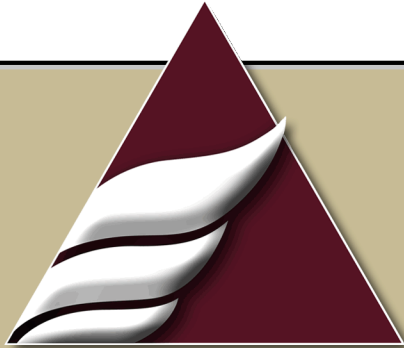


Noise Induced Hearing Injury ICD-9
Surveillance Data Available from
Armed Forces Health Surveillance Center:
The Army Example



USAPHC

UNITED STATES ARMY PUBLIC HEALTH COMMAND (Provisional)

Institute of Public Health

Thomas M. Helfer, PhD et al.

Joint Defense VA Audiology Conference,
San Diego CA, Mar 2011

UNCLASSIFIED

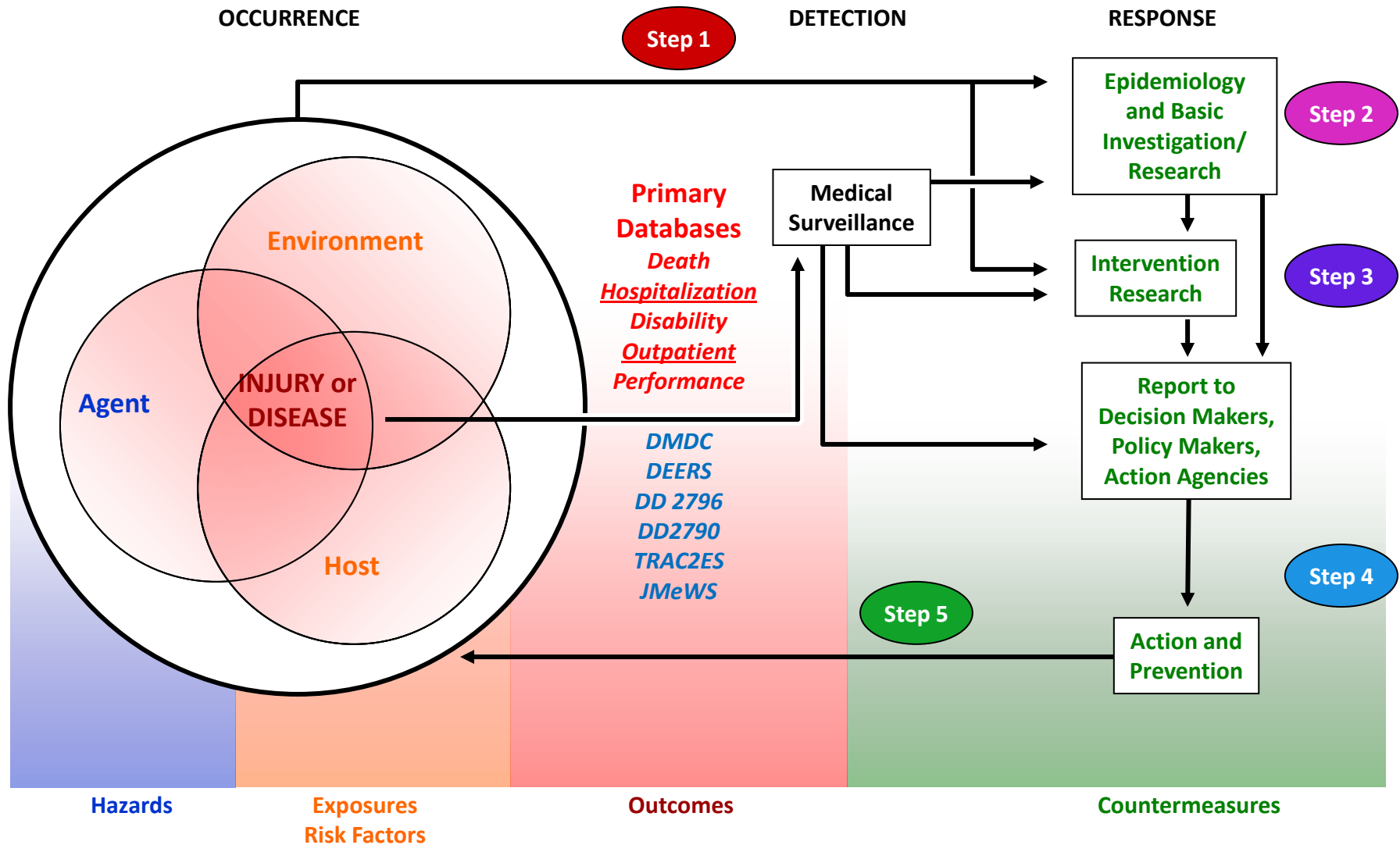
Acknowledgements

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IPH Partnership for Public Health Analysis -
Army-wide NIHI Surveillance Team

Overview

- Identify the ICD-9 data quality objectives & communication to AFHSC
- Show demographics of AD Army in garrison
- Show Army AD NIHI ICD-9 epi trends: examples of reports & reporting cycle
- Conclusions & recommendations



