CSP#579 - Long Term Health Outcomes of Women Veterans Service During the Vietnam Era

Kathryn Magruder, Ph.D., MPH
Ralph h. Johnson VA Medical Center
Medical University of South Carolina Charleston, SC

Tracey Serpi, Ph.D.
Perry Point Cooperative Studies Program Perry Point, MD
CSP #579 Team

• Study Chairs
  – Kathryn Magruder, Ph.D., Charleston, SC VA
  – Amy Kilbourne, Ph.D., Ann Arbor, MI VA
  – Han Kang, Dr.P.H., Washington, DC VA (retired)

• Executive Committee
  – Rachel Kimerling, Ph.D.
  – Susan Frayne, MD, MPH
  – Avron Spiro III, Ph.D.
  – Matt Reinhard, Psy.D.
  – Yasmin Cypel, Ph.D.

• Consultant
  – Joan Furey, RN, MA – Vietnam Veteran

• CSPCC Study Team
  – Joseph Collins, Sc.D.
  – Tracey Serpi, Ph.D.
  – Erin Norman, LGSW
How old were you in 1975?

a. Not yet born
b. <10 years old
c. 10-19 years old
d. 20+ years old
DSM I 1952
DSM II 1968
DSM III 1980
DSM III-R 1987
DSM IV 1994
DSM IV-TR 2000
DSM V 2013
History of CSP # 579

Early Studies

• 3 large scale studies of Vietnam Era Veterans
  – National Vietnam Veterans Readjustment Study (NVVRS) 1988
  – Vietnam Era Twin Study (1992)
  – Vietnam Experience Study (Center for Disease Control Study) 1989

Recent Studies

• National Vietnam Veterans Longitudinal Study (NVVLS) 2001 (not completed)
• Vietnam Era Twin Study (CSP #569) 2011-12
• Health ViEW Study (CSP #579)
• NVVLS 2010-13
Question

• How many women served in the armed forces during the Vietnam Era?
  – 3,000
  – 10,000
  – 100,000
  – 250,000
Greetings from Vietnam!
HealthViEWS

• An epidemiologic study designed to assess the prevalence of PTSD and other mental and physical health conditions for women Vietnam veterans, and to explore the relationship between PTSD and the Vietnam deployment experience.

• This study was designed to examine those women Veterans who served in Vietnam and may have had more direct exposure to traumatic events, those who served in facilities near Vietnam and may have had different exposures with women who served in the military during the Vietnam Era, but not in or near Vietnam.

• Largest study of women Vietnam Veterans conducted to date. This study will help the VA to understanding the physical and emotional health care needs of women Veterans as well as inform the VA’s efforts to assure that appropriate services are available and to develop proactive program planning to prepare for future waves of aging women Veterans.
HealthViEWS Study

• Three cohorts of women Vietnam Veterans:

  – Women serving **in Vietnam** are those who were deployed to the country of Vietnam during the Vietnam Era for >30 days

  – Women serving **near Vietnam** are those who were deployed to Japan, Guam, Philippines, Korea, Thailand, or Okinawa (but not Vietnam) during the Vietnam Era for >30 days

  – Women serving **in the 50 United States (U.S.)** are those who did not serve in any part of Vietnam or near Vietnam (Japan, Guam, Philippines, Korea, Thailand, or Okinawa) for >30 days during the Vietnam Era
STUDY AIMS AND DESIGN
Pre Disposing Characteristics
- Age
- Race
- Ethnicity
- Education
- Married
- Nurse
- Officer
- Years of Nursing Experience

Pre Military Exposures and Conditions
- Mental Health Conditions
- Medical Conditions
- Childhood Trauma

Military
- Theater Yes/No
  - Exposures
  - Stressors
    - Military Sexual Trauma
    - Casualties
    - Injury
    - Chemical Exposures
    - Infection

Post Military

Mental Health
- PTSD
- Major Depressive Disorder
- Generalized Anxiety Disorder/Substance use Disorder
- Overall Mental Health

Physical Health
- CHD/Hypertension/Diabetes
- ALS/MS/Parkinson’s Disease/Brain Cancer
- Breast Cancer
- Gynecological Cancer
- Overall Physical Health

Disability

Health System Impact
- Utilization
- Mortality

Risk
- Health Behavior
- Social Support
- Desirable/undesirable effects of service

Resilience

Homecoming

Other Life Events
- Trauma
- Other Deployments
Study Aim 1

• To determine the prevalence of lifetime and current psychiatric conditions, including PTSD, among women veterans who served during the Vietnam Era.
  – Post Traumatic Stress Disorder
  – Major Depression
  – Generalized Anxiety Disorder
  – Substance Abuse Disorder
  – Overall Mental Health

• Compare current psychiatric conditions between those who served in Vietnam versus those who served in the US.

