

VIReC Database & Methods Cyberseminar Series

Ascertaining Veterans' Vital Status: VA Data Sources for Mortality Ascertainment and Cause of Death

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Presented by:

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Session Objectives

- At the conclusion of the program participants will be able to:
 - Identify data sources for Veteran vital status ascertainment
 - Understand the contents and structure of the VA Vital Status Files and their appropriate use for mortality ascertainment
 - Describe the respective strengths and limitations of available VA data sources for mortality ascertainment
 - Understand the benefits of alternative sources of Veteran mortality data

Session Topics

- Data sources for Veteran vital status ascertainment
- VHA Vital Status Files
 - Structure and contents
 - Challenges in using the VHA VSF
- Date of Death Workgroup
- Alternative sources of Veteran mortality data
- Example of using mortality data for research

Poll Question #1

I am interested in VA data primarily due to my role as:

- a. Research investigator
- b. Data manager
- c. Project coordinator
- d. Program specialist or analyst
- e. Other (specify)

Poll Question #2

How would you rate your knowledge of methods to ascertain death dates for Veterans in the VA?

- a. 1 (No knowledge)
- b. 2
- c. 3
- d. 4
- e. 5 (Expert)

Session Topics

- **Data sources for Veteran vital status ascertainment**
 - **Included in VHA Vital Status Files**
 - **Other sources**
- VHA Vital Status Files
 - Structure and contents
 - Challenges in using the VHA VSF
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- Alternative sources of Veteran mortality data
- Example using mortality data for research

BIRLS Death File

- Veterans Benefits Administration (VBA) Beneficiary Identification and Records Locator System (BIRLS) database extract
- Information sources:
 - Family
 - VHA hospitals
 - VA National Cemetery Administration
 - Social Security Administration (SSA)
- Coverage: Veterans known to VA
- Updates: Monthly (complete overlay)
- Location: Austin Information Technology Center (AITC) and on VINCI

VA/CMS Medicare Vital Status File

- Received from Centers for Medicare & Medicaid Services (CMS) annually
- Information sources:
 - SSA
 - Medicare claims
 - Other (e.g., family)
- Coverage: Veterans enrolled in Medicare (≥ 65 years old or disabled)
- Updates: Annual (deaths through January 2014)
- Location: Available from VIREC

SSA Death Master File

- Information sources:
 - Multiple, including family members, funeral directors, post offices, financial institutions, other federal agencies, state vital records agencies
- Coverage:
 - Individuals with SSN (first issued 1936)
 - Includes deaths occurring outside United States
 - More complete for over 65 population and for beneficiaries^{1,2}
- Updates:
 - Weekly (and VA receives annual overlay)
- Location: AITC

Patient Treatment File

- Information source: VistA PTF File (#45), Date of Disposition (DISDAY) and Type of Disposition (DISTYPE) fields
- Coverage: Inpatient deaths
 - VA hospitals
 - Non-VA when covered by VA (Fee Basis)
- Updates: Weekly
- Location: AITC (MedSAS); CDW

National Cemetery Administration

- Information sources:
 - Multiple, including families
- Coverage:
 - Veterans who applied for burial benefits
- Updates:
 - Monthly
- Incorporated into Master Veteran Index (MVI)³
 - Daily updates to MVI
- Not included in VHA VSF yet

Other Sources not in VHA VSF

- Corporate Data Warehouse (CDW)
- National Death Index (NDI)
- SSA Epidemiological Search

CDW

- SPatient.SPatient Table
 - Columns:
 - DateofDeath
 - Date of death in SQL date format if complete and valid date in DateofDeathText
 - DateOfDeathText
 - Deceased (created by CDW)
 - Flag set to 'Y' if there is information in the DateOfDeathText column and 'N' if DateOfDeathText column is empty.

CDW Update

- DeathDate
 - [DeathDateTransformSID](#)
 - [DeathVistaErrorDate](#)
- DeathEnteredByStaffIEN
 - [DeathEnteredByStaffSID](#)
- DeathLastUpdatedByStaffIEN
 - [DeathLastUpdatedByStaffSID](#)
- DeathNotificationSource
- DeathUpdatedDate
 - [DeathUpdatedDateTransformSID](#)
 - [DeathUpdatedVistaErrorDate](#)
- Deceased

CDW Limitations

- Current policy: Information to be entered from “official sources” only
 - VHA facility (if patient died in the VHA facility or while under VA auspices)
 - Death certificate
 - National Cemetery Administration
 - VHA Directive 1906
- CDW Date of Death Analysis and Vital Status File Comparison
 - Data Quality Analysis

National Death Index

- Gold standard for death ascertainment
- Available from the National Center for Health Statistics
 - Source of data : State Vital Statistics Offices
 - Records from 1979 through 2013
 - ~12 month lag
- Contains cause of death from death certificates
- Information about fees & access
 - <http://www.cdc.gov/nchs/ndi.htm>
- Suicide Data Repository from the VHA Office of Public Health

SSA Epidemiological Search

- Provides date of death
- Validates SSN
- Provides 'presumed living' status
 - Based on SSA administrative data including:
 - Payroll deductions, railroad retirement or disability payments, death claims filed by beneficiaries⁴
- Advantage: Reduces loss to follow up
- Deaths occurring outside the US
- Fees & Access
 - <http://www.ssa.gov/policy/about/epidemiology.html>

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- **VHA Vital Status Files**
 - **Structure and contents**
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Poll Question #3

Have you ever used the VHA VSF?

