

WOMEN VETERANS IN THE WOMEN'S HEALTH INITIATIVE



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Women Veterans in the Women's Health Initiative

- Overview
- Healthy Aging
- Diseases and Conditions
- Menopause Related
- Mortality



The Gerontologist, February 2016

http://gerontologist.oxfordjournals.org/content/56/Suppl_1.toc

<http://gerontologist.oxfordjournals.org/content/56/1/115.full.pdf+html>

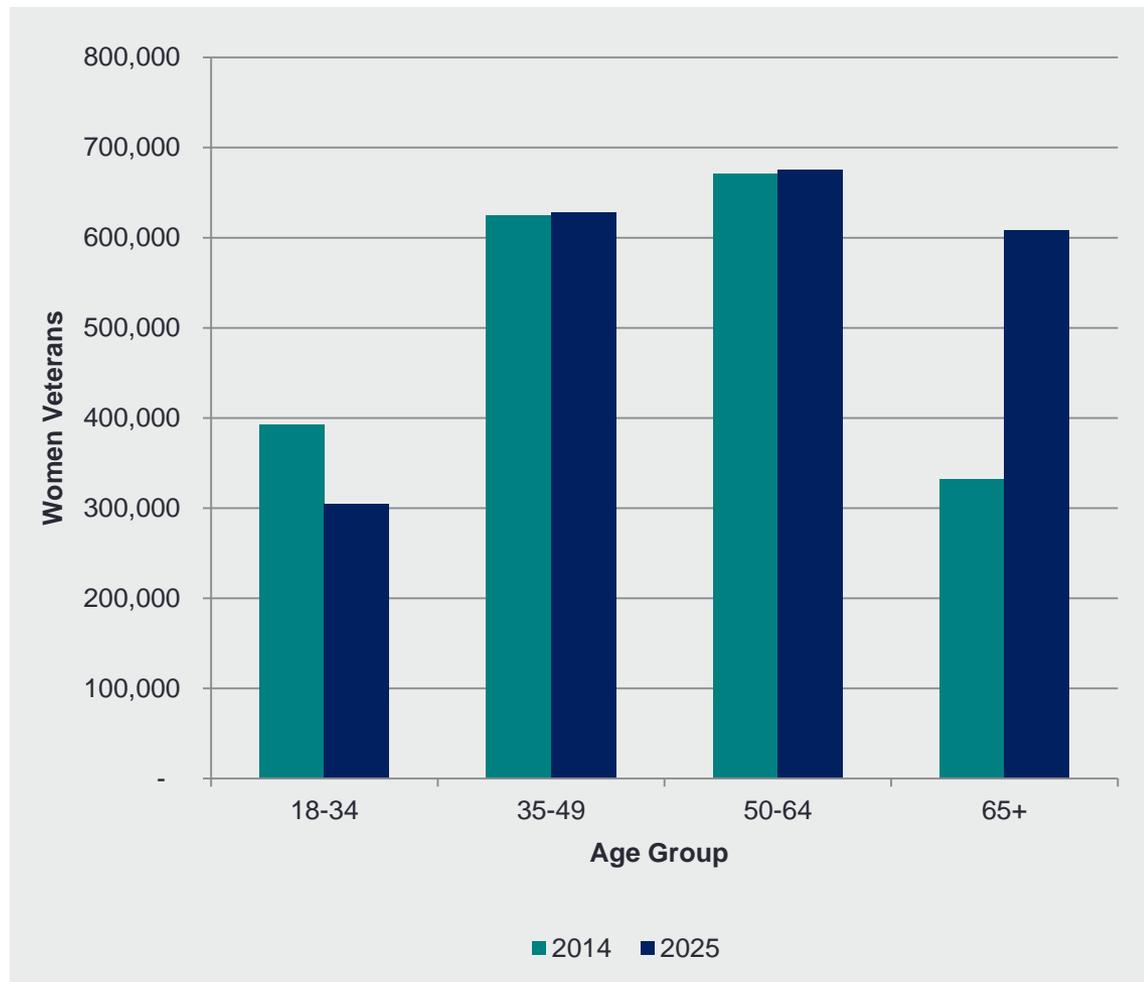
What Motivated This Research in Older Women Veterans?

Unique opportunity to:

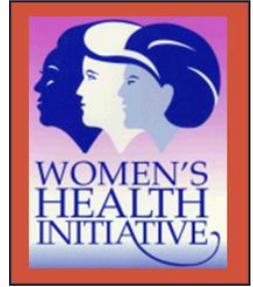
Examine positive and negative associations of military exposure

Address health behaviors and increased risk for disease in later life between women Veterans and non-Veterans

Begin clinical and research preparation for the projected 83% increase in older women Veterans between 2014-2025



Women's Health Initiative (WHI)

