova

Armenia

Turkey

Iraq

Lebanon

Syria

West Bank

China

Tropic of Cancer

Vietnam

Thailand

Cambodia

Equator

Equator

Indonesia

Australia

Tropic of Capricorn

Data Sources

ESRI ITIC

Open Source

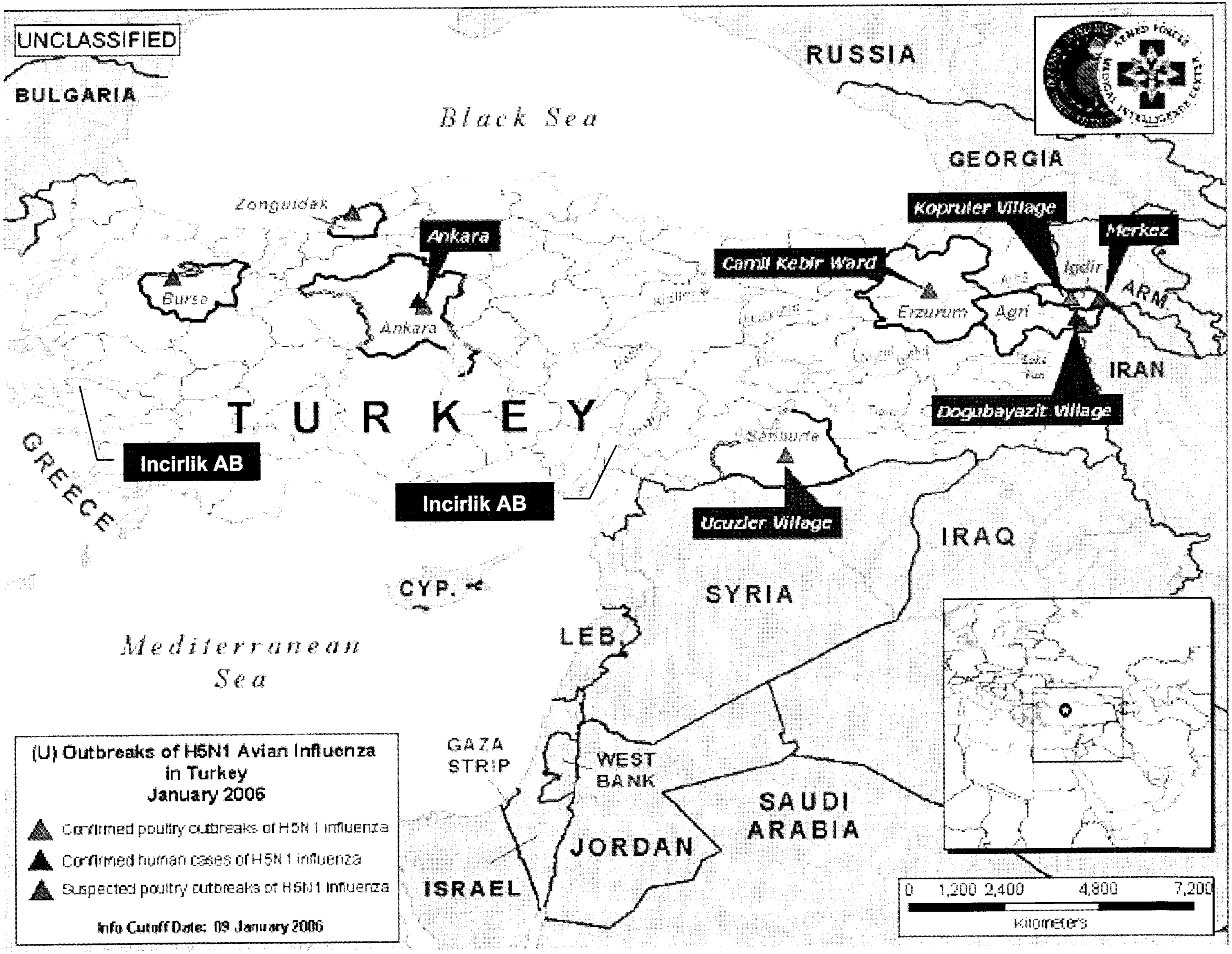
Prioritized Area of Interest

Area of Interest

Confirmed H5N1 Event

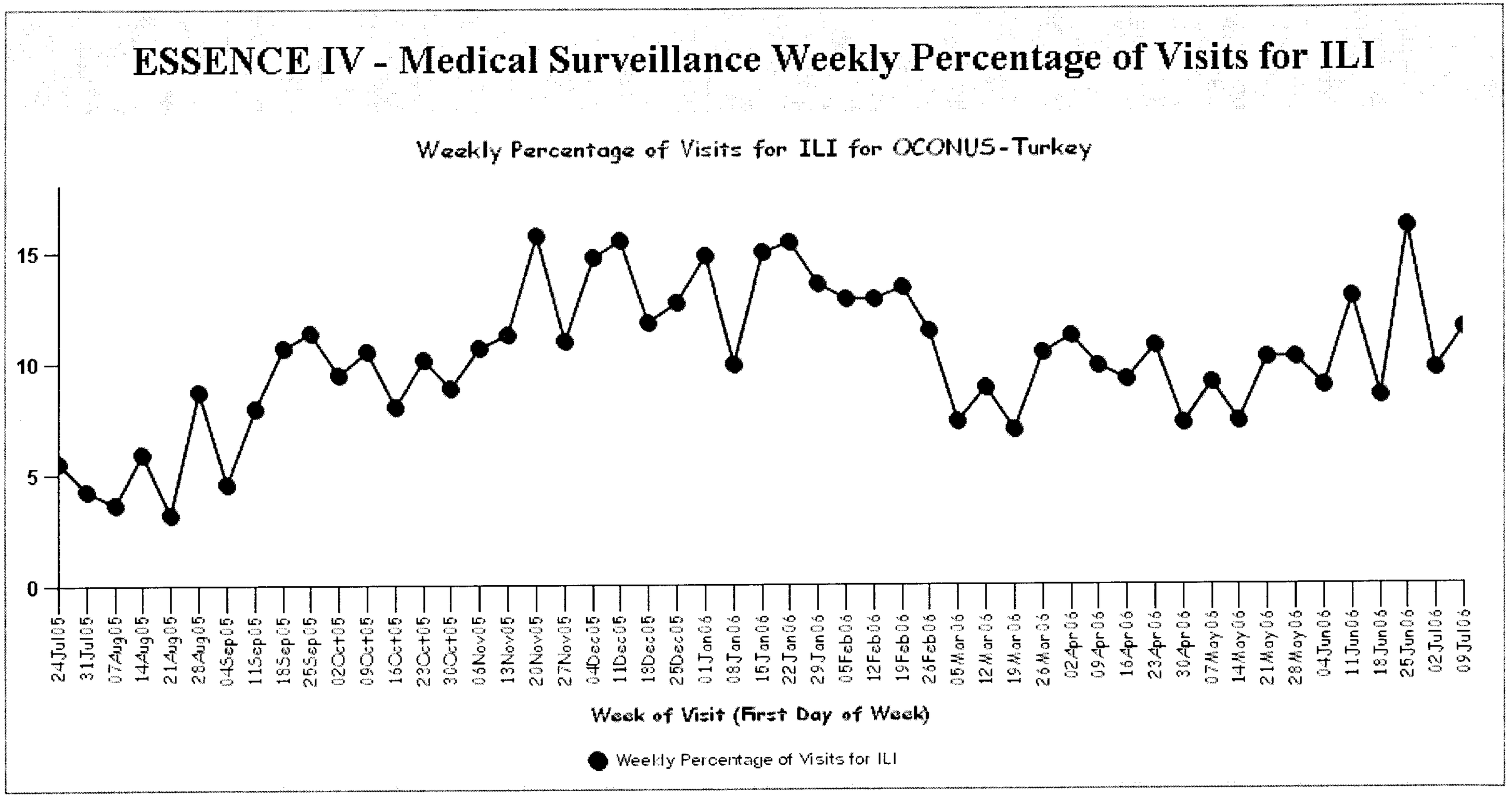
Change from Previous Report

UNCLASSIFIED



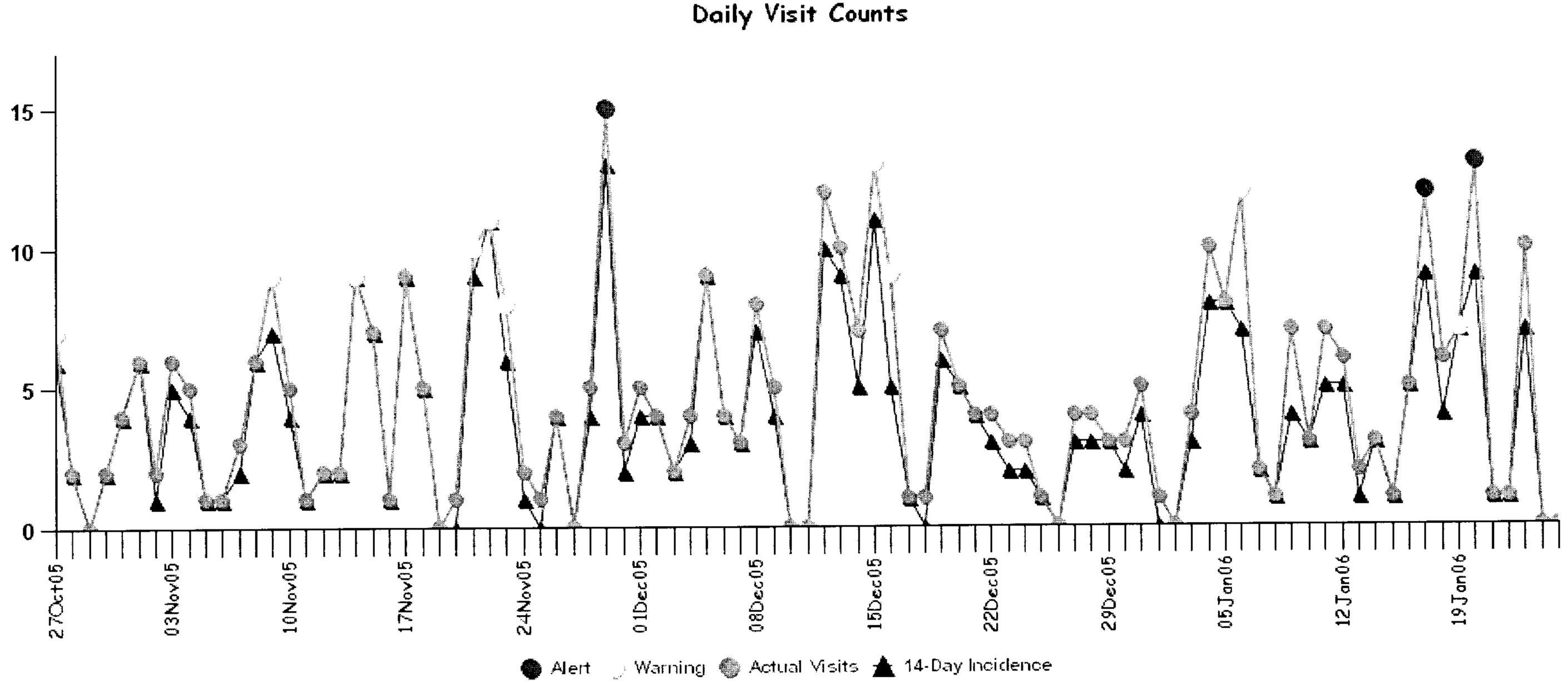
ILI as Percent of all Outpatient Visits

Jan 22: Turkey 16% vs. All MTFs 16%

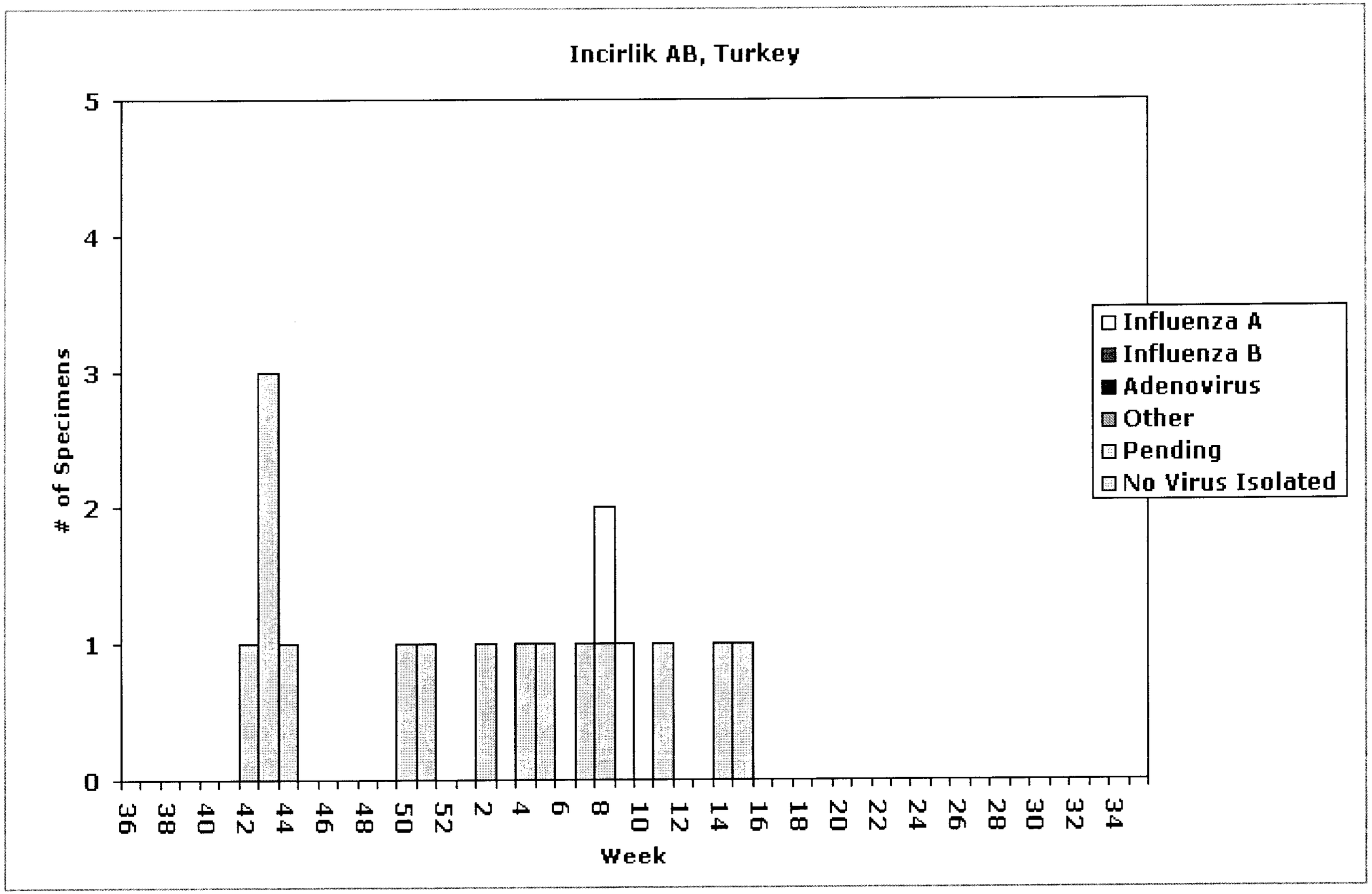


Site	OCONUS-Turkey
Data Source	ADM
MTF	All
Medical Grouping	ILI
Age	All
ClinicType	All
StartDate	27Oct05
EndDate	25Jan06

figuration Options
ph



Site-specific Lab Results



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Questions/Discussion & Backup Material



DOD Overseas Research Medical Unit Capabilities

- Armed Forces Research Institute of Medical Sciences (AFRIMS), Bangkok, Thailand
- Naval Medical Research Unit (NAMRU-2), Jakarta, Indonesia
- Naval Medical Research Unit (NAMRU-3), Cairo, Egypt
- Naval Medical Research Center Detachment (NAMRCD), Lima, Peru
- US Army Medical Research Unit-Kenya (USAMRU-K), Nairobi



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AFRIMS (Bangkok)

- Ongoing surveillance in Bangkok, Kamphaeng Phet, Sangkhla Buri, and Kathmandu
- Starting surveillance in Nepal (nationwide), Sri Lanka (nation wide), and Manila and provide support to Embassies/consulates in Malaysia, Myanmar, Laos, Cambodia, and China
- Outbreak investigation capability
- Lab: BSL-2, rapid bedside test, rapid RT-PCR (including H5)
  - Influenza samples submitted to AFIOH for further characterization
  - Developing cell culture (pending funding)
  - Plan veterinary diagnostics (pending funding)



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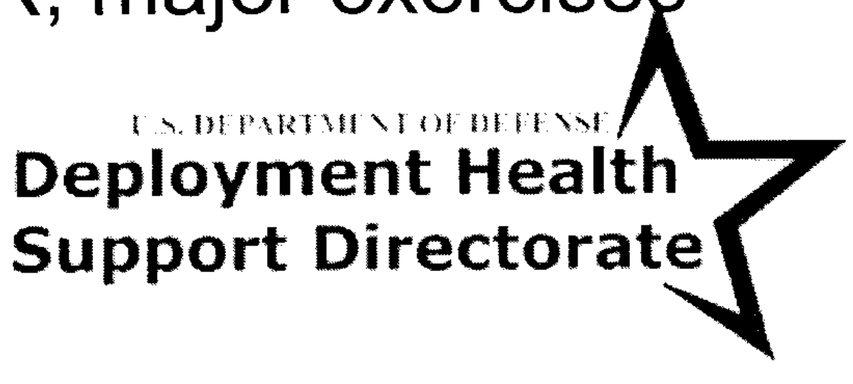
NAMRU-2 (Jakarta)

- Surveillance at 20 sites in Indonesia
  - 2,182 samples, 383 positive in FY05
  - Proposal to DoD HA for additional programs in Cambodia and Laos
- Lab: BSL-2, rapid RT-PCR (including H5), serologic subtyping by hemagglutination inhibition, and cell culture
  - Isolates sent to CDC for confirmation and sequencing
- Outbreak response support to PACOM AOR, major exercises (Cobra Gold), and regional nations

NAMRU-3 (Cairo)

- Surveillance in numerous Middle Eastern, African, and Central Asian countries
  - Directly processed 3658 samples and isolated more than 750 influenza viruses, including 83 influenza A and 423 influenza B, in FY05
- WHO designated Eastern Mediterranean Region (EMRO, 23 nations) influenza laboratory
- Lab: BSL-3+, rapid RT-PCR (including H5), serologic subtyping by hemagglutination inhibition (developing microneutralization capability), molecular sequencing, and cell culture
  - Subset of positive isolates shared with CDC for confirmation and further testing
- Outbreak response support to CENTCOM AOR, major exercises (Bright Star), and regional nations





NMRC-D (Lima)

- 3,000 human specimens over last 5 years from Peru, Bolivia, Argentina, Ecuador, Colombia, and Venezuela.
- Lab: BSL-3, capability to do culture work
  - Viral isolates go to AFIOH for confirmation and sequencing

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USAMRU-K (Nairobi)

- No active influenza surveillance program
  - Surveillance protocol in development
- Lab: BSL-2?, viral isolation in tissue culture, no molecular sequencing.

DOD Domestic Research Laboratory Capabilities

- Air Force Institute for Operational Health (AFIOH)
- Armed Forces Institute of Pathology (AFIP)
- Naval Health Research Center (NHRC)
- US Army Medical Research Institute for Infectious Diseases (USAMRIID)
- Walter Reed Army Institute of Research (WRAIR) and Naval Medical Research Center (NMRC)

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Antiviral Research & Development Efforts--USAMRIID

- Drug screening during SARS outbreak:
  - 350,000 compounds tested in a cell-based assay (3 months, 6 personnel)
  - 32 promising compounds identified; one taken through preclinical development by commercial partner

  USAMRIID also developed a diagnostic assay and non-human primate model for *in vivo* testing.
- Antisense technology:
  - Demonstrated *in vitro* efficacy of antisense technology
  - Highly stable backbone and genetic sequences that are highly conserved across influenza A viruses including H5N1
  - May provide broad therapeutic approach for several influenza viruses

WRAIR/NMRC

- Developing FDA approved point-of-care or hospital-based diagnostic assays for naturally occurring infectious diseases of military importance
- WRAIR chemical library of >400K compounds
- Lab: BSL-3

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Lab Capability Comparison Table

	BSL	H5 PCR	HI	Sequencing	Culture
AFIP					
AFIOH	3	Y	Y	Y	Y
AFRIMS	2	Y			
NAMRCD	3				
NAMRU-2	2	Y	Y		Y
NAMRU-3	3	Y	Y		Y
NHRC	3	Y	Y	Y	Y
USAMRIID	4				
USAMRU-K	2				
WRAIR/NMRCD	3				

DOD Laboratory Response Network

More Labs with Capability to ID Influenza Virus

- Walter Reed Army Medical Center (AMC), Washington, D.C.
- Dwight David Eisenhower AMC, Augusta, GA
- Brooke AMC, San Antonio, TX
- Madigan AMC, Ft. Lewis, WA
- Tripler AMC, Honolulu, HI
- Landstuhl AMC, Germany
- 121st General Hospital, Seoul, Korea
- Navy Environmental & Preventive Medicine Unit (NEPMU) 5, San Diego, CA
- NEPMU-6, Pearl Harbor, HI
- Wright-Patterson Medical Center, Dayton, OH
- Wilford Hall Medical Center, San Antonio, TX

ESSENCE

- ESSENCE = Electronic Surveillance System for the Early Notification of Community-based Epidemics
- Web-based surveillance interface developed to alert public health authorities of disease outbreaks
- Temporal/spatial analyses of outpatient health events
  - Military treatment facilities (MTF)
    - 121 Army, 110 Navy, 80 Air Force and 2 Coast Guard bases
  - Maps ICD-9-CM codes into categorical (syndrome) groupings
  - Laboratory confirmation not required
- Automatic alerts generated daily, system-wide data updated every 8 hours and available for ad hoc queries

Data Sources for ESSENCE

Garrison vs. Theater

- Ambulatory data
  - Outpatient visits to military treatment facilities
    - Both garrison and in-theater (selected sites)
  - ICD9 and CPT codes
- Pharmacy data
  - Prescriptions ordered for military beneficiaries
  - Respiratory and Gastrointestinal syndromes only
- Local civilian hospitals (9 sites only)
  - Emergency room chief complaints





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Syndromic Systems Can . . .

- Provide early detection of outbreaks
  - Earlier than most existing electronic systems
- Provide epidemiologic tools to assist the outbreak investigation
- Provide information for leaders and risk communicators
- Decrease workload for labor intensive active systems
- Prompt more accurate diagnostic testing



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Syndromic Systems Cannot . . .

