Database & Methods Cyberseminar Series

Ascertaining Veterans' Vital Status:

VA Data Sources for Mortality Ascertainment and Cause of Death

VIReC
RESEARCHERS' GUIDE TO VA DATA

The objectives of this cyberseminar are to:

- Identify data sources for Veteran vital status ascertainment

- Understand the contents and structure of the VA Vital Status Files, Spatient, and their appropriate use for mortality ascertainment

- Describe the respective strengths and limitations of available VA data sources for mortality ascertainment

- Identify other relevant sources of death data including the National Death Index and state death certificates

- Demonstrate how these data resources can be used in research studies

Session roadmap

- Data sources for Veteran vital status ascertainment

- VHA Vital Status Files

- Date of Death Project (Spatient)

- Data sources for Veteran & Non-Veteran mortality

- Other resources for mortality data

- Examples of using mortality data for research

Poll Question #1

What is your role in research and/or quality improvement?

- Investigator, PI, Co-I

- Data manager, analyst, or programmer

- Project coordinator

- Other – please describe via the Q&A function

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 roadmap

- **Data sources for Veteran vital status ascertainment**
  - Sources in VHA Vital Status Files
  - Sources not in VHA Vital Status Files

- VHA Vital Status Files

- Date of Death Project

- Data sources for Veteran & Non-Veteran mortality

- Other resources for mortality data

- Examples of using mortality data for research

BIRLS Death File

Received from	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
Update Schedule	Monthly (complete overlay)
Location	Austin Information Technology Center (AITC) and on VINCI

✅ **Available in the VSF**

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)
Update Schedule	Annual (deaths through October 2018)
Location	Available from VIReC

✅ **Available in the VSF**

SSA Death Master File

Received from	Social Security Administration (SSA)
Information Sources	Family, 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
Update Schedule	Weekly (and VA receives annual overlay)
Location	AITC

✔ **Available in the VSF**

Medical SAS Inpatient File

Received from	Austin Information Technology Center (AITC)
Information Sources	VistA PTF File (#45), Date of Disposition (DISDAY), and Type of Disposition (DISTYPE) fields
Coverage	Inpatient deaths in VA facilities Inpatient deaths in non-VA hospitals
Update Schedule	Weekly
Location	AITC (MedSAS) and Corporate Data Warehouse (CDW)

✅ **Available in the VSF**

Corporate Data Warehouse (CDW)

Received from	Corporate Data Warehouse (CDW)
Information Sources	VISTA
Coverage	Deaths verified by official source including VHA facilities, death certificates, and National Cemetery Administration (NCA)
Update Schedule	Daily
Location	[CDW Patient 3.0]

✖ Not Available in the VSF

CDW

SPatient.SPatient Table

Columns were updated in 2017 Patient release

Columns
DeathDateTime *DeathVistaErrorDate and DeathDateTransformSID* *Death date may contain defaulted month and day*
DeceasedFlag (created by CDW) *Flag set to 'Y' if there is information in the DeathDateTime column that can be converted to a date and 'N' otherwise. There are a small number of records with invalid values in the death date time that have an 'N' in this column, previously the Deceased column contained a 'Y' for these records.*

CDW

New Fields

Fields
DeathDocumentationType
DeathEnteredByStaffSID
DeathLastUpdatedByStaffSID
DeathModifiedDateTime
DeathModifiedDateTimeTransformSID
DeathModifiedVistaErrorDate
DeathNotificationSource

CDW Limitations

Current policy: Information to be entered from "<u>official sources</u>" only

- **VHA Directive 1906**
  - *VHA facility* (if patient died in the VHA facility or while under VA auspices)
  - *Death certificate*
  - *National Cemetery Administration*
- **38 CFR 3.211 – Death**
- **EVVE Certification**

