

# Total and per-patient Fiscal Year 2013 VA disability compensation and medical care expenditures and utilization for Vietnam Era Veterans with service-connected disabilities

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**Background:** While Veterans with 50%+ service connection are entitled to VA disability compensation and prioritised VA care, little is known about disability compensation and medical care expenditures/utilisation among Vietnam Era Veterans with 50%+ service connection.

**Methods:** We analysed 836 917 Vietnam Era Veterans with service-connected disabilities in 2013. For males (n=828 861) and females (n=8056), we describe total and per-patient FY2013 VA disability compensation and medical care expenditures/utilisation associated with 50%+ service-connection status (0-40% vs 50%+), and Medicare-eligible age status (age <65 vs age 65+).

**Results:** Overall, those with 50%+ service connection (males = \$10 315/28 visits; females = \$12 146/36 visits) had higher mean per-patient FY2013 VA medical care expenditures and outpatient utilisation, relative to those rated 0-40% (males = \$5520/17 visits; females = \$6735/22 visits). By contrast, those who were Medicare-eligible age (males = \$9779/27 visits; females = \$10 575/32 visits) had lower VA mean per-patient FY2013 medical care expenditures and outpatient utilisation, relative to those below Medicare-eligible age (males = \$11 377/31 visits; females = \$13 290/39 visits).

**Conclusions:** For Vietnam Era Veterans with 50%+ service connection, lower per-patient VA medical care expenditures and outpatient utilisation among those of Medicare-eligible age raises the possibility that medical care substitution effects may occur even among those with cost-free VA care. Prospective follow-up studies based on VA/Medicare data are needed to evaluate this possibility.

## Introduction

With an annual budget of more than \$200 billion in 2019, the US Department of Veterans Affairs (VA) is the largest single healthcare provider in the United States and administers an extensive disability compensation program.<sup>1</sup> Within the VA system, the Veterans Benefits Administration (VBA) administers disability compensation payments while the Veterans Health Administration (VHA) provides medical care.<sup>2</sup> These two programs, disability compensation and medical care, represent long-term budgetary costs borne by the VA.<sup>3</sup>

VBA disability compensation is intended to compensate Veterans for average impairment in earnings resulting from service-connected conditions.<sup>4</sup> 'Service connected' refers to conditions that occurred during military service or those that were aggravated by it.<sup>4</sup> VBA disability compensation payments are tied to a 'combined disability rating', which expresses accumulated service-connected disability severity on a graduated scale from 0% to 100% in increments of 10% (higher ratings denote greater burden of service-connected disabilities and correspond to higher payments).<sup>5</sup> VBA disability compensation payments in 2013 (year of our study) ranged from \$129 to \$2816 for Veterans without dependents.<sup>6</sup>

The *Veterans Health Care Eligibility Reform Act* mandates that Veterans with combined degree of service connection 50–100% ('50%+'), as well as those unable to maintain employment due to service-connected conditions (Individual Unemployability [IU]), are entitled to highest-priority, cost-free VHA care for all service and non-service-connected medical conditions, without enrollment.<sup>7–11</sup> In contrast, Veterans with combined degree of service connection 0–40% receive lower priority, cost-free VHA care for their service-connected conditions, but must enroll and may be responsible for co-payments when receiving care for their non-service-connected conditions.<sup>6,7</sup> Surprisingly, while access to VA disability compensation payments and priority no-cost medical care for veterans with 50%+ service connection is mandated by federal law, little is known about VA disability compensation and medical care expenditures and utilisation among Vietnam Era Veterans with service-connected disabilities. We focused on Vietnam Era (1962–1975) Veterans with service-connected conditions because these Veterans tend to have considerable disability compensation and age-related medical care needs,<sup>12–13</sup> and many are dually eligible to receive care from VHA and/or Medicare providers.<sup>14</sup>

The overall objectives of this study were to describe, (1) VA total Fiscal Year 2013 (FY2013) expenditures on VBA disability compensation and VHA medical care for Vietnam Era Veterans with service-connected disabilities; and (2) per-patient costs of each for that same year. Since disability compensation and medical care expenditures vary by degree of service connection,<sup>7–11</sup> gender<sup>15</sup> and age,<sup>16</sup> we examined, (3) VA total and per-patient FY2013 disability compensation and medical care expenditures and (4) medical care (i.e. inpatient and outpatient) utilisation overall, as well as by degree of service connection (0–40% vs 50%+), gender, and age (age <65 vs age 65+). We include medical care utilisation in this study because of its association with medical care cost.<sup>17</sup> In the current study, we hypothesised that there would be large differences in VA total and per-patient FY2013 disability compensation and medical care expenditures and utilisation between Veterans with 50%+ service connection (relative to 0–40% service connection), men (relative to women) and those age 65+ (relative to age <65).