- a. Yes, both the Master File and Mini File
- b. Yes, only the Mini File
- c. Yes, only the Master File
- d. No

VHA VSF Background

- Single sources are incomplete
- Using the National Death Index as the gold standard^{5,6}

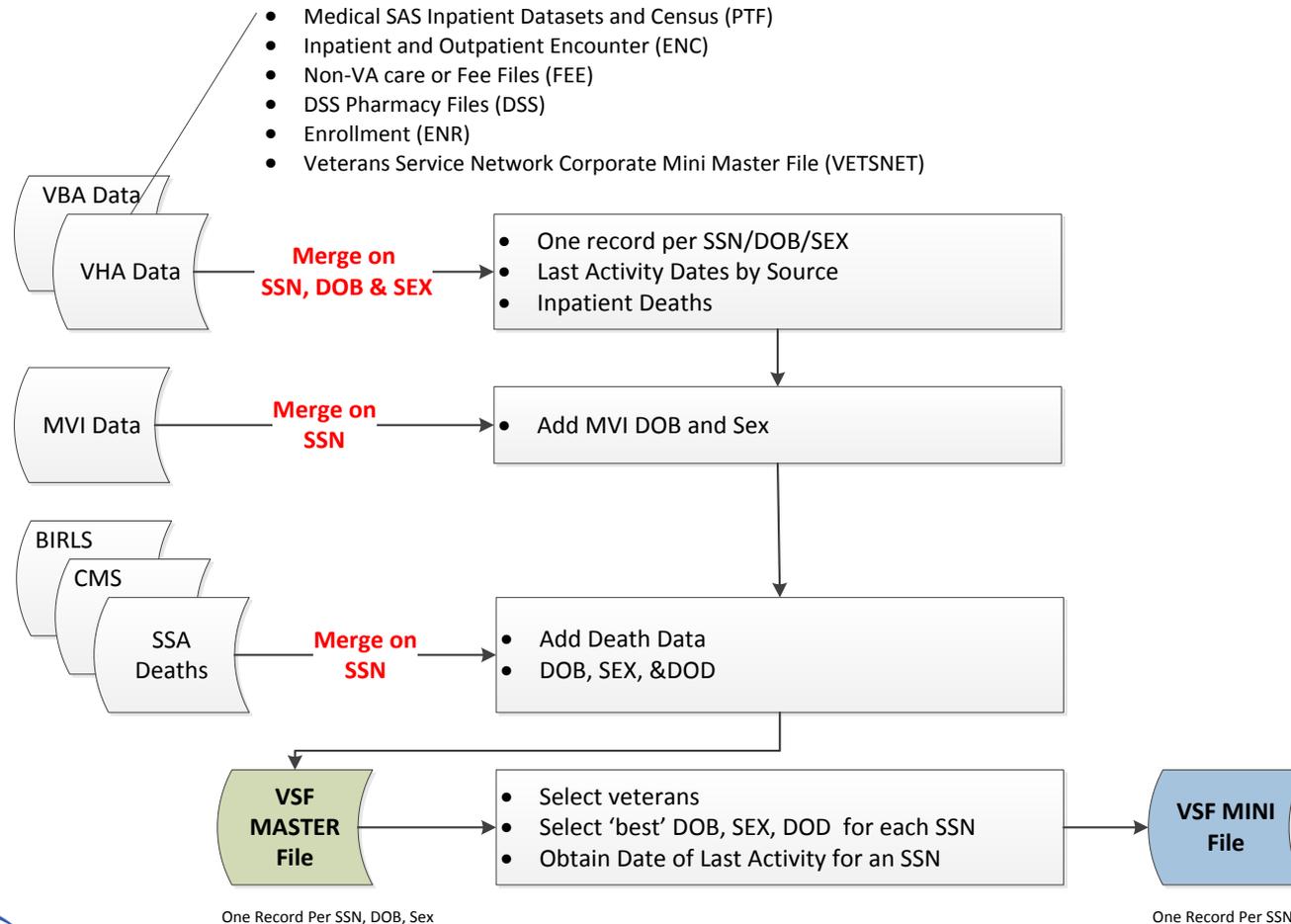
DOD Source	Sensitivity
BIRLS	64-80%
VA/CMS Medicare	83%
SSA	89-95%
PTF	5-12%

- Combined Sources provide 97.5%-98.3% sensitivity
- VIREC VA-NDI Mortality Data Merge Project^{6,7}

VHA VSF Creation

- Owner
 - Built by National Data Systems (NDS)
 - First available in October 2006
- Data access information
 - See [VHA Data Portal website](#)
- Updated quarterly
- Veterans known to VA
 - VHA activity FY 1992 or later
 - VBA compensation and pension
- Two files + conversion file
 - Master, Mini, scrambled/real SSN

Construction of VHA VSF



Construction of VHA VSF (cont.)