• Compare current psychiatric conditions all three cohorts of women (Vietnam, Near-Vietnam and US).
Study Aim 2

• To characterize the physical health of women who served during the Vietnam Era.
  – Cardiovascular Disease, Hypertension
  – Diabetes
  – Amyotrophic Lateral Sclerosis, Multiple Sclerosis, Parkinson’s Disease
  – Brain, Breast, and Gynecological Cancers
  – General Physical Health Status

• Compare mortality between those who served in Vietnam and those who served in the US.

• Compare the physical health conditions between those who served in Vietnam versus those who served in the US.

• Compare the physical health conditions all three cohorts of women (Vietnam, Near-Vietnam and US).
Additional Study Aims

• Study Aim 3
  – To characterize the level of current disability in women who served during the Vietnam Era.
  – Compare current level of disability between those who served in Vietnam versus those who served in the US.
  – Compare current level of disability between all three cohorts of women (Vietnam, Near-Vietnam and US).

• Exploratory Aims
  – To characterize and compare health services utilization of women who served during the Vietnam Era.
  – To characterize and compare current medical conditions (other than cardiovascular disease, hypertension, diabetes, cancers, etc.) in women who served during the Vietnam Era.
Study Design

• Included women who were active duty military personnel in one of the four Armed Services (Army, Navy, Air Force, Marines) between July 4, 1965, and March 28, 1973, with a 30-day minimum period of service.

• Women were identified for potential participation by:
  – Existing roster of women Vietnam Era Veterans that was developed for VA studies of mortality and reproductive health and pregnancy outcomes of women Vietnam Veterans (Thomas et al. 1991; Dalager et al. 1995; Kang et al. 2000a, b)
  – Defense Manpower Data Center (DMDC) Vietnam Roster
  – Self-registration through Perry Point CSP
Figure 1. Identification of Vietnam-Era Women Veteran Cohorts

Vietnam-Era Women Veterans (n = 12,109)

<table>
<thead>
<tr>
<th>Vietnam-cohort</th>
<th>Near-Vietnam-cohort</th>
<th>U.S.-cohort</th>
</tr>
</thead>
<tbody>
<tr>
<td>n = 4,734</td>
<td>n = 2,062</td>
<td>n = 5,313</td>
</tr>
</tbody>
</table>

Vietnam-Era Women Veterans Identified for HealthViEWS (n = 9,335)

<table>
<thead>
<tr>
<th>Vietnam-cohort</th>
<th>Near-Vietnam-cohort</th>
<th>U.S.-cohort</th>
</tr>
</thead>
<tbody>
<tr>
<td>n = 3,766</td>
<td>n = 1,574</td>
<td>n = 3,995</td>
</tr>
</tbody>
</table>

Vietnam-Era Women Alive and Eligible for HealthViEWS (n = 9,263)

<table>
<thead>
<tr>
<th>Vietnam-cohort</th>
<th>Near-Vietnam-cohort</th>
<th>U.S.-cohort</th>
</tr>
</thead>
<tbody>
<tr>
<td>n = 3,733</td>
<td>n = 1,567</td>
<td>n = 3,963</td>
</tr>
</tbody>
</table>

*Number of deaths identified prior to and during mail survey administration only.

Women Veterans who died (n = 2,774*)

Women Veterans who died during survey administration or who were ineligible (n = 72)
Main Study Components

• Mail Survey (Conducted by Westat)
  – A self-administered questionnaire addressing physical and mental health, war time exposures, resilience and stress.
  – All identified eligible women were sent a mail survey.
  – Women received $75 for completion.
• Telephone Interview (Conducted by Westat)
  – A computer-assisted telephone interview (CATI) consisting of modules from the Composite International Diagnostic Interview (CIDI), a structured psychiatric telephone interview, the Behavioral Risk Factor Surveillance System (BRFSS) and the Telephone Interview of Cognitive Status (TICS).
  – All identified eligible women were called for the telephone interview regardless of mail survey completion.
  – Women received $75 for completion.
• Medical Record Verification (Conducted by Ann Arbor VA)
  – A manual review of medical records from a sample of women to confirm self-reported medical conditions.
  – Women were selected from those who completed a mail survey.
Additional Study Components

• National Personnel Record Center (NPRC) data collection
  – Records for women whose service had not been verified were examined. A total of 1,015 women were identified as serving in Vietnam or near-Vietnam and were added to the study.