## Methods

### Research design and study sample

We used a cross-sectional design to identify Vietnam Era Veterans with service-connected disabilities in

2013. Our study population consisted of 1 125 053 Vietnam Era Veterans who had at least one service-connected condition and an active award status recorded in the April 2013 Veterans Service Network Corporate Mini Master File (VETSNET) data extract. Since we were interested in Veterans who were also VHA patients in FY2013, we selected 861 419 (76.5%) with at least one VHA outpatient visit recorded in the VHA Event File (FY2013) or one VHA inpatient visit recorded in the VHA Patient Treatment File (FY2013). We excluded 24 502 (28.4%) Veterans who were not alive in FY2013, or had not served between 1962–1975, or were younger than 59 years of age, or were missing information on age or gender. Our final analytic sample comprised 836 917 Vietnam Era Veterans with service-connected conditions in 2013.

### Data sources

We used VETSNET, the primary source of information on Veterans' disability compensation and pension benefits,<sup>18</sup> to create our final analytic sample and ascertain disability compensation payment information from April 2013. We used VHA event files, which contain one record for each outpatient encounter, to ascertain annual VHA outpatient utilisation in FY2013. Outpatient visits were defined using the National Committee for Quality Assurance (NCQA) Healthcare Effectiveness Data and Information Set definition of face-to-face ambulatory visits.<sup>19–20</sup> We used the VHA Patient Treatment Files (PTFs) to ascertain VHA inpatient utilisation in FY2013. The VHA PTFs contain data for inpatient stays at VA medical and domiciliary care centres, contract and community nursing homes, and non-VA hospitals at VA expense, including admission, diagnoses, procedures, surgical episodes, dispositions (discharges) and transfers.<sup>19–20</sup> We used VHA Health Economics Resource Center healthcare cost data files to ascertain inpatient and outpatient ('medical care') expenditures in FY2013. The VHA Health Economics Resource Center files, in estimating average national VHA inpatient and outpatient costs borne by the VA, apply a Medicare payment methodology. Cost estimates for VHA outpatient visits are based on reimbursement rates from Medicare and other healthcare payers to estimate hypothetical payments for outpatient visits; these payments are then adjusted to reflect the actual aggregate cost of VHA outpatient care. In contrast, costs for VHA inpatient stays are calculated using a Medicare cost function estimate derived from characteristics of the patient admission, such as length of stay and diagnosis-related group relative weights.<sup>15</sup>

## Study variables

We selected variables based on *a priori* knowledge of factors associated with VA system utilisation and costs.<sup>1</sup> Our primary exposure was 50%+ service-connection status in FY2013. Because Veterans with combined disability ratings of 50%+ receive highest-priority, cost-free VHA medical care, we transformed combined disability rating into a dichotomous (0-40% vs 50%+) 50%+ service-connection status variable. Since IU allows a Veteran to receive VBA disability compensation at the 100% rate, Veterans with IU in this study were considered to have a 100% disability rating and included in the 50%+ service-connected group.

Other variables included age, sex, VBA total and per-patient FY2013 disability compensation payment expenditures, VHA total and per-patient FY2013 medical care expenditures, VHA per-patient FY2013 inpatient and outpatient care utilisation. Because Veterans become eligible for Medicare enrolment at age 65,<sup>21</sup> we transformed age into a dichotomous (age <65 vs age 65+) Medicare-eligible age status variable. Since VETSNET is limited to a single month (i.e. April 2013) of data, we annualised disability compensation payments by multiplying each individual monthly payment by 12. In deriving VBA total and per-patient FY2013 disability compensation expenditures, we aggregated and averaged the annualised FY2013 disability compensation payments. In deriving VHA total and per-patient FY2013 medical care expenditures, we aggregated and averaged estimated annualised FY2013 VHA inpatient and outpatient medical care expenditures. To derive VHA per-patient FY2013 medical care utilisation, we used clinic stop codes to ascertain FY2013 VHA inpatient and outpatient visits (a Veteran could have more than one visit on any given day).

## Statistical analysis

The VA New Jersey Health Care System Institutional Review Board approved this cross-sectional study. All analyses were performed with SAS 9.4 (SAS Corp: Cary, NC), were two-tailed and conducted with a 0.05 significance level.

