

Recent Trends in Veterans Affairs Chronic Condition Spending

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Abstract

The change in prevalence and total Veterans Affairs (VA) spending were estimated for 16 chronic condition categories between 2000 and 2008. The drivers of changes in spending also were examined. Chronic conditions were identified through diagnoses in encounter records, and treatment costs per patient were estimated using VA cost data and regression models. The estimated differences in total VA spending between 2000 and 2008 and the contributions of population increase, differences in prevalence, and differences in treatment costs were evaluated. Most of the spending increases during the study period were driven by the increase in the VA patient population from 3.3 million in 2000 to 4.9 million in 2008. Spending on renal failure increased the most, by more than \$1.5 billion, primarily because of higher prevalence. Higher treatment costs did not contribute much to higher spending; lower costs per patient for several conditions may have helped to slow spending for diabetes, chronic obstructive pulmonary disease, heart conditions, renal failure, dementia, and stroke. Lowering treatment costs per patient for common conditions can help slow spending for chronic conditions, but most of the increase in spending in the study period was the result of more patients seeking care from VA providers and the higher prevalence of conditions among patients. As the VA patient population continues to age and to develop more co-morbidities, and as returning veterans seek care for service-related problems, higher spending on chronic conditions will become a more prominent issue for the VA health care system.

Introduction

THE VETERANS AFFAIRS (VA) HEALTH CARE SYSTEM expanded patient enrollment considerably after enactment of the Veterans' Health Care Eligibility Reform Act of 1996. The influx of patients to the VA system included Vietnam era and older cohorts, as well as younger veterans from recent conflicts.

As part of the safety net, the VA tends to treat patients who are sicker than the general population.^{1,2} It is unknown how the influx of patients affected the prevalence of chronic conditions among VA patients and how these population changes impacted total VA spending. As many veterans aged, the chronic condition profile of VA patients likely worsened. In addition, a large percentage of veterans of recent conflicts have post-traumatic stress disorder (PTSD) and other mental disorders³; therefore, it is possible that mental health conditions grew much faster than other conditions among VA patients.

Previous research has found that Medicare costs rose from 1987 to 2002 as patients were diagnosed with a greater

number of chronic conditions and were more likely to receive medical management such as drugs to treat these chronic conditions.⁴ Although VA patients may have experienced similar trends in greater diagnosis and more widespread use of prescription drugs, the VA has continued to improve access to outpatient care by expanding its network of community-based outpatient clinics as part of a system-wide transformation from inpatient to outpatient care begun during the 1990s. This transformation potentially helped to slow the growth of costs for chronic conditions in the VA.^{5,6}

Although researchers previously have estimated the costs of treating common chronic conditions in the VA and other health care systems,^{1,4,7} more recent estimates of treatment costs and total VA spending have not been available. This study adds to the literature by determining the changes in prevalence and total VA spending for 16 chronic condition categories between 2000 and 2008. Changes in total spending between 2000 and 2008 also were decomposed into differences resulting from population growth, prevalence, and treatment costs per patient.

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Methods

Data sources

All users of VA inpatient and outpatient care were identified from utilization data from 2000 and 2008. The cohort for this study was restricted to veterans using eligibility status in the Veterans Health Administration enrollment files because employees and dependents also have VA utilization. There were a total of 3,339,408 unique veteran patients in 2000 and 4,892,300 veteran patients in 2008. Utilization records were linked to the Average Cost data to identify the cost of each encounter. VA utilization and costs files were supplemented with fee basis records for patients who received care from a contracted non-VA provider. Pharmacy records were obtained from the Decision Support System Pharmacy files, which record all prescriptions filled and their costs.

Chronic condition measurement

Thirty-eight chronic conditions initially were identified that were based on earlier research on both VA and private sector providers^{1,7,8}; these conditions accounted for 96% of all VA health care costs in 1999. After the 38 specific conditions were identified, all types of cancer were aggregated into 1 category, several heart conditions were aggregated into 1 category, and drug and alcohol abuse were aggregated into 1 category. This analysis focuses on 16 of the most common conditions and other conditions for which veterans are at high risk: arthritis, asthma, cancer, chronic obstructive pulmonary disorder (COPD), dementia, depression, diabetes, drug and alcohol abuse, heart conditions (ischemic heart disease, peripheral vascular disease, and chronic heart failure), hepatitis C, HIV/AIDS, hypertension, PTSD, renal failure, spinal cord injury, and stroke. Evidence has found that veterans are at high risk for several of these conditions (eg, PTSD, hepatitis C) compared to the general population,^{9,10} and many of the study conditions (ie, heart conditions, depression, diabetes, stroke, HIV/hepatitis C, spinal cord injury, substance use disorders) are the target of quality improvement efforts in the VA^{11,12}; therefore, it is important to understand the spending for these conditions. The multivariate analyses were adjusted for several other conditions to address confounding and to prevent overestimates of the costs of the 16 study conditions. These conditions (ie, headache, multiple sclerosis, acid-related disease, low back pain, prostatic hyperplasia, tobacco dependence, Parkinson's disease, Alzheimer's disease, other psychoses) had relatively low costs or low prevalence or have not been the focus of quality improvement efforts.