• Sub-study Telephone Interview
  – A telephone administered diagnostic interview using the Clinicians Administered PTSD Scale (CAPS).
  – A subset of 165 women who responded to the mail survey and completed the telephone interview were selected to complete the CAPS.

• Mortality Study
  – Vital status was determined for all women Vietnam Veterans identified and cause of death information was established.
CSP #579: Measurement Overview: Military Record

- Data Abstracted from National Personnel Records Center
  - Recorded for entire cohort of women
    - Date of Birth
    - Branch
    - Rank
    - Military Occupation
    - Race
    - Beginning and End Dates of Service
    - Type of Discharge
    - Overseas service during the Vietnam War
    - Start and end dates of military tours in Vietnam or other countries
CSP#579: Measurement Overview: Mail Survey

- **Phase I – Mail Survey**
  - Self-reported physical & mental health (VR-36)
  - Functional status /Disability (WHO-DAS)
  - Psycho-social measures (including WWES-R)
  - Post-traumatic growth (PTGI)
  - Health behaviors
    - Exercise derived from BRFSS
    - Smoking
    - Alcohol
  - Late onset Stress Symptomatology (LOSS)
  - Desirable/Undesirable effects of Service/Homecoming
  - Socio-demographic information
  - Health service utilization (From Survey of Veterans)
  - Wartime Exposures (WWES-R)
CSP#579: Measurement Overview: Telephone Interview and Medical Record Abstraction

- **Phase II – Telephone Interview**
  - Composite International Diagnostic Interview
    - Screening Module
    - Depression Module
    - Mania Module
    - Generalized Anxiety Disorder Module
    - Substance Abuse Module
    - Interviewer Assessment Module
  - BRFSS Diabetes and Heart Disease Questions
  - Telephone Interview for Cognitive Status

- **Phase III – Record Abstraction**
  - Requested medical records from up to 3 medical providers
  - Assessed evidence for medical conditions endorsed on mail survey
Study Timeline

• Scientific Review (June 2009)
• Approved for Funding (Sept 2009)
• Approved by VA Central IRB (Jan 2010)
• First Mailing – May 16th, 2011
• Telephone Interviews Began – June 27, 2011
• Medical record validation began - February 2, 2012
• All Data Collection Completed by December 2012
• Mortality Paper – March 2014
• CAPS/CIDI Comparison Paper – April 2014
Mortality analysis