CDW Date of Death Analysis and Vital Status File Comparison

Session roadmap

- Data sources for Veteran vital status ascertainment

- **VHA Vital Status Files**

  - Structure and contents
  - Challenges in using the VHA VSF

- Date of Death Project

- Data sources for Veteran & Non-Veteran mortality

- Other resources for mortality data

- Examples of using mortality data for research

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
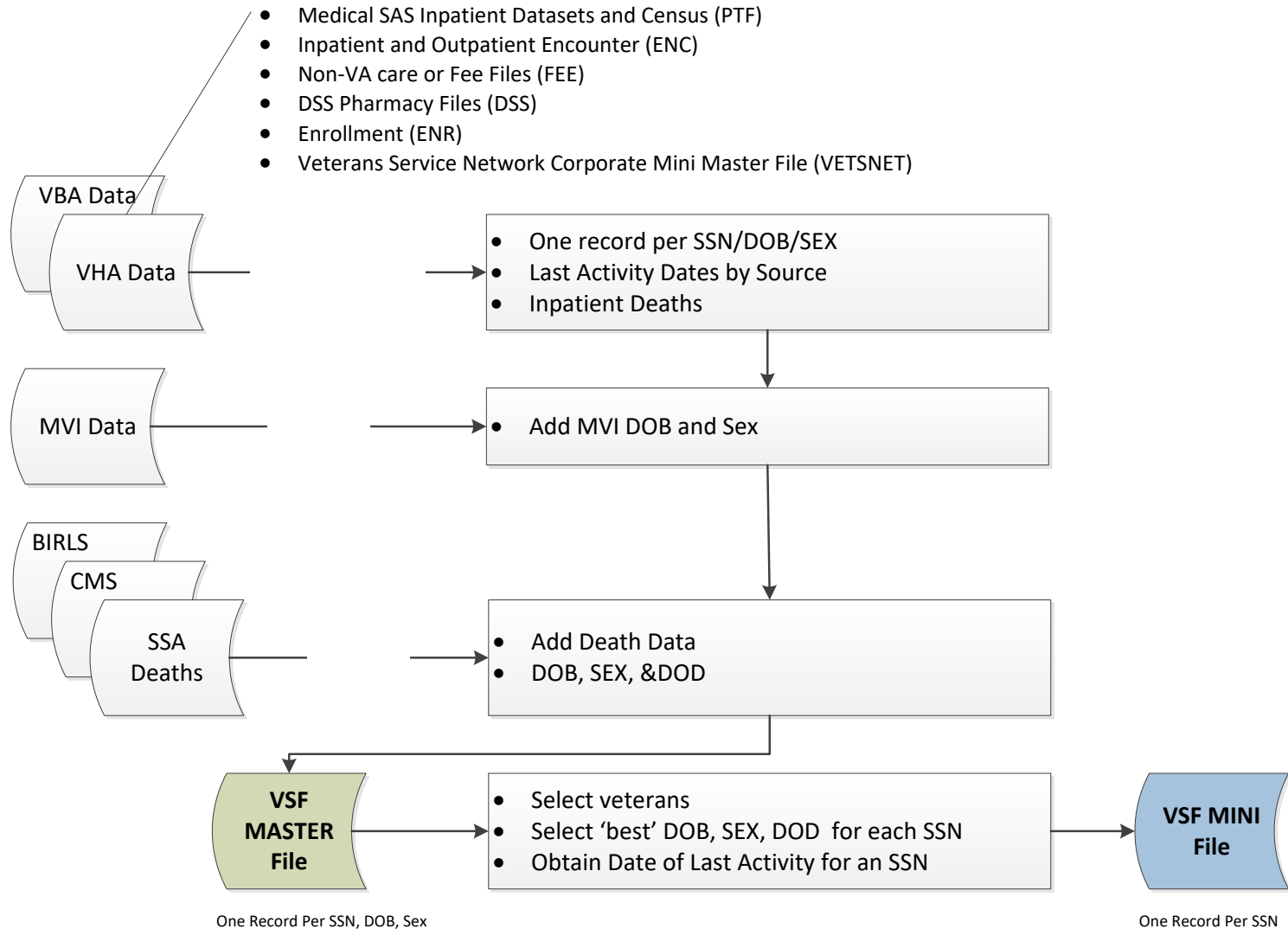- Using the National Death Index as the gold standard:

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

VHA VSF Creation

Owner	Built by National Data Systems (NDS) First available in October 2006
Data Access	See VHA Data Portal website: http://vaww.vhadataportal.med.va.gov/Home.aspx (Intranet only)

Coverage	Veterans known to VA
	   VHA activity FY 1992 or later
	   VBA compensation and pension

Update Schedule	Updated quarterly
Files	Two files + conversion file: Master, Mini, scrambled/real SSN

Construction of VHA VSF

- Medical SAS Inpatient Datasets and Census (PTF)
- Inpatient and Outpatient Encounter (ENC)
- Non-VA care or Fee Files (FEE)
- DSS Pharmacy Files (DSS)
- Enrollment (ENR)
- Veterans Service Network Corporate Mini Master File (VETSNET)