- Detect every outbreak early, especially those with
  - Few cases, or
  - Short, explosive incubation period
- Decrease morbidity/mortality every time
  - Best for diseases with longer incubation periods where effective interventions exist
- Tell you the causative agent
  - Lots of nonspecific information will not give you specific information
- Investigate the outbreak for you
  - Public health professionals remain the important link

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Force Health Protection Quality Assurance Program

Force Health Protection Conference
8 August 2006

(b)(6)

Director, Force Health Readiness
Deployment Health Support Directorate
Office of the Assistant Secretary of Defense
(Health Affairs) Force Health Protection and Readiness

Force Health Protection QA Program

Overview

- Congressional Directions
- GAO Reviews
- DoD Policies
- DoD Programs

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Force Health Protection QA Program

Congressional Directions

- FY1998 National Defense Authorization Act
  - Deployment health assessments (pre and post)
  - Deployment-related health care (record and retain)
  - Quality assurance program (evaluate compliance)
- FY2005 National Defense Authorization Act
  - Establish Joint Medical Readiness Oversight Committee
  - Monitor health status, medical readiness tracking, deployment health surveillance, and policy compliance
  - Report to Congress on FHP quality assurance program

Force Health Protection QA Program

GAO Reviews

- GAO Review of FHP for OEF (2002-2003)
  - Reviewed compliance with FHP requirements
  - Found deficiencies in medical records and databases
  - One recommendation: establish a QA program
- GAO Review of FHP for OIF (2003-2004)
  - Reviewed compliance with FHP requirements and establishment of a QA program
  - Found some major improvements (and deficiencies) in compliance; did not evaluate the QA program
  - No recommendations

Force Health Protection QA Program

GAO Reviews (cont)

- Reserve Component Medical & Physical Fitness (2005)
  - Rec: better monitor and ensure RC fitness for deployment
- Deployment Occ & Env Health Surveillance (2005)
  - Rec: improve deployment OEHS data collection & research
- PTSD Mental Health Referrals (2006)
  - Rec: identify factors for post-deployment mental health referrals
- Civilian Deployment Health (2006-ongoing)
  - Looking at DoD policies and programs for civilian deployers

Force Health Protection QA Program

DoD Policies

- DoDD 6490.2, Joint Medical Surveillance (1997)
- DoDI 6490.3, Joint Medical Surv for Deployments (1997)
- DoD Memo, Deployment Health Surveillance (2002)
- DoD Memo, Enhanced Post-Dep Health Assmnts (2003)
- DoD Memo, Deployment Health QA Program (2004)
- DoDD 6200.4, Force Health Protection (2004)
- DoDD 6490.2, Comprehensive Health Surveillance (2005)
- DoD Memo, Post-Dep Health Reassessments (2005)
- DoDI 6490.3, Deployment Health (2006 est)
- DoDI 6200.dd, Force Health Protection QA Pgm (2006 est)

Force Health Protection QA Program

DoD Programs

- Deployment Health QA Program
  - Scope & key elements
  - DHQA findings & reports
- Force Health Protection QA Program
  - Scope & key elements
  - FHPQA findings & reports
  - DoD Instruction on FHPQA Program



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Deployment Health QA Program

- Deployment health: a commander's responsibility
- Deployment health QA: a collaborative program
- Deployment health QA program key elements:
  - Installation visits by DOD-DHSD and Service-SG staff
  - Reports by AMSA on DMSS centralized data
  - Reports from the Services on their QA programs
  - Annual reports by DHSD to ASD(HA) and Congress

Force Health Protection QA Program

Deployment Health QA Visits

- Visits to one site per Service, per year
- Conducted jointly by DOD-DHSD and Service-SG
- Key activities include:
  - In- and out-briefs with line and medical commanders
  - Dialogue with key unit leaders and service members
  - Identification of deployed/redeployed personnel
  - Completion of deployment health assessments
  - Review medical records for deployment documentation
  - Review and validation of info in the DMSS database, DOD serum repository, and DMDC database

Force Health Protection QA Program

Deployment Health QA Visits—2004

- Sites: Camp Lejeune, Fort Benning, Holloman AFB, USS Laboon
- Medical Records Review: (96~110 records per site, 414 total)
  - Pre-Dep Health Assessments: 3~97%
  - Post-Dep Health Assessments: 15~97%
  - Immunizations: 90~98%
  - Theater Care in Record: 76~94%
  - Referral Care in Record: NA
- Central Database Review:
  - Pre-Dep Health Assessments: 53~68%
  - Post-Dep Health Assessments: 71~94%
  - Pre-Dep Serum Sample: 81~95%
  - Post-Dep Serum Sample: 95~98%

Source: DoD DHQA Report, May 2005

Force Health Protection QA Program

Deployment Health QA Visits—2005

- Sites: Camp Pendleton, Fort Lewis, Hurlburt Field, USS Bataan
- Medical Records Review: (125~155 records per site, 566 total)
  - Pre-Dep Health Assessments: 80~97%
  - Post-Dep Health Assessments: 94~100%
  - Immunizations: 75~94%
  - Theater Care in Record: 43~89%
  - Referral Care in Record: 14~90%
- Central Database Review:
  - Pre-Dep Health Assessments: 24~99%
  - Post-Dep Health Assessments: 59~95%
  - Pre-Dep Serum Sample: 88~100%
  - Post-Dep Serum Sample: 92~97%

Source: DoD DHQA Report, March 2006

Force Health Protection QA Program

DHQA Visits 2004 - 2005

DHQA Element	2004	2005
DD2795 in Med Record	70%	90%
DD2796 in Med Record	76%	98%
Theater Care in Record	85%	63%
DD2795 in DMSS	61%	68%
DD2796 in DMSS	84%	82%
Pre-Deployment Serum	90%	96%
Post-Deployment Serum	97%	94%

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Force Health Protection QA Program

Post-Deployment Health Assessments—2004

- Service Members with DD Form 2796: 303,959
- Electronic DD Form 2796: 59% (6~76%)
- General Health E/VG/G: 91% (89~98%)
- Medical or Dental Problems: 30% (11~38%)
- Currently on Profile: 9% (2~17%)
- Mental Health Concerns: 5% (1~7%)
- Exposure Concerns: 17% (6~23%)
- Health Concerns: 15% (6~19%)
- Referral Indicated: 23% (8~29%)
- Follow-Up Medical Visit: 89% (61~93%)
- Post-Deployment Serum: 91% (84~95%)

Source: AMSA Report, January 2006

Force Health Protection QA Program

Post-Deployment Health Assessments—2005

- Service Members with DD Form 2796: 353,229
- Electronic DD Form 2796: 81% (12~100%)
- General Health E/VG/G: 92% (90~98%)
- Medical or Dental Problems: 31% (11~39%)
- Currently on Profile: 8% (1~12%)
- Mental Health Concerns: 6% (1~8%)
- Exposure Concerns: 16% (3~22%)
- Health Concerns: 13% (6~17%)
- Referral Indicated: 21% (10~27%)
- Follow-Up Medical Visit: 91% (61~96%)
- Post-Deployment Serum: 92% (83~95%)

Source: AMSA Report, March 2006

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Force Health Protection QA Program

PDHAs 2004 - 2005

PDHA Category	2004	2005
Electronic DD2796	59%	81%
Health Good-VG-Excellent	91%	92%
Medical-Dental Problems	30%	31%
Mental Health Concerns	5%	6%
Exposure Concerns	17%	16%
Health Concerns	15%	13%
Referral Indicated	23%	21%
Follow-Up Medical Visit	89%	91%

Force Health Protection QA Program

PDHAs - Military Services - 2005

PDHA Category	Army	Navy	USAF	USMC
Electronic DD Form 2796	94%	12%	100%	22%
Health G-VG-Excellent	90%	96%	98%	94%
Medical-Dental Problems	39%	16%	11%	24%
Mental Health Concerns	8%	3%	1%	3%
Exposure Concerns	22%	8%	3%	11%
Health Concerns	17%	8%	6%	11%
Referral Indicated	27%	10%	10%	15%
Follow-Up Medical Visit	96%	70%	82%	61%

Force Health Protection Quality Assurance

- Force Health Protection QA Program Drivers
  - ASD(HA) focus on monitoring of and improvement in service member life-cycle health and readiness
  - Congressional interest in health assurance and compliance—especially related to deployments
- Force Health Protection QA Program Goals
  - Identify important Force Health Protection elements (high-risk, high-volume, problem-prone)
  - Monitor those important elements to assess status, measure improvement, and document compliance

FHP QA Program—Report to Congress

- Annual Report to Congress on Force Health Protection QA directed by the FY2005 NDAA
- Covers activities in preceding calendar year
- 2005 report (on CY2004 activities) in two parts:
  - Deployment health policy compliance
    - Pre- and post-deployment health assessments/sera samples
    - Documentation in medical records and central databases
  - Deployment exposures and health concerns
    - Confirmed exposures to occupational & environmental hazards
    - Post-deployment health concerns: general/mental/exposure

Force Health Protection QA Program

Deployment Health Exposures

- USACHPPM has a comprehensive surveillance program for deployment-related OEH exposures
- FHPQA Report to Congress for OIF/OEF (2004)
  - 3,900 air/water/soil samples from 300 locations
  - 10,000 OEH surveillance documents
  - Report highlighted 6 specific exposure incidents
  - Hazards include depleted uranium, particulate matter, sarin, chemicals (PCBs, chromium, chlorine), sulphur dioxide, carbon monoxide, and lead
  - No significant long-term adverse health effects noted

Source: DoD FHPQA Report to Congress, August 2005

Force Health Protection QA Program

Post-Deployment Health Concerns

- Concerns from service members redeploying from OIF or OEF in CY2004
- Three broadly-focused health questions asked by providers, plus four mental health-focused questions completed by service members
- Findings:
  - General Health: 19% Concerns (13% Referrals)
  - Mental Health: 36% Concerns (16% Referrals)
  - Exposure Health: 21% Concerns (13% Referrals)

Source: DoD FHPQA Report to Congress, August 2005

FHP QA Program—DoD Instruction

- New DoD Instruction 6200.dd: FHP QA Program
  - Based on DoD Directive 6200.4, Force Health Protection
  - Expands beyond deployment to full scope of force health
    - Healthy and Fit Force
    - Prevention and Protection
    - Medical and Rehabilitative Care
    - Infrastructure and Support services
  - Encompasses service member's entire military career (accession, in garrison, deployment, separation)
- Formal coordination completed, publish this year

FHP QA Program—Key Elements

- Individual Medical Readiness
- Individual Physical Fitness
- Deployment Health Assessments
- Deployment Locations and Exposures
- DoD Health Information Provided to VA
- Education and Training
- Research and Development
- Lessons Learned

Force Health Protection QA Program

FHP QA Key Elements—Examples

- **Physical Fitness:** % with passing scores
- **Deployed Locations:** daily location data at DMDC
- **Deployment Exposures:** exposure documentation in health records and at CHPPM
- **Deployment Health Assessments:** pre & post & reassessments in health records and DMSS
- **Health Information to VA:** information available for separated DoD service members

Force Health Protection QA Program

Summary

- DoD leaders and Congress remain focused on the health of service members
- Deployment health QA program served as basis for monitoring compliance, identifying problems documenting improvements, and reporting status
- Force health protection QA program developed to address full range of military activities across entire period of military service

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Support Directorate

ESSENCE, NEW AND IMPROVED

Force Health Protection Conference
9 August 2006

(b)(6)

Director, Force Health Readiness
Deployment Health Support Directorate
Office of the Assistant Secretary of Defense
(Health Affairs) Force Health Protection and Readiness

What is ESSENCE?

Electronic
Surveillance
System for the
Early
Notification of
Community-based
Epidemics

Web-based medical surveillance system developed to alert public health authorities of a possible biological warfare attack or other infectious disease outbreaks

Existing ESSENCE CONOPS

- Automated ingestion, analysis, and reporting of health events
- Temporal/spatial analyses of outpatient health events
  - All MTFs, by DMIS (Defense Medical Information System)
  - Maps ICD-9-CM & CPT codes into broad categories (syndrome)
  - Doesn't wait for final laboratory results or other confirmation
- Automatic alerts generated daily, system-wide data updated every 8 hours and available for ad hoc queries
- Use dedicated or pre-existing data sources (multi-purpose roles)
- Show actionable data for further investigation/validation

Current Data Sources for ESSENCE-IV

- Ambulatory data
  - Outpatient visits to military treatment facilities
    - Both garrison and in-theater (selected sites)
  - ICD9 and CPT codes
- Pharmacy data
  - Prescriptions ordered for military beneficiaries
  - Respiratory and Gastrointestinal syndromes only
- Local civilian hospitals (9 sites only)
  - Emergency room chief complaints

Broad Syndrome Groups

- Neurologic
- Botulism-like
- Shock / Coma
- Rash
- Gastrointestinal
- Respiratory
- Influenza-like illness
- Fever
- Febrile disease
- Hemorrhagic illness

DoD, 21st Century
The New ESSENCE

AHLTA



GLOBAL INFORMATION
for QUALITY CARE

Support Directorate

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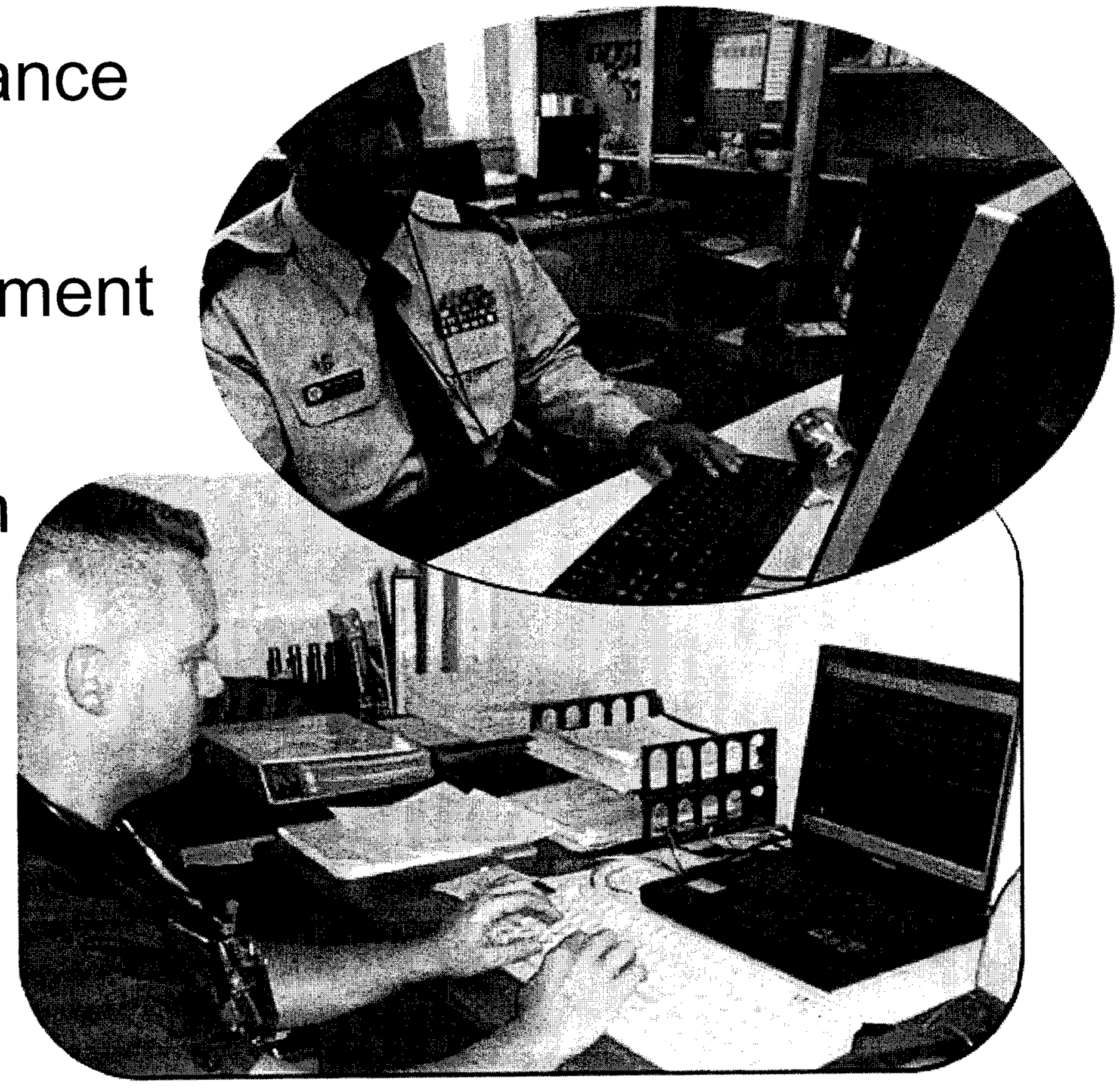
Computable Data = Power

- Bioterror surveillance
- Disease management
- Population health improvement
- Symptom surveillance



Desired Benefits/Outcomes

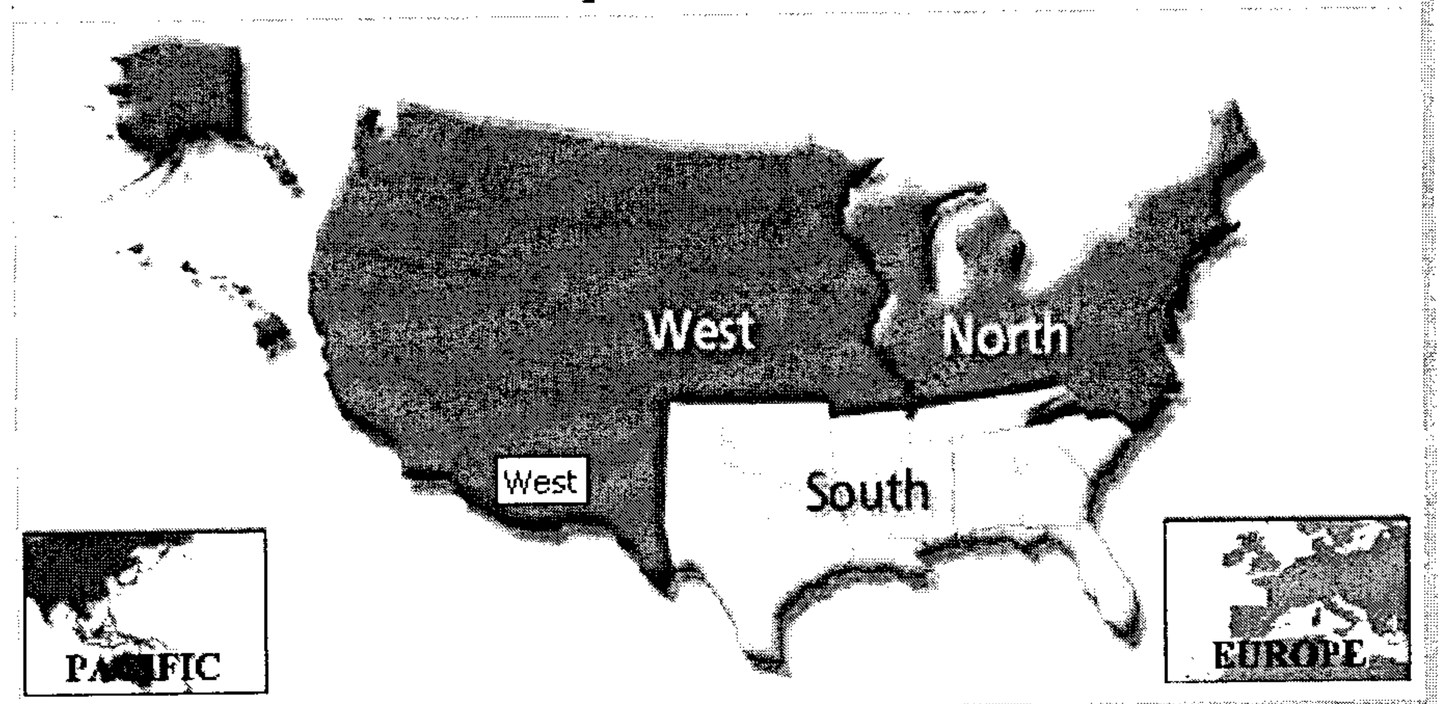
- Reduce illness rates as well as prevalence and severity of preventable conditions
- Detect and map global disease outbreaks
- Assess public health risks
- Assess deployment health and environmental and occupational health hazards
- Evaluate and plan systems based on population health rather than historical workload data

New Capabilities

- Improved outbreak detection
  - Refined analytical engine
    - Adapts to data flow interruptions, maintains sensitivity with fewer false positive alerts after data flow resumes
    - Adjusts for low-level "spikes" of uncommon events
- Role-based access to patient identifying info for local authorized public health staff
- Automated alerts via e-mail, pagers, phone

[TriCare Regions | USACHPPM Regions | NEPMU Regions | AF-MAJCOM]

TriCare Regions Site Selection Map



System Defined Site Selection: Select site

User Defined Site Selection: Select site

User Defined Site Selection Editor - Used to Add/Edit/Delete User Defined Sites

EXECUTIVE INFORMATION AND DECISION SUPPORT

02/Jun/2006

ESSENCE

Home | Site Selection | Alert List | Query | Map Portal | User Profile | Privacy Policy | Logout

Alert List

[SADR Temporal Alerts | SADR Spatial Alerts | Pharmacy Temporal Alerts]

Alert Date ASC DES

ASC DES

ASC DES

Apply Sort Change

Reset Sorting

DATASOURCE: SADR REGION: TRICARE-WEST AGE: All

Alert Date	Syndrome	Detection	Visit Count	Expected	MTF	TimeSeries
31/May/2006	Shk_coma	0.021	1	0.143	FT. SHAFTER-TRIPLER AMC	TimeSeries
31/May/2006	Resp	0.022	17	7.181	VANDENBERG AFB-30th MEDICAL GROUP	TimeSeries
31/May/2006	Neuro	0.046	1	0.000	TRAVIS AFB-60th MEDICAL GROUP	TimeSeries
31/May/2006	ILI	0.003	16	6.101	VANDENBERG AFB-30th MEDICAL GROUP	TimeSeries
31/May/2006	Hemr_ill	0.021	1	0.143	OFFUTT AFB-55th MEDICAL GROUP	TimeSeries
31/May/2006	GI	0.015	4	1.179	BUCKLEY AFB-460th MDS-BUCKLEY AFB	TimeSeries
31/May/2006	Fever	0.003	3	0.607	SAN DIEGO-BMC MCRD SAN DIEGO	TimeSeries
31/May/2006	Fever	0.001	3	0.286	MALMSTROM AFB-341st MEDICAL GROUP	TimeSeries
31/May/2006	Feb_dis	0.007	3	0.679	SAN DIEGO-BMC MCRD SAN DIEGO	TimeSeries
31/May/2006	Feb_dis	0.001	3	0.286	MALMSTROM AFB-341st MEDICAL GROUP	TimeSeries
31/May/2006	Bot_like	0.043	1	0.214	FT. CARSON-EVANS ACH	TimeSeries
31/May/2006	Bot_like	0.025	1	0.179	ELMENDORF AFB-3rd MEDICAL GROUP	TimeSeries

Syndrome Definitions | Detector Algorithms | Data Dictionary | What's New | History of ESSENCE | User Guide | Data Tutorial | Map Tutorial | Get Adobe Reader

Done

Internet

02/Jun/2006

EXECUTIVE INFORMATION AND DECISION SUPPORT

ESSENCE

Home | Site Selection | Alert List | Query | Map Portal | User Profile | Privacy Policy | Logout

Time Series

Description

Site	TRICARE-WEST
Data Source	SADR
MTF	SAN DIEGO-BMC MCRD SAN DIEGO
Syndrome	Fever
Age Range	All
Clinic Type	all
Start Date	03/Mar/2006
End Date	31/May/2006

Configuration Options

Data Configuration

Site	TRICARE-WEST	**Data Source**	SADR
MTF	All MTFs BEALE AFB-9th MEDICAL GROUP BREMERTON-NH BREMERTON	**Clinic Type**	All Clinic Types ER Other
Syndrome	GI	**Age Range**	All Ages 26-64 65+
Start Date	03/Dec/2005	**End Date**	2/June/2006

Change Configuration

SADR Time Series

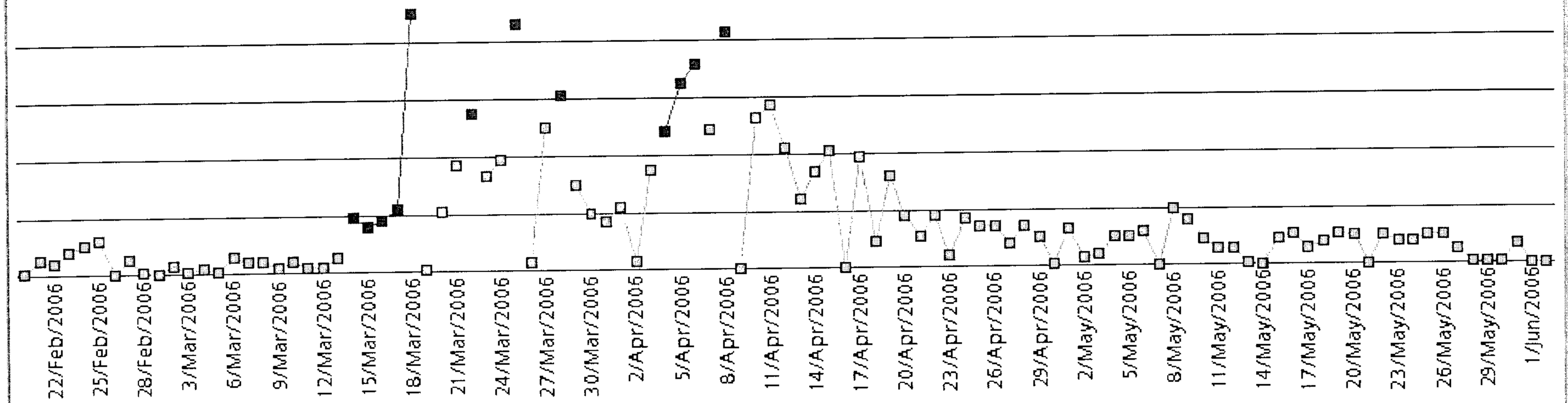
6

Internet

Site	TRICARE-WEST	**Data Source**	SADR
MTF	All MTFs BEALE AFB-9th MEDICAL GROUP BREMERTON-NH BREMERTON	**Clinic Type**	All Clinics ER Other
Syndrome	GI	**Age Range**	5-17 18-25 26-64
Start Date	03/Dec/2005	**End Date**	02/Jun/2006

Change Configuration

SADR Time Series



Encounter Date

Group Chart | MTF Chart | Incidence Count | Data Details

11:41:08

- 1 -

Syndrome Definitions | Detector Algorithms | Data Dictionary | What's New | History of ESSENCE | User Guide | Data Tutorial | Map Tutorial | Get Adobe Reader

Internet

Site	TRICARE-WEST
Data Source	SADR
MTF	SAN DIEGO-BMC MCRD SAN DIEGO
Syndrome	GI
Age Range	18-25
Clinic Type	all
Start Date	03/Dec/2005
End Date	02/Jun/2006

Data Table

Data Details MapLink

Date	Actual Visits	14-Day Incidence	Detection	Temporal Data Link	Temporal Map Link
2/Jun/2006	0	0	0.000	Details	MapLink
1/Jun/2006	0	0	0.000	Details	MapLink
31/May/2006	7	5	0.899	Details	MapLink
30/May/2006	1	1	0.972	Details	MapLink
29/May/2006	1	1	0.961	Details	MapLink
28/May/2006	1	0	0.919	Details	MapLink
27/May/2006	5	1	0.705	Details	MapLink
26/May/2006	10	3	0.364	Details	MapLink
25/May/2006	10	2	0.468	Details	MapLink
24/May/2006	8	3	0.619	Details	MapLink
23/May/2006	8	3	0.661	Details	MapLink
22/May/2006	10	4	0.716	Details	MapLink
21/May/2006	0	0	0.000	Details	MapLink
20/May/2006	10	4	0.520	Details	MapLink
19/May/2006	11	6	0.652	Details	MapLink
18/May/2006	8	4	0.768	Details	MapLink

start https://eidsms.den.di... Report Viewer - SAD... FDA Demo Overview EIDS Romano Briefing... 1:42 PM