- More detail on construction
 - *Ascertaining Veterans' Vital Status and Dates of Death: The VHA Vital Status File and Other Data Sources for Mortality Ascertainment in VA* by Elizabeth Tarlov, PhD.
 - Seminar date: 7/14/2014
 - http://www.hsrd.research.va.gov/for_researchers/cyber_seminars/archives/video_archive.cfm?SessionID=857
 - NCA date of death is not yet used (MVI Primary View)

Vital Status Files (April 20, 2015)

Master

- Veterans and non-veterans
- One record per SSN/DOB/Sex combination
- 124 variables
- 26,331,067 records
- 18,272,441 SSNs
- 7,138,962 SSNs have more than one record (39% of SSNs)

Mini

- Veterans
- One record per SSN
- Combined data from multiple Master records
- 16 variables
- 16,181,788 records (SSNs)

Best DOB and DOD on VSF Mini

Best Birth Date Data Source

BIRLS DEATH FILE	1,703
MEDICARE DATA	502,713
DECISION SUPPORT SYSTEM	14,374
OUTPT/INPAT ENCOUNTER	554,047
ENROLLMENT SYSTEM	162,832
FEE BASIS	8,115
MVI	14,486,083
PATIENT TREATMENT FILE	174,512
SOCIAL SECURITY DEATH FILE	30,440
VBA	246,969
Total	16,181,788

Best Death Date Data Source

No Death Date	10,413,372
BIRLS DEATH FILE	146,100
MEDICARE DATA	3,471,552
FEE BASIS	89,078
PATIENT TREATMENT FILE	737,186
SOCIAL SECURITY DEATH FILE	1,324,500
Total	16,181,788

VHA VSF Mini on April 20, 2015

Potential Challenges when using the VHA VSF

- Demographics do not match
- Multiple dates of death
- Activity after date of death
- Erroneously recorded dates of death in sources
- Note: VHA VSF should not be used for business operations regarding individual veterans

Matching a Cohort to VHA VSF

- Decisions
 - Use Mini File?
 - Use Master File?
 - Match on SSN + DOB + Sex?
 - All must match?
 - Partial match (e.g., just year and sex)?

Possible Strategy

- Use the Mini File for the initial search for deaths
 - Match on SSN
- Use the Master File to investigate unusual cases, for example:
 - Cohort DOB/Sex do not match Mini DOB/Sex
 - May be records on the Master File with matching demographics
- Activity after death
 - Check DOB/Sex for DOD sources on Master File
 - Are all DOD on Master File the same?

Possible Strategy (cont.)

- Consider additional supplementary data sources
 - Use the NDI or State Vital Statistics Offices for cases lost to follow up, i.e.,
 - No death date
 - No VHA or VBA activity after end of follow up
- CDW for individuals without activity after 1991 or very recent deaths

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- **Date of Death Workgroup**
- Alternative sources of Veteran mortality data
- Example using mortality data for research

Date of Death Workgroup

- Headed by Tony Guagliardo, Executive Officer, Member Services, Chief Business Office (CBO)
- Purpose: improve VHA maintenance of accurate dates of death for enrollment and eligibility and healthcare purposes
- Participating: CBO, Health Eligibility Center (HEC), National Data Systems (NDS), Data Quality (DQ) and Identity Management (IdM)
- Develop processes and procedures to improve accuracy and completeness of date of death
- Pilot and implement use of EVVE

Date of Death Workgroup (cont.)

- EVVE – Electronic Verification of Vital Events
 - NAPHSIS
 - National Association for Public Health Statistics and Information Systems
 - Online query system of state vital statistics data bases
 - Death Certificates
 - Birth Certificates

Date of Death Workgroup

- Analyses (DQ, IdM, and HEC)
 - Individuals in the CDW without a date of death in the CDW
 - 2.7 million had a date of death in another source (SSA Death Master File, BIRLS, NCA, Department of Defense, etc.)
 - Activity after death
 - Most individuals had only one event after death
 - Research into individual cases found few individuals where the activity after death indicated individual was living
 - Individuals with many events need careful research

Claire Hoffmire, PhD

Session Topics

- Data sources for Veteran vital status ascertainment
- VHA Vital Status Files
- Date of Death Workgroup
- Where to go for more help
- **Alternative sources of Veteran mortality data**
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Poll Question #4

Have you ever used Non-VHA Mortality data on Veterans (e.g. NDI)?