VBA Data

VHA Data

- One record per SSN/DOB/SEX
- Last Activity Dates by Source
- Inpatient Deaths

MVI Data

- Add MVI DOB and Sex

BIRLS

CMS

SSA Deaths

- Add Death Data
- DOB, SEX, &DOD

VSF MASTER File

- Select veterans
- Select 'best' DOB, SEX, DOD for each SSN
- Obtain Date of Last Activity for an SSN

VSF MINI File

One Record Per SSN, DOB, Sex

One Record Per SSN

More detail on VHA VSF Construction

Ascertaining Veterans' Vital Status: VA Data Sources for Mortality Ascertainment & Cause of Death
Noreen Arnold, MS & Claire Hoffmire, PhD
5/4/2015
http://www.hsrd.research.va.gov/for_researchers/cyber_seminars/archives/video_archive.cfm?SessionID=982

Ascertaining Veterans' Vital Status and Dates of Death: The VHA Vital Status File and Other Data Sources for Mortality Ascertainment in VA
Elizabeth Tarlov, PhD
7/14/2014
http://www.hsrd.research.va.gov/for_researchers/cyber_seminars/archives/video_archive.cfm?SessionID=857

Vital Status Files

January 8, 2019

Master	**Mini** *Combined data from multiple Master records*
Veterans & Non-Veterans	Veterans only
1 record per SSN/DOB/Sex combination	1 record per SSN
125 variables	16 variables
31,265,546 records	19,168,889 records
21,696,734 SSNs	19,168,889 SSNs
39% of SSNs have >1 record (8,514,506)	

Vital Status Mini Contents

1/8/2019
n = 19,168,889

Variable	Label
ACT_LAST_DT	LAST HEALTHCARE OR BENEFIT ACTIVITY DATE
ACT_LAST_DT_IND	LAST HEALTHCARE OR BENEFIT ACTIVITY DATE INDICATOR
ACT_LAST_DT_SRC	LAST HEALTHCARE OR BENEFIT ACTIVITY DATE SOURCE
DOB	BEST DATE OF BIRTH
DOB_IND	BEST DATE OF BIRTH INDICATOR
DOB_SRC	DATA SOURCE BEST DATE OF BIRTH
DOD	BEST DATE OF DEATH
DOD_IND	BEST DATE OF DEATH INDICATOR
DOD_SRC	DATA SOURCE BEST DATE OF DEATH
LIVING_IND	PRESUMED LIVING INDICATOR
SCRSSN	SCRAMBLED SOCIAL SECURITY NUMBER
SEX	BEST GENDER
USE_AFTER_DTH_FLG	UTL_LAST_DT IS GT DOD +31 DAYS (0=NO 1=YES)
UTL_LAST_DT	LAST HEALTHCARE UTILIZATION DATE
UTL_LAST_DT_IND	LAST HEALTHCARE UTILIZATION DATE INDICATOR
UTL_LAST_DT_SRC	LAST HEALTHCARE UTILIZATION DATE SOURCE

Best DOB and DOD Sources on VSF Mini

VHA VSF Mini on January 8, 2019

Best Birth Date Data Source	
BIRLS DEATH FILE	1,194
MEDICARE DATA	500,294
DECISION SUPPORT SYSTEM	10,906
OUTPT/INPAT ENCOUNTER	1,742,011
ENROLLMENT SYSTEM	99,263
FEE BASIS	6,780
MVI	16,413,512
PATIENT TREATMENT FILE	130,297
SOCIAL SECURITY DEATH FILE	22,431
VBA	242,201
Total	**19,168,889**

Best Death Date Data Source	
No Death Date	11,694,950
BIRLS DEATH FILE	174,115
MEDICARE DATA	4,513,388
FEE BASIS	103,842
PATIENT TREATMENT FILE	822,105
SOCIAL SECURITY DEATH FILE	1,860,489
Total	**19,168,889**

Potential Challenges when using 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

Possible Strategies for Matching Cohorts

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?*
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*
Consider using CDW	→	*Use for individuals without activity after 1991 or very recent deaths*

05/20

Session roadmap

- Data sources for Veteran vital status ascertainment

- VHA Vital Status Files

- **Date of Death Project**

- Data sources for Veteran & Non-Veteran mortality

- Other resources for mortality data

- Examples of using mortality data for research

Date of Death Project

- VHA Date of Death Workgroup evolved into the Date of Death Project that now includes leadership and participation from VHA, VBA, and NCA

- Purpose: improve VA ascertainment and documentation of death of individuals known to the VA

- Develop processes and procedures to improve accuracy and completeness of date of death

- Master Veteran Index (MVI) is the authoritative service for date of death

- Electronic Verification of Vital Events is now in use at the VA

05/20

Date of Death Project (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 Project

- Master Patient Index (MPI) became the authoritative source for date of death in August 2017.