For males and females separately, we stratified VA total and mean and median per-patient FY2013 disability compensation and medical care expenditures by 50%+ service-connection status. We further stratified mean and median per-patient FY2013 disability compensation and medical care expenditures and utilisation, for separate subsets with 0-40% and 50%+ service connection. Totals, means (standard error, s.e.) and medians (interquartile range, i.q.r.) were used to compare FY2013 per-patient disability

compensation and medical care expenditures and utilisation. Statistically significant differences were evaluated with chi-square tests for categorical variables, t-tests for normally distributed means, with or without equal variances, Wilcoxon rank-sum and Kruskal Wallance tests for medians. In the results section below, we report means for greater comparability with existing studies.

## Results

Overall, almost two-thirds of Vietnam Era Veterans in our sample were 50%+ service connected in 2013. Additionally, the proportion of the sample with 50%+ service connection was similar for males and females and those aged <65 and 65+ (Table 1).

All expenditures are reported in 2013 US dollars. Overall, VA spent an estimated \$8.6 billion more (twice as much) in FY2013 on disability compensation (\$15.7 billion) than on medical care (\$7.1 billion), in this sample. Presumably, because of their greater numbers (males = 828 861, females = 8056), VA spent an estimated \$22.3 billion more in FY2013 on disability compensation and medical care for males (\$22.5 billion) than for females (\$236.9 million), and an estimated \$2.8 billion more for those age 65+ (\$10.8 billion, n = 552 950) relative to those age <65 (\$7.99 billion, n = 283 967). As expected, VA total FY2013 disability compensation and medical care spending for Veterans with 50%+ service connection (\$19.7 billion) exceeded expenditures for Veterans with 0-40% service connection (\$3.03 billion) by approximately \$16.7 billion (Table 1).

As hypothesised, VA mean per-patient FY2013 medical care expenditures and outpatient utilisation were higher for Veterans with 50%+ service connection (males = \$10 315/28.7 visits; females = \$12 146/36.5 visits), relative to Veterans with 0-40% service connection (males = \$5520/16.7 visits; females = \$6735/22 visits), in this sample (Table 2).

As further hypothesised for Veterans with 50%+ service connection, VA mean per-patient FY2013 medical care expenditures and outpatient utilisation were lower for those age 65+ (males = \$9779/27.5 visits; females = \$10 575/31.7 visits), relative to those age <65 (males = \$11 377/31.2 visits; females = \$13 290/39.9 visits), among the sample (Table 3). Similarly, for Veterans with 0-40%+ service connection, VA mean per-patient FY2013 medical care expenditures and outpatient utilisation were lower for those age 65+ (males = \$5122/15.8 visits; females = \$6168/20.0 visits), relative to those age <65 (males=\$6297/18.6 visits; females = \$7179/23.6 visits), among the sample (Table 4).

**Table 1. Estimated Fiscal Year 2013 Expenditures for VBA Disability Compensation Payments and VHA Medical Care for service-connected Vietnam Era Veterans Overall and by Gender, Age and Degree of Service-Connection**

	Overall	Service-Connection 0-40%	Service-Connection 50%+
<b>Full Sample</b>	<b>n=836,917</b>	<b>n=321,769</b>	<b>n=515,148</b>
Annualized FY2013 disability compensation payments	\$15,717,348,174	\$1,250,518,902	\$14,466,829,272
Estimated FY2013 medical care expenditures	\$7,103,552,458	\$1,779,866,330	\$5,323,686,127
Sum total FY2013 disability compensation payments and medical care expenditures	\$22,820,900,632	\$3,030,385,232	\$19,790,515,399
<b>&lt;65 years</b>	<b>n=283,967</b>	<b>n=109,715</b>	<b>n=174,252</b>
Annualized FY2013 disability compensation payments	\$5,314,192,836	\$411,772,932	\$4,902,419,904
Estimated FY2013 medical care expenditures	\$2,680,562,574	\$692,305,286	\$1,988,257,288
Sum total FY2013 disability compensation payments and medical care expenditures	\$7,994,755,410	\$1,104,078,218	\$6,890,677,192
<b>65+ years</b>	<b>n=552,950</b>	<b>n=212,054</b>	<b>n=340,896</b>
Annualized FY2013 disability compensation payments	\$10,403,166,338	\$838,745,970	\$9,564,409,368
Estimated FY2013 medical care expenditures	\$4,422,989,884	\$1,087,561,044	\$3,335,428,840
Sum total FY2013 disability compensation payments and medical care expenditures	\$10,845,415,622	\$1,926,307,014	\$12,899,838,208
<b>Males</b>	<b>n=828,861</b>	<b>n=318,905</b>	<b>n=509,956</b>
Annualized FY2013 disability compensation payments	\$15,562,784,382	\$1,239,588,054	\$14,323,196,328
Estimated FY2013 medical care expenditures	\$7,021,199,035	\$1,760,575,476	\$5,260,623,559
Sum total FY2013 disability compensation payments and medical care expenditures	\$22,583,983,417	\$3,000,163,530	\$19,583,819,887
<b>Females</b>	<b>n=8,056</b>	<b>n=2,864</b>	<b>n=5,192</b>
Annualized FY2013 disability compensation payments	\$154,563,792	\$10,930,848	\$143,632,944
Estimated FY2013 medical care expenditures	\$82,353,422	\$19,290,854	\$63,062,568
Sum total FY2013 disability compensation payments and medical care expenditures	\$236,917,214	\$30,221,702	\$206,695,512