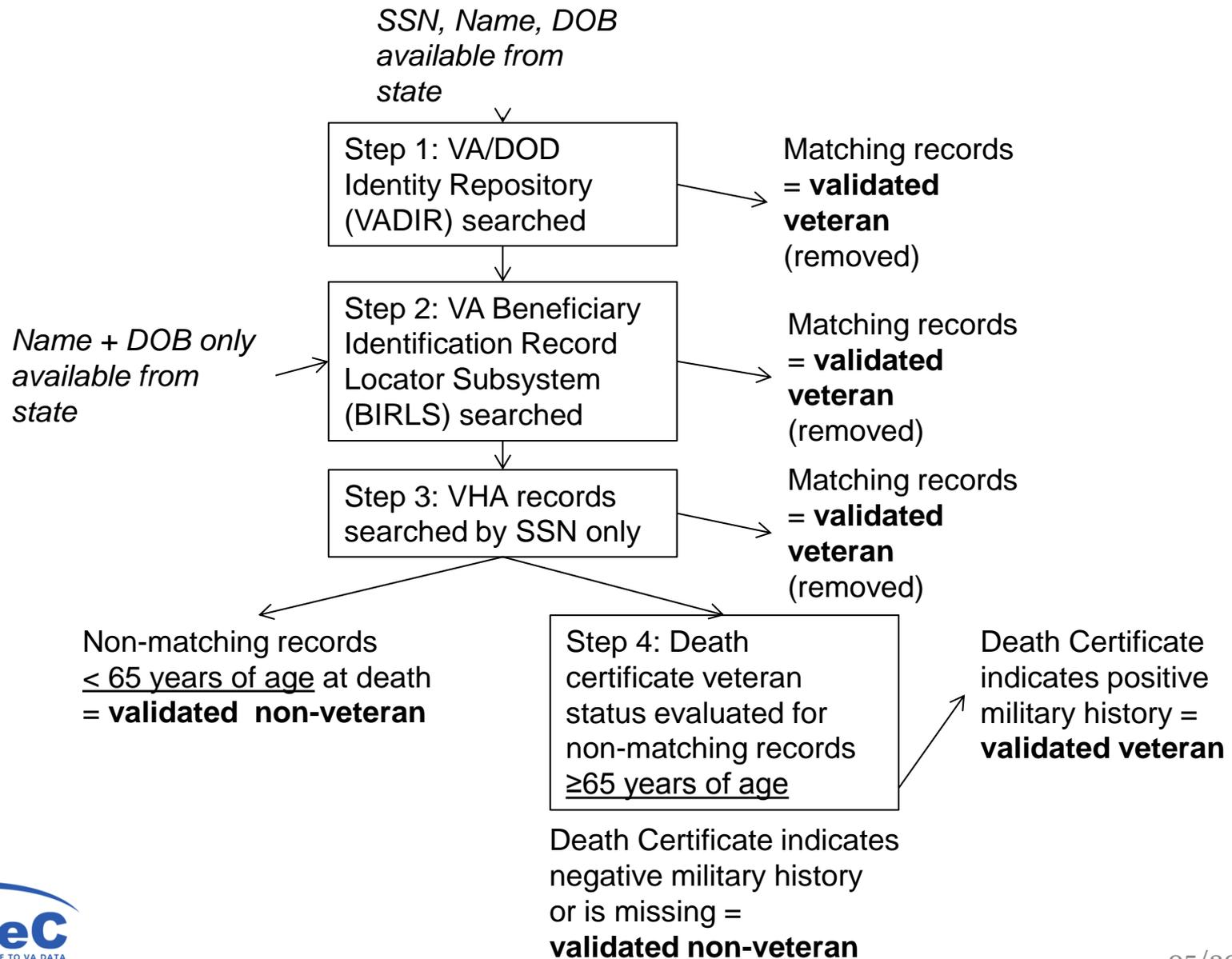
- a. Yes – specifically NDI data
- b. Yes – other (e.g. NVDRS, study-specific)
- c. No