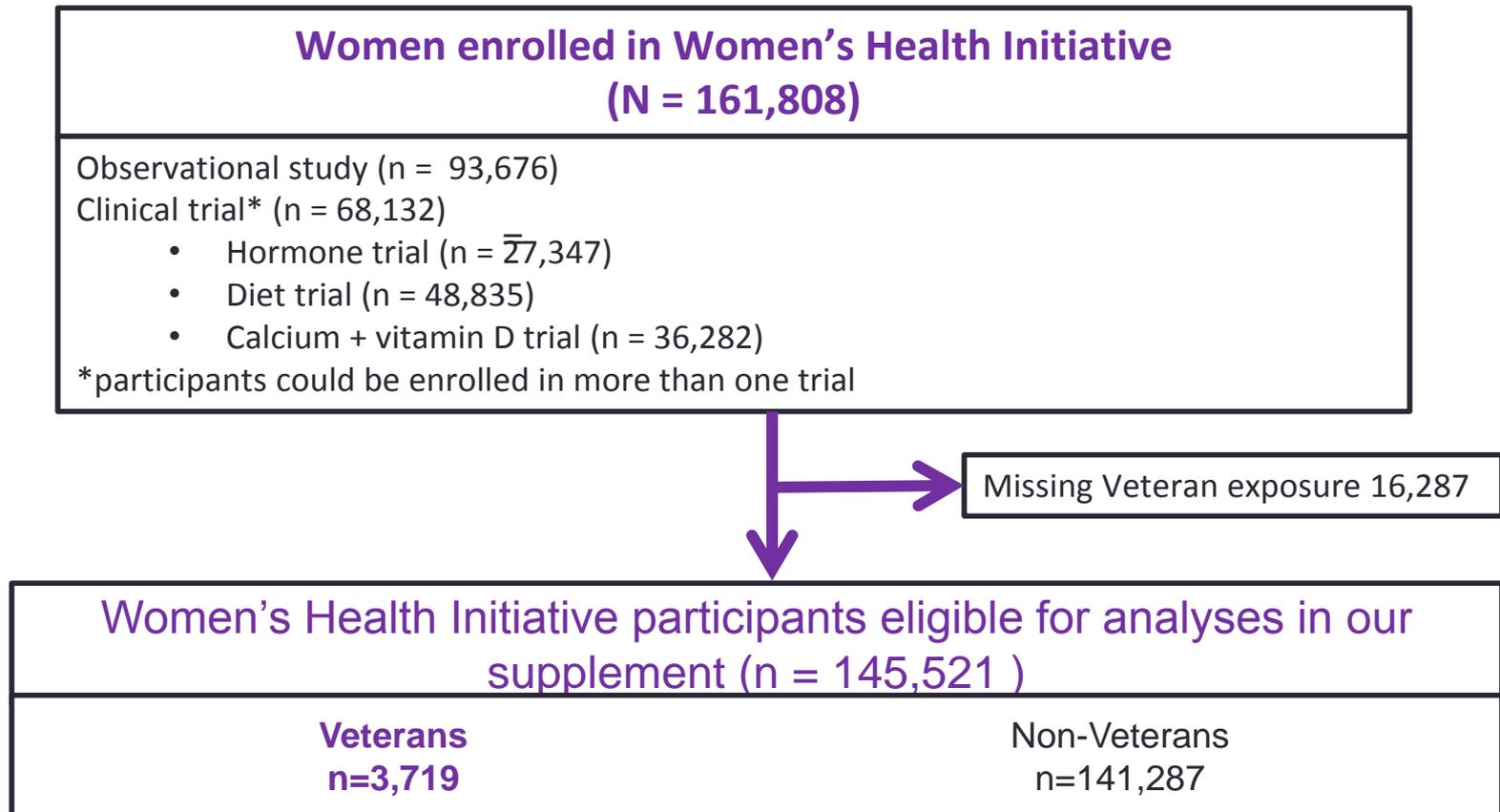


- Goal: Answer major questions about postmenopausal women's health (cancers, heart disease, osteoporosis-related bone fractures)
- Vast scientific undertaking
 - 161,808 participants from 40 U.S. centers followed up to 12 years in main study (1993-2005)
 - 115,403 participants enrolled in WHI Extension Study 2005-2010
 - 93,500 participants enrolled in WHI Extension Study 2010-2015

WHI Eligibility Criteria

- General inclusion criteria
 - Aged 50 to 79 years
 - Postmenopausal
 - Planning to reside in the area for at least 3 years
 - Able/willing to provide written informed consent
- Additional eligibility criteria specific to each study component, related to:
 - Safety
 - Competing risk
 - Adherence/retention