STUDY AIM 2
1. Mortality Study

- Built on a previous study conducted by Dr. Han Kang
- Compared mortality by service location
  - N=4734 Vietnam
  - N=2062 Near Vietnam
  - N=5313 US
- Compared mortality by nurse/non-nurse occupation
<table>
<thead>
<tr>
<th>Underlying cause of death (ICD9; ICD10)</th>
<th>Deployment Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vietnam cohort</td>
</tr>
<tr>
<td></td>
<td>Observed SMR</td>
</tr>
<tr>
<td>All causesd</td>
<td>955 0.85 0.80-0.91*</td>
</tr>
<tr>
<td>All cancers (140-239; C00-C97)d</td>
<td>361 0.94 0.85-1.05</td>
</tr>
<tr>
<td>Breast (174-175; C50)</td>
<td>81 1.11 0.88-1.38</td>
</tr>
<tr>
<td>Ovary (183; C56,C57.0-C57.4,C57.8)</td>
<td>27 1.13 0.75-1.65</td>
</tr>
<tr>
<td>Uterus (179,181-182; C54-C55,C58)</td>
<td>9 0.95 0.44-1.51</td>
</tr>
<tr>
<td>Cervix (180; C53)</td>
<td>5 0.62 0.20-1.44</td>
</tr>
<tr>
<td>Respiratory cancer (160-165; C30-C34,C37,C38.0-C38.4,C38.8,C39)</td>
<td>95 0.92 0.75-1.13</td>
</tr>
<tr>
<td>Lung, trachea, bronchus (162; C33-C34)</td>
<td>91 0.90 0.73-1.11</td>
</tr>
<tr>
<td>Stomach (151; C16)</td>
<td>6 1.02 0.38-2.23</td>
</tr>
<tr>
<td>Intestine - except rectum (152-153; C17-C18)</td>
<td>15 0.53 0.30-0.88*</td>
</tr>
<tr>
<td>Biliary passages, liver, and gall bladder (155-156; C22-C24)</td>
<td>7 0.79 0.32-1.64</td>
</tr>
<tr>
<td>Rectum (154; C19-C21)</td>
<td>3 0.57 0.12-1.68</td>
</tr>
<tr>
<td>Pancreas (157; C25)</td>
<td>28 1.47 0.97-2.12</td>
</tr>
<tr>
<td>Connective tissue (171; C46.1,C49)</td>
<td>9 3.32 1.52-6.29*</td>
</tr>
<tr>
<td>Brain &amp; other parts of nervous system (191-192; C47,C70-C72)</td>
<td>14 1.42 0.77-2.38</td>
</tr>
<tr>
<td>Lymphatic and hematopoietic (200-208; C46.3,C81, C82-C85, C88.0,C88.3,C88.7,C88.9,C90,C91.0-C91.3,C91.4, C91.5-C91.9,C92-C95, C96)</td>
<td>31 0.98 0.66-1.39</td>
</tr>
<tr>
<td>Underlying cause of death (ICD9; ICD10)</td>
<td>Vietnam cohort</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td></td>
<td>Observed</td>
</tr>
<tr>
<td>Ischemic heart disease (410-414,429.2; I20-I22,I24-I25,I51.3,I51.6)</td>
<td>101</td>
</tr>
<tr>
<td>Cardiomyopathy (425; I42,I52.8)</td>
<td>7</td>
</tr>
<tr>
<td>Hypertensive heart disease (402,404; I11,I13)</td>
<td>11</td>
</tr>
<tr>
<td>Conductive disorder (426-427; I44-I49,R00.1,R00.8)</td>
<td>17</td>
</tr>
<tr>
<td>Other circulatory diseasesd</td>
<td>61</td>
</tr>
<tr>
<td>Cerebrovascular disease (430-438; G45.0-G45.2,G45.4-G45.9,I60-I69)</td>
<td>36</td>
</tr>
<tr>
<td>Hypertension (401,403,405; I10,I12)</td>
<td>5</td>
</tr>
<tr>
<td>Respiratory system diseasesd</td>
<td>71</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease (490-492, 496; J40-J44)</td>
<td>33</td>
</tr>
<tr>
<td>Underlying cause of death (ICD9; ICD10)</td>
<td>Vietnam cohort</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td></td>
<td>Observed</td>
</tr>
<tr>
<td>Cirrhosis and other chronic liver disease (571; K70,K73-K74,K76.0)</td>
<td>17</td>
</tr>
<tr>
<td>Chronic and unspecified nephritis, renal failure, and other renal sclerosis (582-587;N01.9,N03-N07,N14.0-N19,N26)d</td>
<td>6</td>
</tr>
<tr>
<td>Nervous system disordersd,e</td>
<td>30</td>
</tr>
<tr>
<td>Multiple sclerosis (340; G35)</td>
<td>4</td>
</tr>
<tr>
<td>Mental psychoneurotic and personality disordersd</td>
<td>22</td>
</tr>
<tr>
<td>Alcoholism (291,303,305.0; F10,G31.2)</td>
<td>6</td>
</tr>
<tr>
<td>All external causes (E800-E999; V01-V99,W00-W99,X00-X99,Y00-Y89)d,f</td>
<td>73</td>
</tr>
<tr>
<td>Motor vehicle - Driver (E810-E819.2; V20.4-V86.0)d</td>
<td>22</td>
</tr>
<tr>
<td>Accidental poisoning (E850-E869,E929.2; X40-X49)</td>
<td>3</td>
</tr>
<tr>
<td>Suicide (intentional self harm) (E950-E959; X60-X84,Y87.0)</td>
<td>15</td>
</tr>
<tr>
<td>Assault &amp; Homicide (E960-E978; X85-X99,Y00-Y09,Y35,Y87.1)</td>
<td>3</td>
</tr>
<tr>
<td>Underlying cause of death</td>
<td>n(^a)</td>
</tr>
<tr>
<td>---------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>All causes</td>
<td>2260</td>
</tr>
<tr>
<td>All cancers</td>
<td>782</td>
</tr>
<tr>
<td>Intestine - except rectum</td>
<td>53</td>
</tr>
<tr>
<td>Heart disease</td>
<td>451</td>
</tr>
<tr>
<td>All external causes</td>
<td>143</td>
</tr>
<tr>
<td>Motor vehicle - Driver</td>
<td>35</td>
</tr>
<tr>
<td>Accidental poisoning</td>
<td>10</td>
</tr>
<tr>
<td>Suicide (intentional self harm)</td>
<td>36</td>
</tr>
<tr>
<td>Assault &amp; Homicide</td>
<td>9</td>
</tr>
</tbody>
</table>
Question