Benefits of Additional Mortality Information

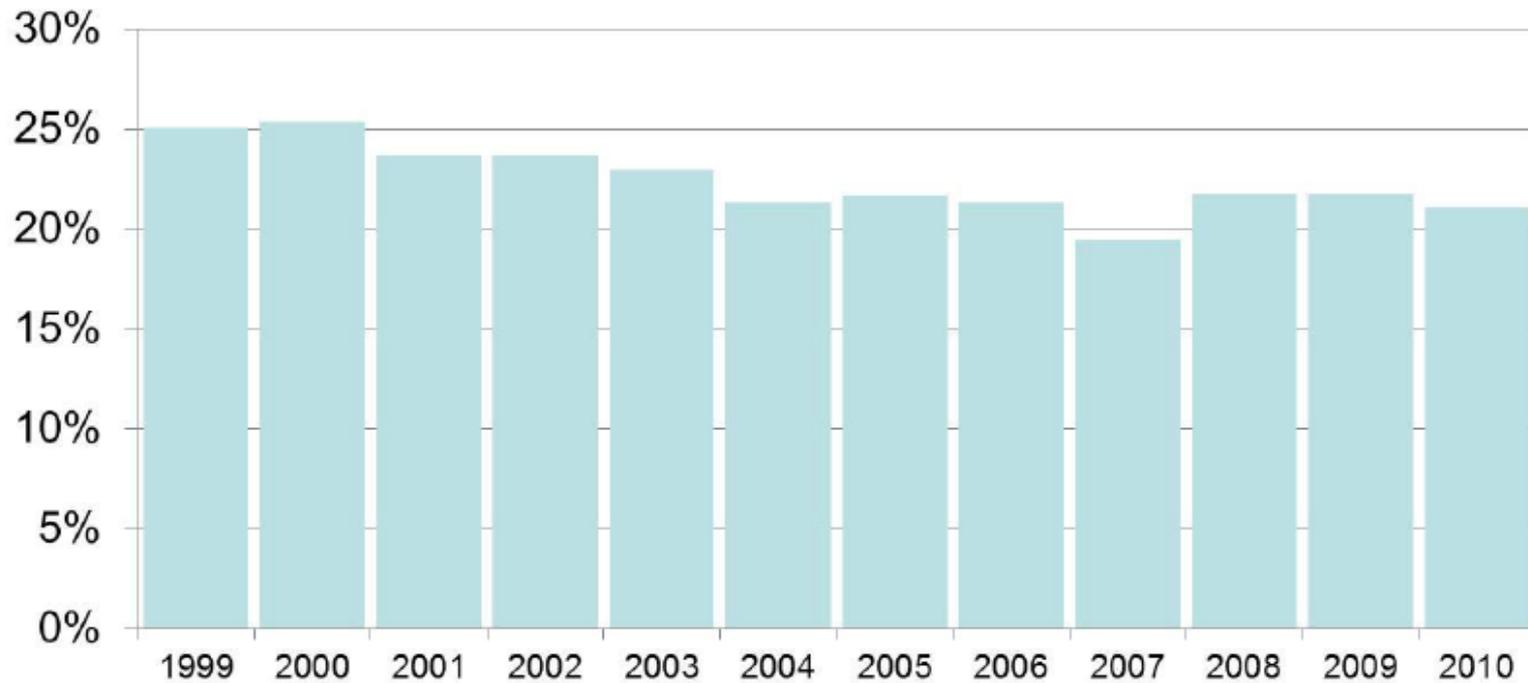
- Findings derived from information on VHA Veterans alone are unlikely to be broadly generalizable to all Veterans
 - >70% of the 22 million living U.S. Veterans in 2012 not enrolled/using VHA service
- Relative to the Vital Status File, additional data sources allow VA researchers to:
 - Study the whole/general Veteran population
 - Compare Veterans who use VHA services prior to death to those who do not
 - Compare Veteran and non-Veteran decedents
Compare Veterans decedents by cause of death (SDR)

Alternative VA Mortality Sources

- **Office of Public Health State Mortality Database**
 - **PI: Robert Bossarte, PhD**
 - A State-VA Collaborative Project
 - In 2010 VA Secretary Shinseki requested collaboration and support from all U.S states
 - Data on all known suicides reported from 1999 through 2015
 - Data Requested from state death certificates for all adult suicides
 - SSN, Name, DOB, DOD, Age, Sex, Race/ethnicity, Marital status, Education, Cause of death, State & County of residence and death, Veteran Status, Industry, occupation
 - Includes Veterans (not only VHA users) & non-Veterans
 - Validation of Veteran status for all decedents



Percentage of all suicides identified as Veterans in the State Mortality Database



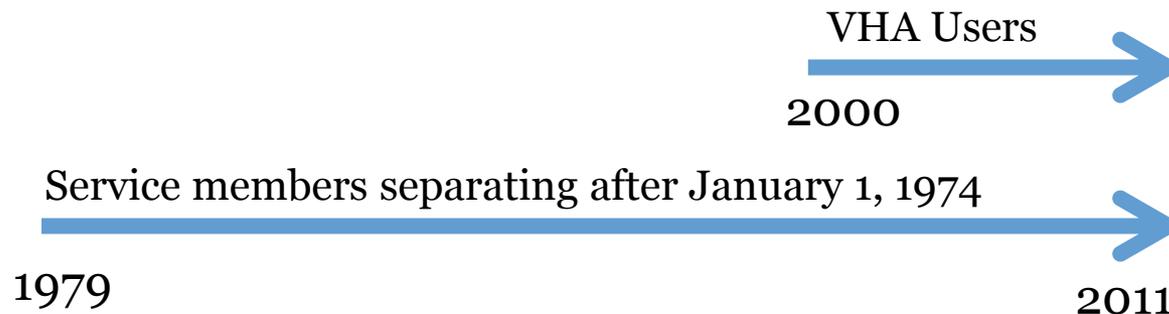
Veteran Status Missing from Death Certificate – Maine, North Carolina, Massachusetts, West Virginia, Oklahoma (1999-2003), Nebraska (1999-2004), Minnesota (2010)

Alternative VA Mortality Sources, cont.