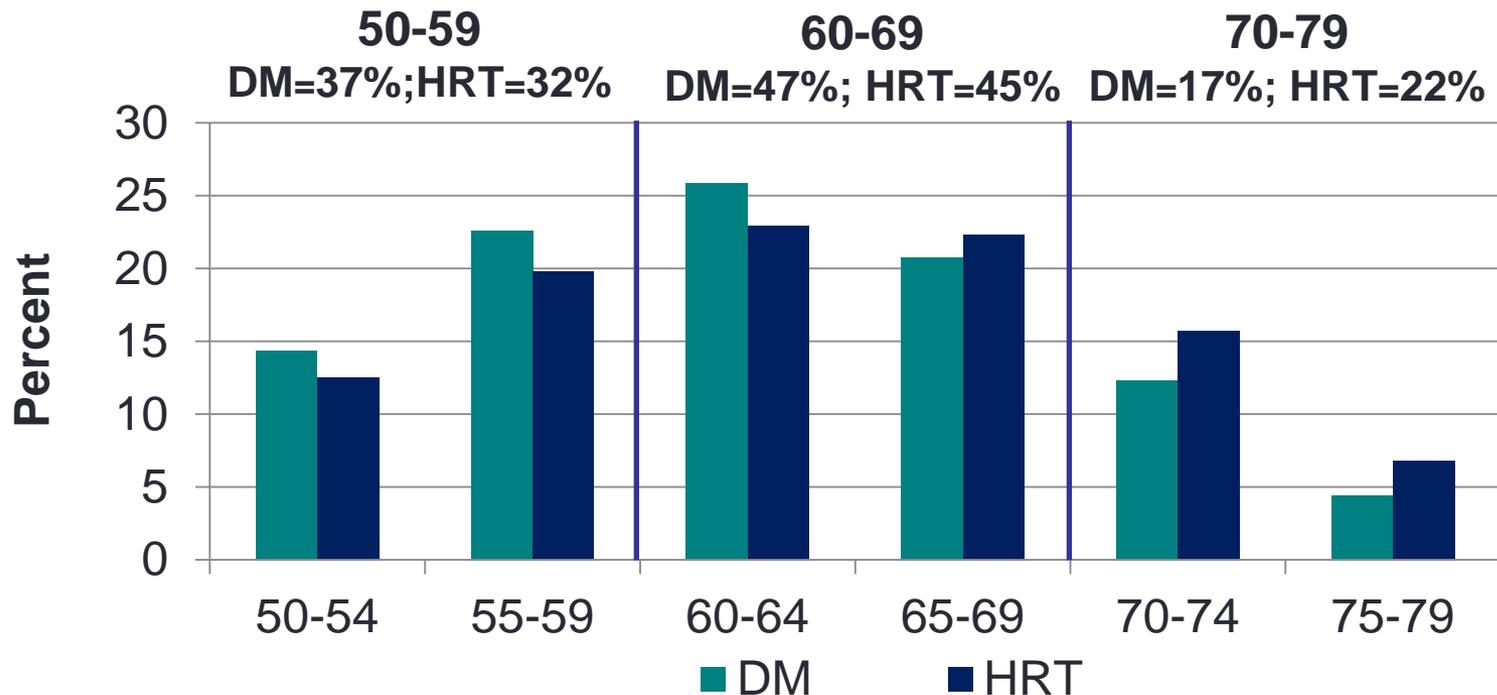
Women Veterans in the WHI



WHI CT: Baseline Age Distribution

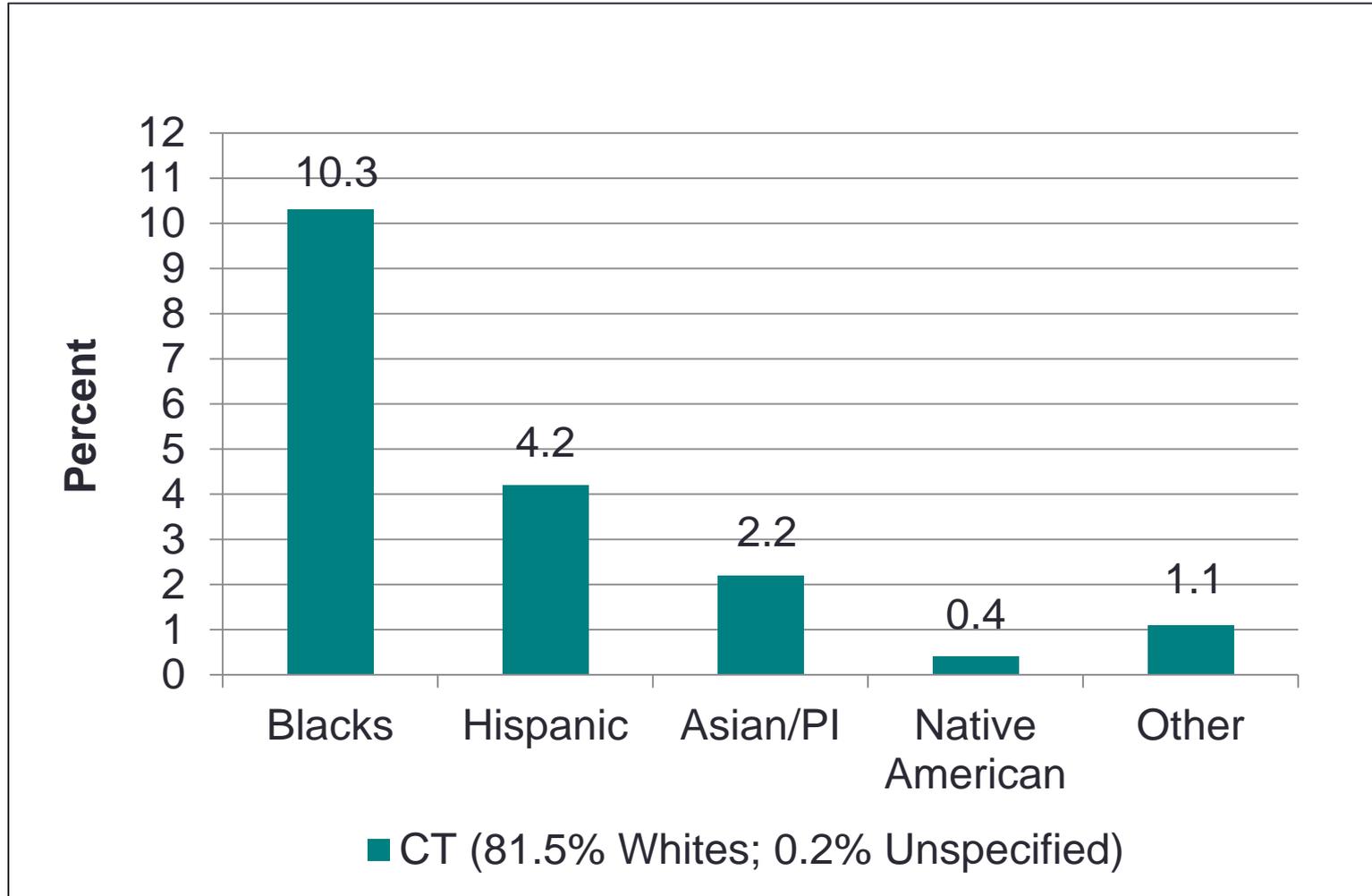
Mean \pm S.D.: DM = 62.3 \pm 6.9; HRT = 63.4 \pm 7.2

Goal: 50-54=10%; 55-59=20%; 60-69=45%; 70-79=25%



WHI CT (DM+HRT): Minority Distribution

Total CT = 68,133 Minorities = 12,462 (18.3%)



Who are the Women Veterans in the WHI?



- 3,719 women Veterans in WHI
~ 3% of total WHI Recruits
- Health similar to non-Veterans
- Demographically distinct from non-Veterans—
 - Older
 - Highly Educated
 - Disproportionately Caucasian
 - Less Likely to be Married



Research Article

Aging Well Among Women Veterans Compared With Non-Veterans in the Women's Health Initiative

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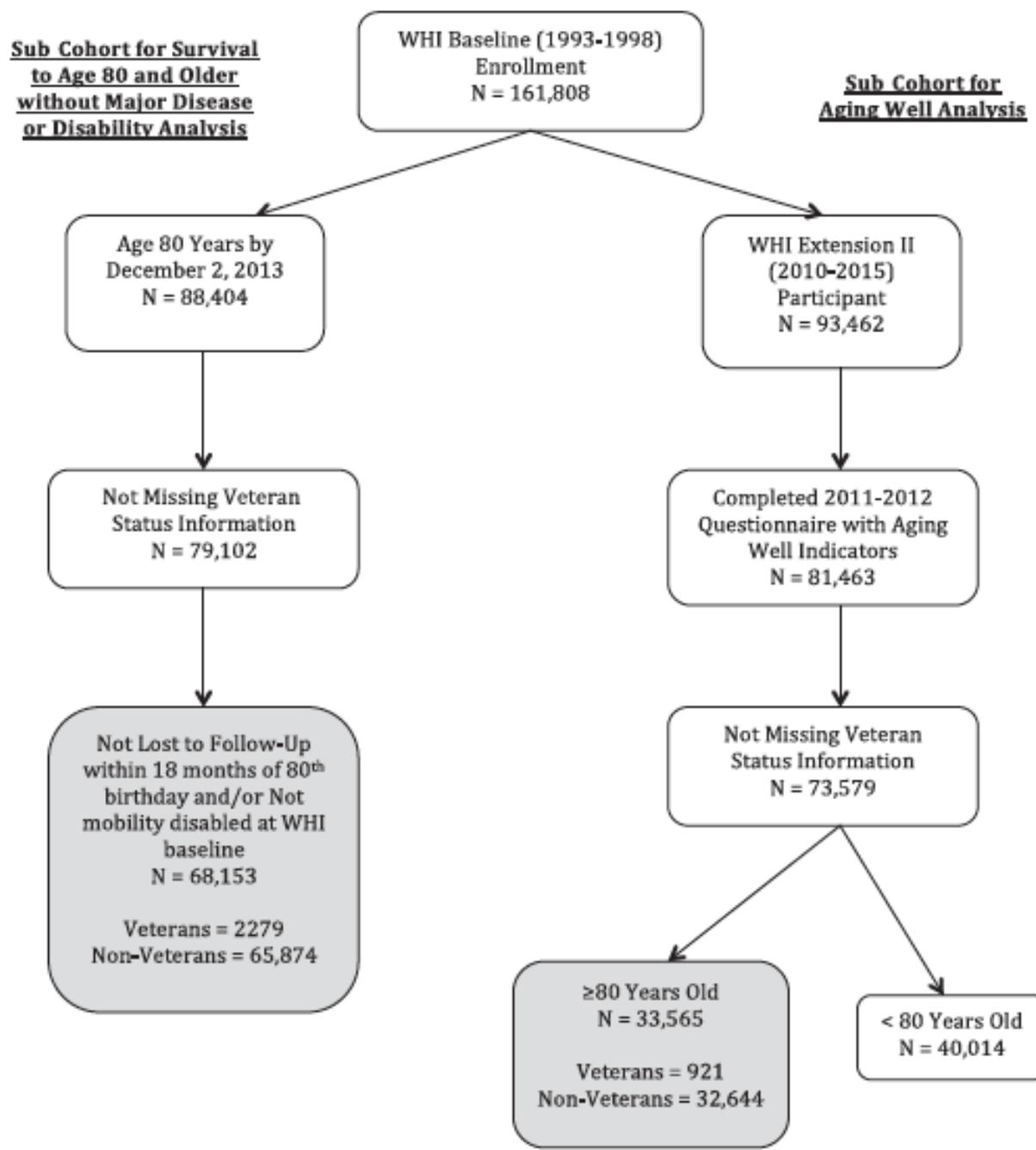
Background