Notes: 2013 US \$; Abbreviations: VHA=Veterans Health Administration, VBA=Veterans Benefits Administration, IQR=Interquartile Range.

**Table 2. Estimated Fiscal Year 2013 Per-Patient VBA Disability Compensation Payments and VHA Medical Care Expenditures and Utilization for service-connected Vietnam Era Veterans by Gender and Degree of Service-Connection**

	0-40%	50%+	p <sup>1</sup>	0-40%	50%+	p <sup>2</sup>
N (%)	318,905 (38.4%)	509,956 (61.5%)		2,864 (35.5%)	5,192 (64.4%)	
<b>Annualized FY2013 per-patient disability compensation payments</b>						
Mean (s.e.)	\$3,887.01 (2,319) n=318,905	\$28,087.12 (11,517) n=509,956	<.0001	\$3,816.64 (2,207) n=2,864	\$27,664.28 (12,045) n=5,192	<.0001
Median (i.q.r.)	\$3,060 (1,548-5,304)	\$33,792 (16,824-35,676)	<.0001	\$3,060 (1,424-6,301)	\$33,792.00 (15,516-35,052)	<.0001
<b>Estimated FY2013 per-patient medical care expenditures</b>						
Mean (s.e.)	\$5,520.69 (10,573) n=318,905	\$10,315.84 (15,013) n=509,956	<.0001	\$6,735.63 (11,158) n=2,864	\$12,146.10 (15,841) n=5,192	<.0001
Median (i.q.r.)	\$2,443.73 (1,122-5,314)	\$5,479.38 (2,581-11,150)	<.0001	\$3,134.07 (1,336-7,271)	\$6,829.19 (3,057-14,398)	<.0001
<b>Estimated FY2013 per-patient outpatient medical care expenditures</b>						
Mean (s.e.)	\$3,670.03 (5,644) n=316,153	\$6,431.32 (8,050) n=506,511	<.0001	\$4,538.56 (6,342) n=2,849	\$7,426.96 (8,401) n=5,146	<.0001
Median (i.q.r.)	\$1,964.09 (916-4,246)	\$4,055.01 (1,855-8,057)	<.0001	\$2,469.88 (1,047-5,530)	\$4,889.65 (2,116-9,678)	<.0001
<b>FY2013 per-patient outpatient medical care visits</b>						
Mean (s.e.)	16.7 (20.7) n=316,153	28.7 (30.3) n=506,511	<.0001	22.0 (25.7) n=2,864	36.5 (39.8) n=5,192	<.0001
Median (i.q.r.)	10.0 (5.0-21.0)	20.0 (10.0-38.0)	<.0001	14.0 (5.0-29.0)	25.0 (12.0-49.0)	<.0001
<b>Estimated FY2013 per-patient inpatient medical care expenditures</b>						
Mean (s.e.)	\$19,243.82 (19,181) n=17,296	\$20,041.80 (19,961) n=52,469	<.0001	\$17,102.63 (16,317) n=193	\$19,265.18 (1,910) n=656	<.0001
Median (i.q.r.)	\$12,209 (5,640-26,315)	\$12,710 (5,758-27,668)	<.0001	\$11,386.00 (5,560-25,481)	\$12,275.00 (5,941-25,369)	<.0001
<b>FY2013 per-patient inpatient medical care visits</b>						
Mean (s.e.)	1.47 (0.90) n=17,296	1.60 (1.08) n=52,469	<.0001	1.45 (0.76) n=193	1.59 (1.03) n=656	0.0303
Median (i.q.r.)	1.0 (1.0-2.0)	1.0 (1.0-2.0)	<.0001	1.0 (1.0-2.0)	1.0 (1.0-2.0)	0.3250
	MALES (828,861)			FEMALES (8,056)		

Notes: p<sup>1</sup>=among male subset, differences between those with 50%+ vs. 0-40%; p<sup>2</sup>=among female subset, differences between those with 50%+ vs. 0-40%; Dollars rounded to nearest whole dollar. Abbreviations: VHA=Veterans Health Administration, SE=standard error, VBA=Veterans Benefits Administration, PTSD=Post-traumatic stress disorder, IQR=Interquartile Range, n=sample size. Statistically significant differences (p<0.05) were assessed using t-tests (for continuous variables), and Wilcoxon rank sum tests (for non-normal, continuous variables).