- In the fall of 2017, MPI was seeded with dates of death originating from VistA.

- In November 2017, MPI began accepting dates of death from the weekly SSA DMF file after internal verification of the deaths.

- In 2018 MPI loaded dates of death from the full SSA DMF.

- Project decreased estimated percentage of unrecorded deaths in CDW/VistA patient records from 30% to 5%.

  - CDW Date of Death Analysis and Vital Status File Comparison Update

    - (http://vaww.vhadataportal.med.va.gov/Portals/0/DataQualityProgram/Reports/CDW_Date_of_Death_Analysis_and_VSF_Comparison_Update.pdf)

Dates of Death in MPI

- The MPI accepts and shares dates of death with multiple sources

  - MPI accepts dates of death from the SSA DMF weekly file

  - NCA sends dates of death to MPI daily

  - Department of Defense shares death dates with MPI

  - Deaths entered into VistA are fed to MPI, and MPI deaths are pushed out to VistA records

- MPI death data is available in the CDW MVI domain

- A small percentage deaths in MPI are not in VistA and vice versa

  - Healthcare Identity Management (HC IdM) continues to review and resolve the differences

05/20

Dates of Death in MPI (cont.)

- Electronic Verification of Vital Events (EVVE)
  - Online query of death certificates and birth certificates
  - Provided by National Association for Public Health Statistics and Information Systems (NAPHSIS)
  - A tool used by HC IdM to verify deaths in the MPI
  - One of the death notification sources in the MPI
- VHA Vital Status File can be used to augment MPI to capture the small percentage of deaths that may not be in MPI

Session roadmap

- Data sources for Veteran vital status ascertainment

- VHA Vital Status Files

- Date of Death Project

- **Data sources for Veteran & Non-Veteran mortality**

- Other resources for mortality data

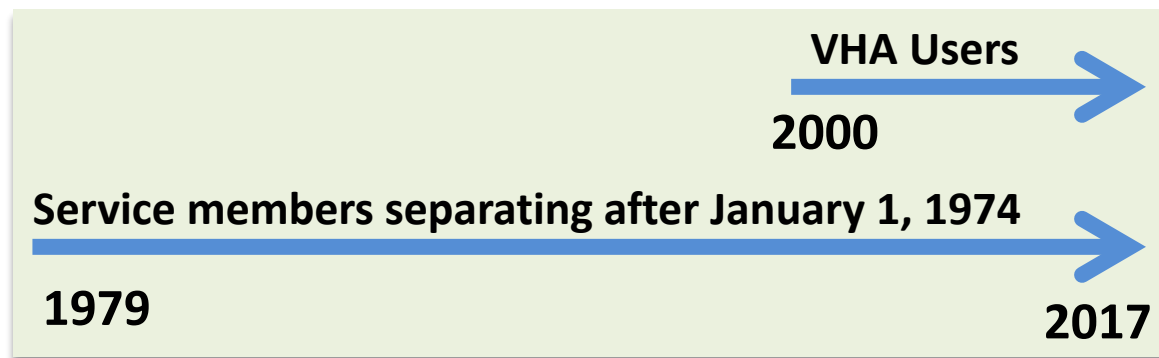- Examples of using mortality data for research

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 2019 early release (~12 month lag)

- Contains cause of death from death certificates

- Information about fees & access:

  - http://www.cdc.gov/nchs/ndi.htm

- Suicide Data Repository

National Death Index for Veterans

CDC's National Death Index Plus contains ~3.0 million records (1979-2017)

- 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, FY2000-2017

  - Please see http://vaww.virec.research.va.gov/Mortality/Overview.htm

VHA Users →

2000

Service members separating after January 1, 1974 →

1979

2017

05/20

National Death Index for Veterans

Availability	Suicide Data Repository (SDR), which is administered jointly between VA Office of Mental Health and DoD
Data Access	All applications for access to NDI data available from SDR Reviewed by a joint VA-DoD Board of Governance (meets quarterly – January, April, July, October)
Contact Information	Contact VHACANSDRDataRequests@va.gov for more information about accessing NDI data from the SDR. Data through 2018 will be available soon.