- What role did most women serve in during the Vietnam Era?
  - Front-line combat
  - Cooks
  - Nurses
  - Clerical positions
### Cause-specific Mortality Risk among Women Vietnam and Near-Vietnam Veterans Compared with Non-Vietnam Veterans, 1965-2010, Nurses Only

<table>
<thead>
<tr>
<th>Underlying cause of death</th>
<th>Vietnam cohort</th>
<th>Near-Vietnam cohort</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Crude rate ratio</td>
<td>Adjusted RR&lt;sup&gt;a&lt;/sup&gt; (95% CI)&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>All causes</td>
<td>1627</td>
<td>0.68</td>
</tr>
<tr>
<td>All cancers</td>
<td>551</td>
<td>0.81</td>
</tr>
<tr>
<td>Pancreas</td>
<td>35</td>
<td>1.43</td>
</tr>
<tr>
<td>Brain &amp; other parts of nervous system</td>
<td>16</td>
<td>3.67</td>
</tr>
<tr>
<td>Heart disease</td>
<td>343</td>
<td>0.52</td>
</tr>
<tr>
<td>Motor vehicle - Driver</td>
<td>22</td>
<td>2.88</td>
</tr>
</tbody>
</table>
Comparison of the CAPS and the CIDI

SUB-STUDY
PTSD (CAPS vs CIDI) Sub-study

• Evaluated the diagnostic utility of the Composite International Diagnostic Interview (CIDI 3.0) PTSD module and the Clinician Administered PTSD Scale (CAPS).

• A sample of women completing the mail survey (PCL-C) were selected to participate in the substudy.
  – Women were asked to participate after completion of the CIDI telephone interview.
  – 165 women were contacted and invited to participate in the follow-up interview (CAPS) by telephone.
  – Women were compensated $75 for completion of this interview.
CAPS Administration

• CAPS was administered by trained interviewers at the Charleston VAMC.

• CAPS was completed within 3 weeks of completing the HealthVieWS telephone interview.

• Women were sampled based upon PCL-C scores.
  – Score of > 30 was used as cut score to ensure a wide range of PTSD symptoms
  – Oversample cases with current PTSD

• CAPS interviewers were blinded to PCL-C and CIDI results.
Scoring

• 160 women completed the CAPS interview
  – 5 women excluded due to incomplete CAPS interviews.
• PCL-C score
  – 68 scored above the PCL-C threshold
  – 92 scored below
    • Scores ranged from 17 to 76
• CAPS Scoring
  – Results were compared using the more lenient (F1/I2) scoring rule and the more conservative (F1/I2/Sever65) scoring rule.
  – Results revealed no statistically significant differences between scoring rules, so F1/I2 was used as the scoring for the CAPS.
Estimates of Diagnostic Accuracy for the CIDI, Compared to the CAPS (n=160)

<table>
<thead>
<tr>
<th></th>
<th>CAPS PTSD n (%)</th>
<th>CIDI PTSD n (%)</th>
<th>AUC (95% CI)</th>
<th>Sensitivity (95% CI)</th>
<th>Specificity (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lifetime PTSD</strong></td>
<td>72 (45.0%)</td>
<td>54 (33.7%)</td>
<td>0.77 (0.71 - 0.84)</td>
<td>0.64 (0.52 - 0.75)</td>
<td>0.91 (0.83 - 0.96)</td>
</tr>
<tr>
<td><strong>Past Year PTSD</strong></td>
<td>35 (21.9%)</td>
<td>44 (27.5%)</td>
<td>0.78 (0.70 - 0.86)</td>
<td>0.71 (0.54 - 0.85)</td>
<td>0.85 (0.77 - 0.91)</td>
</tr>
</tbody>
</table>