**Table 3. Estimated Fiscal Year 2013 Per-Patient VBA Disability Compensation Payments and VHA Medical Care Expenditures and Utilization for Vietnam Era Veterans with 50%+ Service-Connection, by Gender and Age**

	Age <65	Age 65+	p <sup>1</sup>	Age <65	Age 65+	p <sup>2</sup>
N (%)	171,248 (33.5%)	338,708 (66.4%)	--	3,004 (57.8%)	2,188 (42.1%)	--
<b>Annualized FY2013 per-patient disability compensation payments</b>						
Mean (s.e.)	\$28,137.05 (11,344) n=171,248	\$28,061.88 (11,603) n= 338,708	0.0277	\$27,964.83 (11,741) n=3,004	\$27,251.64 (12,441) n=2,188	0.0351
Median (i.q.r.)	\$33,792 (16,824-35,676)	\$33,792 (16,716-35,676)	<.0001	\$33,792 (15,516-35,070)	\$33,792 (14,640-34,992)	0.1146
<b>Estimated FY2013 per-patient medical care expenditures</b>						
Mean (s.e.)	\$11,377.26 (1,587) n=171,248	\$9,779.19 (14,527) n=338,708	<.0001	\$13,290.23 (16,546) n=3,004	\$10,575.29 (14,678) n=2,188	<.0001
Median (i.q.r.)	\$33,792 (16,824-35,676)	\$5,151.34 (2,398-10,549)	<.0001	\$7,653.44 (3,658-15,998)	\$5,582.01 (2,426-12,010)	<.0001
<b>Estimated FY2013 per-patient outpatient medical care expenditures</b>						
Mean (s.e.)	\$6,962.12 (8,403) n=170,115	\$6,162.89 (7,852) n=336,396	<.0001	\$8,194.94 (8,977) n=2,981	\$6,369.52 (7,408) n=2,165	<.0001
Median (i.q.r.)	\$4,520.37 (2,133-8,696)	\$3,828.59 (3,722-17,332)	<.0001	\$5,495.59 (2,569-10,546)	\$3,998.18 (1,695-8,315)	<.0001
<b>FY2013 per-patient outpatient medical care visits</b>						
Mean (s.e.)	31.2 (32.5) n=170,115	27.58 (28.9) n=36396	<.0001	39.9 (43.7) n=2,981	31.7 (33.0) n=2,165	<.0001
Median (i.q.r.)	22.0 (11.0-41.0)	19.0 (9.0-36.0)	<.0001	28.0 (14.0-52.0)	21.0 (10.0-42.0)	<.0001
<b>Estimated FY2013 per-patient inpatient medical care expenditures</b>						
Mean (s.e.)	\$20,346.50 (19,958) n=20,247	\$19,850.34 (19,961) n=32,222	0.0056	\$19,213.07 (19,837) n=408	\$19,350.91 (19,806) n=248	0.9312
Median (i.q.r.)	\$13,040 (6,087-28,0652)	\$12,572.50 (5,535-27,371)	<.0001	\$12,064.50 (6,155-24,789)	\$13,136 (5,361-26,454)	0.9615
<b>FY2013 per-patient inpatient medical care visits</b>						
Mean (s.e.)	64.5 (46.9) n=20,247	62.2 (41.7) n=32,222	0.2147	76.1 (59.7) n=408	68.7 (51.1) n=248	0.2972
Median (i.q.r.)	53.0 (34.0-80.0)	53.0 (34.0-81.0)	0.6048	63.5 (41.0-96.0)	58.0 (35.0-89.0)	0.1086
	MALES (N=509,956)			FEMALES (N=5,192)		

32,222

Notes: p<sup>1</sup>=among male subset, differences between those with 50%+ vs. 0-40%; p<sup>2</sup>=among female subset, differences between those with 50%+ vs. 0-40%; Dollars rounded to nearest whole dollar. Abbreviations: VHA=Veterans Health Administration, SE=standard error, VBA=Veterans Benefits Administration, PTSD=Post-traumatic stress disorder, IQR=Interquartile Range, n=sample size. Statistically significant differences (p<0.05) were assessed using t-tests (for continuous variables), and Wilcoxon rank sum tests (for non-normal, continuous variables).