05/20

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 beneficiaries

    - Advantage: Reduces loss to follow up

- Deaths occurring outside the US

- Fees & Access

  - http://www.ssa.gov/policy/about/epidemiology.html

State Death Certificates

- States' policies regarding the release of death certificates vary considerably, as deceased individuals are not human subjects.

- An informal review of state vital statistics offices websites revealed that 24 mentioned a process for obtaining death records.

State Death Certificates
Advantages and Disadvantages

- Veteran status is reported on the death certificate.

- The whole death record, including contributing causes and not just underlying cause, is available.

- With identifiers can be linked to VA data.

- Limited in scope-not all states allow release of records for research.

- Death record is the official record but concerns about accuracy of information remain.

Defense Manpower Data Center (DMDC)

- Contains files that report casualties in past and ongoing conflicts.

- These publicly available files contain the actual names, rank, pay grade, unit, and place of death.

- This reporting is part of the Defense Casualty Analysis System (DCAS).

- For more information: https://dcas.dmdc.osd.mil/dcas/pages/casualties.xhtml

- These files have been used for research purposes, e.g. The association of state per capita income and military service deaths in the Vietnam and Iraq wars. *Population Health Metrics* 2009; 9:2.

Session roadmap

- Data sources for Veteran vital status ascertainment

- VHA Vital Status Files

- Date of Death Project

- Data sources for Veteran & Non-Veteran mortality

- **Other resources for mortality data**

- Examples of using mortality data for research

CDC National Center for Health Statistics

- The Centers for Disease Control (CDC) also has a number of death search tools as well as limited individual death files.

- Examples include CDC Wonder underlying cause of death search tool

  - http://wonder.cdc.gov

  - Individual level multiple cause of death files are also available

  - http://www.cdc.gov/nchs/data_access/VitalStatsOnline.htm#Mortality_Multiple

CDC Injury Prevention & Control
Data & Statistics

- Web-based Injury Statistics Query and Reporting System (WISQARS)

  - http://www.cdc.gov/injury/wisqars/index.html

- These databases have limited information due to privacy concerns, but have research applications.

- Essentially these files are de-identified.

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 by cause of death

05/20

Session roadmap

- Data sources for Veteran vital status ascertainment

- VHA Vital Status Files

- Date of Death Project

- Data sources for Veteran & Non-Veteran mortality

- Other resources for mortality data

- **Examples of using mortality data for research**

Mechanisms in suicide for decedents with and without diagnosed mental illness

- Simonetti, et. al. Characteristics and injury mechanisms of Veteran primary care suicide decedents with and without diagnosed mental illness. *Journal General Internal Medicine,* published ahead of print.

- Used National Death Index for Veterans.

- From 2000 to 2014, of the nearly 30,000 VHA primary care patients who died by suicide, almost half had no antecedent mental health or substance use diagnosis.

Midlife mortality in White non-Hispanic male Veterans

- Liu, et. al. Midlife mortality in White non-Hispanic Veterans enrolled in Department of Veterans Affairs primary care, 2003-2014. *Helyion* 6,2020:e03328. [doi: j.helyion.2020.e03328].

- Used National Death Index for Veterans.

- For White non-Hispanic male Veterans ages 55-64, the increase in all cause mortality from 2003 to 2014 was accompanied by significant changes due to poisoning, alcoholic liver disease, and suicide.

State Death Certificates

- Washington State offers death records for purchase.

- Files of decedent names and the death records themselves are available from 1968 to current with each file costing $20 per year.

- For more information: http://www.doh.wa.gov/DataandStatisticalReports/VitalStatisticsData/OrderDataFiles.

05/20

Studies using Washington State Death Records

- Dominitz, et al. Assessment of vital status in Department of Veterans Affairs National Databases: Comparison with state death certificates. *Annals of Epidemiology* 2001;11:281-86.

- Maynard, et al. Differences in cause of death between Washington State veterans who did and did not use VA health care services. *Journal of Rehabilitation Research and Development* 2006;43:825-830.

- Maynard, et al. Suicide rates in the Washington State veteran population. *Psychiatric Services* 2008;6:3.

- Maynard, et al. Cause of death in Washington state veterans hospitalized with acute coronary syndromes in the Veterans Health Administration. *Population Health Metrics* 2008;6:3.

- Maynard. Accidental deaths in Veterans and non-veterans in Washington State. *Internet Journal of Epidemiology* 2010;8:2.

- Maynard. Cause of death in middle age white non-Hispanic Washington State veterans, 2000-2003. *Internet Journal of Epidemiology* 2015;13:1.

