Trends in Preventative Health Services for Veterans with Military Coverage Compared to Non-Military Coverage

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INTRODUCTION

Veterans have a wide range of health care coverage options through military sources, including Veterans Affairs health care and TRICARE health plans, and non-military sources, including private insurance, Medicare, and Medicaid.¹ Multiple comparisons have demonstrated that care in VA facilities outperforms care in health care settings; however, differences in care delivery based on coverage source have not been fully evaluated.^{2–4} Increasingly, non-military payors have established numerous quality reporting programs and incentives in primary care, which may impact care delivery differentially in veterans with military compared with non-military coverage.⁵ We examined the quality of preventative care delivery over time among veterans with military coverage compared with non-military coverage.

METHODS

We performed a serial cross-sectional analysis of the Behavioral Risk Factor Surveillance System survey, a federally funded nationally representative telephone survey. Our sample included veterans, and our predictor was TRICARE, VA, or military care, assessed by “What is the primary source of your health care coverage?” We assessed two time periods, 2000 and 2014–2017, as coverage information for Veterans was available for those years in the BRFSS.

Our primary outcomes were preventative health services, according to United States Preventative Services Task Force recommendations, the Centers for Disease Control, and American Diabetes Association guidelines. Outcomes were categorized as cancer screening (colorectal cancer, breast cancer, cervical cancer); cardiovascular risk reduction (cholesterol checked in the low-risk and high-risk individuals, aspirin use); infectious disease prevention (influenza vaccination,

pneumonia vaccination, HIV testing); and diabetes care (hemoglobin A1c checked, foot examination, eye examination, and influenza vaccination, pneumonia vaccination).

We first compared the receipt of preventative health care in veterans with military coverage compared with non-military coverage using chi-squared tests, stratified by time period. We performed multivariable logistic regression to assess the difference in military compared with non-military coverage, adjusting for patient demographics (age, sex, and race) and social factors (employment, education, income, and marital status). We assessed the interaction of military coverage across the two time periods to determine if differences between military and non-military coverage were changing over time.

RESULTS

Survey responses from 67,833 Veterans were included in the analysis, representing 36,029,691 observations from US adults. Participants with primary military coverage ($N = 11,088$) were less likely to be non-Hispanic white (69% vs. 81%, $p < 0.001$), were employed for wages (52% vs. 56%, $p < 0.001$), have completed ≥ 4 years of college (25% vs. 29%, $p < 0.001$), and have an income of \$50,000 or more (36% vs. 52%, $p < 0.001$), compared with those with non-military coverage ($N = 56,745$).

In 2000, veterans with military coverage had a higher prevalence of cervical cancer screening (98% vs. 90%, $p < 0.001$), cholesterol checked in low-risk individuals (93% vs. 83%, $p = 0.032$), influenza vaccination (53% vs. 36%, $p < 0.001$), and HIV testing (89% vs. 59%, $p < 0.001$) compared with those with non-military coverage in unadjusted analyses. In 2014–2017, prevalence of colorectal screening (85% vs. 79%, $p < 0.001$), breast cancer screening (89% vs. 78%, $p < 0.001$), influenza vaccination (59% vs. 53%, $p < 0.001$), and HIV testing (78% vs. 56%, $p < 0.001$) was higher in those with military coverage compared with non-military coverage (Table 1). When adjusted for patient demographics and social factors, in 2014–2017, military coverage was associated with higher colorectal cancer screening, breast cancer screening, influenza vaccination, and HIV testing compared with non-military coverage (Table 1).

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Table 1 Use of Recommended Preventative Health Services in Veterans with Primarily Military Coverage Compared with Non-Military Coverage, 2000 and 2014–2017