- Tremendous growth in the size of older women Veterans population
- No prior studies of how history of military service affects the probability of survival to age 80 and later, or various indicators of healthy aging
- Understanding the predictors of healthy aging among the growing population of women Veterans is critical to preparing family, professional, and health care systems with which these women interact and support.

Objectives

1. Determine whether prior military service affects the probability of living to age 80 years without disease and disability.
2. Determine whether the factors affecting survival to age 80 without major diseases or disability are the same or different among women Veteran and non-Veterans.
3. Among women who survive to age 80, compare measures of “aging well” (successful, effective, and optimal aging) among women Veterans and non-Veterans.

Methods



Results

Table 3. Survival Outcomes for Veteran Women Relative to Non-Veteran Women.

Survival outcome	Veteran	Non-Veteran	Odds ratios (95% confidence intervals)	
	N (%)	N (%)	Crude ^a	Adjusted ^b
1. Lived to age 80 years with no disease and with no mobility disability	744 (32.7)	20,316 (30.8)	Ref	Ref
2. Lived to age 80 years with baseline disease but no incident disease or mobility disability	515 (22.6)	11,630 (17.7)	1.07 (0.95–1.20)	1.10 (0.97–1.25)
3. Lived to age 80 years with incident disease but no mobility disability	452 (19.8)	15,199 (23.1)	0.97 (0.86–1.09)	0.98 (0.86–1.12)
4. Lived to age 80 years with mobility disability, with or without disease	208 (9.1)	8,062 (12.2)	1.03 (0.88–1.21)	1.01 (0.84–1.21)
5. Did not live to age 80 years	360 (15.8)	10,667 (16.2)	1.17 (1.03–1.33)	1.20 (1.04–1.38)

Notes: ^aAdjusted for baseline age only.

^bAdjusted for race/ethnicity, study membership (observational study vs clinical trial), and baseline age, education, marital status, family income, hormone therapy use, smoking status, alcohol use, physical activity, body mass index, and depression.

Results

Predictors of survival to age 80 without major disease or disability

Risk factors the same in women Veterans and non-Veterans.

Factors associated with better odds of healthy survival included:

- Older age at baseline
- Being married
- Moderate alcohol consumption vs. non-drinkers
- Not smoking
- Higher physical activity levels
- Lower levels of depressive symptoms
- Healthy body weight vs. underweight or obese

Results

Aging Well Indicators Among Women Surviving to Age 80

Women Veterans compared to non-Veterans:

- 85% vs. 87% reported at least good perceived health
- 32% vs. 22% lived in a place with services for older people
- Physical function scores were lower (Rand-36 scores of 53 vs. 60)
- Lower scores on satisfaction with life, social support, quality of life and purpose in life scales
- No differences in several measures of “effective” and “optimal aging” including resilience, self and environmental mastery, self-control, emotional well-being, happiness, enjoyment of life, or personal growth scores.

Research Implications

- A deeper understanding of the factors leading to the observed differences between women Veterans and non-Veterans is needed.
- Studies with more information on pre-military physical and mental health, and occupational exposures during military service are needed.
- Learning more about the aging of younger cohorts of women Veterans from post-Vietnam service eras will also be critically important in the light of these findings.

Clinical Implications

- Women Veterans would benefit from targeted programs promoting physical activity, weight management, social connections, smoking cessation (as needed) and treatment for depressive symptoms.
- Group activities for women Veterans may be helpful by offering both structure and support.
- Preservation of physical and mental function should be a high priority during the post-military life course.

Research Article

Trajectories in Physical Activity and Sedentary Time Among Women Veterans in the Women's Health Initiative

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Special thanks to: Gayle Reiber, PhD, MPH, Andrea LaCroix, PhD, MPH, & Erica Ma, BA

Physical Activity & Sedentary Time

- Maintaining a physically active lifestyle and limiting sedentary time is recommended for health promotion and disease prevention



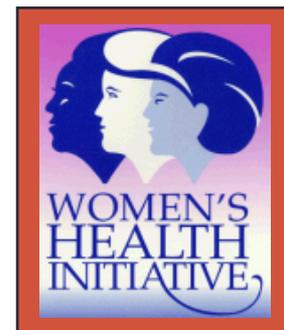
- Inadequate physical activity and high levels of sedentary time each contribute to premature mortality risk
- Military entry requires a baseline level of physical fitness, military retention requires maintenance of those standards
- After military discharge, Veterans develop similar levels of obesity as non-Veterans, which may be a marker for changes in health behavior
 - Little is known about maintenance of physical activity or development of sedentary time after military service among women Veterans