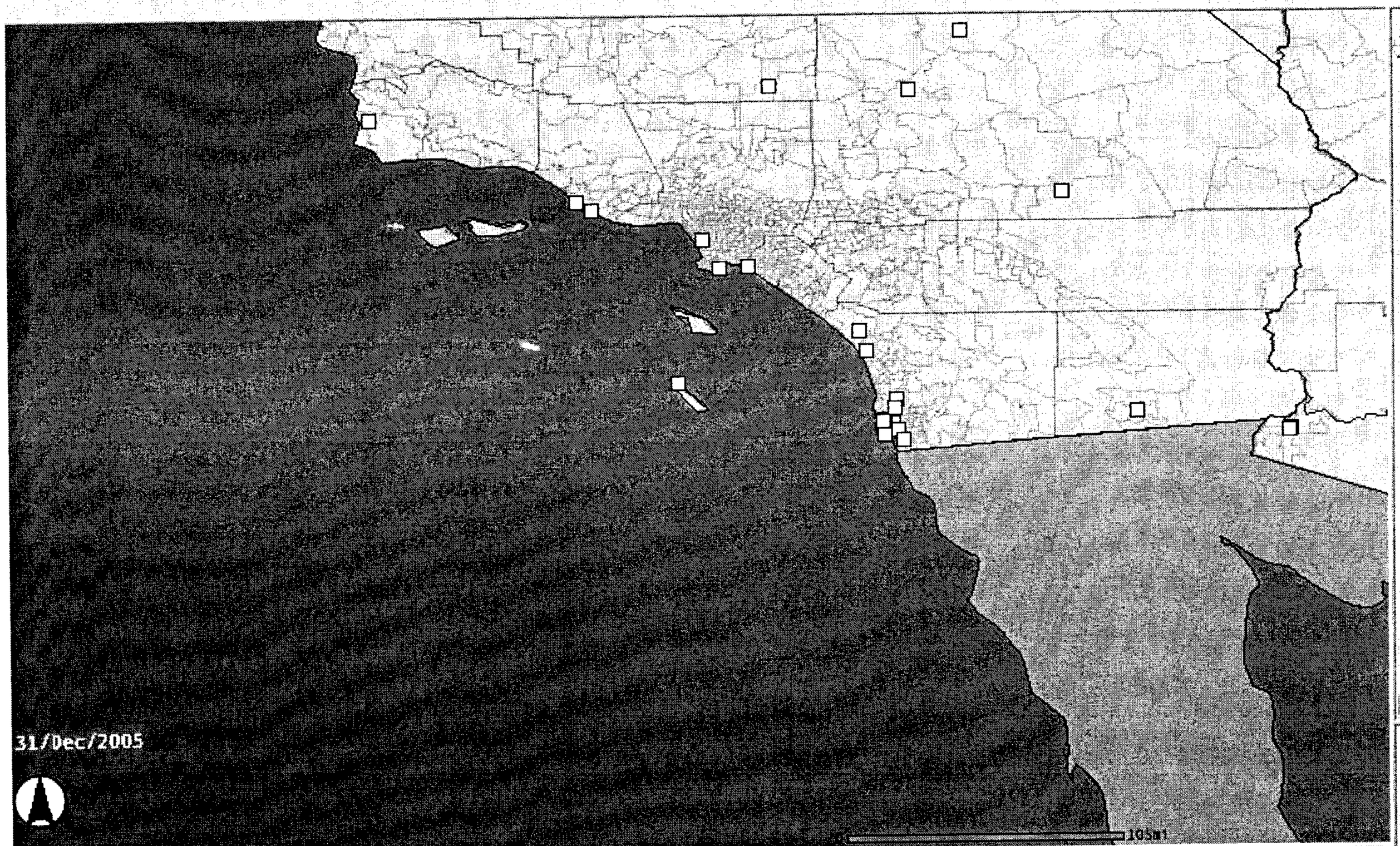
EXECUTIVE INFORMATION AND DECISION SUPPORT

[Time Series | Details]

ESSENCE : SADR

Toggles: Navigation: Date Range: Other: Help:

Current Tool: Zoom In



LAYERS

- All Layers
  - Base Layers

|Visible|Label|Active|Name|

- Cities
- Counties
- Countries
- MTFs
- Rivers
- States
- States:OutLi
- Zips
  - Results

|Visible|Label|Active|Name|

- Results

Reset Map

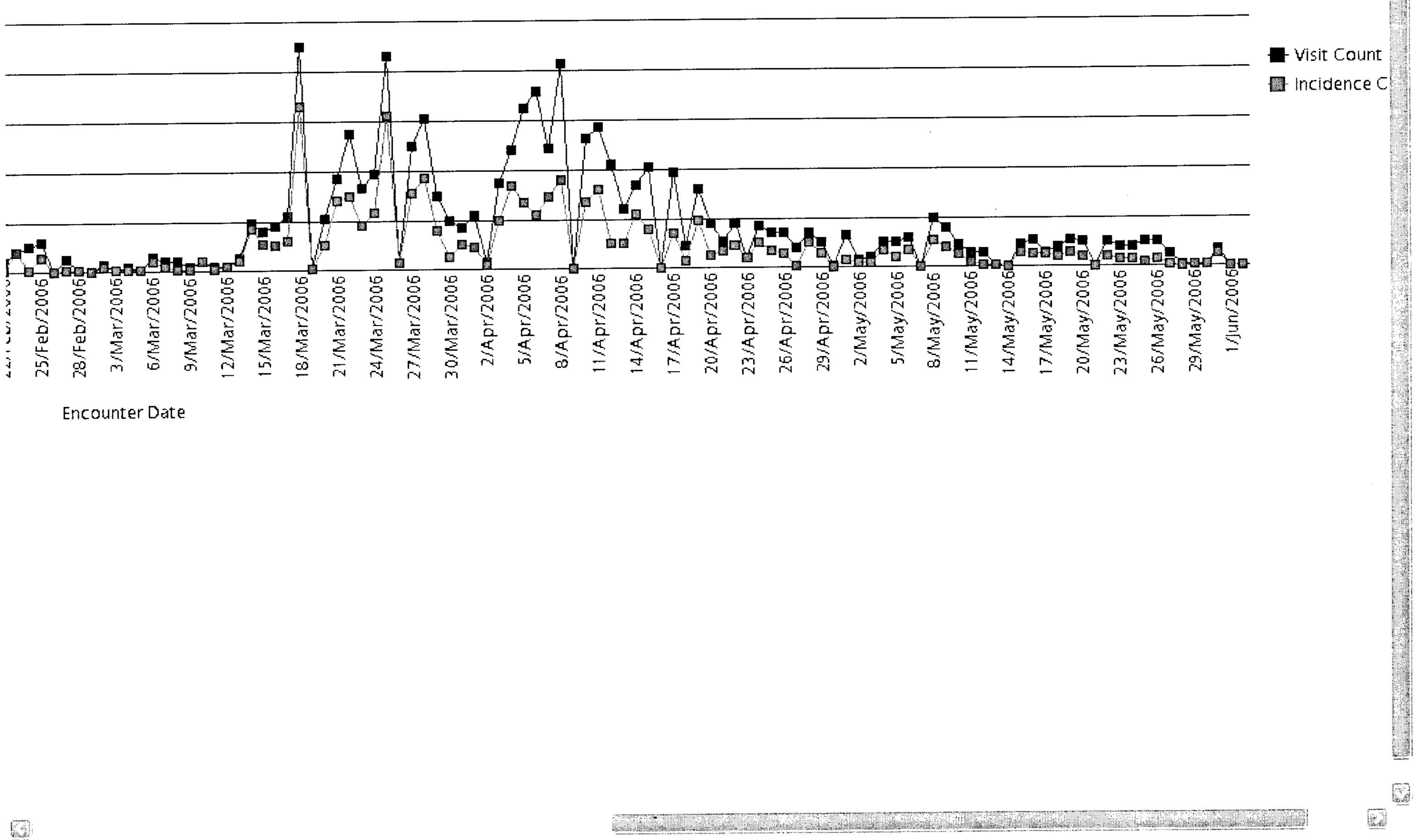
Legend

- MTFs
- Rivers
- States:OutLine
- Counties
- Zips
- States
- Countries

Layer Name	Results	**Data Column Name**	Value
Site	TRICARE-WEST	**Data Source**	SADR
Medical Grouping	GI	**Age**	18-25
ClinicType	All	**StartDate**	31/Dec/2005

start | https://eidsms.den.d... | Report Viewer - SAD... | ESSENCE - Microsoft ... | ESSENCE - Microsoft ... | EIDS Romano Briefin... | 1:51 PM

Incidence & Visit Count Chart



Encounter Date

Done
Internet

Site	TRICARE-WEST		**Data Source**	SADR	
Start Date	03/Dec/2005		**End Date**	02/Jun/2006	
MTF	All MTFs BEALE AFB-9th MEDICAL GROUP BREMERTON-NH BREMERTON		**Clinic Type**	All Clinic Types ER Other	
Syndrome	GI		**Age Range**	5-17 18-25 26-64	

Change Configuration

24/Dec/2005	0407572B77	20	20	008.69	OTHER VIRAL INTES INFEC	GI	BHAR	ARANDAA	Primary Care	SAN DIEGO-BMC MCRD SAN DIEGO	2,500
24/Dec/2005	040756B027	20	20	008.69	OTHER VIRAL INTES INFEC	GI	BHAR	ARANDAA	Primary Care	SAN DIEGO-BMC MCRD SAN DIEGO	2,501
24/Mar/2006	0715104394	20	20	008.69	OTHER VIRAL INTES INFEC	GI	BHAR	ARANDAA	Primary Care	SAN DIEGO-BMC MCRD SAN DIEGO	2,502
24/Dec/2005	03B1810EC7	20	20	008.69	OTHER VIRAL INTES INFEC	GI	BHAR	ARANDAA	Primary Care	SAN DIEGO-BMC MCRD SAN DIEGO	2,503
27/Mar/2006	24BCE25EA0	20	20	008.69	OTHER VIRAL INTES INFEC	GI	BHAR	ARANDAA	Primary Care	SAN DIEGO-BMC MCRD SAN DIEGO	2,504
24/Dec/2005	1AAD4A1633	20	20	008.69	OTHER VIRAL INTES INFEC	GI	BHAR	ARANDAA	Primary Care	SAN DIEGO-BMC MCRD SAN DIEGO	2,505
5/Apr/2006	1255287B04	19	20	008.69	OTHER VIRAL INTES INFEC	GI	BHAR	ARANDAA	Primary Care	SAN DIEGO-BMC MCRD SAN DIEGO	2,506

Alert Subscription

Pharmacy Temporal Alerts

Alert Level:

(•) Yellow and Red

( ) Red Only

Subscribed Sites

<< Add

Remove >>

Select Site:

NEPMU-2

SADR Temporal Alerts

Alert Level:

(•) Yellow and Red

( ) Red Only

Subscribed Sites

<< Add

Remove >>

Select Site:

NEPMU-5

Select MTF:

1 AD DIVARTY CAS (TOE)

vv Add

Remove ^^

Subscribed MTFs

SADR Spatial Alerts

Alert Level:

(•) Yellow and Red

( ) Red Only

Subscribed Sites

<< Add

Remove >>

Select Site:

USACHPPM-West

Subscribed Zip Codes

<< Add

Remove >>

Enter zip Code:

E-mail Addressable Accounts

Address 1 james.smith@pentagon.mil

E-mail Devices

( ) Computer (•) Cell Phone ( ) PDA

Done

Internet

On the Horizon

- Revised ILI ICD-9 mapping scheme reduces background noise
- New data source evaluations
  - Laboratory and radiology test orders
  - Chief complaint text parsing
- Add field for local input regarding validity of alarms and findings/status of any investigation
- Explore potential power of MEDCIN structured note analysis
  - Create detailed case definitions using CC, VS, ROS, Physical Exam, test results, etc.

Roles/Responsibilities

- Installation level (most important)
  - Daily monitoring of beneficiary population and other nearby military communities
  - Monitoring of civilian community health, as possible
- Service-specific Public Health Center
  - CHPPM, NEHC, and AFIOH
- Higher HQ, regional and Service
- DoD level (Health Affairs)
- National level (CDC BioSense)

U.S. DEPARTMENT OF DEFENSE
Deployment Health
Support Directorate

Discussion & Questions

Backup Material

Syndromic Systems Can . . .

- Provide early detection of outbreaks
  - Earlier than most existing electronic systems
- Provide epidemiologic tools to assist the outbreak investigation
- Provide information for leaders and risk communicators
- Decrease workload for labor intensive active systems
- Prompt more accurate diagnostic testing

Syndromic Systems Cannot . . .

- Detect every outbreak early, especially those with
  - Few cases, or
  - Short, explosive incubation period
- Decrease morbidity/mortality every time
  - Best for diseases with longer incubation periods where effective interventions exist
- Tell you the causative agent
  - Lots of nonspecific information will not give you specific information
- Investigate the outbreak for you
  - Public health professionals remain the important link

Joint Health Surveillance, Intelligence, and Preventive Medicine (JHSIPM) Transformation

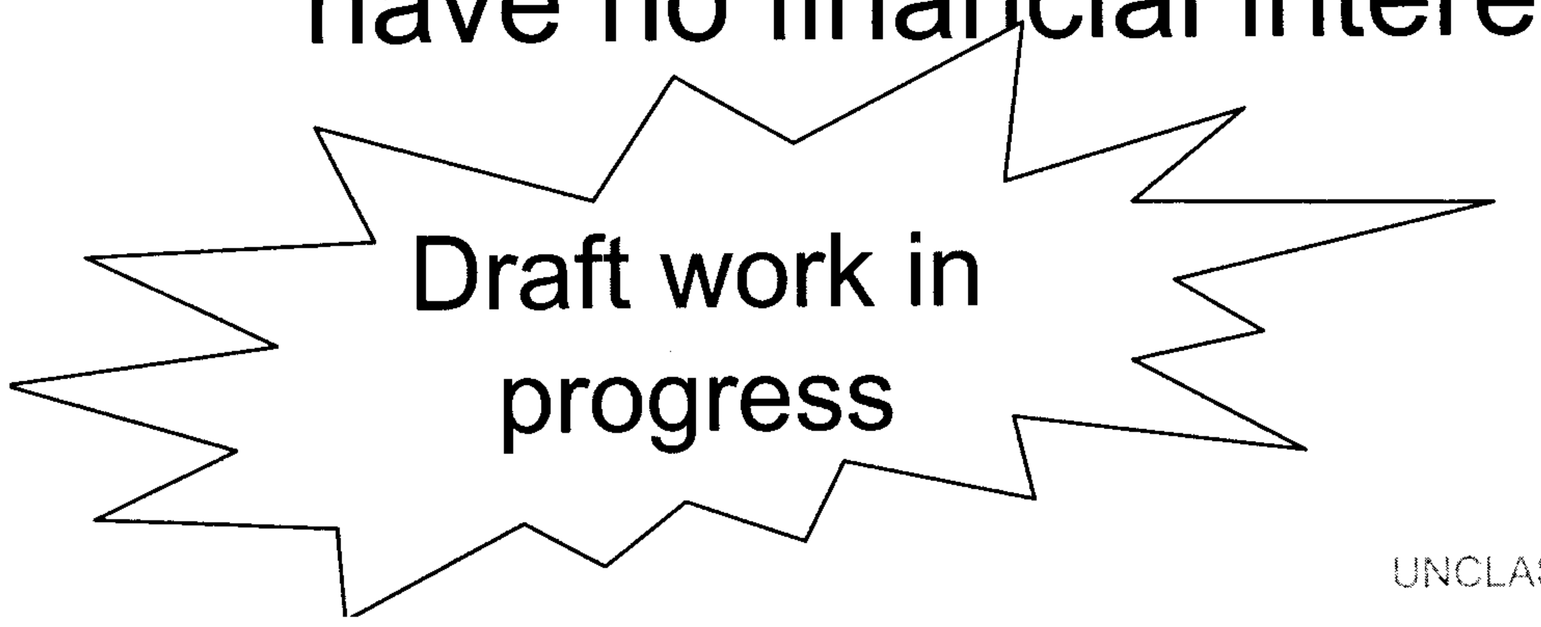
Functional Solution Analysis

JHSIPM Integrated Process Team

27 July Draft

Caveats and Disclaimers

- Presentation summarizes work of a joint Service/COCOM/Joint Staff/OSD Integrated Process Team (IPT)
- Presentation reflects “a working draft”, and does not represent the official position of the Department of Defense or other Federal agency
- No brand names will be used; the speakers have no financial interests to be disclosed



Joint Capabilities Development

FAA

The Functional Area Analysis (FAA) defines what it is I want to be able to do, under what conditions and how well I need to be able to do it. It defines the "to-be" state in capabilities.

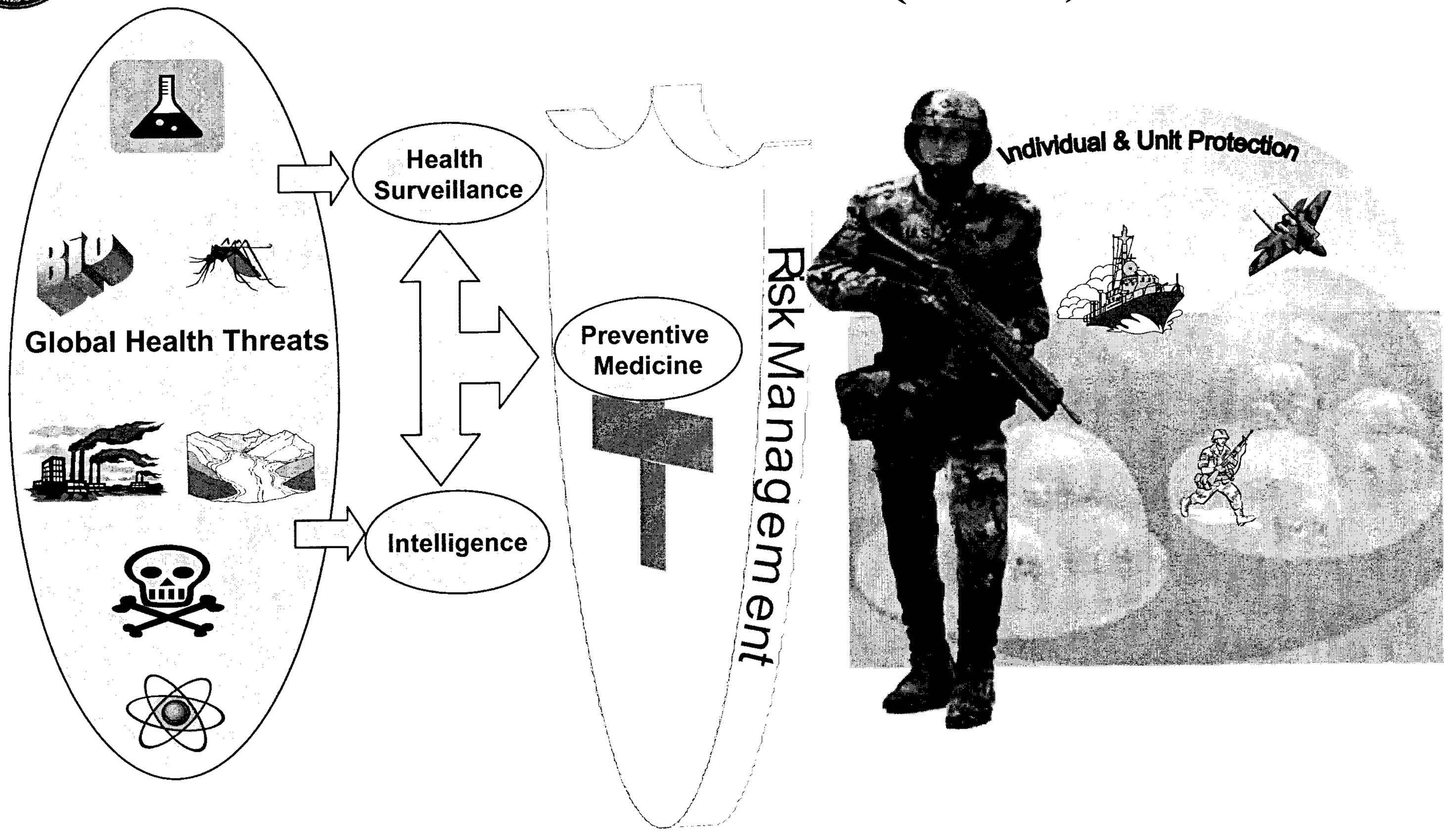
FNA

The Functional Needs Analysis (FNA) reviews current, programmed and future systems and solutions and determines if the "to-be" defined in the FAA is achievable. If not, a gap or shortfall exist.

FSA

The Functional Solutions Analysis (FSA) looks at the potential solutions to fill the gaps identified in the FNA. Solutions can be material and non-material and they should be evaluated on the basis of cost, schedule, performance, technical feasibility and human intellectual capital required.

Joint Health Surveillance, Intelligence & Preventive Medicine (OV-1)



"Protect & Enable Warfighter Health: Putting the "Protection" in "Force Health Protection"

JHSIPM FNA Prioritized Gaps
Health Surveillance and Intelligence

- **Detect, identify, and quantify health threats (DIQ)**
  - DIQ 1-Inadequate organization and equipment in theater causes over-reliance on reachback
  - DIQ 3-Medical surveillance community lacks infrastructure and access to classified and unclassified data sources
- **Monitor health status of populations (MHS)**
  - MHS 1-Information systems are inadequate to provide numerator, denominator, and medical readiness info
- **Document, report, and archive med information (DRA)**
  - DRA 1- Poorly networked and incomplete medical info systems
- **Integrate medical/OEH intelligence into IPB (I)**
  - I 1- Operational staffs do not appreciate contribution of medical/OEH intelligence for IPB
  - I 2- Lack of emphasis/recognition of operational staffs adversely impacts requirements and use of medical/OEH intell for IPB

JHSIPM FNA Prioritized Gaps
Preventive Medicine

- **Anticipate, evaluate, and predict threats (AEP)**
  - AEP 1-Information systems for detection, identification, and quantification are limited
  - AEP 2- Inadequate OEHS sampling/detection technology
  - AEP 4- Insufficient joint training and education for AEP
- **Provide for immuno- and chemoprophylaxis (I&C) countermeasures (PIC)**
  - PIC 1- Joint I&C countermeasures materiel solutions are not developed in timely and complete manner, nor is production capability maintained
- **Provide for preventive medicine countermeasures (PMC)**
  - PMC 3- Inadequate med information systems for documentation of PMC
- **Provide public health laboratory services (PHLS)**
  - PHLS 1- Inadequate materiel solutions for timely, accurate, comprehensive PHLS
- **Provide public health support (PHS)**
  - PHS 1- Lack of joint PHS doctrine limits interoperability and use of best practices
  - PHS 2- Inadequate PHS information systems

The Way Ahead: Functional Solution Analysis

- Description: It is an operationally based assessment of potential DOTMLPF approaches to solving (or mitigating) one or more of the capability gaps (needs) identified in the FNA (documented in approved JCD(s). The needs identified in the FNA are inputs to the FSA
- Primary Output: Potential solutions in order of priority
  - **DOTMLPF changes**
  - **Product improvements**
  - **Adoption of interagency/foreign materiel solutions**
  - **New materiel starts**

DOTmLPF Analysis

- First analysis in FSA determines whether an integrated DOTMLPF approach can fill the FNA identified gaps
- If determined a materiel approach is required, an Initial Capabilities Document (ICD) will be developed
- Routinely, capability proposals involve combinations of DOTMLPF changes and materiel changes. Those proposals continue through the FSA process as described below

Joint Health Surveillance, Intelligence, and Preventive Medicine (JHSIPM) Transformation Update

Questions?

U.S. DEPARTMENT OF DEFENSE
Deployment Health
Support Directorate

Embedded Metal Fragments: a Cause for Concern?

(b)(6)

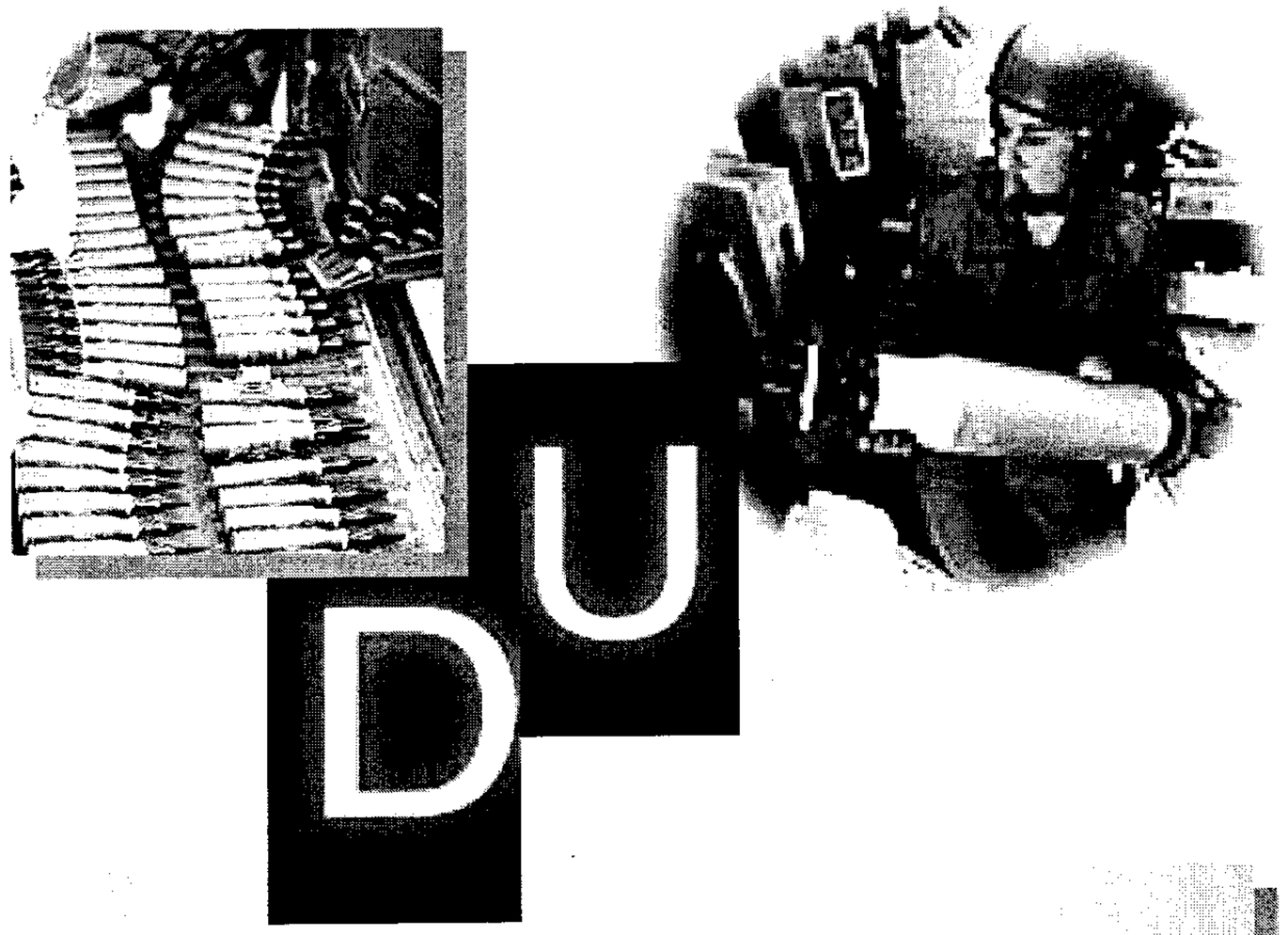
Director Force Health Readiness and Assessments
DASD Force Health Protection & Readiness