Preventative health service	2000 (N)	Military coverage, 2000 (% n = 1923)	Non-military coverage, 2000 (% n = 13,260)	p value, unadj.	Adjusted OR (95% CI) Military coverage, 2000 (ref. non-VA coverage)	2014–2017 (N)	Military coverage, 2014–2017 (% n = 9165)	Non-military coverage, 2014–2017 (% n = 43,485)	p value, unadj.	Adjusted OR (95% CI) Military coverage, 2014–2017 (ref. non-VA coverage)
Cancer screening										
Colorectal cancer screening ^a	—	—	—	—	—	25,218	84.6	79.2	< 0.001	1.82 (1.53 to 2.18)
Breast cancer screening ^b	239	84.5	83.7	0.94	0.81 (0.17 to 3.94)	2116	88.8	78.1	< 0.001	2.37 (1.52 to 3.70)
Cervical cancer screening ^c	1,533	97.6	90.1	< 0.001	3.17 (1.48 to 6.81)	2851	82.7	82.5	0.96	0.88 (0.58 to 1.31)
Cardiovascular risk reduction										
Cholesterol checked in low-risk individuals ^d	960	92.5	83.1	0.03	2.78 (1.02 to 7.59)	4855	96.2	96.1	0.94	1.14 (0.35 to 3.67)
Cholesterol checked in high-risk individuals ^d	488	95.5	93.8	0.61	2.14 (0.51 to 8.94)	3566	97.5	97.9	0.77	0.66 (0.11 to 3.97)
Aspirin use ^e	1,871	31.9	40.2	0.12	0.72 (0.44 to 1.18)	192	40.6	44.7	0.71	1.11 (0.36 to 3.42)
Infectious disease prevention										
Influenza vaccination ^f	4,588	53.4	36.4	< 0.001	1.88 (1.38 to 2.56)	50,176	59.4	52.7	< 0.001	1.63 (1.48 to 1.80)
Pneumonia vaccination ^g	156	70.7	50.7	0.29	0.51 (0.08 to 3.34)	28,917	75.4	72.4	0.04	1.24 (1.05 to 1.45)
HIV testing ^h	6,459	89.0	58.5	< 0.001	4.10 (2.56 to 6.58)	18,541	77.6	56.3	< 0.001	2.58 (2.22 to 3.01)
Diabetes care										
Hemoglobin A1c checked ⁱ	760	92.5	89.7	0.58	1.70 (0.39 to 7.47)	4267	92.7	95.0	0.17	0.63 (0.34 to 1.18)
Foot examination ^j	833	71.1	66.1	0.53	1.39 (0.64 to 3.02)	4502	82.2	79.9	0.48	1.16 (0.76 to 1.77)
Eye examination ^k	795	66.3	72.5	0.46	0.61 (0.26 to 1.43)	4477	76.7	77.6	0.79	1.00 (0.69 to 1.44)
Influenza vaccination ^l	286	56.5	60.8	0.76	1.06 (0.29 to 3.81)	9689	64.3	61.4	0.20	1.40 (1.14 to 1.71)
Pneumonia vaccination ^m	262	55.2	43.5	0.44	1.91 (0.54 to 6.70)	9183	71.1	72.4	0.55	1.16 (0.93 to 1.45)

Years included in time periods are 2000, and 2014, 2016, and 2017. Adjusted odds ratios (aORs) were adjusted for age, sex, race, and social factors (employment, education, income, and marital status). All analyses took into account the complex survey design and weighted sampling probabilities of the data source

^aColonoscopy in the past 10 years or blood stool test in past year among participants aged 50 to 74. Colonoscopy in the past 10 years not assessed in BRFSS 2000 data

^bMammogram in the past 2 years among women aged 50 to 74

^cPap test in the past 3 years among women aged 21 to 65

^dCholesterol checked in the past 5 years. Low-risk individuals defined as men aged ≥ 35 and women aged ≥ 45 . High-risk individuals defined as those with a history of hypertension, hyperlipidemia, or cardiovascular disease

^eAspirin use in men aged 45 to 79 and women aged 55 to 79, excluding those who reported having a health condition that makes taking aspirin unsafe

^fInfluenza vaccination in the past year among all participants

^gEver received pneumonia vaccination among participants 65 and older

^hEver tested for HIV among participants aged 18 to 65

ⁱHemoglobin A1c checked in the past year among participants with diabetes

^jFoot examination in the past year among participants with diabetes

^kDilated eye examination in the past year among participants with diabetes

^lInfluenza vaccination in the past year among participants with diabetes

^mEver received pneumonia vaccination among participants with diabetes

Table 2 Difference in Recommended Preventative Health Services in Veterans with Primarily Military Coverage Compared with Non-Military Coverage over Time