Chronic condition indicators were created based on all *International Classification of Diseases, Ninth Revision* diagnosis codes in inpatient and outpatient utilization records in fiscal years 2000 and 2008. If a patient had at least 2 diagnosis codes for a given condition in 2 or more separate encounters in a given fiscal year, they were coded as having that condition. Two diagnoses were chosen to exclude infrequent users of VA care and to avoid counting patients who had diagnoses listed as "rule out" codes.

Costs

Because there are no billing records in the VA, costs were estimated using hypothetical Medicare payments. Inpatient

costs were based on diagnosis-related group, length of stay, and demographic characteristics^{13,14}; outpatient costs were estimated using average Medicare outpatient reimbursement rates.¹⁵ Pharmacy costs included drug supply and dispensing costs for all prescriptions filled at the VA. Annual costs for each patient were obtained by summing costs for all encounters and pharmacy fills during each year. Costs incurred in 2000 were adjusted to 2008 dollars using the general consumer price index, which is preferred over the medical price index.¹⁶

Other independent variables

Demographic characteristics of patients, including age, sex, race/ethnicity, marital status, means test indicator, and insurance status, were identified from utilization files. Veterans were grouped by eligibility status because eligibility determines cost-sharing requirements that affect level of utilization. Veterans with a compensable service-connected disability or those in the first 5 years after discharge from active duty did not have co-payments and were categorized as service connected. Those veterans without a service-connected disability who met an income-based means test were not subject to co-payments and were categorized as below the means test; veterans who were above the means test were responsible for co-payments and categorized as above the means test. All remaining nonspecified categories of eligibility were grouped into the other category. The degree of disability of a service-connected condition was rated from 0% to 100%. Insurance was grouped into those with no insurance, those with private or public insurance other than Medicare (ie, major medical or private health maintenance organization, preferred provider organization, Champus, or indemnity insurance), or those covered by Medicare and/or Medicare supplemental coverage.

Analysis

The crude prevalence rates for all chronic condition categories were calculated by taking the total number of patients with each condition in each year and dividing it by the total number of VA patients in that year. The reported number is per 1000 patients.

A 20% random sample was drawn from the total patient cohorts in each year for a total of 1,646,061 patients, and the marginal costs per patient attributable to each chronic condition in each year were estimated using methods from a previous study.¹ Briefly, we predicted costs per patient from a regression model with covariates for each chronic condition and demographic characteristics including age, sex, race/ethnicity, marital status, means test indicator, service connection, and insurance status using an ordinary least squares (OLS) model with total costs. The regression models included a dummy variable for year and an interaction term for year with each chronic condition. Several other regression models such as a semi-log and a generalized linear model (GLM) log link with a gamma distribution were tested because health care costs do not follow a normal distribution. In the Copas test for overfitting,¹⁷ the OLS models with total and log costs performed better than the GLM models.

Total VA spending for chronic conditions in each year was estimated by multiplying the costs per patient for each condition obtained from the regression model by the number of

patients with each condition in each year. Total spending in 2000 was subtracted from total spending in 2008 to get the difference over time. More specifically, the following formula was used: $\text{spending}_{2008, \text{condition}_x} - \text{spending}_{2000, \text{condition}_x} = (\text{Pr}08 * \text{N}08 * \text{C}08) - (\text{Pr}00 * \text{N}00 * \text{C}00)$ where Pr08 is the proportion of patients with each condition in 2008, N08 is the total patient population in 2008, and C08 is the cost attributable to each condition in 2008. For each condition, the portion of the difference in total VA spending was computed that was due to differences in population size ($\text{Pr}08 * \text{C}08 * (\text{N}08 - \text{N}00)$), differences in costs per patient ($\text{Pr}00 * \text{N}00 * (\text{C}08 - \text{C}00)$), and differences in prevalence ($\text{N}00 * \text{C}08 * (\text{Pr}08 - \text{Pr}00)$) between 2000 and 2008. These dollars are reported as a percentage of the total difference in spending. This decomposition of costs has been used previously to analyze changes in Medicare spending.⁴

Results

Patient characteristics

The total number of patients who received care in the VA health care system grew from 3.3 million veterans in 2000 to 4.9 million veterans in 2008 (Table 1). The oldest age group grew the fastest; a quarter of all veteran patients were 76 years of age or older in 2008. While sex, race/ethnicity, and marital status of patients remained constant during the 9-year period, patients were more likely to have high service-connected disabilities (at least 50%) in 2008. VA patients also were more likely to be covered by Medicare and less likely to be uninsured or below the means test over time. The chronic condition burden grew among VA patients as 22% of VA patients had 4 or more chronic conditions in 2008, up from 15% in 2000.