- VA/DOD Joint Suicide Data Repository (SDR)
 - VA/DOD Board of Governance
 - DoD and VA Co-Chairs (Ms. Jacki Garrick, Director of the Defense Suicide Prevention Office (DSPO) and Dr. Caitlin Thompson, Deputy Director, VA Suicide Prevention Program)
 - Co-Coordinator (Mr. Chris Dorr (DSPO) and Dr. Robert Bossarte).
 - VA & DOD Investigators request access through BOG application process
 - *See archived VIREC presentation 2/17/15*

SDR Search Criteria

- CDC's National Death Index Plus which contains approximately 2.5 million records (1979-2011)
 - Date and cause of death (ICD-10 codes)
 - Veteran decedents only, all causes of death
 - Current mortality archive:
 - Service members who separated from active duty service (including deactivation NG & Reserve) between 1979-2011.
 - All users of VHA services, FY2000-2011



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Background: Suicide among Veterans

- Suicide is an important public health problem
 - 10th leading cause of death in the U.S.
- Members of the Armed Forces and Veterans are among 11 high-risk populations named by the National Action Alliance for Suicide Prevention
- Further research is needed to better understand increased suicide risk among Veterans
 - For VHA veterans 42% to 66% increase between 2000 and 2007 in relative risk of suicide compared with the general U.S. population observed

Changes in Suicide Mortality for Veterans Relative to Nonveterans by Gender and History of VHA Service Utilization, 2000-2010

- A more complete picture of the absolute and relative risk of suicide within meaningful Veteran subgroups is necessary to appropriately target and evaluate treatment and prevention programs, allocate suicide prevention resources, and track changes in suicide rates over time.
 - Key subgroups of interest defined by Gender & VHA service utilization prior to death
 - Findings from VHA Veterans may not generalize to all Veterans
 - Findings derived from all Veterans or male Veterans are unlikely to be generalizable to women Veterans who constitute the fast growing subgroup of Veterans.

State Mortality Database: 23 state sample, 2000-2010

- 173,969 suicide decedents
 - 25% Veterans
 - 5% were VHA-utilizing Veterans
- 4 Northeastern states: New Jersey, New York, Pennsylvania, Rhode Island
- 5 Midwestern states: Iowa, Kansas, Michigan, Minnesota, Nebraska
- 8 Southern states: Alabama, Arkansas, Florida, Louisiana, North Carolina, Tennessee, Texas, West Virginia
- 6 Western states: Alaska, Idaho, Montana, Oregon, Utah, Washington
- Suicide rates for these 23 states were similar to the nation
 - Rang: 8.0 to 23.1 per 100,000
 - 10 at or below, and 13 above the 2010 national average (12.4)

Methods: Standardized Mortality Ratios

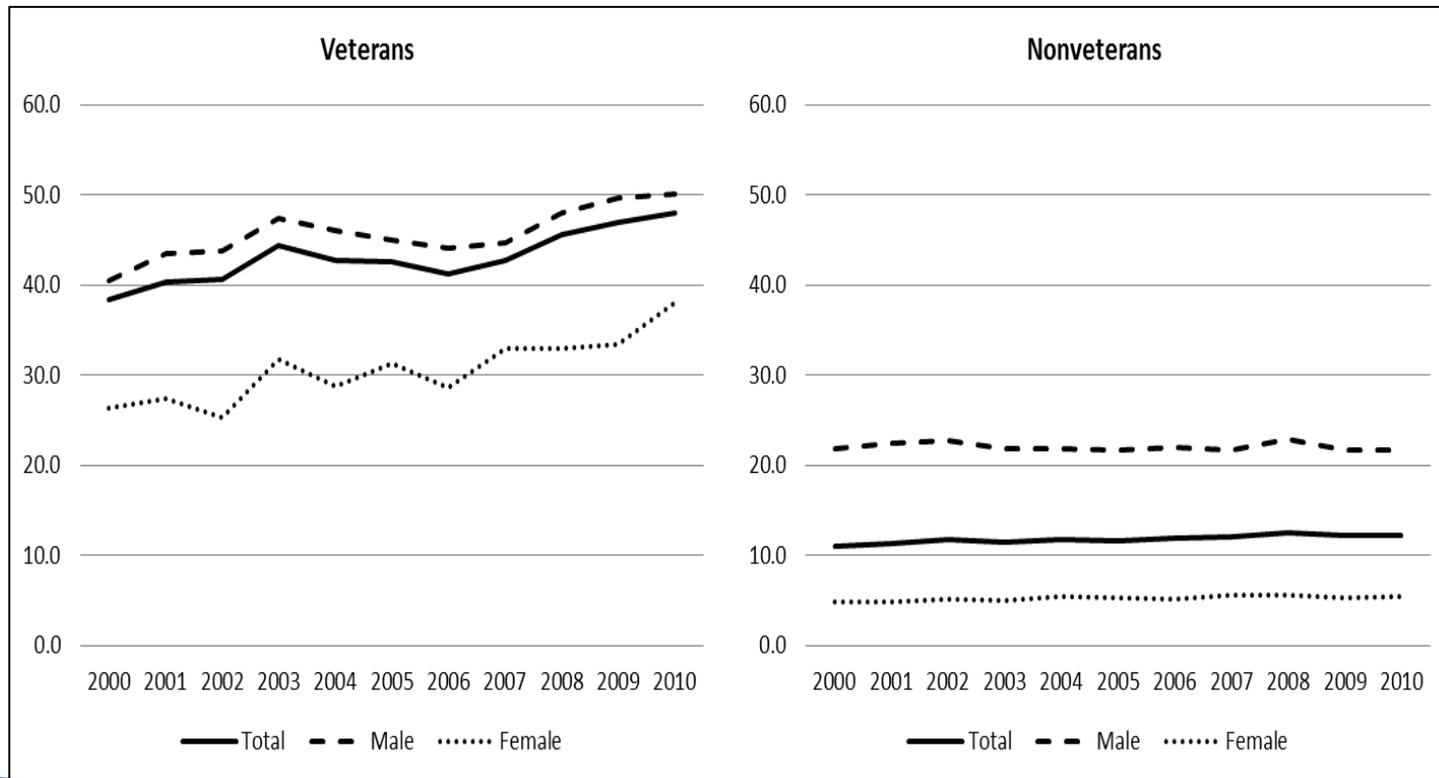
- Indirect method to estimate adjusted rate ratios for two populations
 - $SMR = \text{Observed Deaths} / \text{Expected Deaths}$
 - Expected deaths computed based on mortality rate in the standard/comparison population and the size of the study population
 - In this study we computed SMRs that were:
 - Age- & gender-adjusted
 - Gender stratified, age-adjusted
 - Age categories used for adjustment:
 - 18-29, 30-39-, 40-49, 50-59, 60-69, 70-79, 80+
- SMR Strengths
 - Better for 'sparse' data as the more stable standard population rates are used rather than study population rates
- SMR Limitations
 - Caution must be used when comparing SMRs for different groups
 - SMR may over or under estimate the true rate ratio of interest