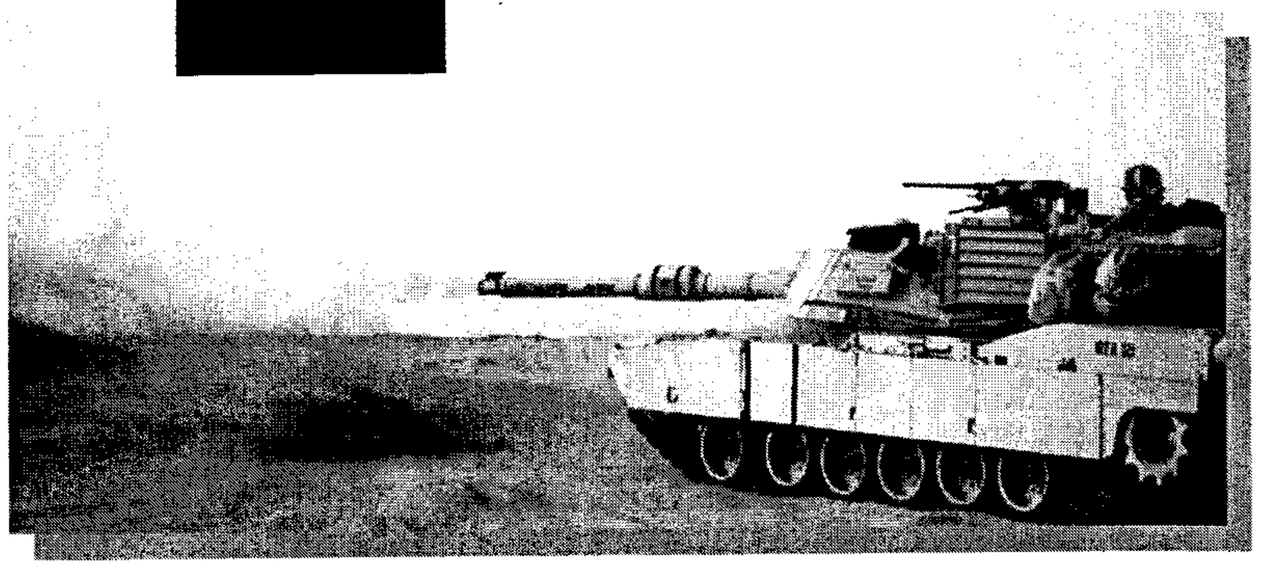
Summary

- Background
- Depleted Uranium
  - DU Screening of Deployed Service Members
  - DU Capstone Study
  - VA DU Medical Follow-up Program
- Tungsten Alloys Concerns
- Embedded Metal Fragments Workshop
- Future Plans, Programs, Policies

Depleted Uranium

- Specific Gravity – 19 g/cm^3 (2.42 X Fe)
- Melting Point – 1,132° C
- The most effective armor plate penetrator
- Self sharpening
- Scatters into smaller-sized particles when compared to lead and tungsten
- 16 munition items in inventory





Isotopic Comparison of Natural and Depleted Uranium

Isotope	Radioactivity μCi/g	Natural Uranium Concentration of isotopes	Depleted Uranium Concentration of isotopes
^{234}U	6200.0	0.0058%	0.001%
^{235}U	2.2	0.72%	0.2%
^{238}U	0.3	99.28%	99.8%
Relative Radioactivity		100%	60%

U.S. DEPARTMENT OF DEFENSE
Deployment Health Support Directorate

Depleted Uranium Background

- 1991 Gulf War involved first widespread combat use of depleted uranium (DU) munitions
- Some Service members were injured by DU munitions in combat
- Metal fragments were left in place if risk of surgery was greater than risk of leaving fragments—assumed fragments were not toxic
- Uncertainty about long-term DU health effects promoted the search for substitutes for DU in munitions—led to use of tungsten alloys

Depleted Uranium Screening

- ASD(HA) Policy 03-12, "Policy for the Operation Iraqi Freedom Depleted Uranium (DU) Medical Management" May 30, 2003
  - Level I and II exposures – requirement to screen for DU in individuals with higher risk of exposure
  - Level III exposures- any person concerned about exposure may obtain an evaluation and bioassay if desired
- Post-deployment health assessments ask about DU exposure
- Servicemembers who report DU exposure complete an additional DU questionnaire and can request a DU test

DU Exposure Categories



I *	Soldiers in, on, or near armored vehicle struck and penetrated with DU munitions
II *	Soldiers whose military occupation requires entering DU-damaged vehicles
III **	Soldiers with incidental DU exposure

*Bioassay Mandatory **Bioassay Optional





DU Bioassay Results – Cumulative Totals
June 1, 2003 – March 31, 2006

	Army	Navy/ Marine	Air Force	Totals	Elevated Total Uranium	Detectable Levels of DU in Urine	Retained Fragments or Fragment-Type Injury
Level I	197	48	2	**247**	4	6	17
Level II	298	220	8	**526**	0	0	1
Level III	214	43	7	**264**	0	0	7
Uncat	1126	11	0	**1137**	0	1	29
Totals	**1835**	**322**	**17**	**2174**	**4**	**7**	**54**

Veterans Affairs
DU Follow-up Program

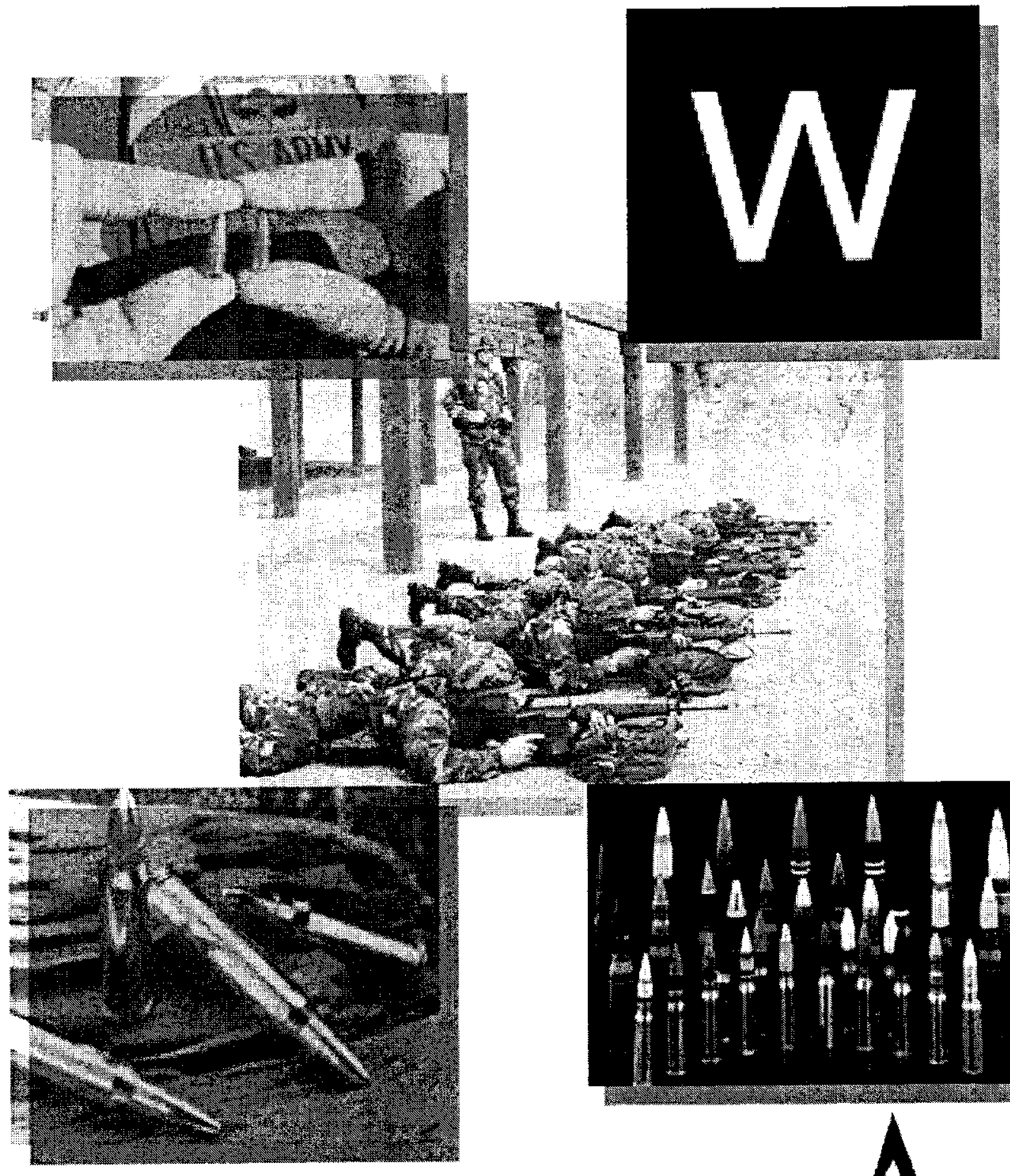
- Program began in 1993 for the 1991 Gulf War veterans
- Service members with the highest risk of DU exposures were invited to participate
- Of the 104 with retained depleted uranium fragments or inhalational exposures, 74 have participated
- Four of the eight OIF veterans with detectable levels of DU also joined the cohort study
- Veterans with inhalational exposure rapidly cleared the DU and appear to have had no adverse effects
- Veterans with retained DU fragments continue to excrete elevated levels of urinary uranium
- None have developed kidney abnormalities, leukemia, bone, lung cancer, or any other uranium/radiation related health problem

DU Capstone Study

- Description: 4-year, $6.4 million study published in 2004
- Method: 13 DU rounds fired at Abrams tanks and Bradley Fighting Vehicles
- Analysis: 8,000 samples taken within vehicles – aerosols characterized
- Results:
  - Predicted radiation doses are below U.S. peacetime safety standards and not likely to cause adverse health effects
  - Predicted uranium concentrations in the kidneys are not likely to cause adverse health effects

Tungsten

- Specific Gravity – 19.25 g/cm^3 (2.45 X Fe)
- Melting Point - 3422° C
- Tungsten is used in various munitions;
  - 470 unique US munitions
  - Small arms to bunker busters
- Typically alloyed with cobalt, nickel, tin, copper, and/or iron
- Used by many countries



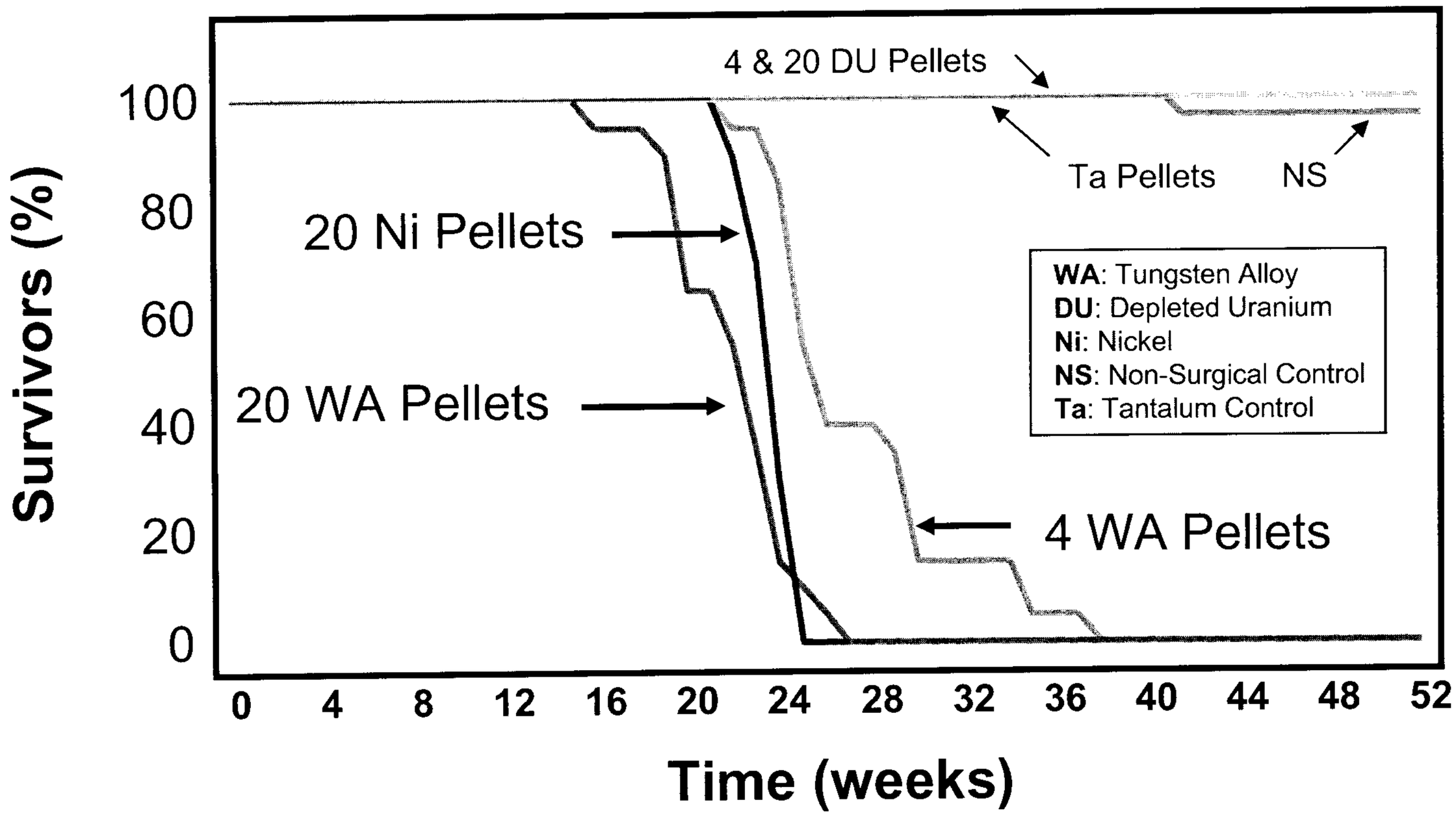
Tungsten Alloys

- Developed as an alternative to DU in munitions because of concerns about environmental impact of DU
- Currently concerned about development of aggressive rhabdomyosarcoma in rats implanted with W/Ni/Co alloy
- ASD(HA) requested USD(AT&L) Director of Defense Systems to fund "with the highest priority possible" tungsten alloy munitions research relating to the long-term risks associated with embedded fragments
- USD(AT&L) memo to munitions developers required "deliberate action to ensure that appropriate health-hazard assessments are included in human systems integration plans for tungsten/alloy munitions…"

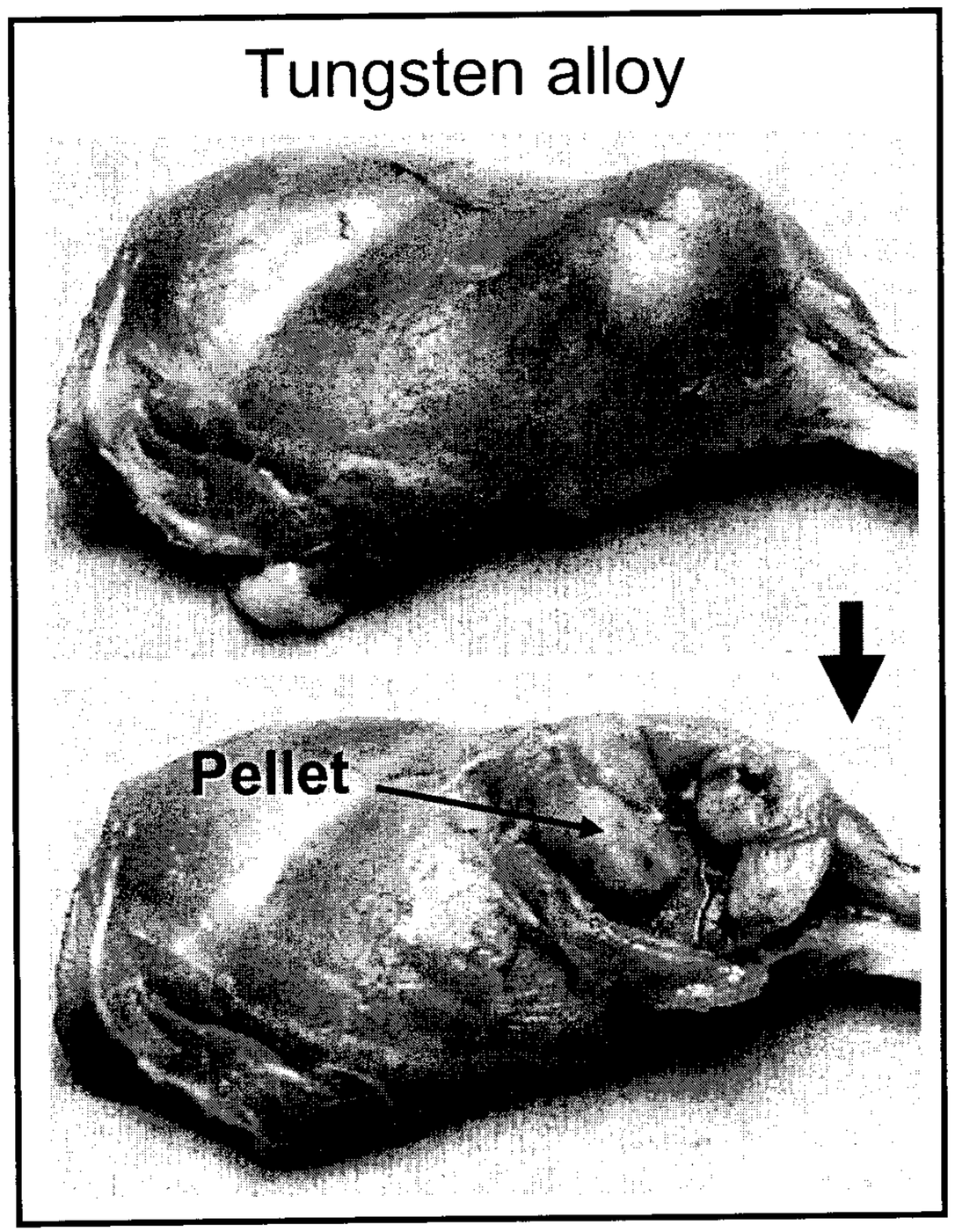
AFRRI Embedded Heavy Metals Health Effects Research

- Implanted metal pellets in Fisher 344 rats
  - Depleted uranium (DU)
  - 92% Tungsten/5% Nickel/3% Cobalt Alloy (W/Ni/Co)
  - Nickel (Ni)
  - Tantalum (Ta)
- Followed for up to 24 months
- All DU and Ta implanted rats survived
- All Ni and W/Ni/Co alloy rats died

Survival After Pellet Implantation

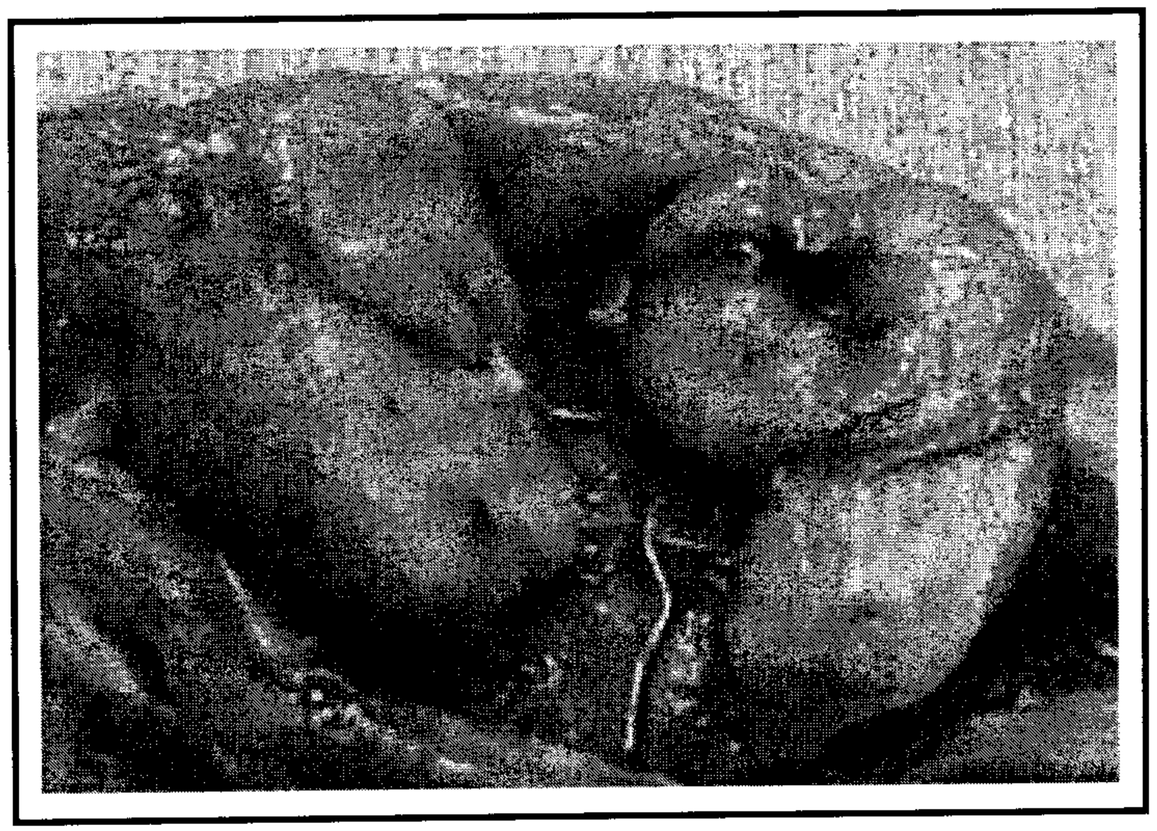


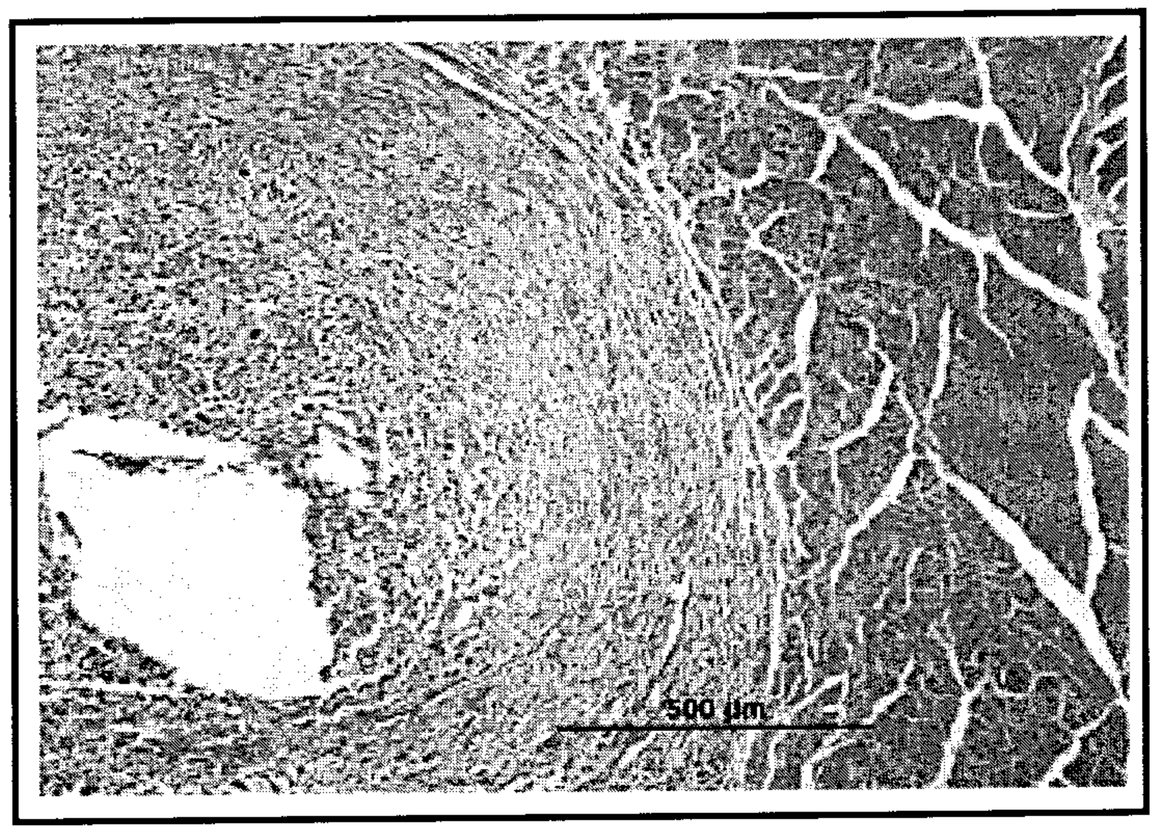
Tungsten Alloy-Associated Tumors



- Rapidly growing tumors up to 5 cm in diameter
- No tumors in Ta controls

Tumor Characterization





- Pleomorphic rhabdomyosarcoma
- Tumor displaces and replaces skeletal muscle around pellet
- Pulmonary Metastases

USACHPPM Embedded Heavy Metals Health Effects Research

- Implanted metal pellets in Fisher 344 rats
  - Tungsten (W)
  - 92% Tungsten/5% Nickel/3% Cobalt Alloy (W/Ni/Co)
  - 97% Tingsten/2% Nickel/1% Iron Alloy (W/Ni/Fe)
  - Tantalum (Ta)
- Currently 12 months into study, plan to follow for up to 24 months
- All W, W/Ni/Fe, Ta implanted rats are alive
- All W/Ni/Co rats developed tumors—rhabdomyosarcoma
- Confirmed AFRII study

USACHPPM Metal Fragment Analysis

- 58 fragments from 50 individuals have been analyzed for their metal composition
- No fragments with tungsten identified to date



Embedded Metal Fragments Workshop

- Jan 17-18, 2006, workshop sponsored by the Deputy Assistant to the Secretary of Defense for Force Health Protection and Readiness

- Disciplines represented: surgery, occupational medicine, toxicology, pathology, radiology, metallurgy, public health, preventive medicine

- Other organizations represented: All Services, VA, ASD(HA), AFIP, USACHPPM, Deployment Health Clinical Center, US Army Heavy Metals Office

Embedded Metal Fragments Workshop Consensus Statements

- Some metals used in weapons are potentially harmful as retained metal fragments by virtue of their toxicity
- Current policies/procedures are inadequate for assessing and managing casualties with all types of retained metal fragments
- There should be a registry of all Service members with retained metal fragments
- All metal fragments that are removed from Service members should be sent for analysis

Embedded Metal Fragments Workshop
Questions to be Addressed

- Are W/Ni/Co tungsten alloy embedded fragments carcinogenic in humans?
- Are all tungsten alloys equally hazardous in humans?
- Are tungsten alloys currently used on the battlefield?
- Are there Service members today with embedded tungsten alloy fragments?
- Can a biologic test determine the nature of an unknown embedded fragment?