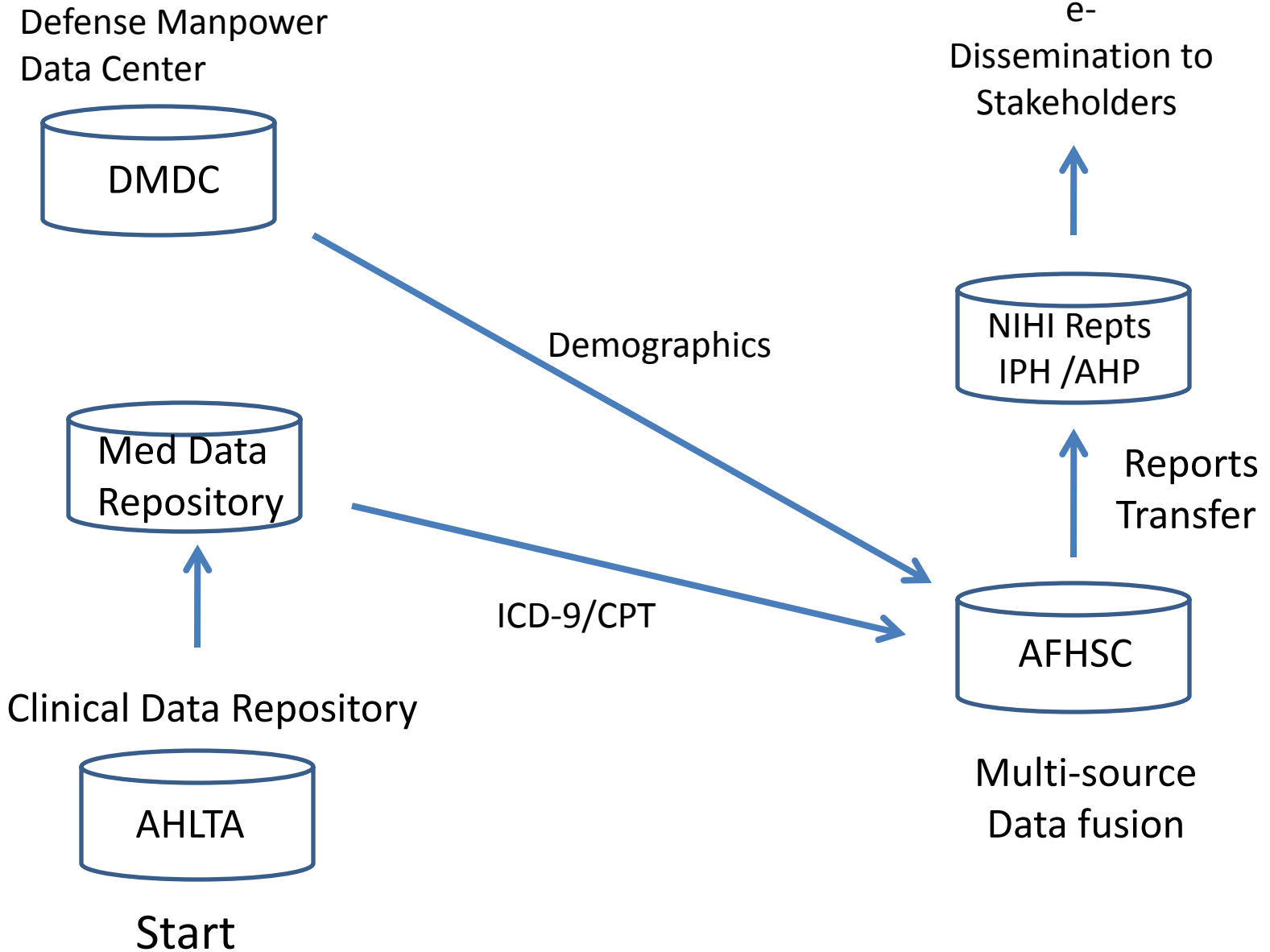
The Risk Management Process

- Step 1. Identify Hazards
- Step 2. Assess Hazards
- Step 3. Develop Controls and Make Decisions
- Step 4. Implement Controls
- Step 5. Supervise and Evaluate

Steps 1-5 = Steps of the Public Health Process

- Step 1. Identification of Problems
- Step 2. Determination of Causes
- Step 3. Determination of What Works to Prevent the problem
- Step 4. Implementation of Programs
- Step 5. Monitoring/Surveillance and Evaluation of Program/Strategy Effectiveness

Data Flow

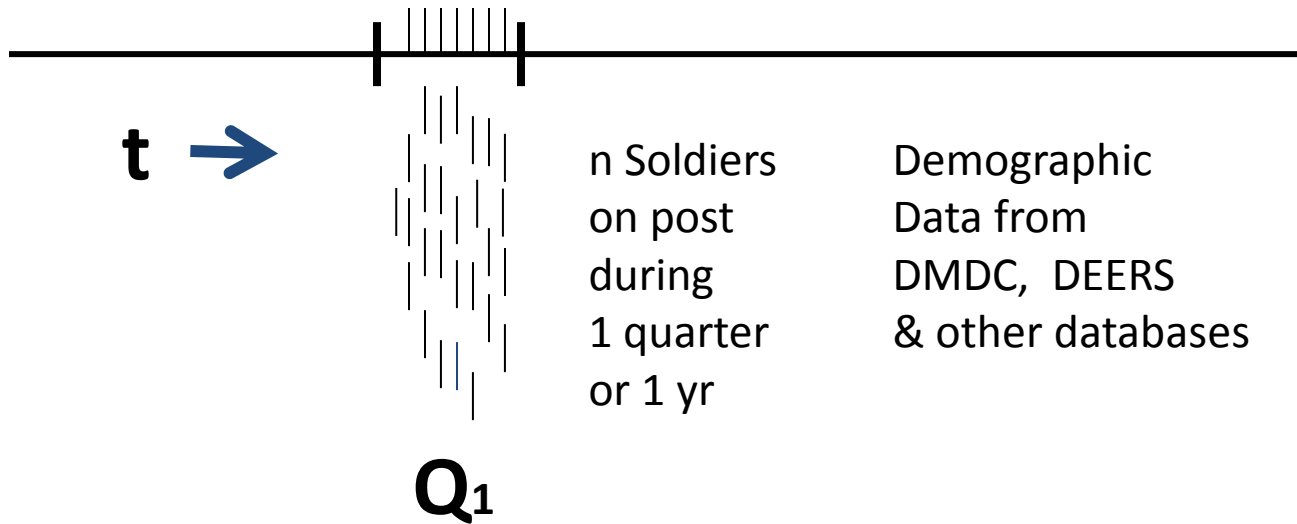


NIHL and comorbidity watch list of ICD-9-CM major diagnostic groups

<i>ICD-9-CM</i>	<i>Condition diagnosed</i>
388.10-.12	Noise Induced Hearing Loss (NIHL)
794.15	Significant Threshold Shift (STS): MHS Coding Guidelines (since January , 2005)
389.10-.11, 389.15-.18	Sensorineural Hearing Loss (SNHL)
850.0, 850.11-.12 850.2-.3, -.5, -.9, 959.01, V15.52	Mild Traumatic Brain Injury (mTBI) (MHS Coding Guidelines)
388.30-.32	Tinnitus
386.1-.2; 386.8-.9, -.19; 780.4	Dizziness
384.20-.5, -.81, -9, 385.23, 389.2	Tympanic Membrane Perforation (TMP)
784.60-.61, -.69; 787.20	Speech Language Pathologies Disorders of Interest re: Head Trauma
309.81	Post Traumatic Stress Disorder (PTSD)