Preventative health service	OR (95% CI) Interaction military coverage and time period	p value for interaction	Adjusted OR ^a (95% CI) Interaction military coverage and time period	p value for interaction
Cancer screening				
Breast cancer screening ^b	2.08 (0.42 to 10.41)	0.37	2.21 (0.42 to 11.68)	0.35
Cervical cancer screening ^c	0.23 (0.08 to 0.66)	0.006	0.22 (0.09 to 0.55)	0.001
Cardiovascular risk reduction				
Cholesterol checked in low-risk individuals ^d	0.42 (0.12 to 1.49)	0.18	0.49 (0.11 to 2.25)	0.36
Cholesterol checked in high-risk individuals ^d	0.58 (0.09 to 3.96)	0.58	0.36 (0.04 to 2.98)	0.34
Aspirin use ^e	1.22 (0.45 to 3.31)	0.70	1.89 (0.63 to 5.64)	0.26
Infectious disease prevention				
Influenza vaccination ^f	0.66 (0.49 to 0.89)	0.007	0.84 (0.62 to 1.13)	0.25
Pneumonia vaccination ^g	0.50 (0.10 to 2.51)	0.40	1.19 (0.23 to 6.23)	0.83
HIV testing ^h	0.47 (0.31 to 0.71)	< 0.001	0.59 (0.36 to 0.94)	0.03
Diabetes care				
Hemoglobin A1c checked ⁱ	0.48 (0.12 to 1.91)	0.29	0.39 (0.08 to 1.91)	0.25
Foot examination ^j	0.92 (0.39 to 2.15)	0.84	0.85 (0.35 to 2.06)	0.71
Eye examination ^k	1.28 (0.54 to 3.02)	0.58	1.34 (0.57 to 3.19)	0.50
Influenza vaccination ^l	1.35 (0.44 to 4.15)	0.60	1.49 (0.53 to 4.24)	0.45
Pneumonia vaccination ^m	0.59 (0.17 to 2.00)	0.39	0.69 (0.17 to 2.73)	0.59

Interaction between military coverage and time period (2000 compared with 2014–2017). All analyses took into account the complex survey design and weighted sampling probabilities of the data source

^aAdjusted odds ratios (aORs) were adjusted for age, sex, race, and social factors (employment, education, income, and marital status)

^bMammogram in the past 2 years among women aged 50 to 74

^cPap test in the past 3 years among women aged 21 to 65

^dCholesterol checked in the past 5 years. Low-risk individuals defined as men aged ≥ 35 and women aged ≥ 45 . High-risk individuals defined as those with a history of hypertension, hyperlipidemia, or cardiovascular disease

^eAspirin use in men aged 45 to 79 and women aged 55 to 79, excluding those who reported having a health condition that makes taking aspirin unsafe

^fInfluenza vaccination in past year among all participants

^gEver received pneumonia vaccination among participants 65 and older

^hEver tested for HIV among participants aged 18 to 65

ⁱHemoglobin A1c checked in the past year among participants with diabetes

^jFoot examination in the past year among participants with diabetes

^kDilated eye examination in the past year among participants with diabetes

^lInfluenza vaccination in the past year among participants with diabetes

^mEver received pneumonia vaccination among participants with diabetes

The difference between military coverage and non-military coverage was found to be decreasing over time for cervical cancer screening (aOR 0.22; 95% CI 0.09–0.55) and HIV testing (aOR 0.59; 95% CI 0.36–0.94), adjusting for patient demographics and social factors (Table 2).

DISCUSSION

In a nationally representative sample of US veterans, those who primarily used military coverage to pay for health care services had higher receipt of several preventative health services in 2000 and 2014–2017. Gaps between military and non-military coverage were found to decrease over time for

cervical cancer screening and HIV testing. Limitations of our analysis include the self-reported nature of the dataset, which has been validated in other studies.⁶

Our results show that among veterans, while military coverage was associated with better preventative health care for several outcomes, the gap between veterans with military and non-military coverage may be narrowing. As veteran care becomes more privatized with the VA Mission Act, ongoing assessment of care delivery is critical to ensure high-quality care for this population.

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Compliance with Ethical Standards:

Conflict of Interest: The authors declare that they do not have a conflict of interest.

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