Crude Veteran and Nonveteran Suicide Rates per 100,000 Lives at Risk: 2000-2010

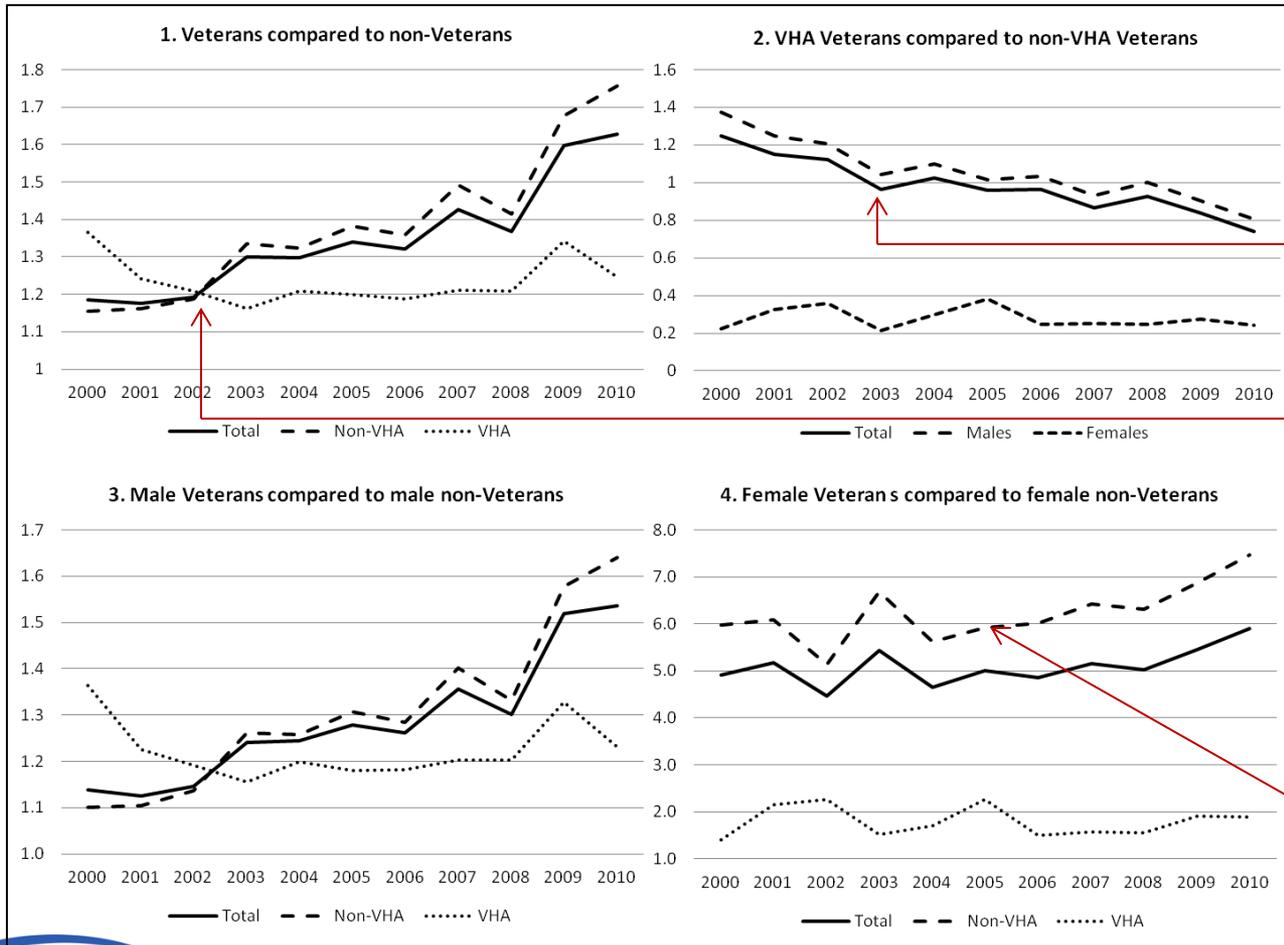
	Year	Nonveterans			Veterans				
		Total	Male	Female	Total	Male	Female	VHA	Non-VHA
12% Increase Males: 6% Females: 13%	2000	11.1	20.1	4.8	28.6	28.8	24.7	34.5	27.6
	2001	11.4	20.5	4.9	29.4	29.6	26.4	32.4	28.8
	2002	11.8	21.0	5.1	30.1	30.5	24.3	32.1	29.6
	2003	11.5	20.4	5.0	31.3	31.4	29.3	29.2	31.8
	2004	11.8	20.5	5.4	30.8	31.1	26.6	30.1	31.0
	2005	11.8	20.4	5.3	31.8	32.0	28.5	29.9	32.3
	2006	11.9	20.9	5.2	31.5	31.9	26.9	29.8	32.0
	2007	12.2	21.0	5.5	33.1	33.2	30.7	28.8	34.3
	2008	12.7	22.0	5.6	33.9	34.2	30.4	30.9	34.8
	2009	12.3	21.4	5.3	35.7	36.0	31.7	30.1	37.4
	2010	12.4	21.4	5.4	35.9	36.0	34.6	27.6	38.7