Future Plans, Programs, Policy

- Working with the Joint Theater Trauma Registry to identify service members with retained metal fragments
- Investigating the incidence of rhabdomyosarcoma in active duty and recently retired service members
- Working with the IED task force, AFMIC, and DIA to determine extent of tungsten use in OEF/OIF
- Preparing policy to require all fragments removed from service members are sent for analysis

Requirements/Drivers/Issues

- Need for additional study on tungsten alloy
  - Health effects of different alloys
  - Health effects of W/Ni/Co alloy on different species
  - Biomarkers for W/Ni/Co alloy
- Retrospective analysis of Rhabdomyosarcoma in active duty and retired Service members

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Embedded Metal Fragments: a Cause for Concern?

(b)(6)

Director Force Health Assessment & Readiness
DASD Force Health Protection & Readiness

[redacted]

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Avian/Pandemic Influenza

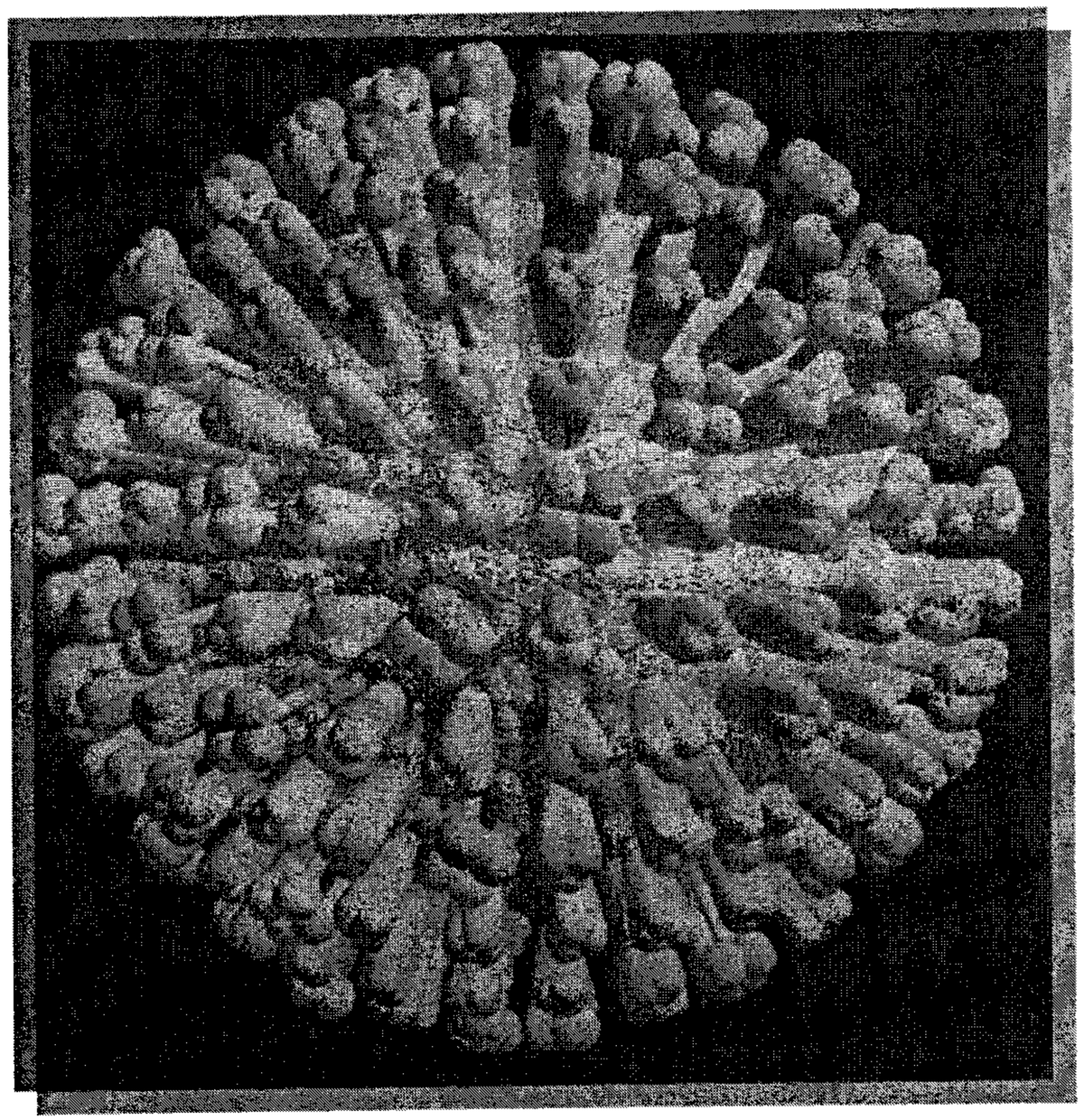
Where We've Been, Where We Are Now, Where We're Going

Force Health Protection Conference
August 2006

(b)(6)

Office of the Assistant Secretary of Defense
(Health Affairs) Force Health Protection and Readiness

The Influenza A Virus



- Typically spherical
  - 50-120 nm diameter
- Single-stranded RNA virus
  - No proof reading
- Genome in 8 segments
- 10 proteins
  - Includes key surface glycoproteins
  - Haemagglutinin (HA)
  - Neuraminidase (NA)

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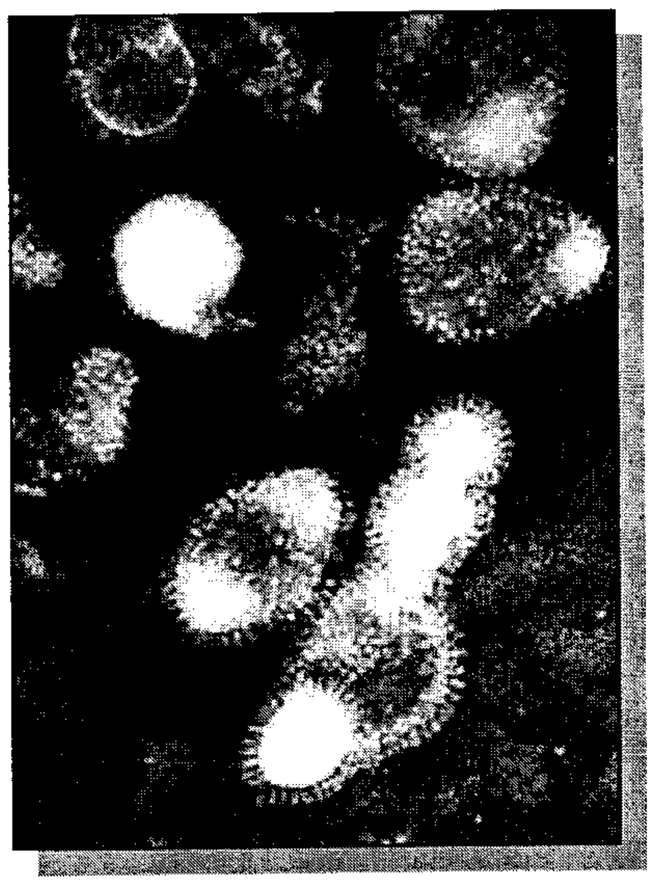
Influenza A Viruses

- High mutation rate
  - Rapid change by antigenic drift and exchange of gene segments (antigenic shift or reassortment)
- Found in a wide variety of avian and mammalian species (human, pigs, horses)
- Waterfowl probably the natural hosts
  - (fowl plague described in 1878)



Influenza A & People

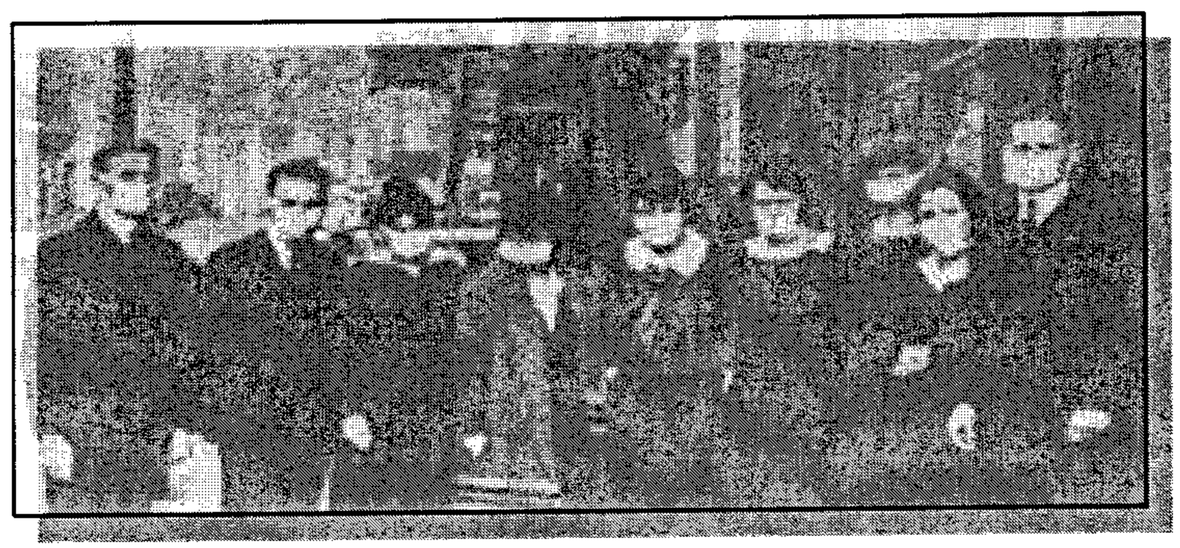
- Yearly outbreak – 36,000 deaths in US
- Pandemic strains with novel surface protein have/can cause significant increases in illness and death
- 1918 Spanish flu was most likely an avian flu that adapted without reassortment.
- Other two pandemics in 1957 & 68 result of reassortment (H2N2 & H3N2)

Why Worry?
1918 Spanish (Kansas) Flu

- Duration of pandemic 1918-1920
- Rapid onset. Some died within 24 hours of symptoms
- Secondary pneumonia biggest killer
- Virus seems to have mutated from a less virulent flu experienced earlier in the year

1918 Spanish Flu

- In the US:
  - 25 million infected
  - 500,000 – 675,000 dead
  - 103 million population (292M in 2004)
  - Only year in 20th century U.S. had negative population growth
- World wide:
  - 20 to 50 million dead
  - World population approximately 2 billion
    (6.3B in 2004)



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Previous Impact of a Pandemic on DoD

Why DoD Is Concerned

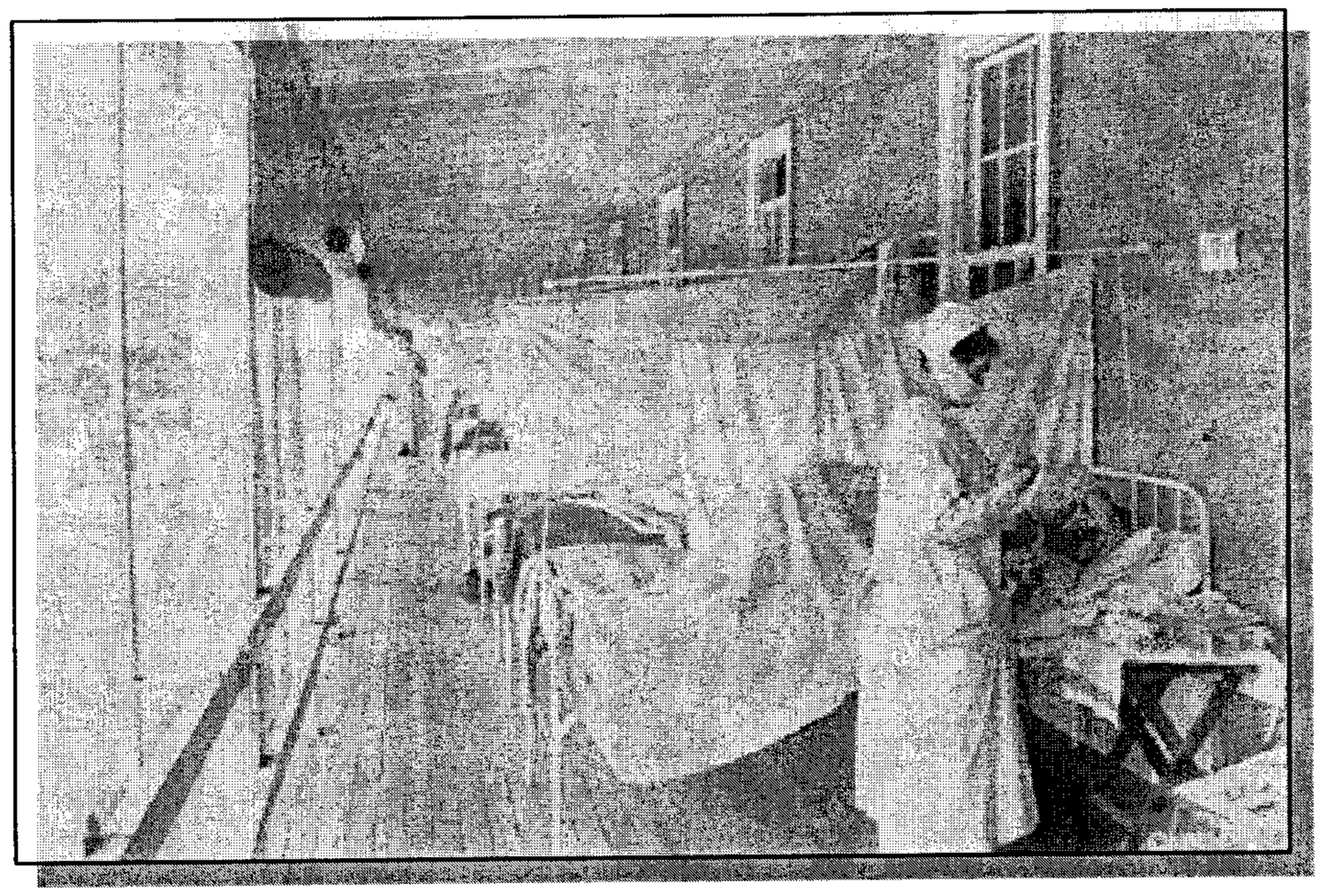
The 1918 Pandemic in the U.S. Military

• 1st wave	Jan-Feb 1918 Haskell County Kansas – seeded Camp Funston, Kansas
• 2nd wave Start: Index epidemic	~12 September 1918 @ Camp Devens, Massachusetts
• Next 8 days:	11 other major camps
• By end of September:	31 major camps
• By end of October:	All major U.S. camps

Sopor GA. The pandemic in the Army camps. JAMA 1918 71:23(December 7), 1899-1908.

September 12 – October 31

- 22% caught the flu
- 5.8% of those with flu died
- 17% of those with flu caught pneumonia
- 34% of those with pneumonia died



Flu ward at Walter Reed Hospital

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September – October 1918

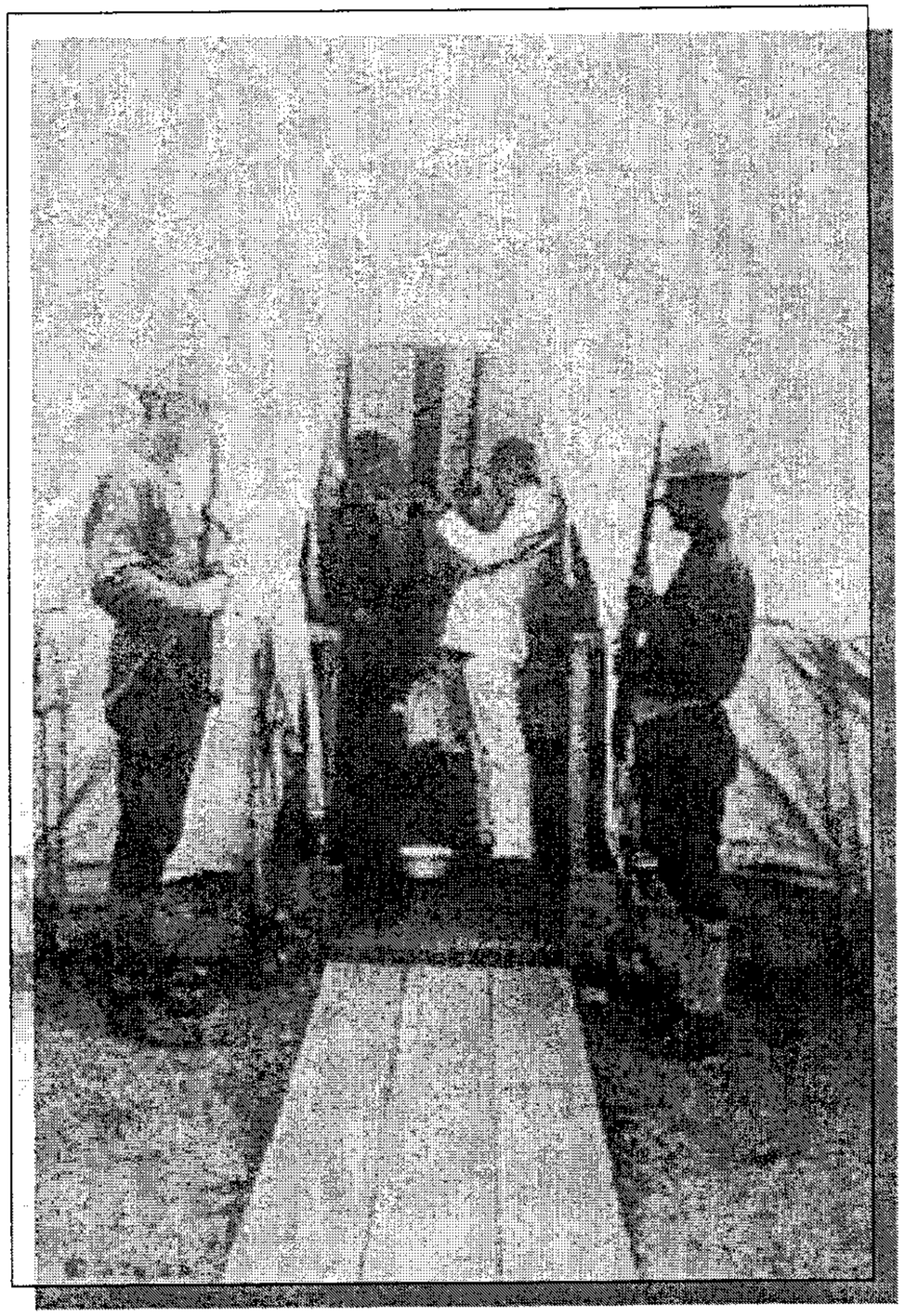
- Camp Devens: **September 1-30**
  - 25% of the camp developed influenza
    - 17% developed pneumonia
      - 35% of those with pneumonia died
- Camp Dix: **mid September - October 31**
  - 20% of the camp developed influenza
    - 18% developed pneumonia
      - 50% of those with pneumonia died

Military Impact

- 25% of military caught the flu
  - 1 million soldiers
  - Mirrored civilian population

- Flu killed more than bullets
  - 57,460 died of flu vs 50,280 in combat

- War dept. estimated that it lost 8,743,102 days among enlisted men



Soldier receives throat spray for Spanish Flu

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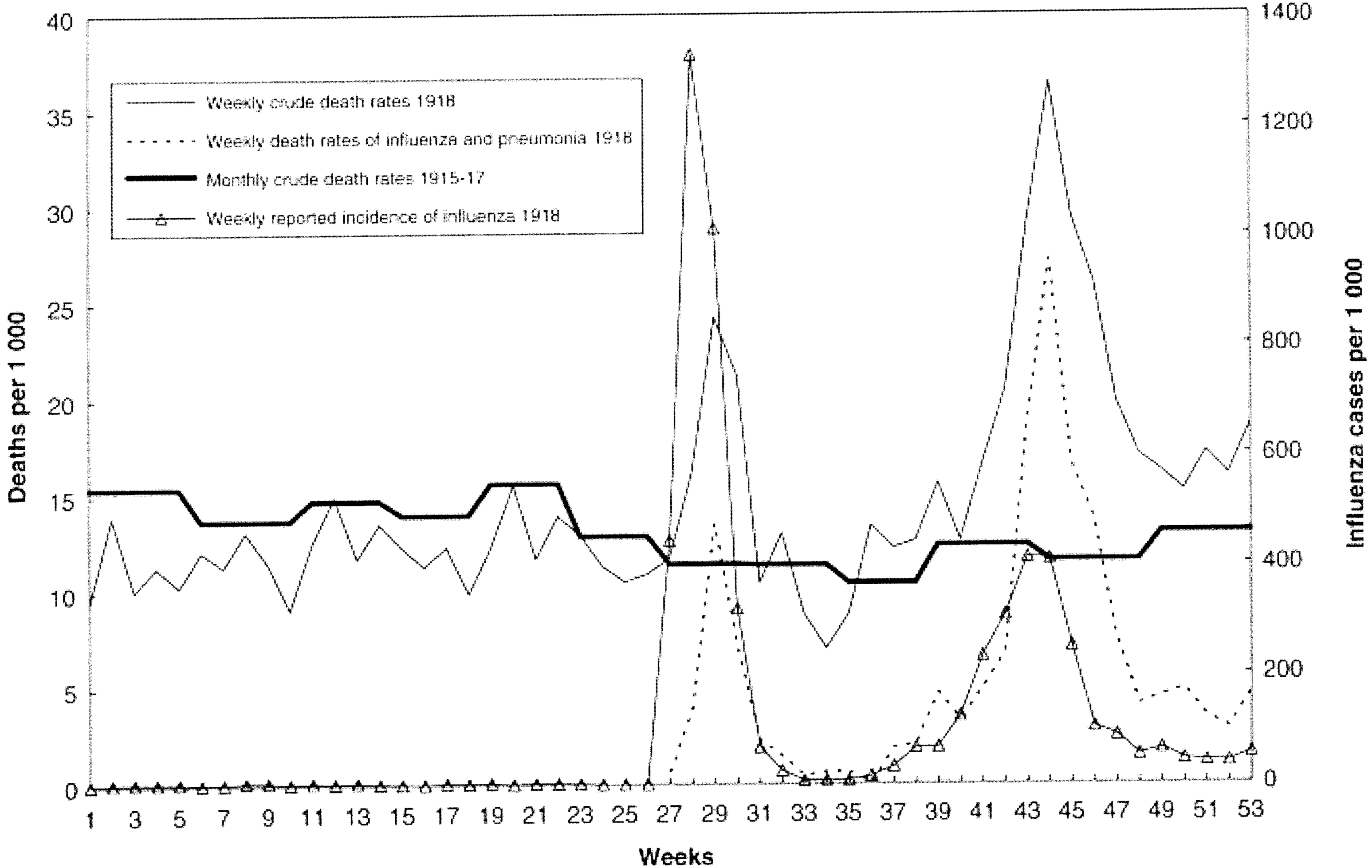
Potential Impact on DoD with the Next Pandemic

- 30-35% attack rate
- 50% seeking care
- 10-20% hospitalization rate
- 40% of workforce out
- Disruption of essential services
- Multiple taskings in the face of decreased manpower
  - National defense
  - Humanitarian relief
  - National response efforts





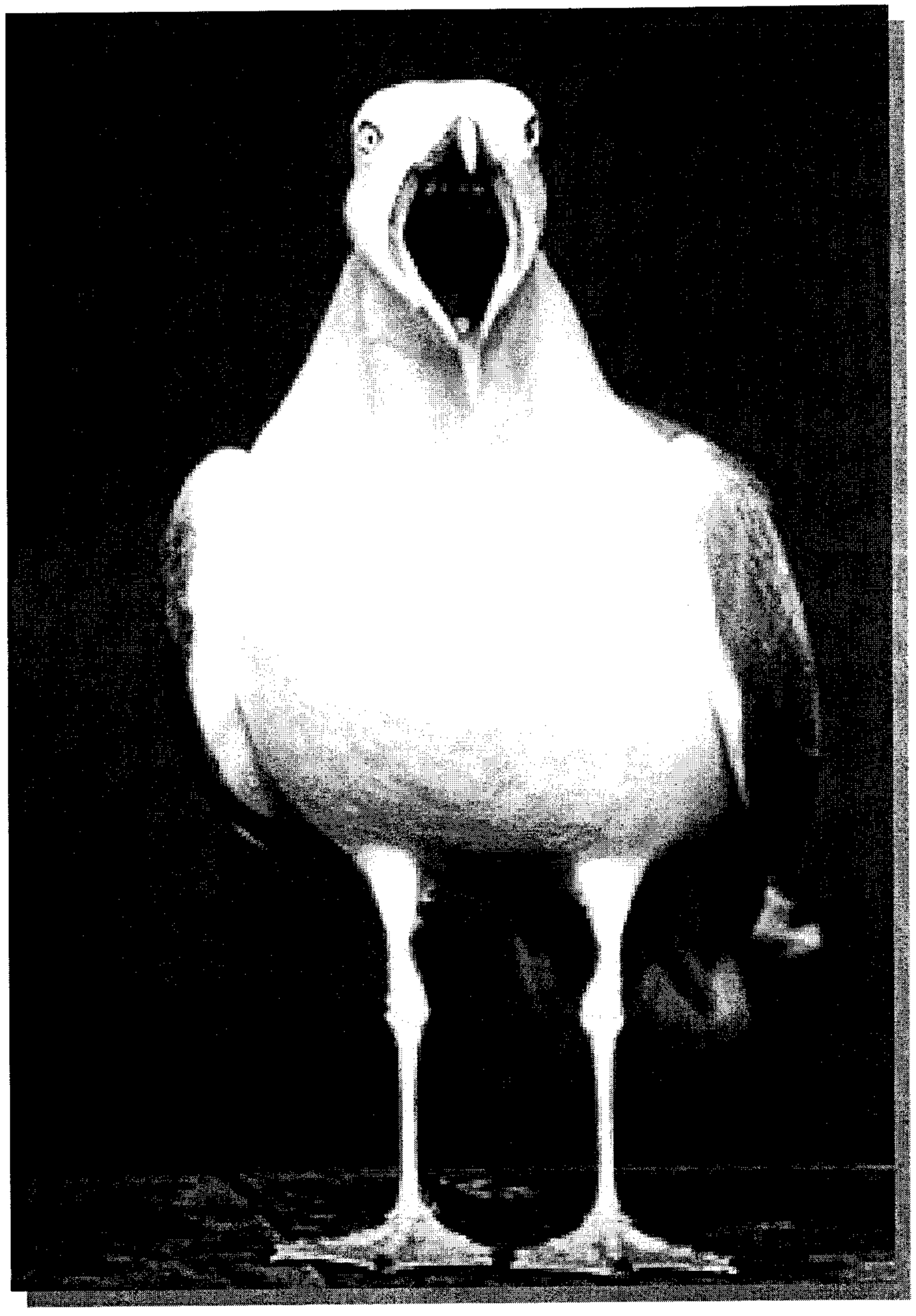
Weekly crude death rates, incidence rates and death rates from influenza in 1918, and monthly average crude death rates for the years 1915–17 in Kristiania. *Sources*: Kristiania Sundhetskommision, 1919; Mamelund, 2003a.