**Table 4. Estimated Fiscal Year 2013 Per-Patient VBA Disability Compensation Payments and VHA Medical Care Expenditures and Utilization for Vietnam Era Veterans with 0-40% Service-Connection, by Gender and Age**

	Age <65	Age 65+	p <sup>1</sup>	Age <65	Age 65+	p <sup>2</sup>
N (%)	108,109 (33.9%)	210,796 (66.1%)	--	1,606 (56.1%)	1,258 (43.9%)	--
<b>Annualized FY2013 per-patient disability compensation payments</b>						
Mean (s.e.)	\$3,752.22 (2,279) n=108,109	\$3,956.15 (2,336) n=210,796	<.0001	\$3,813.55 (2,251) n=1,606	\$3,820.58 (2,150) n=1,258	0.9322
Median (i.q.r.)	\$3,060 (1,548-5,305)	\$3,060 (1,548-5,304)	<.0001	\$3,060 (1,548-5,304)	\$3,060 (1,548-5,304)	0.6474
<b>Estimated FY2013 per-patient medical care expenditures</b>						
Mean (s.e.)	\$6,297.12 (11,579) n=108,109	\$5,122.49 (9,994) n=210,796	<.0001	\$7,179.59 (11,750) n=1,606	\$ 6,168.86 (10,330) n=1,258	0.0145
Median (i.q.r.)	\$2,780.14 (1,261-6,120)	\$2,286.88 (1,059-4,920)	<.0001	\$3,343.36 (1,395-7,970)	\$ 2,768.39 (1,285-6,455)	0.0018
<b>Estimated FY2013 per-patient outpatient medical care expenditures</b>						
Mean (s.e.)	\$4,069.78 (6,012) n=107,132	\$3,465.15 (5,435) n=209,021	<.0001	\$4,889.48 (6,651) n=1,593	\$4,093.50 (5,900) n=1,256	0.0009
Median (i.q.r.)	\$2,229.47 (1,021-4,819)	\$1,844.36 (872-3,962)	<.0001	\$2,695.88 (1,125-6,098)	\$2,186.32 (981-4,850)	<.0001
<b>FY2013 per-patient outpatient medical care visits</b>						
Mean (s.e.)	18.6 (22.9) n=108,109	15.8 (19.4) n=209,021	<.0001	23.6 (28.0) n=1,593	20.0 (22.2) n=1,256	0.0002
Median (i.q.r.)	11.0 (5.0-23.0)	9.0 (4.0-20.0)	<.0001	15.0 (6.0-30.0)	12.0 (6.0-26.0)	0.0005
<b>Estimated FY2013 per-patient inpatient medical care expenditures</b>						
Mean (s.e.)	\$19,931.51 (19,511) n=6,989	\$18,777.51 (18,941) n=10,307	0.0001	\$17,102.88 (16,693) n=109	\$17,102.31 (15,916) n=84	0.9998
Median (i.q.r.)	\$12,749 (5,907-26,942)	\$11,810 (5,449-25,706)	0.0001	\$10,399 (6,013-24,966)	\$12,757 (5,393-26,370)	0.8425
<b>FY2013 per-patient inpatient medical care visits</b>						
Mean (s.e.)	53.4 (40.6) n=6,989	50.9 (35.1) n=10,307	0.2315	66.6 (54.3) n=109	55.0 (32.0) n=84	0.9796
Median (i.q.r.)	42.0 (28.0-66.0)	43.0 (28.0-64.0)	0.1007	54.0 (34.0-77.0)	52.0 (28.0-74.5)	0.6277
	MALES (N=318,905)			FEMALES (N=2,864)		

Notes: p<sup>1</sup>=among male subset, differences between those with 50%+ vs. 0-40%; p<sup>2</sup>=among female subset, differences between those with 50%+ vs. 0-40%; Dollars rounded to nearest whole dollar. Abbreviations: VHA=Veterans Health Administration, SE=standard error, VBA=Veterans Benefits Administration, PTSD=Post-traumatic stress disorder, IQR=Interquartile Range, n=sample size. Statistically significant differences (p<0.05) were assessed using t-tests (for continuous variables), and Wilcoxon rank sum tests (for non-normal, continuous variables).

## Discussion

In this study of Vietnam Era Veterans with VA service-connected disabilities, total FY2013 expenditures for VA disability compensation and medical care exceeded \$22 billion: \$15.7 billion was spent on disability compensation payments and \$7.1 billion on medical care. In FY2013, about one-fifth of total VA expenditures that year (\$142.8 billion, according to VA)<sup>22</sup> went to disability compensation payments and medical care for our sample of Vietnam Era Veterans with service-connected disabilities. There were some important differences among subgroups. Among men and women in our sample, being 50%+ service connected was associated with higher per-patient VA disability compensation and medical care expenditures and outpatient utilisation. In contrast, being Medicare-eligible age (65+) was associated with lower per-patient VA medical care expenditures and utilisation, but similar per-patient VA disability compensation, in FY2013.