Study Objective

Compare longitudinal trajectories of recreational physical activity and sedentary time between Veteran and non-Veteran postmenopausal women from the Women's Health Initiative (WHI)

Methods

- Participants were women Veterans (n=3,719) and non-Veterans (n=141,800) from the WHI observational study and clinical trials who had baseline data on Veteran status
- Self-reported participation in **recreational physical activity (PA)**, converted to metabolic equivalent (MET)-hours/week, was prospectively assessed over 8 years
- Self-reported **sedentary time (ST)**, defined as hours/day sitting or lying down, collected at baseline and years 3 & 6
- Generalized estimating equations used to compare Veterans' and non-Veterans' trajectories of PA and ST, adjusted for demographics, lifestyle behaviors, study arm



Baseline Differences in recreational Physical Activity and Sedentary Time between Veteran and Non-Veteran Women

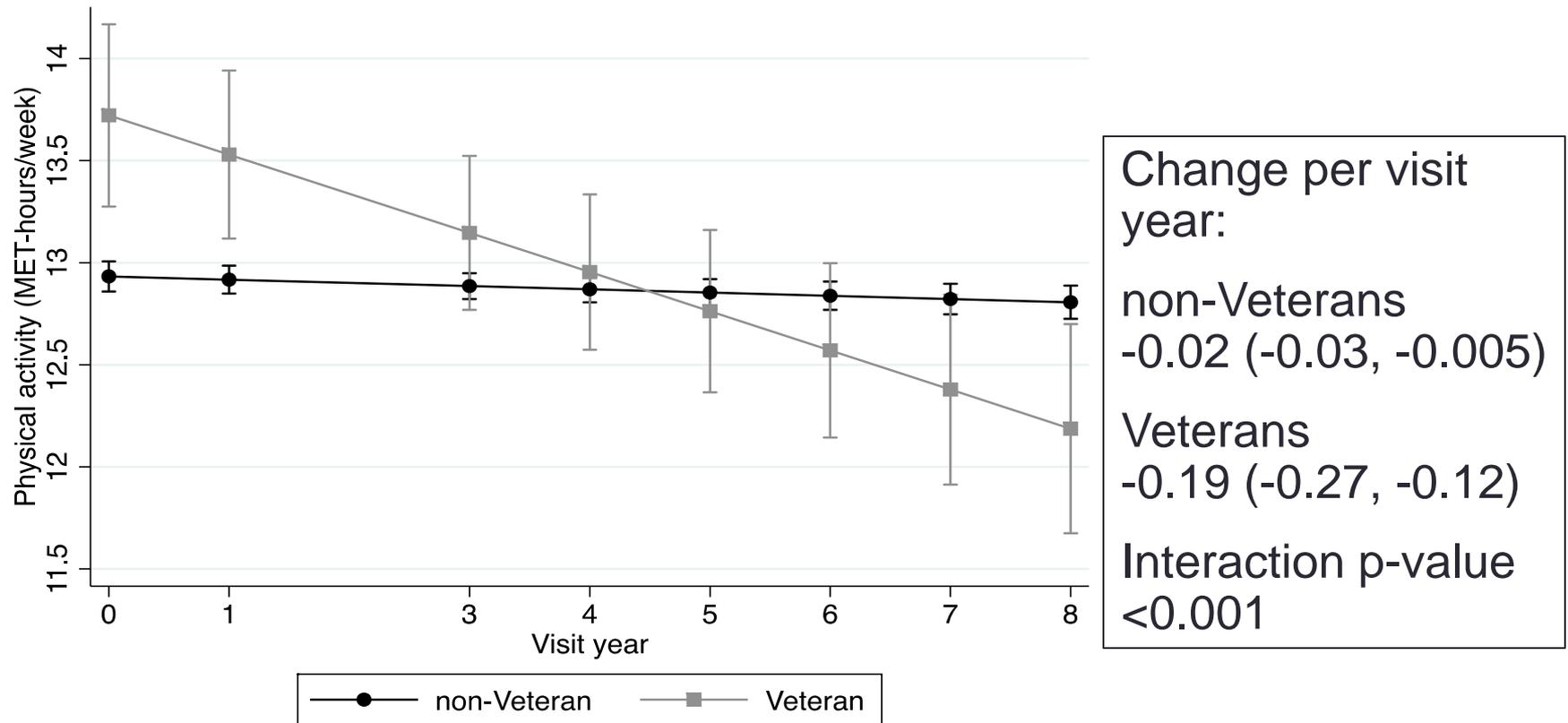
	PA (MET-hrs/wk)	ST (hrs/wk) [^]
Veterans, mean (sd)	13.2 (14.2)	107.2 (28.4)
Non-Veterans, mean (sd)	12.5 (13.7)	105.9 (29.2)
Unadjusted difference	0.7 (0.2, 1.2)*	1.1 (-0.1, 2.3)
Adjusted difference [‡]	0.5 (0.1, 1.01)**	0.5 (-0.7, 1.8)

*p=0.003; **p=0.03

[‡]adjusted for age, race/ethnicity, education, income, marital status, social support, smoking status, Healthy Eating Index 2005, BMI, and (for PA) study assignment