Additional Resources

Mortality Data Sources Cheat Sheet

Data Source	Coverage	Update schedule	Included in VHA VSF?
BIRLS Death File	Veterans known to VA	Monthly (complete overlay)	YES
VA/CMS Medicare Vital Status File	Veterans enrolled in Medicare (>=65 years old or disabled)	Annual	YES
SSA Death Master File	Individuals with SSN (first issued 1936); Includes deaths occurring outside United States; More complete for over 65 population and for beneficiaries	Weekly (and VA receives annual overlay)	YES
Patient Treatment File	Inpatient deaths (VA hospitals, Non-VA when covered by VA	Weekly	YES
Corporate Data Warehouse	Veterans	Daily	NO
National Death Index	Veterans and non-veterans	Search engine, lags 1 year	NO
SSA Epidemiological Search	Social Security recipients and applicants	Search engine	NO
State death records	Veterans and non-veterans	Annually	NO

Resources

VHA Data Quality
http://vaww.virec.research.va.gov/DataQuality/Overview.htm

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 VA data sources like VHA VSF
(http://vaww.virec.research.va.gov/VSF/Overview.htm)

VHA Data Portal
Integrates information from multiple sources into a single
location to promote a comprehensive knowledge base
http://vaww.vhadataportal.med.va.gov/Home.aspx (Intranet only)

VIReC Options for Specific Questions

HSRData Listserv

- Community knowledge sharing

- ~1,400 VA data users

- Researchers, operations, data stewards, managers

- Subscribe by visiting http://vaww.virec.research.va.gov/Support/HSRData-L.htm (VA Intranet)

HelpDesk

- Individualized support

virec@va.gov

(708) 202-2413

Quick links for VA data resources

Quick Guide: Resources for Using VA Data
http://vaww.virec.research.va.gov/Toolkit/QG-Resources-for-Using-VA-Data.pdf (VA Intranet)

VIReC: http://vaww.virec.research.va.gov/Index.htm (VA Intranet)

VIReC Cyberseminars: http://www.virec.research.va.gov/Resources/Cyberseminars.asp

VHA Data Portal: http://vaww.vhadataportal.med.va.gov/Home.aspx (VA Intranet)

VINCI: http://vaww.vinci.med.va.gov/vincicentral/ (VA Intranet)

Health Economics Resource Center (HERC): http://vaww.herc.research.va.gov (VA Intranet)

CDW: https://vaww.cdw.va.gov/Pages/CDWHome.aspx (VA Intranet)

Archived cyberseminar: *Meet VIReC: The Researcher's Guide to VA Data*
https://www.hsrd.research.va.gov/for_researchers/cyber_seminars/archives/video_archive.cfm?SessionID=3696&Seriesid=22

References

- Da Graca B, Filardo G, Nicewander D. Consequences for healthcare quality and research of the exclusion of records from the death master file. *Circ Cardiovasc Qual Outcomes* 2013;6:124-128.
- U.S. Department of Veterans Affairs. VHA Directive 1906 Data Quality Requirements for Healthcare Identity Management and Master Veteran Index Functions. April 29, 2013.
- Doody MM, Chimes K. The Social Security Administration "presumed living" search. *Am J Public Health* 2000;90:1948-1949.
- Savas LS, del Junco DJ, Bastian LA, Vernon SW. Mortality ascertainment of women veterans: a comparison of sources of vital status information, 1979-2002. *Med Care* 2009;47:125-128.
- Sohn MW, Arnold N, Maynard C, Hynes DM. Accuracy and completeness of mortality data in the Department of Veterans Affairs. *Popul Health Metr* 2006;4:2.

References

- Arnold N, Sohn M, Maynard C, Hynes DM. VIReC Technical Report 2: VA NDI Mortality Data Merge Project. April 9, 2006. VA Information Resource Center. Available: http://vaww.virec.research.va.gov/Reports/TR/TR-VA-NDI-Mortality-CY06-ER.pdf.
- 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.
- Maynard C. Databases. *The Encyclopedia of Death and the Human Experience.* Thousand Oaks CA: Sage Publications, 2009:258-261.
- Maynard C. Using administrative data to understand the association between disability severity rating and survival in Veterans with service-connected disability. *Sage Research Methods Cases*,2020 [https://dx.doi.org/10.4135/9781529734652.

Contact information

VA Information Resource Center

Hines VA Hospital

virec@va.gov

708-202-2413

Chuck Maynard
cmaynard@uw.edu