Avian Influenza

- Diverse group of Influenza A viruses infecting wild and domestic birds
  - can have a low or high pathological disease presentation
- Usually affects avian GI or respiratory tracts
- Usually low path (mild or no symptoms)
- Usually high path is a domestic poultry disease (only H5 or H7)
  - H5N1 is an outlier that is jumping back and forth between wild and domestic birds

Is it here yet?



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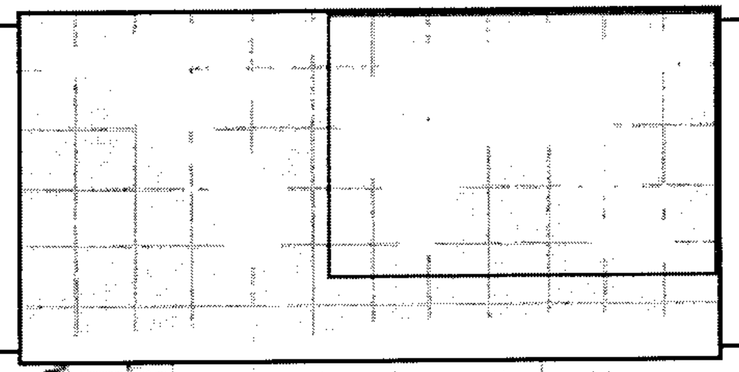
NBIC BioStatus
Avian Influenza (H5N1) in Birds
Eastern Hemisphere



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Confirmed Bird

Suspected Bird

Change from Previous Report

ARCTIC OCEAN

ARCTIC OCEAN

NORTH ATLANTIC OCEAN

NORTH PACIFIC OCEAN

SOUTH ATLANTIC OCEAN

INDIAN OCEAN

SOUTH PACIFIC OCEAN

Confirmed animal cases of H5N1 infection have been reported in Afghanistan, Albania, Austria, Azerbaijan, Bosnia-Herzegovina, Bulgaria, Burkina Faso, Cambodia, Cameroon, China, Croatia, Cyprus, Czech Republic, Denmark, Djibouti, Egypt, Ethiopia, France, Gaza, Georgia, Germany, Greece, Hong Kong, Hungary, India, Indonesia, Iran, Iraq, Israel, Italy, Ivory Coast, Japan, Jordan, Kazakhstan, Laos, Malaysia, Mongolia, Myanmar, Niger, Nigeria, Pakistan, Poland, Romania, Russia, Saudi Arabia, Serbia, Slovakia, Slovenia, South Korea (ROK), Sudan, Sweden, Switzerland, Thailand, Turkey, Ukraine, United Kingdom (Scotland), Vietnam, and the West Bank.

Suspected animal cases of H5N1 infection have been reported in Armenia, Cape Verde, Congo (Democratic Republic), Eritrea, Gabon, Ghana, Ireland, Kazakhstan, Kenya, Lebanon, Mauritania, Moldova, Morocco, Nepal, North Korea, Tajikistan, Uganda, the United Arab Emirates (Dubai), United Kingdom (England) and Yemen.

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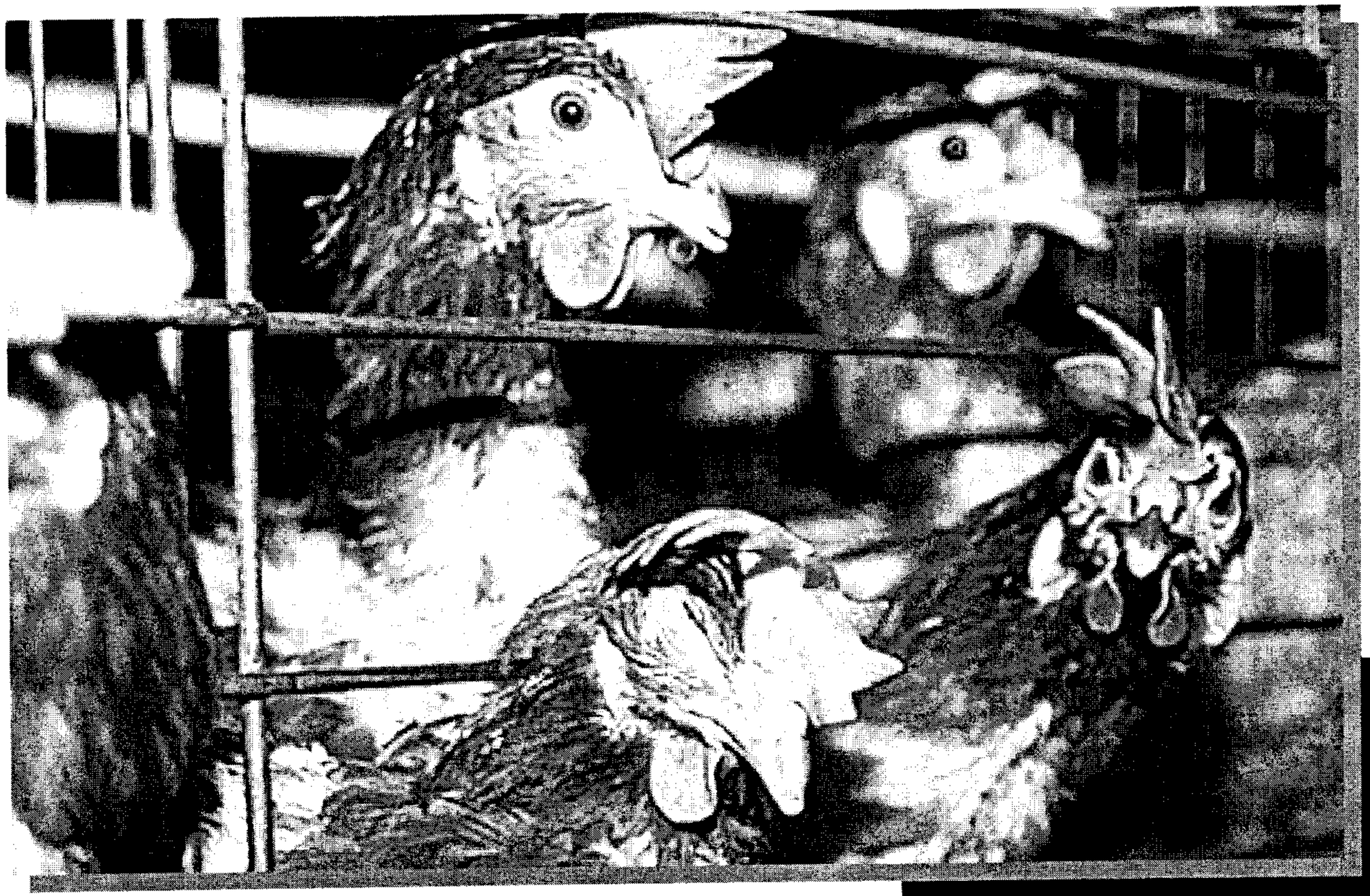
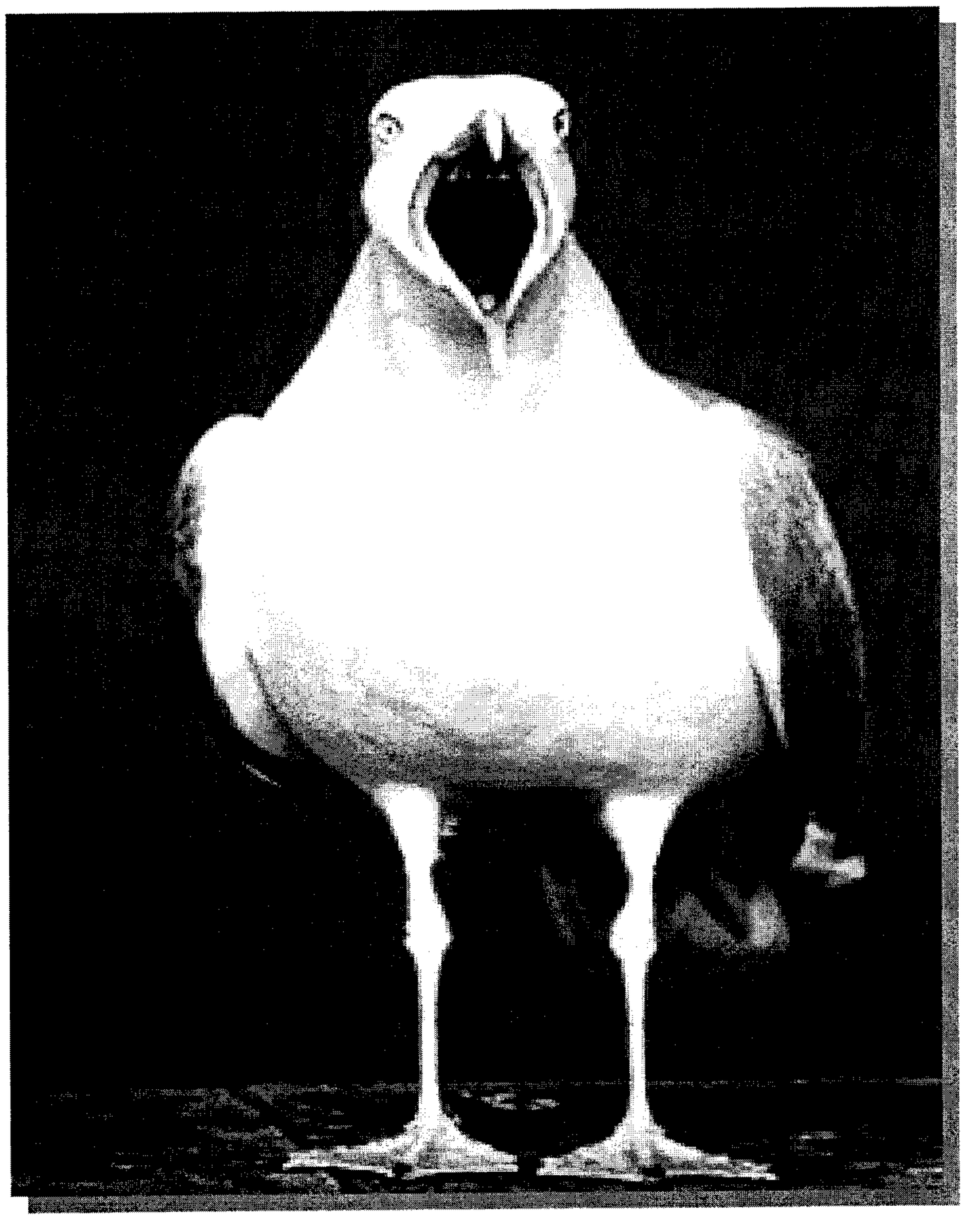
Who to Blame?





Is There a Pandemic?



Only If You Have Feathers



Global H5N1 Situation

- 1997 emerged as poultry & human disease
- Remains an avian influenza virus
- 2006 continued spread in poultry
  - 54 countries (Africa, Asia, Europe, Middle East) since 2004
- 2006 continued infections of people
  - 10 countries
  - Remains rare
  - Most infected by direct exposure to infected poultry
  - A minority infected by contact with an infected person

Is There a Change in the Epidemiology in Poultry or in the Virus ?

- Still high mortality in poultry
- Continued geographic spread
- Establishment of endemicity
- Limited data suggest some changes to the virus but not enough to change strains in current animal vaccines

Has the Epidemiology of H5N1 in Humans Changed?

- Increase in geographic location of cases since 2005
- No major changes in age, sex, and clinical characteristics
- Clusters continue to occur
  - In 2005, cluster size 2-3 cases
  - In 2006, cluster size 2-8 per cluster
- Most cases had poultry exposures (OR 29, 3-308)
- Non-sustained human-to-human transmission observed in 2005 and 2006

Clinical Characteristics

- Higher mortality with decreasing age
- All have fever
- Cough, sputum, dyspnea and rhinorrhea frequent
- Thrombocytopenia seen commonly and almost exclusively in pediatric population
- Neutropenia in nearly all pediatric cases and less than 40% of adults
- Most deaths associated with ARDS

Clusters

- Not new – first seen in 1997 in Hong Kong
- Seen in several countries under certain conditions
- Can have different causes
  - Sometimes when multiple persons exposed to infected poultry (products)
  - Sometimes when person(s) in close, intimate contact with an infected person
- Human-to-human transmission that is not sustained is NOT a reason to change pandemic alert phase

Clusters

- Size
  - Does NOT by itself indicate increased transmissibility
  - Is not criteria for making pandemic phase change
- Critical questions for investigations
  - Is basic cause exposure to bird (products) or human-to-human?
  - If human-to-human did transmission occur because of close, intimate contact?
  - Is the transmission limited or sustained?

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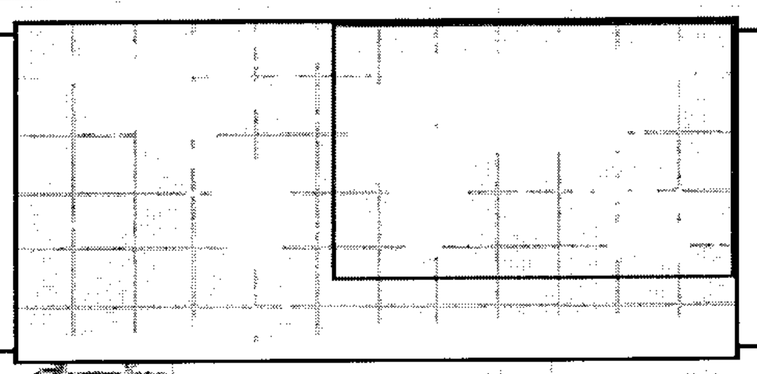
NBIC BioStatus
Avian Influenza (H5N1) in Humans
Eastern Hemisphere



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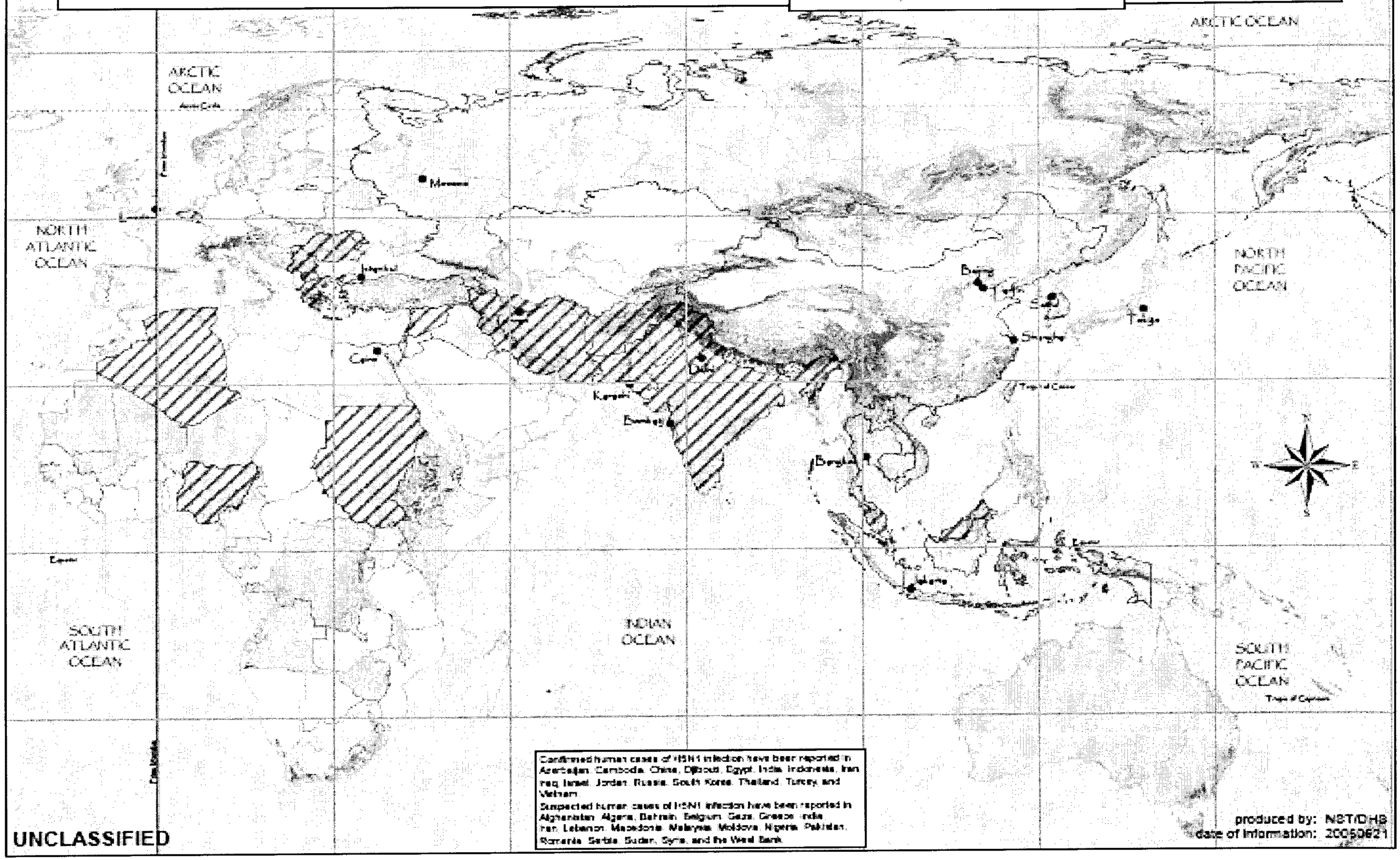
Confirmed Human

Suspected Human

Change from Previous Report



Confirmed human cases of H5N1 infection have been reported in Azerbaijan, Cambodia, China, Djibouti, Egypt, India, Indonesia, Iran, Iraq, Israel, Jordan, Russia, South Korea, Thailand, Turkey, and Vietnam.

Suspected human cases of H5N1 infection have been reported in Afghanistan, Algeria, Bahrain, Belgium, Gaza, Greece, India, Iran, Lebanon, Macedonia, Malaysia, Moldova, Nigeria, Pakistan, Romania, Serbia, Sudan, Syria, and the West Bank.

produced by: NBT/DHS
date of information: 20060621

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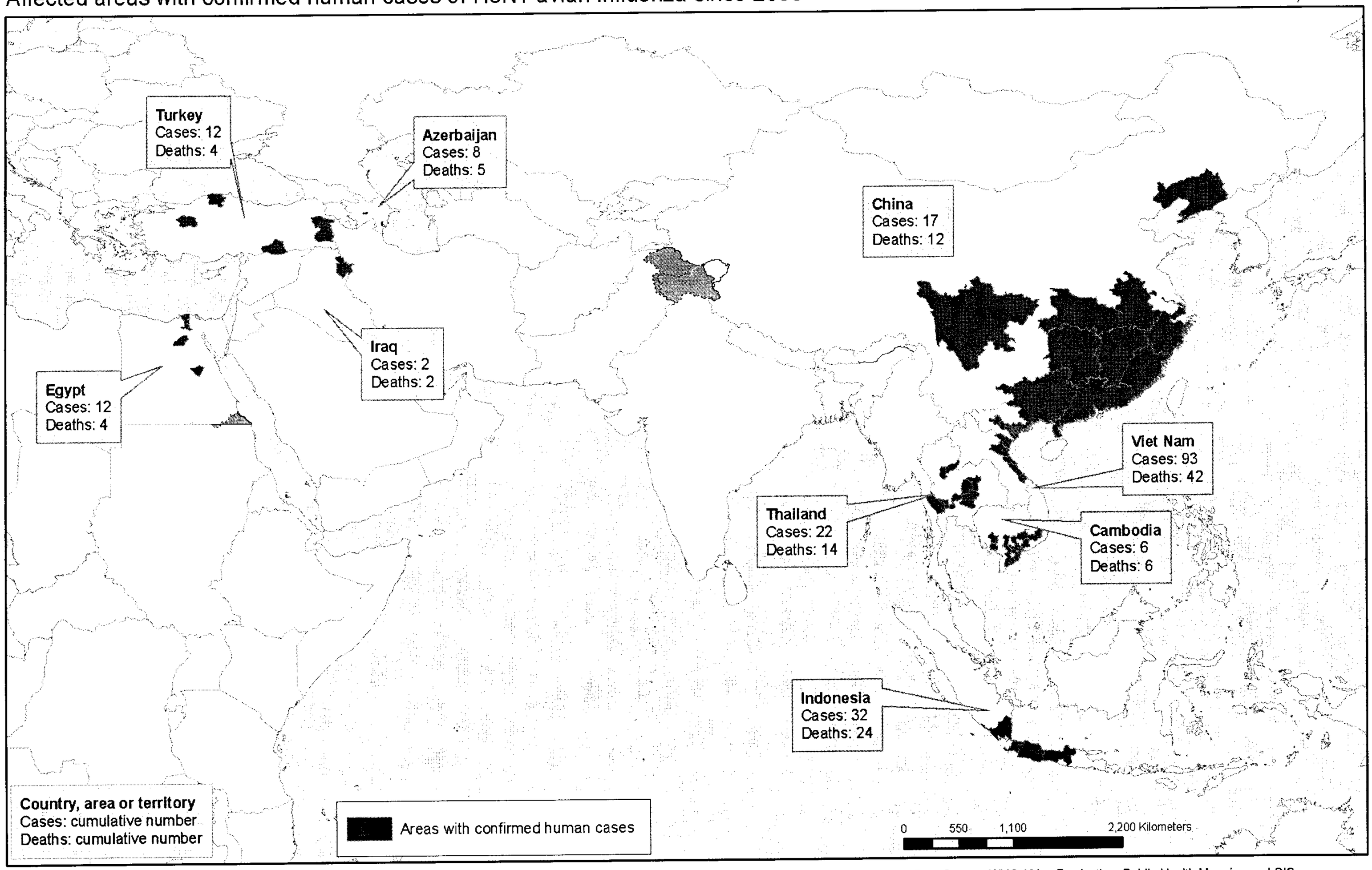
Cumulative Number of Confirmed Human Cases of Avian Influenza Reported to WHO July 4, 2006

Country	2006		Total since 2003	
	Cases	Deaths	Cases	Deaths
Azerbaijan	8	5	8	5
Cambodia	2	2	6	6
China	10	7	18	12
Djibouti	1	0	1	0
Egypt	14	6	14	6
Indonesia	35	29	49	37
Iraq	2	2	2	2
Thailand	0	0	22	14
Turkey	12	4	12	4
Viet Nam	0	0	93	42
Total	85	55	229	131

Affected areas with confirmed human cases of H5N1 avian influenza since 2003

Status as of 21 April 2006



World Health Organization

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: WHO / Map Production: Public Health Mapping and GIS
Communicable Diseases (CDS) World Health Organization

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Current Threat
Containment Problems

- 75-80% poultry farms are small backyard operations - limits biosecurity
- Numerous endemic viruses resulting in 50-70% baseline poultry deaths
- Multiple disincentives to report a die-off
  - Fear
  - Distrust
  - Poor or no reimbursement
  - Attachment

Containment Problems

- Uncertain transparency
  - H5N1 has been circulating in China for at least a decade
    - Not reported because information on epidemics of High Path AI were State secrets until 2003
    - Currently one laboratory in China has permission to conduct AI research
  - H5N1 noted in PRC veterinary sources before 1997
  - Improving



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Containment Problems

- Many countries lack comprehensive surveillance or response plans
  - Lack short, intermediate or long term plans or needs assessment
  - Poor coordination between Ministries of Agriculture and Health result in inability to assess true capabilities and needs

U.S. Risk

- 3 Million registered fighting cocks in CA
- 9.3 Billion commercial chickens - good biosecurity
- 100 Million chickens in unregulated live bird market – not so good biosecurity
- 60 Million foreign visitors to the US
- 60 Million US visitors to foreign countries
- 400 Million crossings in from Mexico
- Fomite in Viet Nam can be in Boise in two flights

National Plan Tasks
HA As Primary Agency

1. Open source information sharing
2. Inpatient and outpatient disease surveillance
3. Monitoring health of military forces worldwide
4. Develop/enhance DoD network of overseas infrastructure
5. Refinement of DoD laboratory methods
6. Employ active and passive influenza surveillance in foreign countries
7. Enhance influenza surveillance reporting techniques
8. Provide health statistics on influenza-like illnesses

National Plan DoD (HA) Tasks

9. Conduct medical materiel requirements gap analysis
10. Maintain antiviral and vaccine stockpiles
11. Establish stockpiles of vaccine against H5N1
12. Procure 2.4 million antiviral medications
13. Supply military units/bases with influenza medication
14. Enhance public health response capabilities
15. Ensure DoD hospital access to diagnostic testing
16. Implement infection control campaigns
17. Update risk communication material