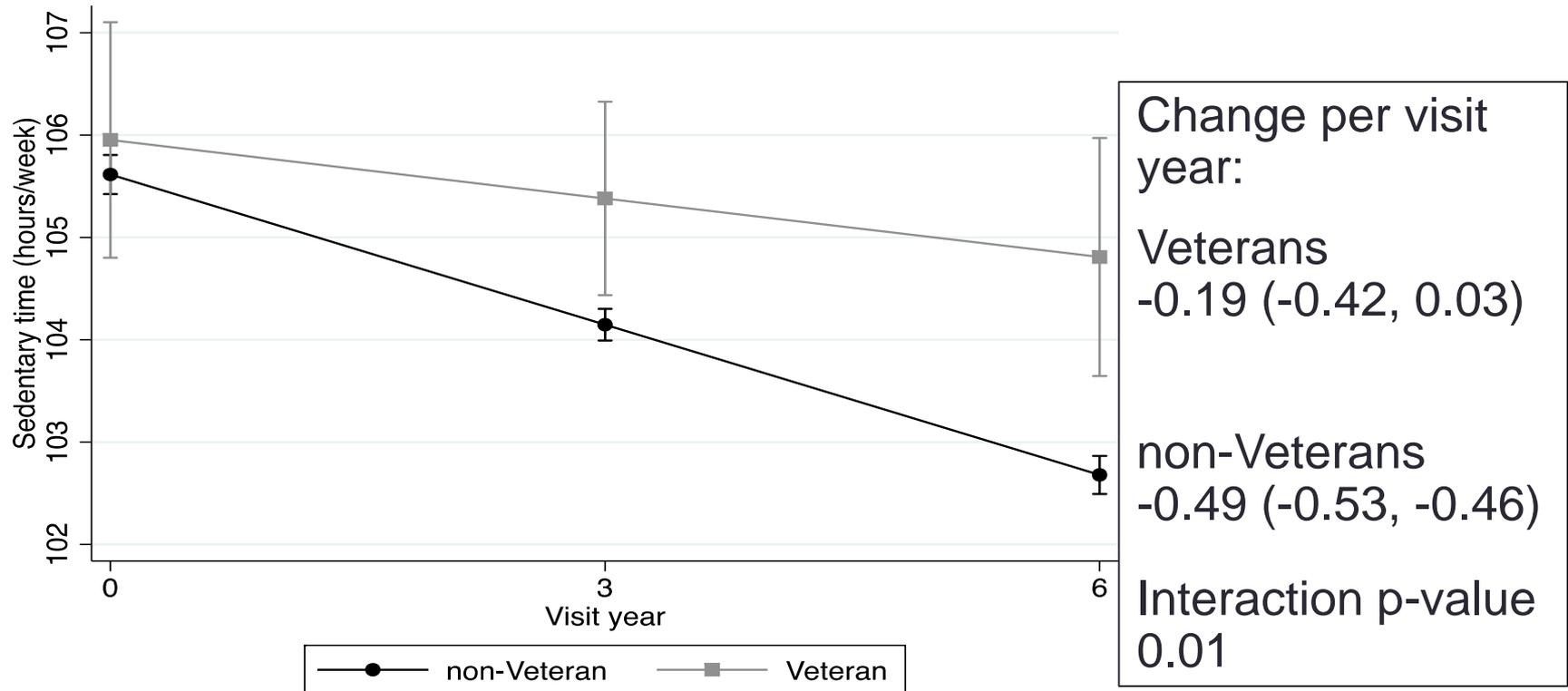
[^]among Observational Study participants only

Trajectories in Physical Activity‡



‡adjusted for baseline age, race/ethnicity, education, income, marital status, social support, smoking status, Healthy Eating Index 2005, BMI, and study assignment

Trajectories in Sedentary Time‡



‡adjusted for baseline age, race/ethnicity, education, income, marital status, social support, smoking status, Healthy Eating Index 2005, and BMI

Discussion

- Women Veterans developed more adverse PA trajectories than non-Veteran women, with the early Veteran advantage in level of PA dissipating by year 5 of follow-up
- Baseline ST was similar between Veterans and non-Veterans; ST declined (improved) for non-Veterans, but not for Veterans
- Though women Veterans may have had a behavioral disposition toward PA earlier in life, these findings suggest that factors beyond behavioral disposition influenced Veterans after military service
- Longitudinal declines in women Veterans' PA, coupled with maintenance of high levels of ST, creates an adverse health behavior trajectory for women Veterans that may explain, in part, the excess Veterans mortality risk that has been described in other studies

Research Implications

- An understanding of the correlates of women Veterans' adverse health behavior trajectories may help inform preventive action
- Military exposures and health conditions that are related to military service should be evaluated as potential contributors

Clinical Implications

- Initiatives that encourage healthcare providers to include PA when designing treatment plans for patients* could be incorporated into Veterans Health Administration (VA) and non-VA health care settings that care for women Veterans
- Embedding PA interventions and other health promotion activities into Veteran service organizations and community organizations with large Veteran constituencies may be useful strategies to reach and engage women Veterans

*e.g., Exercise is Medicine (American College of Sports Medicine, 2015) global health initiative

Research Article

Longitudinal Cognitive Trajectories of Women Veterans from the Women's Health Initiative Memory Study

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Gayle Reiber, PhD, MPH,⁴ Barbara B. Cochrane, PhD, RN,⁵ Michelle J. Naughton, PhD,⁶
Wenjun Li, PhD,^{7,8} Michelle Rissling, PhD,⁹ Kristine Yaffe, MD,¹⁰ Julie R. Hunt, PhD,¹¹
Marcia L. Stefanick, PhD,^{12,13} Mary K. Goldstein, MD, MS,¹⁴ and Mark A. Espeland, PhD¹⁵**