Annual/Quarterly Rates: Report Design

n ICD-9 code counts
within a quarter



n Soldiers
on post
during
1 quarter
or 1 yr

Demographic
Data from
DMDC, DEERS
& other databases

$\frac{n \text{ ICD codes}}{n \text{ Soldiers on post}}$

=

$\frac{\bar{X}}{1,000 \text{ Person yrs}}$

Population estimate

US Army tympanic membrane perforations and hearing loss, by diagnosis, 2007-2010

	2007	2008	2009					2010²			
	ANN	ANN	ANN				ANN				
	ANNUAL	UAL	UAL	Q1	Q2	Q3	Q4	UAL†	Q1	Q2	Q3
	Rate ¹	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate
Tympanic membrane perforation	0.47	0.47	0.47	0.43	0.50	0.54	0.40	0.48	0.38	0.47	0.50
Sensorineural hearing loss	3.43	3.54	3.66	3.62	3.85	3.58	3.58	3.83	3.63	3.79	3.62
Mixed hearing loss	0.07	0.37	0.33	0.37	0.35	0.30	0.29	0.35	0.41	0.33	0.30
Noise-induced hearing loss	0.97	0.87	0.84	0.90	0.76	0.79	0.92	0.76	0.81	0.76	0.63
Significant threshold shift	4.34	4.62	4.32	3.73	4.43	4.71	4.42	4.78	3.89	4.37	5.23

US Army tympanic membrane perforations and hearing loss, by demographics and deployments, 2007-2010

Occupation	2007	2008
	ANNUAL	ANNUAL
	Rate ¹	Rate
<i>Infantry, Gun Crew, and Seaman</i>	16.8	17.6
<i>Electronic Equipment Repairer</i>	5.0	5.4
<i>Communications and Intelligence</i>	11.2	12.6
<i>Healthcare</i>	6.9	7.1
<i>Technical and Other Professional</i>	7.9	7.7
<i>Functional Support and Admin</i>	5.2	5.0
<i>Electrical/Mechanical Repair</i>	5.8	5.9
<i>Craftwork & Construction</i>	4.2	4.5
<i>Service, Transport & Supply</i>	9.9	10.1
<i>Students & Trainees</i>	0.5	0.8
<i>General/Flag. Off. & Executives</i>	5.1	7.1
<i>Tactical Operations Off.</i>	6.4	7.4
<i>Intelligence Off.</i>	8.0	7.5
<i>Engineering & Maintenance Off.</i>	8.8	7.5
<i>Scientists & Professional Off.</i>	7.7	8.1
<i>Healthcare Off.</i>	6.6	6.3
<i>Administrative Off.</i>	6.5	6.9
<i>Supply & Logistics Off.</i>	6.7	6.5
<i>Students, Trainees & Other Off.</i>	2.4	1.9

Sex		2007	2008
	<i>Male</i>	9.2	9.1
	<i>Female</i>	3.5	3.5
Age			
	<i><20</i>	3.7	3.5
	<i>20-24</i>	8.0	8.2
	<i>25-29</i>	9.5	8.9
	<i>30-34</i>	8.6	8.8
	<i>35-39</i>	9.0	9.0
	<i>>=40</i>	9.4	9.3
		Count	Count
	OIF-associated	5826	6312
	OEF-associated	461	510
	Not Deployment Associated	12261	11895

US Army tympanic membrane perforations and hearing loss, by location of diagnosis, 2007-2010