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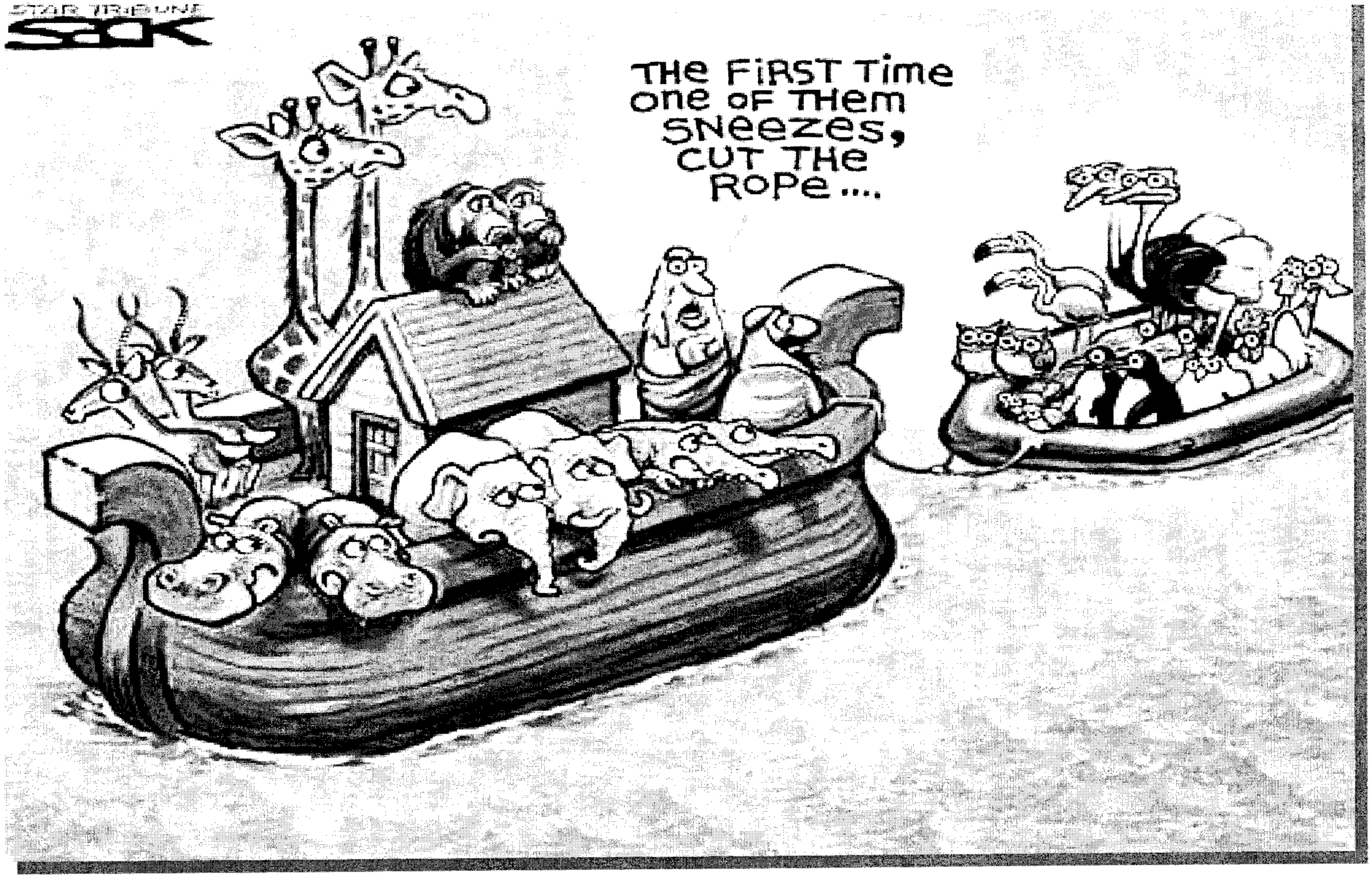
Plans are Nice but You Need Material to Make It Happen



Vaccine

- 2.4 Million doses (90ug) purchased
  - 1.7 million available due to vaccine degredation
- Bottled 1.3 million doses
- Following licensure
  - Current concept includes administration beginning at WHO Phase 4.
- Adjuvant trial results anticipated July 2006
- Clade 2 pilot lot commissioned by HHS

Vietnam 1203 H5N1 Vaccine Safety and Immunogenicity

- No severe adverse events
  - Generally well tolerated
- Only those receiving two doses of 90 ug
  - Achieved neutralization antibody titers of 1:40 or greater in > 50% of subjects (54%)
  - Achieved hemagglutination-inhibition titers of 1:40 or greater in > 50% of subjects (58%)

Cross Reactivity of Vietnam 1203 Vaccine with Clade 1 & 2 Strains

HEMAGGLUTINATION INHIBITION REACTIONS OF H5 INFLUENZA SPECIMENS

		REFERENCE FERRET ANTISERA							
	REFERENCE ANTIGENS	VN/1203	VN/30321	VN30408	DK/KP	IND/5	IND/6	DK/HU/15	IND/5-R
1	A/VIETNAM/1203/2004	320	80	320	10	20	10	160	10
2	A/VIETNAM/JPHN30321/2005	80	320	80	160	160	20	40	10
3	A/VIETNAM/HN30408/05	160	40	640	160	20	5	320	10
4	A/DUCK KULON PROGO/BBVET/1X/04	20	40	20	2560	1280	320	80	640
5	A/INDONESIA/5/2005	10	40	10	1280	1280	320	40	320
6	A/INDONESIA/6/2005	10	20	20	1280	1280	640	40	320
7	A/DUCK/HUNANWG/15/04	20	40	40	80	80	10	160	10
8	A/INDONESIA/5/05 X PR/8-R (CDC)	10	40	20	2560	1280	1280	80	320

CDC

Antivirals
Relenza

- Now approved for treatment and prophylaxis
- Still no clinical experience with H5N1
- Contract awarded to Glaxo Smith Kline for $5.25 million worth of Relenza, or 241,000 treatment courses
  - Anticipated delivery in March 2007
  - Possible partial shipment in mid-2006
- Concern: effectiveness if + viremia

Antivirals
Tamiflu

- 2.4 million treatment courses prepositioned
  - Revised contract permits use in Phases 3-6
- Purchasing an additional 470,000 treatment courses and preposition at MTF's
  - 470K represents 10% of PAR
  - Facilitate use during initial stages of pandemic and for use during primary zoonotic outbreaks with limited human disease
- Plan to purchase an additional 500K to be added to 2.4 million stockpile

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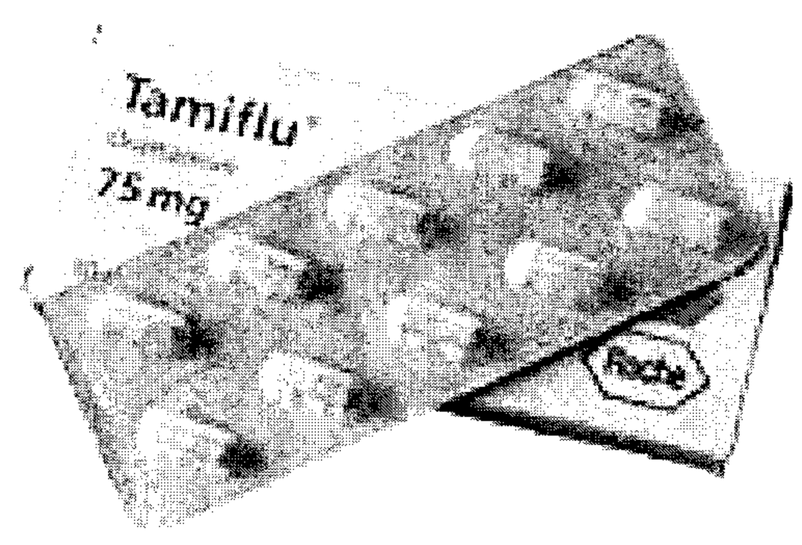
Tamiflu

- Adult & pediatric formulations – pediatric compounding instructions now available via MILVAX
  - Compounded formlation stable for 45 days
- Anecdotal and animal data demonstrates efficacy and effectiveness for treatment of current H5N1
- Effective in ferrets following viral doses of biblical proportion
- Resistance documented for Type A influenza
  - 0.4% in adults 4% pediatrics
  - Resistant mutation results in virus that is either incapable of or has decreased infectivity



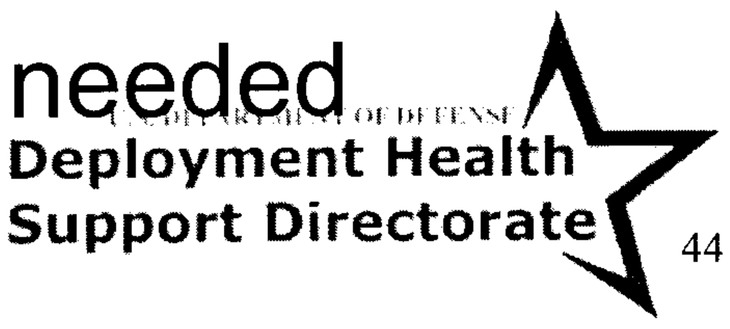
Additional Resources

- PPE
  - Centrally funded
  - Services purchasing to ensure protection for their populations
- Antibiotics
  - Essential list determined by Service ID SME
  - Funding obtained
  - Distribution scheme being formulated

Containment Measures

- Antivirals are not the magic bullet
- Vaccine will be late and in insufficient amounts
- Best measures are non-pharmacologic
  - Sneeze and cough etiquette
  - Hand washing
  - Daily temperature monitoring
  - Social Distancing
    - Tele-commuting if possible
    - Closing schools (keep kids at home)
    - Cancel social gatherings
  - Flu hot lines, triage, early treatment if needed
  - Risk communication





Modeling

- Results of modeling are converging
  - Common findings
    - Interventions have to be early and of sufficient duration
    - Treatment and isolation 1st day of symptoms
      - Need rapid diagnostics
    - Close schools & keep kids at home -effective
    - Social distancing - effective
    - Closing borders and work place not effective
    - BONUS: When non-pharmacologic interventions are used antiviral requirement is significantly reduced



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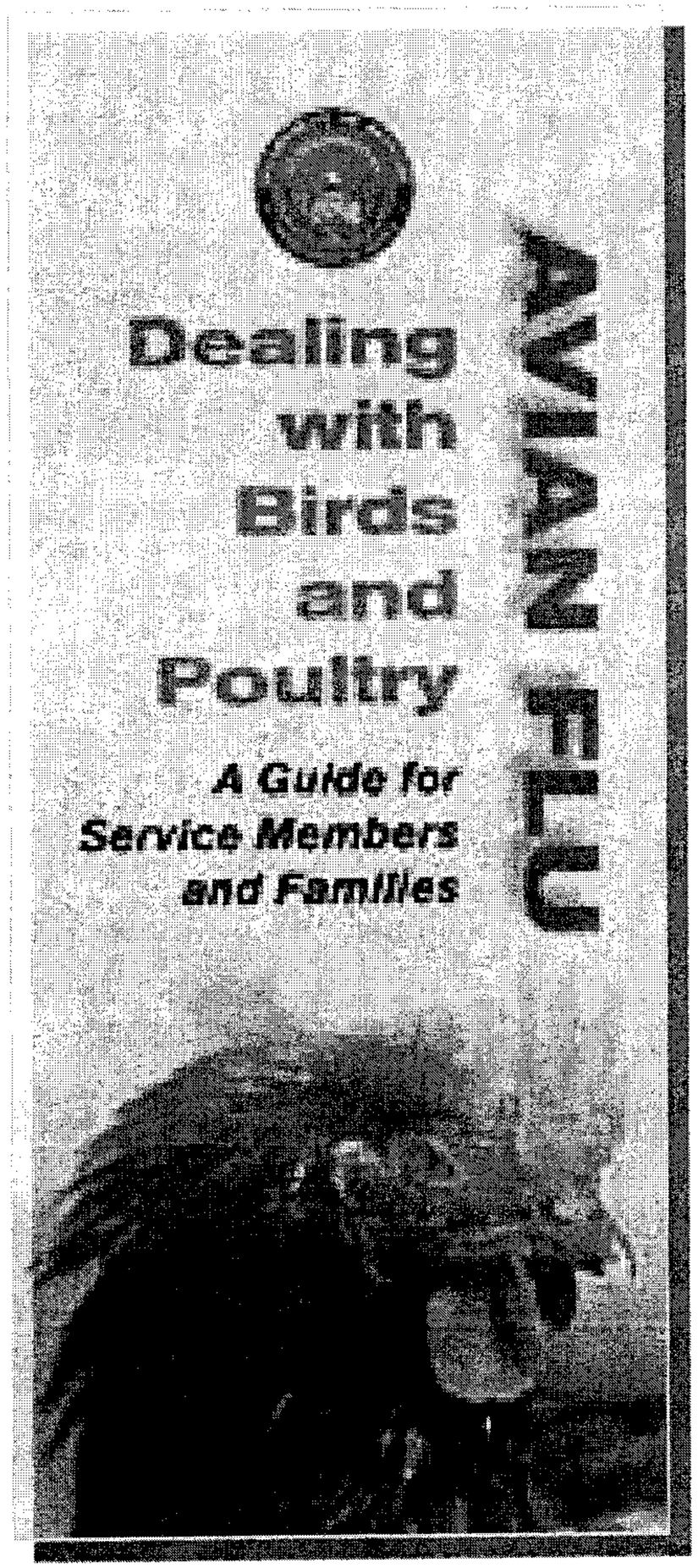
Social Distance Strategy	Peak Infected	Total Infected	Dead
Baseline	1007	5046	463
Close Schools after 10 Sx (99% Compliance), double outside contacts	1064 (-6%)	5746 (-14%)	552 (-19%)
Close Schools after 10 Sx (99% Compliance), keep kids home	30 (97%)	105 (98%)	10 (98%)
Close Schools aft 10 Sx (70% Compliance), keep kids home	64 (94%)	719 (86%)	64 (86%)
Close Schools and Work after 10 Sx (70% Compliance) keep kids home	50 (95%)	413 (92%)	36 (92%)
Adults stay home (99% compliance)	916 (9%)	4728 (6%)	436 (6%)

Extracted from: Local Mitigation Strategies for Pandemic Influenza National Infrastructure Simulation and Analysis Center. Robert J. Glass SAND Number 2005-7955J

Communication

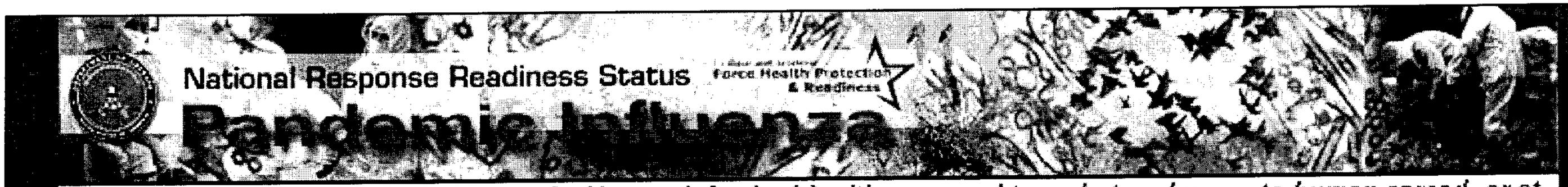
- Beneficary Information
  - Web based
  - Printed
    - Prepandemic influenza information sheets
    - Avian (zoonotic) influenza
    - Pandemic influenza





Communication

- Watch board
- https://fhp.osd.mil/aiWatchboard/index.html
- Continued evolution
  - Disease status
  - Clinical practice guidelines
    - MHS
    - Operational
  - Policy and guidance



ALERTS: Pandemic Alert Period Phase 3 - Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact.

Watchboard Home

Preparedness & Communication

Surveillance & Detection

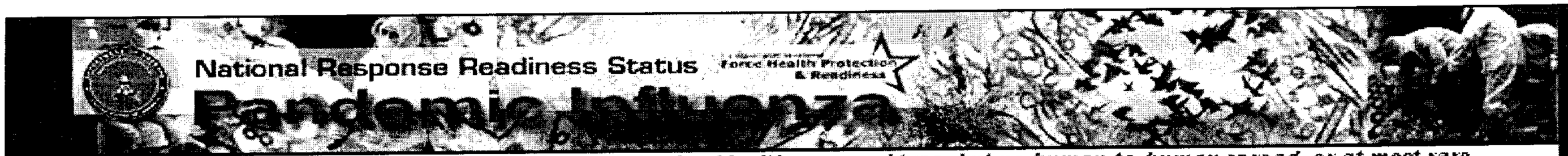
Response & Containment

Related Links
- HHS
- CDC
- WHO
- Pandemic Flu
- VA
- USDA
- DoL OSHA
- State Department
- USAID
- DOD GEIS

Department of Defense Pandemic Flu Stages

Interpandemic Period	National Strategy Goals
Phase 1 No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in animals, the risk of human infection or disease is considered to be low.	Strengthen influenza pandemic preparedness at the global, regional, national and sub national levels.
Phase 2 No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk of human disease.	Minimize the risk of transmission to humans; detect and report such transmission rapidly if it occurs.
Pandemic Alert Period	**National Strategy Goals**
Phase 3 Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact.	Ensure rapid characterization of the new virus subtype and early detection, notification and response to additional cases.
Phase 4 Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans.	Contain the new virus within limited foci or delay spread to gain time to implement preparedness measures, including vaccine development.
Phase 5 Larger cluster(s) but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).	Maximize efforts to contain or delay spread, to possibly avert a pandemic, and to gain time to implement pandemic response measures.
Pandemic Period	**National Strategy Goals**
Phase 6 Increased and sustained transmission in general population.	Maximize efforts to contain or delay spread, to possibly avert a pandemic, and to gain time to implement pandemic response measures.

More Links



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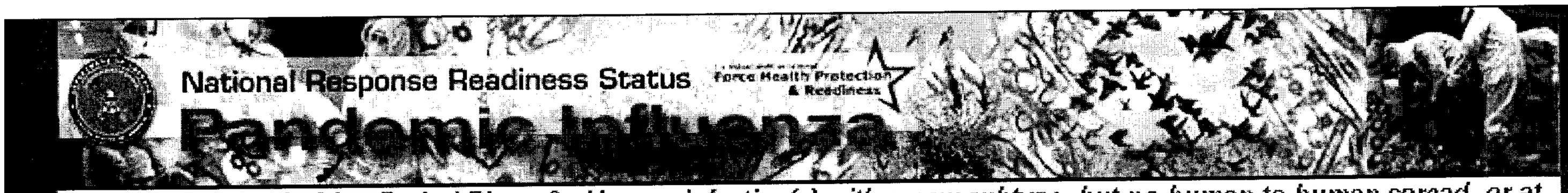
Human Avian Influenza Cases

Human Cases Reported for the Week Ending November 18: The World Health Organization (WHO) confirmed five cases, including: in Thailand, an 18-month-old boy from Bangkok; in China, two cases, including a 9-year-old boy from Hunan Province, who recovered, and a 24-year-old female poultry worker who died in Anhui Province; and in Indonesia, two fatalities, a 16-year-old girl and a 20-year-old woman, both from Jakarta. An additional case from Hunan Province, the 12-year-old sister of a confirmed case, was not confirmed by WHO because she died one day after being admitted to the hospital, and was cremated without undergoing testing for H5N1. Her brother was admitted to the hospital the day she died, and received treatment, although no specific information is available. All of the human cases occurred in regions with ongoing poultry outbreaks. All of the victims had contact with sick poultry, including the Bangkok toddler who was playing near them.

Avian Flu Outbreaks	Week Ending Nov. 18, 2005			2005 Cases[1]	2004 Cases[2]
Location	Date Reported	Probable Source	#Deaths / #Cases	#Deaths / #Cases	#Deaths / #Cases
Thailand Bangkok	Nov. 14	chickens	0/1 0/1	1/4	12/17
Vietnam			0/0	23/66[3]	20/27
Cambodia			0/0	4/4	0/0
Indonesia Jakarta	Nov.17		2/2 2/2	9/13[4]	0/0
China Human Province Anhui Province	Nov.16 Nov.16	chickens chickens	2/3[5] 1/2[5] 1/1	2/3[5]	0/0
TOTAL			4/6	39/90[3,4,5]	32/44

[1]The reported cases and deaths are from Mid-December 2004 through November 18,2005.
[2]The reported cases and deaths are from late-December 2003 through October 2004.
[3]One fatal case from Vietnam in September has not been counted yet by WHO.
[4]Two fatalities from Tangerang in July are included here, but not in the WHO official count.
[5]One fatal case from Human Province is a sister of a confirmed case, but will not be officially confirmed by WHO because she was cremated prior to testing for H5N1.



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Preparedness and Communication

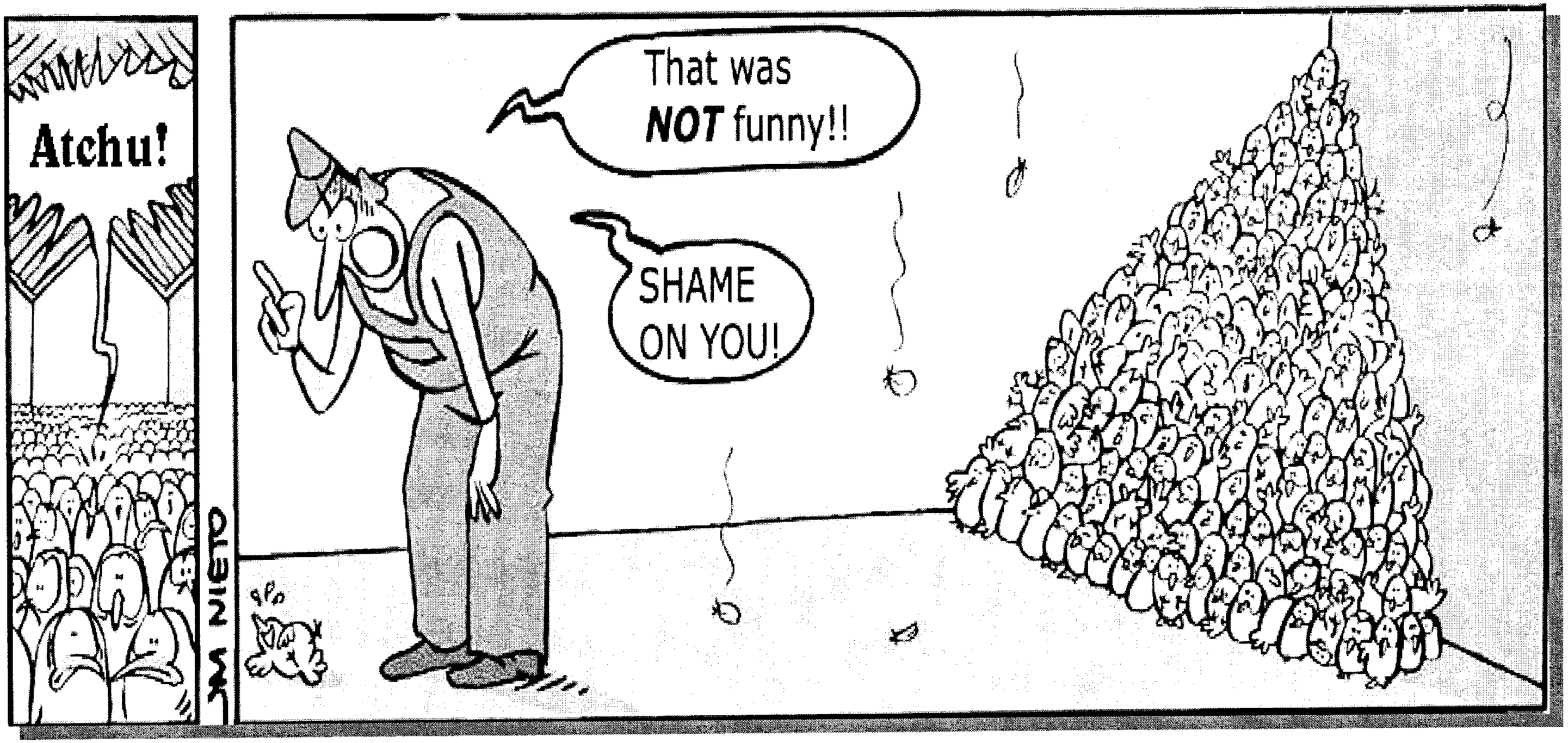
DOD Policy

Department of Defense Influenza Pandemic Preparation and Response Health Policy Guidance Final Draft (25 JAN 2006)

Policy for Release of Tamiflu (Oselatmivir) Antiviral Stockpile During an Influenza Pandemic Final Draft (10 JAN 2006)

DOD Interim Guidance

Interim Guidance for Protecting DOD Personnel Involved in Avian Influenza Disease Eradication Activities (21 MAR 2006)


Atchu!
That was
NOT funny!!
SHAME
ON YOU!
M NIGP

U.S. DEPARTMENT OF DEFENSE
Deployment Health
Support Directorate

DoDI 6490.03,
"*Deployment Health*"

(b)(6)

Jack Dennison

Hayley Hughes

Bill Voelkner

DoDI 6490.03
Presentation Overview

- Purpose, Scope, Approach
- Deployment Health Model
- Major changes
  - Change in the "definition" of deployment and its impacts
  - Risk-based methodology used to determine deployment health activities for all deployments
  - Once-daily personnel location accountability and reporting requirements

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Deployment Health Support Directorate

DoDI 6490.03

Purpose

- To enhance Force Health Protection by taking deployment health policy and procedures to the "next-level" of prevention and protection through:
  - Risk Based identification and management of health risks, including hazardous exposures for all deployments
  - Conduct of comprehensive health surveillance
    - Medical and occupational/environmental health
  - Effective (timely, accurate, etc.) health risk communication

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Deployment Health Support Directorate

DoDI 6490.03
Scope

- Applies across all phases of the deployment (pre-, during, and post-)
- Also applies to DoD civilian employees and DoD contractor personnel
  - Additional implementing policies and instructions required
- Excludes shipboard operations not anticipated to involve operations ashore except when risks are beyond shipboard occupational health program

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Deployment Health Support Directorate

DoDI 6490.03

Approach

- Prescribes a comprehensive, risk-based approach to identify full scope of deployment health activities for all deployments
  - Risk assessment and management
  - Health surveillance
  - Health risk communications
- Requires once-daily location recording for all deployed personnel and reporting of location data at least weekly (Line/Personnel function)
- Facilitates creation of longitudinal exposure records

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Deployment Health Support Directorate

DODI 6490.03

Rescinds/Incorporates Recent Policies

- Rescinds/Incorporates
  - USD (P&R) Policy, *Enhanced Post-Deployment Health Assessments*, Apr 22, 2003
  - USD(P&R) Policy, *Improved Occupational and Environmental Health Surveillance (OEHS) Reporting and Archiving*, June 30, 2003
  - ASD(HA), Policy, *Human Immunodeficiency Virus Testing Interval,* Mar 29, 2004
  - *USD (P&R) Improved Occupational and Environmental Health Surveillance Reporting and Archiving,* May 29, 2003
  - *ASD(HA) Post-Deployment Health Reassessment (PDHRA),* Mar 10, 2005
  - *ASD(HA) Pre- and Post-Deployment Serum Collection,* Mar 14, 2006

DoDI 6490.03

References/Supporting Documentation

- References
  - American Society for Testing Materials, *ASTM Standard Guide for Environmental Health Site Assessment Process for Military Deployments,* Dec 2003
  - US Army Center for Health Promotion and Preventive Medicine, *Technical Guide 230, Chemical Exposure Guidelines for Deployed Military Personnel,* Jan 2004