US Veterans represent a population who have served their country, many facing risks to both short- and long-term health during their active-duty military service. Because many Veterans have served on hazardous missions, including combat, Veterans with service-connected disabilities are a clinically complex population.<sup>6-10</sup> In recognition, the US Congress has mandated that Veterans with the highest burden of service-connected disabilities (i.e. 50%+) are entitled to large disability compensation payments and highest-priority, cost-free VHA care for all medical conditions.<sup>6-9</sup> Consistent with Congressional intent to reduce barriers to service-connection benefits for Vietnam Era Veterans—Congress and VA presume service connection for Vietnam Theatre Veterans with specific diagnosed medical conditions—we observed that almost two-thirds of the overall sample of Vietnam Era Veterans with service-connected disabilities were 50%+ service connected in FY2013. By comparison, only about one-third of Vietnam Era Veterans with service-connected disabilities were 50%+ service connected in FY2001, according to VA.<sup>23</sup> Relative to FY2001, the higher proportion in our overall sample with 50%+ service connection is consistent with government reporting that since the late 1990s, overall total and per-patient spending on VA disability compensation and medical care has grown faster than inflation, despite an overall decline in the number of living Veterans.<sup>24-25</sup>

Since Veterans with 50%+ service connection, including those with IU, are eligible for large VBA disability compensation payments and highest-priority, cost-free VHA care,<sup>6</sup> we hypothesised that Vietnam Era Veterans with 50%+ service connection (relative to 0–40%) would have higher medical care

expenditures and utilisation in FY2013. Consistent with expectations, we observed large differences in FY2013 per-patient VA medical care spending and outpatient utilisation for those with 50%+ service connection, relative to those with 0–40%. Notably, both men and women in our sample made a substantial number of outpatient visits, in FY2013. For instance, the mean number of outpatient visits in FY2013 for male and female veterans with 50%+ service connection was 28 and 36 visits, respectively. By comparison, similarly aged adults in the US general population during the same period averaged between 6–12 outpatient visits, according to the Agency for Healthcare Research and Quality.<sup>26</sup>

As many older VHA patients are dual enrollees of VHA/Medicare, and most dual enrollees utilise some private sector healthcare services covered by Medicare.<sup>15,23,27,28</sup> we anticipated large differences in medical care expenditures and utilisation between those aged 65+ relative to those aged <65. Consistent with expectations, for males and females, we found that Veterans who were age 65+ had lower FY2013 per-patient VA medical care expenditures and used less VHA outpatient care than those aged <65. Our finding that among Veterans with 50%+ service connection, VA spent less in FY2013 on medical care for those who were Medicare-eligible age is consistent with prior studies, which have reported considerable dual-system use among older VHA patients in general.<sup>29-31</sup> In this context, we suspect but cannot confirm that even Veterans eligible for Congressionally-mandated highest-priority, cost-free care may use non-VA providers, at least for some medical care services. Subsequent studies using VA and Medicare data are needed to evaluate the dual-system utilisation patterns of Vietnam Era Veterans with 50%+ service connection.

Historically, female Veterans, in general, have been less likely than their male counterparts to enroll in or use VA benefits.<sup>15</sup> While studies have compared VA service-connection award approval rates between male and female Vietnam Veterans,<sup>32-33</sup> differences in VA disability compensation and medical care expenditures and utilisation between male and female Vietnam Era Veterans with service-connected disabilities have received little attention. However, the number of women with service-connected disabilities has been increasing since the 1970s.<sup>32</sup> Among our sample, two findings are noteworthy. First, similar proportions of male and female Vietnam Era Veterans in our FY2013 sample were 50%+ service connected. This finding, which requires replication, suggests that policies and programs intended to reduce barriers to 50%+ service connection may be benefiting males and females equally. This is encouraging if true, given female Veterans' historical tendency to use

fewer VA benefits than males. Second, among female Vietnam Era Veterans with 50%+ service connection, similar to their male counterparts, those who were Medicare-eligible age had lower per-patient medical care costs and outpatient utilisation, relative to those below Medicare-eligible age. This is consistent with our contention that Veterans, irrespective of gender, who are eligible for Congressionally-mandated highest-priority cost-free care may prefer to use non-VA providers when barriers are reduced due to age-related Medicare eligibility.