Lifetime PTSD – CIDI correctly classified 78.8% (κ=0.56)  
Past Year PTSD – CIDI correctly classified 82% (κ=0.52)

Target range for κ is 0.4 – 0.6 = moderate level of agreement
Misclassified Cases

• False negative cases
  – 26 cases diagnosed with lifetime PTSD by the CAPS, but missed by the CIDI
    • 11 (42%) – subthreshold levels of PTSD symptoms on CIDI but meet criteria for subthreshold levels of PTSD symptoms
    • 5 cases did not meet trauma exposure criteria on the CIDI and were not assessed for PTSD because of skip patterns

• False positive cases
  – 8 cases not diagnosed with lifetime PTSD by the CAPS, but met criteria for lifetime PTSD on CIDI
    • 5 cases demonstrated subthreshold levels of PTSD on the caps, meeting criteria for all but one symptom cluster
Results

• Key Result
  – The CIDI has good utility for identifying PTSD, though is a somewhat conservative indicator of lifetime PTSD as compared to the CAPS.
  – Published in the Journal of Traumatic Stress, April 2014.
RESPONSE AND WEIGHTING
Survey Completion

450 out of 900 women selected participated in the medical record validation.
Weighting

• Two Stage Propensity cell method of weighting was used:
  – Mail Survey Only
  – Telephone Survey Only
  – Mail Survey & Telephone Interview

• Logistic regression model for located/not located was developed
  – Race
  – Nurse
  – Service Time (categorical)
  – Branch
  – Area of Service
  – Age on 12/31/2010

• Resulting propensity cell weights were used in logistic regression models for responded/did not respond.
  – Same variables as above

• Resulting weights were used in the analyses for that population.
PTSD Prevalence

POPULATION = 4219 Women who completed both a Mail Survey and Telephone Interview

PRIMARY OBJECTIVE 1
<table>
<thead>
<tr>
<th></th>
<th>Vietnam</th>
<th>Near VN</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enlistment age (mean)</td>
<td>22.5</td>
<td>22.9</td>
<td>21.5</td>
</tr>
<tr>
<td>Enlistment year (mean)</td>
<td>1964</td>
<td>1964</td>
<td>1965</td>
</tr>
<tr>
<td>% Non-white</td>
<td>4.9</td>
<td>9.8</td>
<td>8.0</td>
</tr>
<tr>
<td>Branch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Army</td>
<td>77.4</td>
<td>42.9</td>
<td>83.5</td>
</tr>
<tr>
<td>% Navy</td>
<td>7.0</td>
<td>6.1</td>
<td>7.0</td>
</tr>
<tr>
<td>% Air Force</td>
<td>14.8</td>
<td>50.8</td>
<td>8.8</td>
</tr>
<tr>
<td>% Marines</td>
<td>0.8</td>
<td>0.2</td>
<td>0.7</td>
</tr>
<tr>
<td>% Nurse</td>
<td>79.9</td>
<td>56.1</td>
<td>57.8</td>
</tr>
<tr>
<td>Service Time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% &lt; 3 years</td>
<td>29.3</td>
<td>18.4</td>
<td>37.5</td>
</tr>
<tr>
<td>% 3 – 19 years</td>
<td>52.3</td>
<td>55.3</td>
<td>52.2</td>
</tr>
<tr>
<td>% 20+ years</td>
<td>18.4</td>
<td>26.3</td>
<td>10.3</td>
</tr>
</tbody>
</table>
2010 Self-Reported Socio-demographics

<table>
<thead>
<tr>
<th></th>
<th>Vietnam</th>
<th>Near VN</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean)</td>
<td>68.2</td>
<td>68.7</td>
<td>66.3</td>
</tr>
<tr>
<td>% Married</td>
<td>45.5</td>
<td>45.4</td>
<td>53.6</td>
</tr>
<tr>
<td>% Never Married</td>
<td>27.2</td>
<td>29.0</td>
<td>15.4</td>
</tr>
<tr>
<td>% some grad school or grad/professional degree</td>
<td>42.9</td>
<td>47.7</td>
<td>40.4</td>
</tr>
</tbody>
</table>