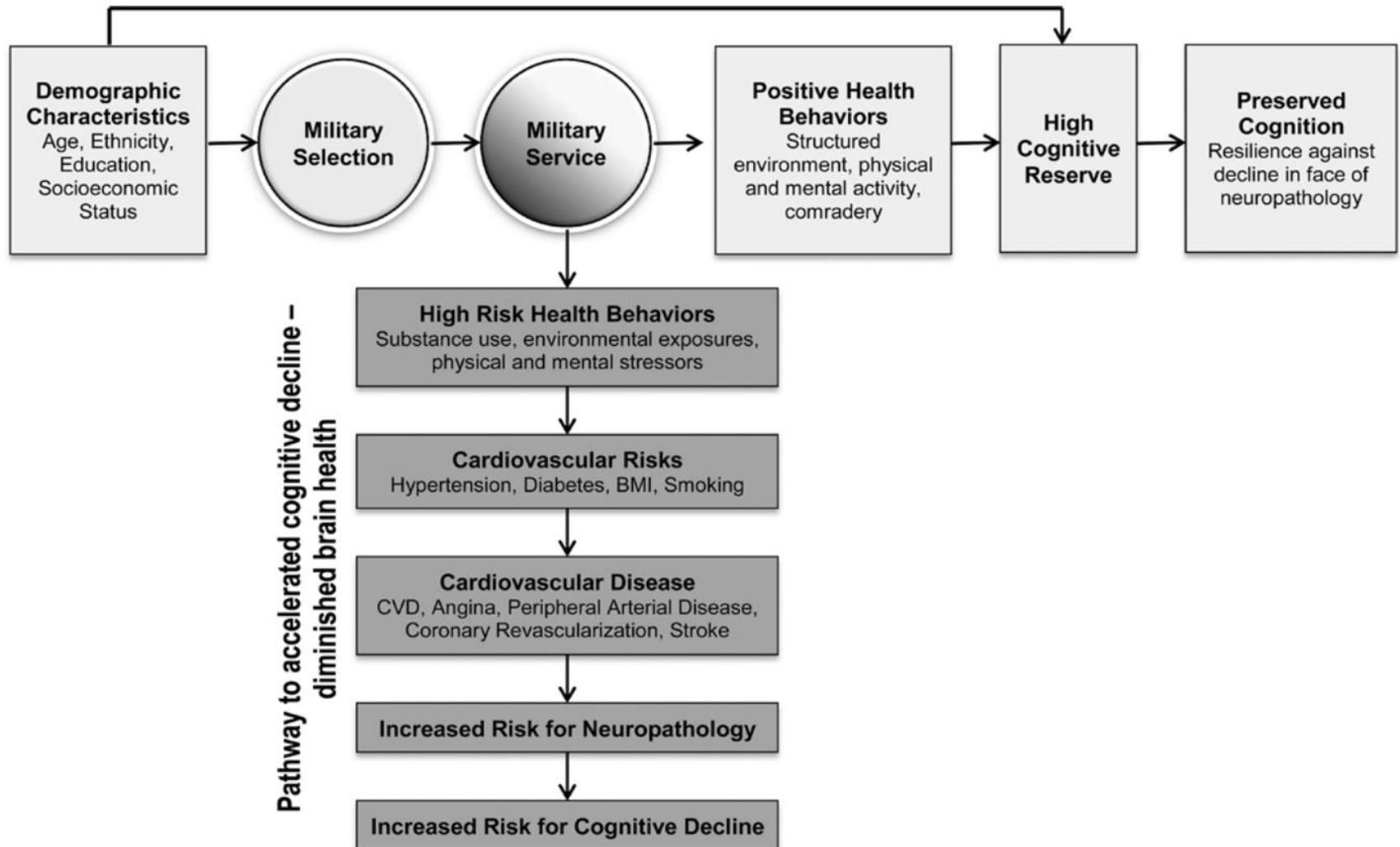
Acknowledgements and Disclaimers

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- The Women's Health Initiative program is funded by the National Heart, Lung, and Blood Institute, U.S. Department of Health and Human Services. Wyeth Pharmaceuticals provided the study drug and the placebo to the WHI trial. The Women's Health Initiative Memory Study was funded by Wyeth Pharmaceuticals, Inc; St. Davids, PA; Wake Forest University; and the National Heart, Lung, and Blood Institute.

Background

- Age related cognitive decline in older, post-menopausal women Veterans has received little empirical attention to date.
 - There are several compelling reasons to believe that there may be a distinctive pattern of cognitive decline.
 - Healthy soldier effect (military selection bias)
 - Protective factors (education, occupation) may buffer against decline
- Vs.
- Health Risk Exposures Associated with Military Service
 - Health Risk Behaviors (Smoking)

Pathways to resilience against cognitive decline – cognitive reserve



Objectives

1. Characterize global cognitive functioning, as measured by the Modified Mini Mental Status Examination (3MSE), among women Veteran and non-Veteran participants in the Women's Health Initiative Memory Study (WHIMS).
2. Compare the trajectories of annual 3MSE assessments over multi-year ($m = 8$) follow-up and test differences between Veteran and non-Veteran average rates of change over this 8 year period.
3. Assess whether differences in the rate of change in 3MSE scores over time are moderated by risk factors for cognitive decline.

Data Source:

The Women's Health Initiative Memory Study (WHIMS)

- WHIMS participants were the more than 7,000 women aged 65+ from the WHI Hormone Trial, who were free of cognitive impairment/dementia at baseline and consented to WHIMS participation.
- Randomly assigned with equal probability to HT 0.625 mg·day⁻¹ of conjugated equine estrogens (CEE-Alone) if prior hysterectomy or CEE in combination with 2.5 mg·day⁻¹ of medroxyprogesterone acetate (CEE + MPA) if no prior hysterectomy or matching placebos.
- The goal of WHIMS was to test the effect of these hormonal preparations on the incidence of probable dementia and other cognitive outcomes and women 65–80 were enrolled in WHIMS 1 year after HT trial began.
- Prospective Follow-up for WHIMS participants was, on average, 8 years.