While VHA healthcare benefits are arguably the more visible benefit of service connection, our results illustrate that among our 2013 sample, the preponderance of VA spending went for disability compensation payments to Vietnam Era Veterans. Our finding that FY2013 per-patient spending was approximately two times higher for disability compensation than for medical care is consistent with recently expressed concerns about VA disability benefits long-term affordability.<sup>6,8,13,24</sup> VA disability compensation spending, as a proportion of total annual VA spending, has increased dramatically between FY2001–2013, for all periods of service. In FY2001, VA disability compensation (\$15.8 billion) and medical care (\$23.1 billion) spending represented approximately 29% and 42% of total FY2001 expenditures (\$54.5 billion), respectively.<sup>22,23</sup> By comparison, little more than a decade later, VA disability compensation (\$54.9 billion) and medical care (\$55.9 billion) spending in FY2013 represented approximately 38% and 39% of total FY2013 expenditures (\$142.8 billion), respectively.<sup>34,35</sup>

Historically, the bill for Veterans' disability compensation costs has come due many decades after a conflict. The peak year for paying disability compensation to American Veterans was 1969 for World War I Veterans and the mid-1980s for World War II Veterans.<sup>36</sup> Concerning Vietnam Era Veterans, disability compensation payments may have not yet peaked.<sup>31</sup> Congress has recently expanded service-connection benefits eligibility to more than 20 000 'Blue Water Navy' Veterans, who served aboard ships that operated off the coast of the Republic of Vietnam during the Vietnam War.<sup>33</sup> The magnitude of future per capita expenditures may be even higher for Gulf War Era Veterans, characterised by higher survival rates, more generous VA benefits, earlier granting of service-connection benefits, and newer and more expensive medical treatments.<sup>6,13,24</sup> Currently, the US continues to expand Veteran disability compensation programs, making it easier for Veterans to receive service-connected disability compensation for conditions attributed to military-related exposures, which are difficult to confirm in retrospect (e.g. Agent Orange).<sup>32,33,36,37</sup> Consequently,

the percentage of service members who have accessed VBA disability benefits and medical care has risen to unprecedented levels,<sup>6,13,19,24</sup> raising cost concerns. This underscores the importance of forecasting studies, which can predict the long-term costs of VBA disability compensation and VHA healthcare for Veterans with and without service-connected conditions.

Government reporting suggests that disability compensation spending for Vietnam Era Veterans with service-connected conditions may continue to increase at a rate greater than inflation. In that case, VBA disability compensation expenditures will likely grow disproportionately to VHA medical care expenditures over the lifetimes of currently living Veterans and active-duty military personnel. Government reports also predict an increasing reliance on private insurance or Medicare, although the recent expansion of VA-reimbursed care in the community may change that trajectory. Future studies might wish to consider our findings in the context of the recently-enacted 'VA Maintaining Systems and Strengthening Integrated Outside Networks Act' (the VA MISSION Act), which will presumably further influence Veterans' decision-making about healthcare and related costs.

Several limitations should be considered in the context of this analysis. First, the cross-sectional design precludes establishing temporality between spending and service-connection status. Second, in identifying Vietnam Era Veterans, there is some possibility of misclassification. Third, because VETSNET is a snapshot of Veterans receiving disability compensation for service-connected conditions in a single month (i.e. April 2013), we annualise FY2013 expenditures from a single month's data. Fourth, because we did not have access to Medicare claims data for this analysis, we assumed that Veterans who were aged 65+ were eligible for Medicare.<sup>15,18,21</sup> However, since younger Veterans with Social Security Disability Insurance for two or more years may also be eligible for Medicare, observed differences in medical care costs/utilisation for those of Medicare-enrollment age (relative to those below Medicare-enrollment age) may be underestimated. Finally, because we did not have access to pharmacy data, pharmacy expenditures and utilisation were not included in this analysis. This study also has important strengths. Most notably, this is the first study to use a large sample of Vietnam Era Veterans with service-connected disabilities to evaluate total and per-patient FY2013 VA disability compensation and medical care costs associated with gender, 50%+ service connection and Medicare-eligible age in FY2013.

## Conclusion

VBA disability compensation payments for Vietnam Era Veterans appear costlier to the VA than VHA medical care benefits, even for Veterans eligible for highest-priority, cost-free care. Current policy generally supports consistent and continued payment of VBA disability compensation for the life of a Veteran, while VHA medical care expenditures may fluctuate based on factors such as gender or age. These findings should prompt ongoing policy discussions about potential budgetary impacts of expanding the pool of individuals eligible for VA service connection. To help policymakers assess the

budgetary risks associated with reducing barriers to 50%+ service-connection benefits, future studies that forecast VA disability compensation and medical care costs 10–20 years in the future would provide invaluable insights into potential impacts of any policy changes.

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