	2007	2008
	ANNUAL	ANNUAL
	<i>Rate</i>	<i>Rate</i>
NORTHERN		
Aberdeen Proving Ground, MD	22.9	14.4
Fort Belvoir, VA	9.1	11.4
Fort Bragg, NC	33.6	31.9
Fort Detrick, MD	5.7	9.2
Fort Dix, NJ	0.3	0.5
Fort Drum, NY	18.8	19.0
Fort Eustis, VA	28.6	9.4
Fort George G Meade, MD	7.9	13.3
Fort Knox, KY	43.6	23.4
Fort Lee, VA	10.9	7.6
Fort Meyer, VA	16.3	11.7
Fort Monmouth, NJ	13.4	6.4
Walter Reed AMC, DC	14.6	17.1
West Point USMA, NY	24.4	22.3
SOUTHERN		
Fort Benning, GA	26.6	31.8
Fort Campbell, KY	20.8	16.0
Fort Gordon, GA	8.5	9.4
Fort Hood, TX	98.4	81.2
Fort Jackson, SC	25.3	20.4
Fort McPherson, GA	10.1	8.9
Fort Polk, LA	28.5	22.5
Fort Rucker, AL	21.3	48.3
Fort Sam Houston, TX	23.6	23.0
Fort Sill, OK	24.5	16.4
Fort Stewart, GA	39.5	67.4
Redstone Arsenal, AL	13.5	7.0

WESTERN	2007	2008
Fort Bliss, TX	35.6	32.2
Fort Carson, CO	23.9	16.9
Fort Huachuca, AZ	24.9	8.6
Fort Irwin, CA	6.6	12.7
Fort Leavenworth, KS	8.9	11.6
Fort Leonard Wood, MO	23.3	25.8
Fort Lewis, WA	66.9	69.7
Fort Richardson, AK	22.6	24.2
Fort Riley, KS	36.2	38.5
Fort Wainwright, AK	14.2	17.2
PACIFIC		
Camp Carroll	15.4	2.5
Camp Casey	6.9	5.5
Camp Humphreys	5.0	4.8
Camp Long	36.2	-
Camp Stanley/Red Cloud	6.0	8.1
Japan	12.4	12.2
Schofield Barracks-Wheeler AAF	1.8	11.2
USA Hawaii	14.1	10.7
Yongsan Garrison	10.8	7.7

EUROPEAN	2007	2008
Ansbach	66.8	3.6
Baden-Wuerttemberg	16.0	12.8
Bamberg	18.2	27.2
BeNeLux	2.3	2.0
Grafenwoehr	16.0	12.6
Kaiserslautern	12.5	7.5
Schweinfurt	20.1	11.9
Stuttgart	1.6	5.8
Vicenza	70.7	16.6
Wiesbaden	15.5	11.1

Future Report

$$\frac{\text{n ICD codes}}{\text{n CPT MEPRS}} = \frac{\text{X}}{1,000} \text{ Person yrs}$$

Estimate
STS rate
of tested

Future Report

$$\frac{\text{n CPT MEPRS}}{\text{n Soldiers on post}} = \frac{\text{X}}{1,000 \text{ Person yrs}} \quad \text{Compliance rate Estimate}$$

Future Report

t →

n CPT
w ICD
n CPT
tested

U

CPT:ICD
In 90 days
n CPT
tested



f/u rate
(estimate
using tested
as denominator)

Future Report

t →

STS
ICD

U

SNHL
ICD f/u



PTS rate (estimate)
of Soldiers tested

Denominator
Soldiers tested
in garrison

Discussion

- STS rates increase after 2006
- Army MEDPROS-Hearing Readiness Module gives individual & unit accountability
- Deployment non-deployment are mixed
- ICD-9 rates reported by quarter of diagnosis
- Army-wide AD reports annually
- Recurrent quarterly reports

Conclusions

- Follow future prevalence rates for NIHI based on 2007-2009 baseline
- Reset progress based metrics for prevention effectiveness & efficacy from new baseline
- Inform MHS & VA stakeholders of NIHI prevalence in DOD active duty
- Work with HCOE to report future years' hearing loss prevention services outcome improvements

To Replicate AFHSC-IPH Surveillance Procedures Here are the Mission Essentials

- Maximum use of multidisciplinary SME analysis teams
- Think “learning communities”
- Transform actionable data into practice
- Apply Public Health process to deliver evidence based prevention