* Weighted using 2 tiered propensity cell method by locatability and response status
Women’s Wartime Exposure Scale-Revised (WWES-R)

- Capture military experience
  - 31 questions
  - 5 point scale (never to very often) or yes/no
- 6 scales
WWES Subscales (1)

Sexual Discrimination/Harrassment
- isolated because female
- unfair treatment
- sexual comments
- sexual touching
- unwanted sex – known
- unwanted sex – unknown
- deceptive intimate relationships
- pressure to fraternize

Combat Nursing
- involved in mass casualty
- how often view casualties
- perform under fire
- care for enemy
- provide worse care to enemy
- perform in uncomfortable environment
WWES Subscales (2)

Performance Pressure
- perform exceeding training
- errors/shortages
- excessive fatigue
- told you caused death
- think you caused death
- perform unethical tasks
- support from senior leadership

Casualties & Death
- how often post-mortem ops
- assist in dying
- sit with dying
- triage
- feel responsible for dying
- friends killed/wounded/POW/ MIA
WWES Subscales (3)

Danger/threat
• how often in real danger
• possess a weapon
• use weapon for protection
• kill or injure someone

Overwork
• work > 14 hr/day
• work 7+ days
WWES

• Sexual discrimination/harrassment
  – VN>near>US

• Combat nursing
  – VN>near>US

• Performance pressure
  – VN>near>US

• Casualties & death
  – VN>near<US

• Danger/threat
  – VN>near>US

• Overwork
  – VN>near>US
PTSD Prevalence

• Lifetime
  – VN (20.1%) > nearVN (11.5%) < US (14.1%)

• Current
  – VN (15.9%) > nearVN (8.1%) < US (9.1%)

• Lifetime with pre-military onset
  – VN (2.9%) = nearVN (2.9%) < US (5.0%)

• Lifetime with military or post-military onset
  – VN (16.9%) > nearVN (8.5%) < US (8.9%)
Current PTSD Prevalence Models

Model 1
- Risk factors
  - VN service (vs. US)
  - Army (vs Navy)
- Protective factors
  - Older age in 2010
  - Nurse
- Not significant
  - Near VN (vs US)
  - Race
  - Years of service
  - Air Force or Marines (vs. Navy)

Model 2
- Risk factors
  - Army (vs. Navy)
  - Sexual discrim/harrass
  - Combat nursing
  - Performance pressure
  - Casualties & death
  - Danger/threat
- Protective factors
  - Nurse
- Not significant
  - VN or near VN service (vs US)
  - Age in 2010
  - Years of service
  - Air Force or Marines (vs. Navy)
  - Overwork
Lifetime PTSD Prevalence Models

Model 1
• Risk factors
  – VN service (vs. US)
  – Army (vs. Navy)
• Protective factors
  – Older age @ enlistment
  – Nurse
  – Service >3 years
• Not significant
  – Near VN (vs. US)
  – Race
  – Air Force or Marines (vs US)

Model 2
• Risk Factors
  – Sexual discrim/harrass
  – Performance pressure
• Protective factors
  – Older age @ enlistment
  – Nurse
  – Service >20 years
• Not significant
  – VN or near VN service (vs US)
  – Race
  – Service 3-19 years
  – Service branch
  – Combat nursing
  – Casualties & death
  – Danger/threat
  – Overwork
PTSD Prevalence

• Women Veterans who served in Vietnam have 20% lifetime & 15.9% current PTSD prevalence – higher than those who served near VN or in the US

• All 3 cohorts had higher PTSD prevalence than US women (US: ~10% lifetime, ~5% current)

• After adjusting for wartime experiences, service area was no longer significantly different.
40+ years later

VA Cooperative Studies Program
CSP # 579
Long Term Health Outcomes of Women’s Service During the Vietnam Era

“Greetings from Vietnam!”

“The enemy was on both sides.”
Vietnam Women's Memorial, Washington, D.C.
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Glenna Goodacre, Sculptor
QUESTIONS/COMMENTS?

THANK YOU
References


For Further Information

• Kathy Magruder, MPH, PhD
  – 843.789.7280
  – Kathryn.magruder@va.gov

• Tracey Serpi, Ph.D.
  – 410-642-2411 x 6122
  – Tracey.serpi@va.gov