25% Increase
Males: 25%
Females: 40%

Direct Age-Adjusted Veteran and Nonveteran Suicide Rates per 100,000 Lives at Risk: 2000-2010



Standardized Veteran Suicide Mortality Ratios: 2000 to 2010



VHA Veterans fare better than non-VHA Veterans since 2003

Overall decline among VHA Veterans relative to increase among non-VHA

Greatest excess risk among female Veterans, especially those outside VHA care system



All lines in panel 1 and the total line in panel 2 are age- and gender-standardized. All other SMRs are gender-stratified and age-standardized.

Summary of Findings

- The number of observed veteran suicides was significantly higher than expected had age- and gender-specific suicide rates been the same as those observed for nonveterans:
 - 20% higher in 2000 increasing to 60% higher in 2010
 - Increases in crude and relative rates for Veterans more pronounced among females
- Since 2003, SMRs for VHA Veterans: non-VHA Veterans < 1
 - The observed number of suicides for VHA veterans was less than expected had their age- and gender-specific rates been the same as those for non-VHA veterans
 - In 2010 SMR=0.74, 95% CI=0.69-0.79.
- The decline in relative risk among VHA veterans was primarily observed for males.
 - No clear period(s) of change emerged for female VHA veterans who experienced approximately 80% fewer suicides than expected compared to female veterans outside the VHA system

Implications & Next Steps

- Study findings suggest that veterans without history of VHA service use are at particularly high risk for suicide. Research to better understand suicide risk among this group and whether characteristics related to VHA service eligibility and use are related to suicide risk is warranted.
- VA Mental Health Enhancement Initiative beginning in 2005 and the VA's Suicide Prevention Program launched in 2007 may have curbed suicide rates for VHA users despite continued increases among veterans outside the VHA system.

Authors (Psychiatric Services, May 2015)

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 - Associate Director & Chief of Education
 - VISN2 COE for Suicide Prevention
- Robert Bossarte, PhD
 - Director, Epidemiology Program
 - VA Office of Public Health

Questions?

For more information, contact the VIREC HelpDesk at virec@va.gov.

Additional resources in “bonus slide” section.

Additional Resources (bonus slides)

Resources

- Data Quality
 - Email: VHA10P2OIADQA@va.gov
- National Data Systems
 - Dorothea Garrett (Dorothea.Garrett@va.gov)
- VIREC Website Resources
 - <http://vaww.virec.research.va.gov> (VA Intranet only)
 - Information on VA data sources and how to access data
 - Documentation on some VA datasets

Resources, cont'd

- HSRData Listserv
 - Join at the VIREC Web site
 - Discussion among >850 data stewards, managers, and users
 - Past messages in archive (on intranet)
- VIREC Help Desk
 - VIREC staff will answer your question and/or direct you to available resources on topics
 - VIREC@va.gov
 - (708) 202-2413

Resources, cont'd

- Recently published:
<http://ps.psychiatryonline.org/doi/10.1176/appi.ps.201400031>
- Suicide Data Repository
 - Additional information (VIReC archives)
 - An Overview of VA/DoD Joint Mortality Data Repository and Data From Studies Conducted by the Epidemiology Program in V!'s Office of Public Health
 - http://www.hsrdr.research.va.gov/for_researchers/cyber_seminars/archives/video_archive.cfm?SessionID=931
 - Contacts:
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8. Hoffmire C, Kemp J, Bossarte R. Changes in Suicide Mortality for Veterans Relative to Non Veterans by Gender and History of VHA Service Utilization, 2000-2010. *Psychiatric Services* 2015; 00:1-7; doi: 10.1176/appi.ps.201400031