- New "companion" Joint Staff Memorandum, Deployment Health, under development replacing the February 2002 version

- Deployment Health Risk Communication Manual, under development

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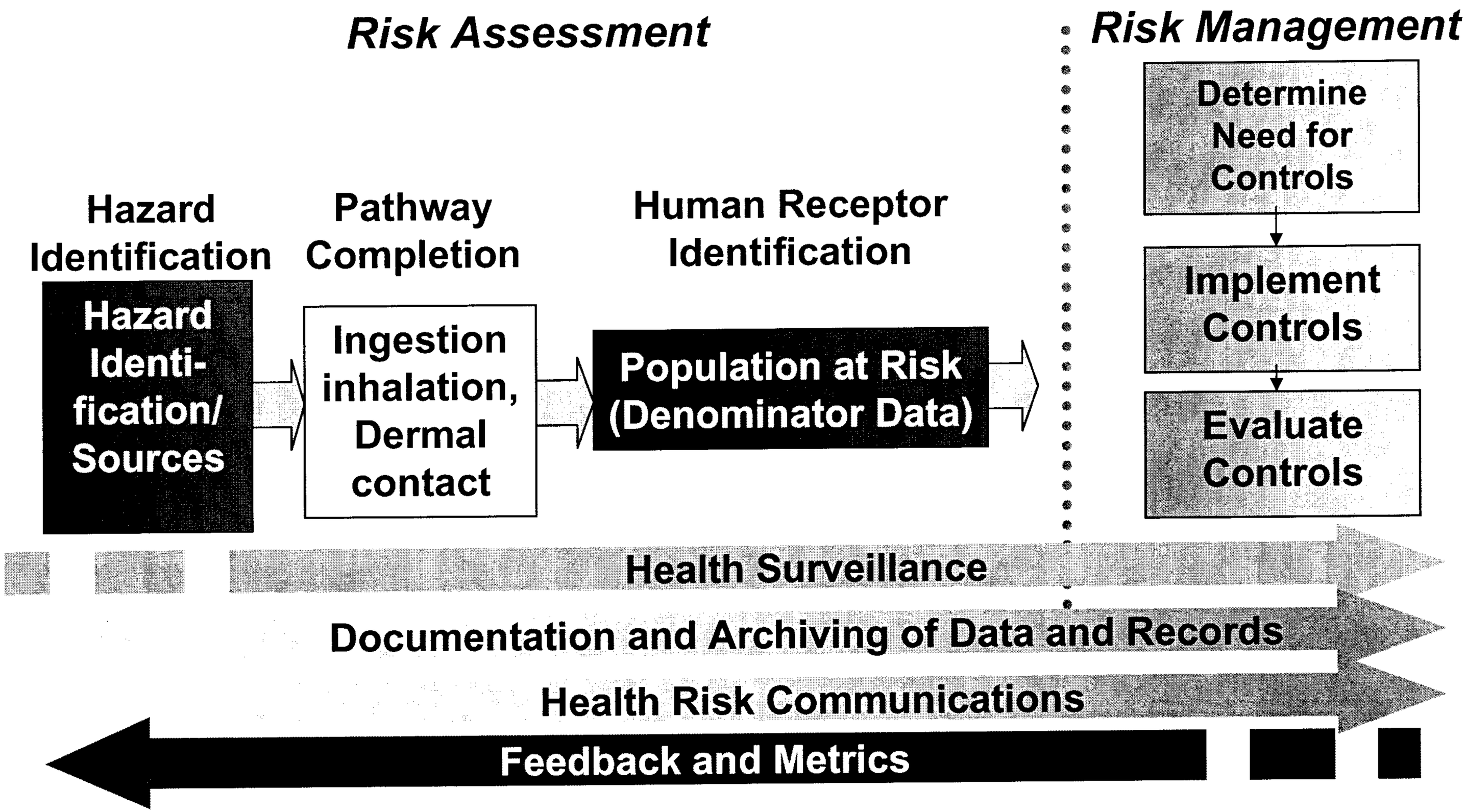
DoDI 6490.03
Deployment Health Model

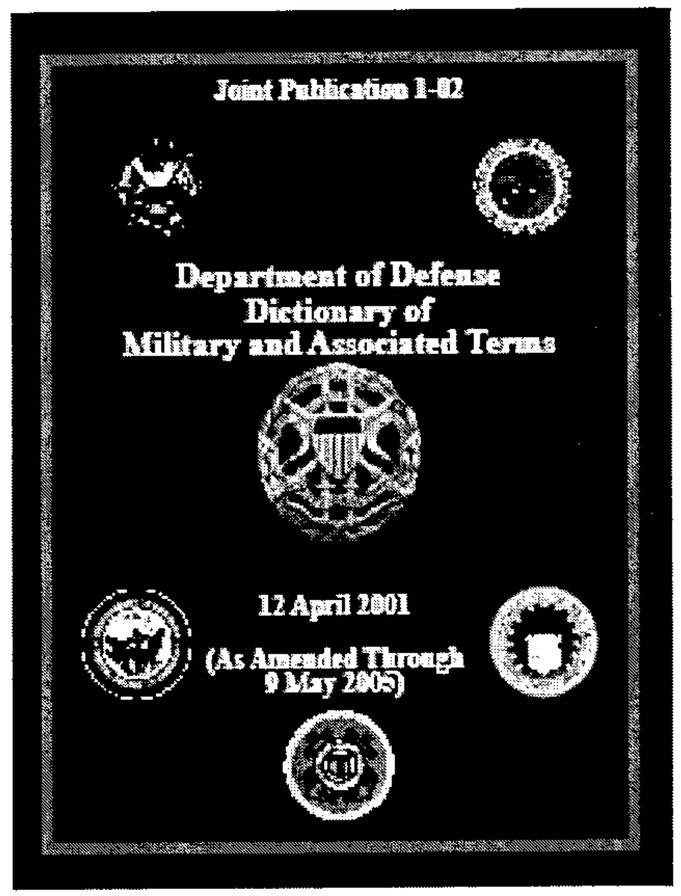


DoDI 6490.03 Major Changes

Expands Deployment Definition

- Incorporates Joint Publication 1-02 "deployment" definition:

  "*… the relocation of forces and materiel to desired operational areas. Deployment encompasses all activities from origin or home station through destination, specifically including intra-continental US, inter-theater, and intra-theater movement legs, staging, and holding areas.*"



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Benefit of JP 1-02,
Deployment Definition

- Ensures that all deployment health prevention and protection measures are identified for "standard" deployments and for all other deployments:
  - Joint vs. Service-specific
  - OCONUS vs. CONUS
  - 30 days or greater vs. less than 30 days in duration
  - Without fixed military medical treatment facilities (MTFs) vs. with fixed military MTFs

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Risk-Based, Deployment Health Activities

- Requires a preliminary health risk assessment by the Operational Command to determine the overall level of health risk associated with the deployment. Draws information from:
  - Armed Forces Medical Intelligence Center (AFMIC)
  - Armed Force Pest Management Board
  - WHO and other open source medical information
  - After-action reports; lessons learned databases; Advanced reconnaissance visits, etc.
- Most requirements for "non-standard" deployments to be identified and implemented based on risk

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DoDI 6490.03

Uses Service Risk Management Methodology*

HAZARD SEVERITY	HAZARD PROBABILITY				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	Extremely High	Extremely High	High	High	Moderate
Critical	Extremely High	High	High	Moderate	Low
Marginal	High	Moderate	Moderate	Low	Low
Negligible	Moderate	Low	Low	Low	Low

*FM 3-100.12/MCRP 5-12.1C/NTTP 5-03.5/AFTTP (I) 3-2.30, Risk Management,
15 Feb 2001

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DoDI 6490.03

Risk-Based, Deployment-Specific Requirements

- "Standard Deployments"
  - "All 31" deployment health activities required
    - For example: Pre-, post-deployment health assessments; serum sampling; biomonitoring (when indicated); health risk communication plan; medical and OEH surveillance including site assessments; documentation of patient encounters and DNBI reporting, OEH base camp monitoring data summaries; OEH monitoring data submitted to DOEHRS; personnel location recording
- All "Other (non-Standard) Deployments"
  - "Core 5-7" deployment health activities plus others **based on risks and commander's decision**



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DoDI 6490.03

"Core" (minimum) Deployment Health Activities

Pre-Deployment	Administer deployment–specific immunizations, Prescribe force health protection prescription products; Issue occupational PPE; and Conduct health threat briefings
Deployment	Conduct deployment site assessments; Document patient encounters (highly recommended and if feasible); and *personnel location reporting* (not a deployment "health" requirement)
Post-Deployment	Integrate all medical documentation into permanent medical record

Pre-deployment Health Activities

Table E4.T1. Pre-Deployment Health Activities

Pre-Deployment Health Activities (E4.A1.1.)	Responsibility (Paragraph)	All OCONUS Deployments > 30 Days with Non-Fixed MTFs	All OCONUS Deployments ≤ 30 Days, OCONUS Deployments with Fixed US MTFs, and CONUS Deployments
Complete or confirm as current Pre-Deployment Health Assessments (DD Forms 2795) within 60 days of expected deployment date. (E4.A1.1.1.)	5.5.7	X	C*
Administer deployment-specific or occupational-related immunizations, prophylaxis, and any medical countermeasures or protective measures, as indicated. (E4.A1.1.2.)	5.5.7; 5.5.11	X	X
Prescribe Force Health Protection Prescription Products (FHPPPs), as indicated. (E4.A1.1.3.)	5.5.9	X	X
Perform pre-deployment tuberculosis screening. (E4.A1.1.4.)	5.5.7	P	P

R =Required; C=Commanders' Decision (commanders of the COCOMs, Service component commanders or commanders exercising operational control); P=Based on potential of high-risk exposure or per COCOM or Service component policy; * Items with asterisks are highly recommended for high and very high risk deployments

DoDI 6490.03

Deployed Personnel Location Reporting

- The Military Health System requires a daily location record (six-digit grid coordinates or lat/long, or geolocation code) for each deployed individual
  - Personnel/Operations responsibility
  - Once-daily personnel location accountability, reported at least weekly to the Defense Manpower Data Center (DMDC)
  - Archived in a database (not later than 30 days after record-creation date)



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Deployed Personnel Location Reporting (Cont.)

- Accurate denominator data allows for more robust epidemiologic/population health-focused Force Health Protection:
  - Permits environmental monitoring and exposure data to be linked with specific individuals (through date/time/and location identifiers)
  - Provides accurate denominator data to calculate rates for epidemiological and prevention purposes
  - Facilitates medical follow-up for and risk communications with affected population

DoDI 6490.03
"Deployment Health"

Questions?

U.S. DEPARTMENT OF DEFENSE
Deployment Health Support Directorate

DHSD Update to the JESWG

7 August 2006

(b)(6)

Director of Force Health Readiness and Assessment

Agenda

- DoDI 6490.3, "Deployment Health" Status
- Embedded Metal Fragment Removal Policy
- International Agreement for Deployment OEHS Information Sharing
- Particulate Matter Health Effects Initiatives
- DoD Deployment Health Risk Communications Working Group
- DoD Biomonitoring Working Group

DoDI 6490.3 Revision (Draft)

- APPROVED by ASD(HA) and awaiting signature by USD(P&R)
  - Dr Winkenwerder very impressed with the instruction and will hand carry to Dr. Chu for signature
  - Public Affairs roll-out events planned
  - (b)(6) will deliver a presentation on the Instruction on Tuesday, 1700 in the Brazos Room

Embedded Metal Fragment Removal Policy

- In process of identifying laboratories with the capability to perform fragment analyses
- Policy under development for the submission of all metal fragments surgically removed in MTFs from wartime and terrorist related casualties
- Coordination on-going with the Joint Theater Trauma Registry (JTTR) to utilize their registry to (1) identify additional casualties who may have fragments and (2) to record fragment analysis results
- Plan is for DHCC to ensure any necessary medical follow-up occurs

International Surveillance Data Sharing Agreements (Australia, Canada, United Kingdom, United States)

- Purpose: Create common database for upload and retrieval of classified/unclassified data
- Original Agreement to be covered under the Technical Cooperation Program (TTCP) as a Project Arrangement
  - TTCP covers only 'Strategic' exchange of data
  - Separate agreement required for 'Tactical' exchange

International Surveillance Data Sharing Agreements (Cont'd)

- New option: Canada, United Kingdom, United States (CANUKUS) MOU Concerning the Research, Development and Acquisition of CBR Defense Materiel
  - Allows for exchange of OEHS data in <u>both</u> 'Strategic' and 'Tactical' environments
- Status:
  - Project Arrangement (PA) under the CANUKUS MOU is in draft and is being reviewed by the Partner Nations
  - Australia was signed on as a participant 07/01/06

Particulate Matter Exposure

- Peer-reviewed journals searched for studies assessing health effects in indigenous populations
  - Purpose: Determine if studies involving local populations can estimate possible chronic exposures in deployed servicemembers
  - Status:
    - Preliminary search complete (~45 articles)
    - Air Force Institute for Operational Health agreed to review articles and analyze content

Particulate Matter Exposure (Cont'd)

- DHSD submitted two research proposals as candidates for funding under the Request for Technical Studies, Analysis or Contract Support program (USD P&R)

  (1) USACHPPM: Pre-, during, and post-deployment cohort study focusing on chronic health effects

  (2) BUMED: Assessment of chemical/physical properties of respirable PM for potential use by adversaries in WMD development

DoD Deployment Health Risk Communications Working Group

- Chartered as a subject matter panel under the Force Health Protection Council
- Interfacing with the VA and HHS (DoD-VA-HSS Health Risk Communications Subcommittee)
- Redesigning the Deployment Health and Family Readiness Library
  - Facilitate navigation
  - Improve document retrieval capabilities
- Starting a media campaign to ensure our customers are aware of the products

  http://deploymenthealthlibrary.fhp.osd.mil/home.jsp

Risk Communications Working Group
Fact Sheets Under Development

- DU (for Servicemembers and for Clinicians)
- Birth Defects and Deployment Exposures
- Camel Spiders
- Q Fever
- Ionizing Radiation
- Meningococcal Meningitis
- Solvents
- Burning Trash and Human Wastes
- Hydrogen Sulfide
- Environmental and Health Concerns of Tungsten
- Larium & DU Pocket Cards for Clinicians/Veterans

DoD Biomonitoring Working Group

- Nerve agent bioassay
  - Limitations
    - Lack of a specific screening biomarker
    - Need for baselines to utilize acetylcholinesterase (AChE) results
    - Field test methods differ from fixed laboratory methods
  - Current Considerations
    - Requiring baseline AChE levels on some/all deployers
    - Recommending utilization of nerve agent reactivation test to confirm exposure

Fluoride Nerve Agent Reactivation Method

- Three possible scenarios where use of this test may be indicated:
  1. To confirm low-level nerve agent exposures in asymptomatic individuals who may have been exposed
  2. To confirm a nerve agent exposure in symptomatic personnel, especially when a covert release may have occurred without any environmental sensors
  3. To define the "geographical limits" of a population exposed to a nerve agent plume (e.g., the nerve agent release during '91 Gulf War during the Khamisiyah ammunition demolition)

Issues Requiring Resolution

- How useful is a baseline AChE for clinical management and return to duty determinations? Should it be required of all deployers?
- For which personnel should we use the fluoride nerve agent reactivation method to confirm nerve agent exposures?

Potential Biomarkers of Exposure

- RBC-ChE (AChE) levels – exposures result in depression of enzyme levels; it regenerates in RBC's at about 1% a day
- Use of AChE as a nerve agent exposure biomarker:
  - Provides similar standards of care for pesticide workers and chemical agent demilitarization workers
  - Provides an estimate of the activity of the AChE in the peripheral tissues and central nervous system
  - Does not always correlate with symptoms -- at low levels of exposure, individuals may be asymptomatic, yet AChE depressed
  - Potentially useful for return-to-duty determinations for high-risk personnel if a baseline AChE has been established

Potential Biomarkers of Exposure

- Use of AChE as a nerve agent biomarker (cont):
  - Current limitations:
    - Not useful for clinical purposes (treatment)
    - Non-specific indicator of exposure (pesticides)
    - Variation in levels among different people (inter-individual)
    - Variations can be found in same individual (intra-individual)
    - Need for established AChE baseline levels
  - Should we establish AChE baselines on all personnel or just for those at high risk of exposure?

Fluoride Nerve Agent Reactivation Method

- Used initially by the Dutch after the 1995 Tokyo sarin attack (Aum Shinriyko)
- Method: highly specific and sensitive (GD – work in progress); costly and time consuming
  - Fluoride ions are used to reactivate the nerve agent molecules bound to ACh, by displacing the ACh with flouride. Results in a "phosphoflouridate" (nerve agent) which can be detected and quantified
  - Method further refined, and validated by the US Army Medical Research Institute of Chemical Defense (USAMRICD) and the US Army Edgewood Chemical Biological Center (ECBC)

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Deployment Health Support Directorate

DHSD Update to the JESWG

7 August 2006

(b)(6)

Director of Force Health Readiness and Assessment

U.S. DEPARTMENT OF DEFENSE
Deployment Health
Support Directorate

DoD Deployment Biomonitoring Program and New Nerve Agent Exposure Guideline (In Progress)

Force Health Protection Conference
8 August 2006

(b)(6)

Senior Environmental Health Policy Analyst
Office of the Assistant Secretary of Defense
(Health Affairs) Force Health Protection and Readiness

Overview

- Why we may need a nerve agent bioassay policy?
- Existing policy for the use of biomarkers to assess deployment-related exposures
- Recent military uses of biomarkers
- Work in-progress on the DoD Nerve Agent Bioassay Policy
  - Potential biomarkers
  - Issues requiring resolution

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Why Do We Need a Nerve Agent Bioassay Policy?

- Long-term health effects of low-level nerve agent exposures largely unknown
  - Potential for delayed health effects
- To help:
  - Create individual exposure records
  - Determine extent of exposure in population-at-risk
- Possible need to inform return-to-duty decisions for high-risk personnel exposed to nerve agents

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Deployment Occupational and Environmental Health Monitoring

- Already monitor pesticide workers for organophosphate/carbamate exposures
- Impossible to monitor all deployment locations
  - Concentrate on base camps or worksites with known/suspected hazardous agents
- Need for appropriate biomarkers/bioassays to supplement occupational and environmental monitoring
  - Environmental monitoring results do NOT always equate to an exposure



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DoD Deployment Biomonitoring Policy

- Feb 2004, USD (P&R) Policy, *Deployment Biomonitoring Policy and Approved Bioassays for Depleted Uranium and Lead*

  http://www.ha.osd.mil/policies/2004/04-004.pdf

  – Established criteria for selection and use of biomarkers to support exposure assessments and clinical management of casualties

  – Provided guidelines to identify personnel possibly exposed to depleted uranium and lead for biomonitoring and medical follow-up

  – Allows for new biomarker guidelines to be added

Policy for the Use of Biomarkers During Deployments (cont)

- Methods must be scientifically valid and reliable
- Test equipment must be rugged and deployable
- Methods must support reliable collection, handling, and testing in deployed settings
- Must be operationally feasible in a deployed setting or lend itself to accomplishment upon redeployment
- Should inform clinical management whenever possible

* USD (P&R) Policy, "Deployment Biomonitoring Policy and Approved Bioassays for Depleted Uranium and Lead", Feb 2004



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Recent Military Use of Biomarkers

- Operation Iraqi Freedom
  - Oct 2003; over 130 personnel were evaluated for possible exposure to chromium and other toxic industrial chemicals at an industrial water treatment plant
    - Blood and urine chromium levels evaluated
  - May 2004; two soldiers evaluated and treated for symptoms of low-level nerve agent exposure
    - Biomarkers were analyzed to (1) identify the nature of agent, (2) assess the severity of the exposures, and (3) make a clinical judgment of when it was safe to return the soldiers to duty

Recent Military Use of Biomarkers

- Based on the biomarkers, the agent was identified (sarin), both soldiers returned to light duty two weeks after exposure
- Returned to full duty when biomarker levels reached 90% of the average population baseline

– Sep 2004; Army issued its policy on the medical management of deployment nerve agent exposures for use of cholinesterase enzyme as a biomarker for high-risk occupations

– Oct 2004; OEH monitoring identified airborne lead levels above military exposure guidelines.

- Resulted in medical screening and bio-monitoring for blood lead level in those recently returned from Camp War Eagle



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Deployment Nerve Agents Exposure Assessments

- 2004 – ASD(HA) established a DoD Biomonitoring Work Group to evaluate biomarkers and bioassays for nerve and mustard agent exposures
- Work group identified several potential limitations for nerve agent bioassay
  - Lack of a specific screening biomarker
  - Need for baselines to compare acetylcholine esterase (AChE) results
  - Field test methods differ from fixed laboratory methods

Nerve Agent Effects

- At high levels of exposure, nerve agents can cause death in a matter of seconds or minutes
- At lower levels of exposure, health effects can range from no evident symptoms to mild symptoms
- Mild symptoms include miosis (pinpoint pupils), blurred vision, runny nose, weakness, dizziness, nausea/vomiting, and diarrhea
  - Symptoms would be indistinguishable from organophosphate/carbamate poisoning

Potential Biomarkers of Exposure

- RBC-ChE (AChE) levels – exposures result in depression of enzyme levels; it regenerates in RBC's at about 1% a day
- Use of AChE as a nerve agent exposure biomarker:
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  - Potentially useful for return-to-duty determinations for high-risk personnel if a baseline AChE has been established

Potential Biomarkers of Exposure

- Use of AChE as a nerve agent biomarker (cont):
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Fluoride Nerve Agent Reactivation Method (cont)

- Recommended by USAMRICD as a confirmatory test, not a screening test
- Blood specimens should be collected as soon as possible following exposures and the plasma frozen for shipment.
  - For low level exposures, after two weeks, the possibility of detecting nerve agent is greatly reduced.
- Not currently useful for clinical management



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Fluoride Nerve Agent Reactivation Method (cont)

- Potentially useful for identifying those with low-level nerve agent exposures in the event that future research indicates possible health effects/risks
  - Clinical management or
  - Determination of service-connected disabilities (VA)

Fluoride Nerve Agent Reactivation Method (cont)

- Three possible scenarios where use of this test may be indicated:
  1. To confirm low-level nerve agent exposures in asymptomatic individuals who may have been exposed
  2. To confirm a nerve agent exposure in symptomatic personnel, especially when a covert release may have occurred without any environmental sensors
  3. To define the "geographical limits" of a population exposed to a nerve agent plume (e.g., the nerve agent release during '91 Gulf War during the Khamisiyah ammunition demolition)

Issues Requiring Resolution

- Should the same medical surveillance standards for pesticide applicators and "chem-demil" personnel be applied in theater operations when it comes to AChE baselines and testing?

Issues Requiring Resolution

- Do we need an accurate method (e.g., 80% of AChE baseline attained) to base medical recommendations on for determining when previously exposed high-risk personnel should be returned to duty, assuming there is a risk for additional exposures?

Issues Requiring Resolution

- Where there is a theater-wide risk of nerve agent exposure, should we require AChE baselines on <u>all</u> deploying personnel to provide for more accurate return-to-duty recommendations for all personnel?

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Issues Requiring Resolution

- For which personnel should we use the fluoride nerve agent reactivation method to confirm nerve agent exposures?
  - Only for those who have a confirmed depression in AChE? Or potentially for everyone with or without AChE baselines and post-exposure results to determine the entire cohort of exposed personnel?

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DoD Deployment Biomonitoring Program

THANK YOU

Nerve Agents Mechanism of Action

- Nerve agents (VX, GA, GB, GD, GF) and OP/carbamate pesticides can cause illness and death through the inhibition of the cholinesterase (ChE) enzymes found in plasma and in red blood cells
  - When certain neurons fire they release acetylcholine (ACh), a neurotransmitter, a nerve synapses and at neuromuscular junctions, causing muscles to contract or nerves to fire
  - ChE releases acetylcholine from the neurosynapses so that the nerves can relax and then after a short rest fire again
  - Without adequate levels of ChE, acetylcholine builds up, causing over stimulation of certain nerves



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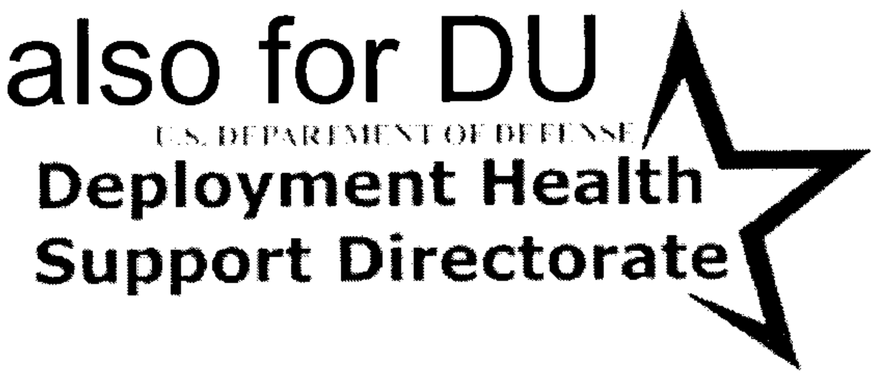
DU Bioassay Guideline

- Services identify personnel potentially exposed to DU
- Requires 24-hour urine samples for all those with
  - Level I exposures – in, on, or near a vehicle when hit by DU munitions, including those who may have may have DU fragments in their body
  - Level II (occupational) exposures
  - Optional for level III (incidental) exposures
- Urine specimens are analyzed for total uranium and if elevated levels are found also for DU





Depleted Uranium Bioassay Guidelines



Level I



Level II



Level III

Determine if bioassay required based on level of exposure

DU Bioassay Required

DU Bioassay Optional

Submission of 24 hour Urine sample for determination of total uranium and depleted uranium levels

OIF DU Bioassay Results
June 1, 2003 – March 31, 2006

Exposure Category	Number of Servicemembers				Urine Bioassay Results		
	Army	Navy/ Marines	Air Force	Total #	Confirmed Elevated Total Uranium	Confirmed Detectable DU	Retained Frag-ments
Level I*	197	48	2	**247**	4	6	17
Level II	298	220	8	**526**	0	0	1
Level III	214	43	7	**264**	0	0	7
Uncat	1126	11	0	**1137**	0	1	29
Total	**1835**	**322**	**17**	**2174**	**4**	**7**	**54**

***Level I exposures**: those who were in, on, or near an armored vehicle when hit by depleted uranium munitions; includes those with DU fragment injuries