WHIMS Study Design

Women who had
no uterus at
start of study
Ended: 2/29/04

YES
N=2,947

Conjugated equine
estrogen (CEE) 0.625
mg/d

Placebo

Hysterectomy

Women who had
a uterus at
start of study
Ended: 7/9/02

NO
N=4,532

CEE 0.625 mg/d +
medroxyprogesterone
acetate (MPA) 2.5 mg/d

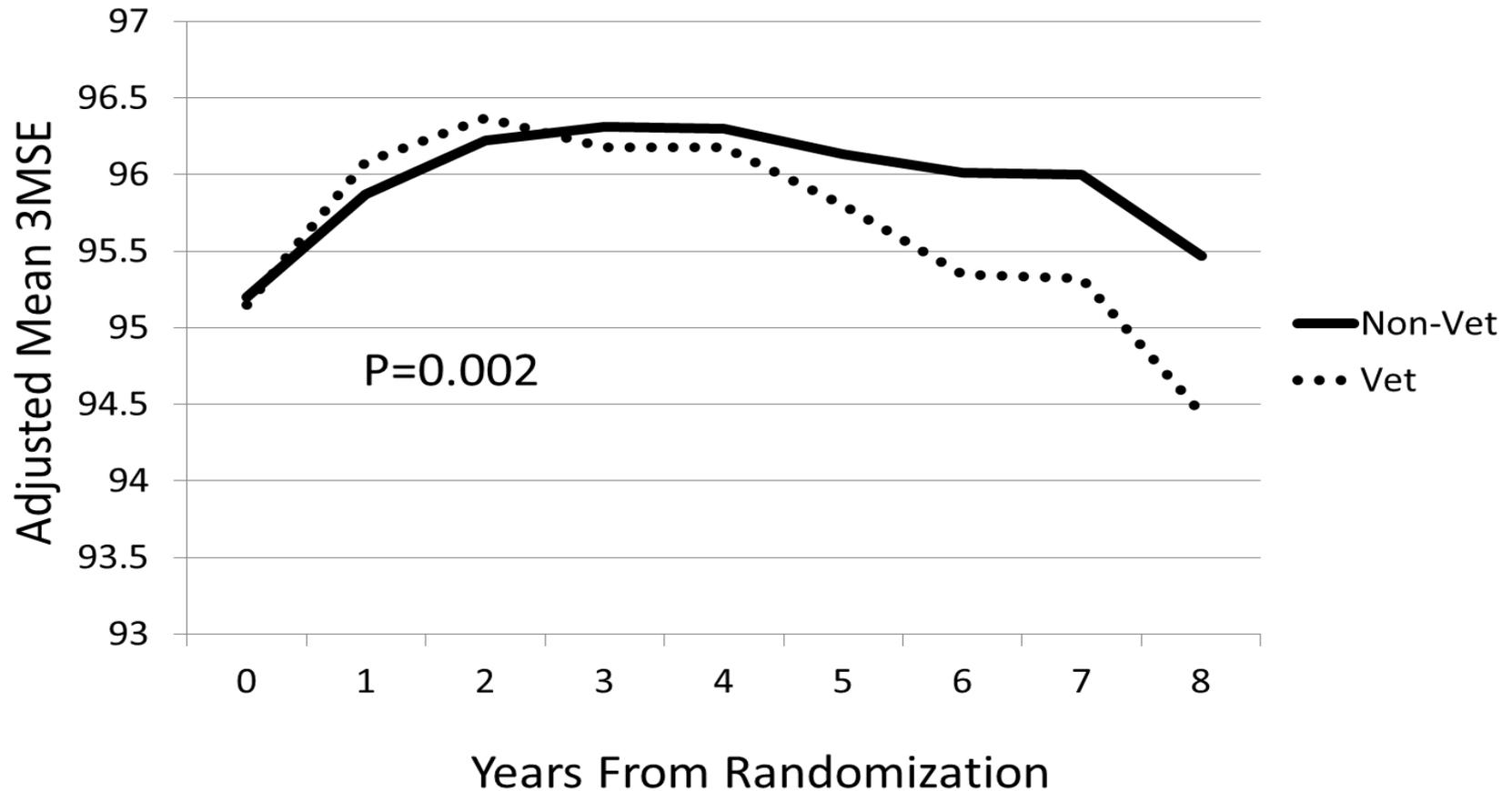
Placebo

Methods

- Participants
 - 7,330 WHIMS Study Participants whose Veteran status was known
 - 279 Veterans (3.8%); 7,051 non-Veterans
 - All participants: 65+ at enrollment
- Outcome Measure
 - Global cognitive function measured by 3MSE (0-100)
- Covariates
 - age, education, race/ethnicity, BMI, hypertension, WHI treatment assignment, history of stroke, history of cardiovascular disease, smoking, and alcohol use

Results

Mean 3MSE Scores Over Time



Results

- Veterans evidenced a greater burden of cardiovascular risk (smoking, hypertension) and disease at baseline.
- Veterans and non-Veterans evidenced similar cognitive functioning at baseline.
- Trajectories of decline were more rapid/precipitous in Veterans relative to non-Veterans, even after controlling for age, socio-demographic and health risk confounds.

Interpreting the Precipitous Decline

- 1) Rapid Decline Signifies Insidious Symptom Onset
 - Undetected health/mental health event
 - Latent, cumulative, synergistic effect of military/civilian life health risk exposures
 - Veteran/Non-Veteran cross over effect (Health Paradox)

- 2) Women Veterans True Burden of Cognitive Impairment at Baseline went Undetected
 - Ceiling Effect of 3MSE
 - Cognitive Reserve Theory
 - Protective Factors Mask Onset of Symptoms

Research Implications

- This represents the first comparative examination of trajectories of cognitive decline in older, postmenopausal women Veterans Vs. non-Veterans.
- Veteran women's heightened cardiovascular risk burden and accelerated trajectory of cognitive decline are noteworthy, and warrant further investigation.
- Further Investigation of women Veterans' late life cognitive health are needed, with attention to protective factors that may mask detection of symptom onset.

Clinical Implications

- Greater attention to women Veterans cardiovascular health is warranted. In particular, attention to modifiable risk factors (i.e., smoking, hypertension) that increase risk for age-related cognitive decline is an important component of preventive women's health care for older women Veterans.
- Assessment of age related cognitive decline among older women Veterans should consider contextual factors (i.e., education) that may preserve functioning in the face of degenerative brain pathology and obscure timely detection of symptom onset.
- Screening instruments should be used cautiously, neuropsychological assessment in conjunction with neuroimaging may be appropriate.

Enjoy all the articles on Women Veterans in the WHI

http://gerontologist.oxfordjournals.org/content/56/Suppl_1.toc
<http://gerontologist.oxfordjournals.org/content/56/1/115.full.pdf+html>

Cyber Seminar 1 - February 22, 2016

Reiber G, LaCroix A. Overview

LaCroix A et-al. Using the Women's Health Initiative to
Answer Key Questions

Weitlauf J, et-al. Who are the Women Veterans?

Bastian L, et-al. Research Results

Cyber Seminars 2, 3

Healthy Aging – Session 2 – February 24, 2016

Lacroix A, et-al. Aging Well Among Women Veterans Compared to Non-Veterans in the Women's Health Initiative

Washington D, et-al. Trajectories in Physical Activity and Sedentary Behavior among Women Veterans in the Women's Health Initiative

Padula C, Weitlauf J, et-al. Longitudinal Cognitive Trajectories of Women Veterans from the Women's Health Initiative Memory Study

Diseases and Conditions – Session 3 – February 29, 2016

Gray K, et-al. Association between chronic conditions and physical function among Veteran and non-Veteran women with diabetes

LaFleur J, et-al. Fracture rates and bone density among postmenopausal Veteran and non-Veteran women from the Women's Health Initiative

Patel K , et-al. Association of Pain with Functional Outcomes, Fatigue, and Sleep Quality among Veterans and non-Veterans: Findings from the WHI

Bastian L, et-al. Differences in Active and Passive Smoking Exposures and Lung Cancer Incidence between Veterans and non-Veterans in the WHI

Cyber Seminars 4, 5

Menopause Related Findings – Session 4 – March 2, 2016

Katon J, et-al. Vasomotor Symptoms and Quality of Life Among Veteran and Non-Veteran Postmenopausal Women

Rissling M, et-al. Sleep Disturbance, Diabetes and Cardiovascular Disease in Postmenopausal Women Veterans

Callegari L, et-al. Hysterectomy and bilateral salpingo-oophorectomy: variations by history of military service and birth cohort

Mortality Findings – Session 5 – March 7, 2016

Washington D, et-al. Military generation and its Relationship to Mortality in Women Veterans in the Women's Health Initiative

Simpson T, et-al. All-cause Mortality and Alcohol Consumption among Women Veterans and non-Veterans Enrolled in the Women's Health Initiative

Lehavot K, et-al. Mortality in Postmenopausal Women by Sexual Orientation and Veteran Status



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The Women
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Questions?