Prevalence

A greater number of patients had 1 or more of the study conditions in 2008 compared with 2000, which reflects both the overall increase in VA patients and an increase in prevalence for many of the conditions (Table 2). Hypertension and diabetes grew steadily over the study period and remained the most prevalent conditions overall with more than a third of all VA patients having hypertension and almost a fifth having diabetes in 2008. Depression, one of the most common mental health problems, affected 1 in 10 VA patients, while PTSD also grew rapidly and affected 70 patients per 1000 in 2008. Hepatitis C, which is very prevalent among veterans, continued to climb from 9 to 17 per 1000 patients. Other conditions, such as renal failure and stroke, also grew relatively quickly among VA patients between 2000 and 2008. In contrast, heart conditions, COPD, HIV/AIDS, dementia, and spinal cord injury declined in prevalence.

Changes in total spending

The single largest increase in total VA spending between 2000 and 2008 was more than \$1.5 billion for renal failure, with 66% of this increase related to the greater prevalence of the disease (Table 3). Although renal failure is an expensive condition to treat, with annual costs of \$16,338 per patient (Table 4), costs per patient decreased during the study period and offset higher spending by 11%. Spending for cancer, another high-cost condition, also rose by more than \$1.5

billion. This increase was primarily the result of the larger population size; higher treatment costs and prevalence contributed only modestly to cancer spending. The expansion of the VA patient population accounted for the majority of the rise in spending for most other conditions. For instance, 141% of spending for heart conditions was driven by population growth; these conditions would have had significantly higher spending because of population size had treatment costs and prevalence not decreased over time and contributed negatively to spending. Spending increases for other conditions that had rapid growth in prevalence over the study period—hepatitis C, stroke, hypertension, diabetes, PTSD, and depression—were driven in large part by their higher prevalence.

Changes in the cost of treating conditions did not contribute much to higher VA overall spending, with the exception of arthritis and spinal cord injury. Higher treatment costs accounted for more than half of the increased spending for arthritis and more than a third for spinal cord injury between 2000 and 2008. Lower costs of treating dementia,

TABLE 1. DEMOGRAPHICS OF ALL VETERAN VA PATIENTS, 2000 AND 2008

Characteristic	2000	2008
	N = 3,339,408 % of Patients	N = 4,892,300 % of Patients
<45 years of age	15	12
45–64 years of age	39	41
65–75 years of age	28	22
76+ years of age	19	25
Female	5	5
Male	95	95
White	62	63
Black	14	13
Hispanic	5	5
Other/unknown race/ ethnicity	19	20
Never married	15	14
Married	58	59
Separated/divorced/ widowed	27	28
Below means test	45	29
Service connected	34	37
Above means test, not service connected	17	25
Other category of eligibility	4	8
No insurance	54	40
Major medical/HMO/PPO/ Champus/Indemnity	16	17
Medicare and/or supplemental insurance	27	40
All other insurance	2	2
0% Service connected	66	64
1–49% Service connected	20	19
50+% Service connected	13	18
No Chronic conditions	40	37
1 Chronic conditions	19	15
2 Chronic conditions	16	15
3 Chronic conditions	10	11
4+ Chronic conditions	15	22

HMO, health maintenance organization; PPO, preferred provider organization; VA, Veterans Affairs.

TABLE 2. NUMBER OF VA PATIENTS WITH CHRONIC CONDITIONS,* 2000 AND 2008†

Condition	2000		2008		Percent change 2000–2008
	Number of Patients	Number per 1,000 Total Patients	Number of Patients	Number per 1,000 Total Patients	
Hypertension	957,899	287	1,761,150	360	25%
Diabetes	477,571	143	936,773	191	34%
Heart conditions	455,361	136	646,991	132	–3%
Depression	232,477	70	488,813	100	44%
Arthritis	252,502	76	390,367	80	6%
PTSD	134,664	40	344,255	70	74%
COPD	206,519	62	276,313	56	–9%
Cancer	150,572	45	257,326	53	17%
Drug/alcohol abuse	136,897	41	205,601	42	3%
Renal failure	31,803	10	138,584	28	197%
Hepatitis C	30,515	9	82,244	17	84%
Asthma	41,689	12	73,850	15	21%
Stroke	30,650	9	67,801	14	51%
HIV/AIDS	15,437	5	20,493	4	–9%
Dementia	14,357	4	17,328	4	–18%
Spinal cord injury	13,503	4	16,675	3	–16%

*Chronic conditions were identified by at least 2 ICD-9 codes in separate encounters during the year.

†Numbers are crude, unadjusted for age.

COPD, chronic obstructive pulmonary disease; PTSD, post-traumatic stress disorder; VA, Veterans Affairs.

COPD, diabetes, heart conditions, renal failure, and stroke over time helped to slow the growth of expenditures for these conditions. Total spending for dementia actually declined by \$28 million as the lower costs of treating the condition plus lower prevalence outweighed the growth of the older patient population.

Discussion

The number of patients who sought VA care grew by 40% between 2000 and 2008; this influx of patients drove most of

the growth in chronic condition spending. VA patients became increasingly older and had greater service-connected disabilities because of the aging of older veteran cohorts and the entry of recent veterans into the VA system. The higher prevalence of renal failure, diabetes, hypertension, depression, and PTSD reflect these demographic shifts. The large increase in patients with renal failure appeared to be driven by aging and the rising prevalence of its primary risk factors—hypertension and diabetes—over time. As a result, the growing number of patients receiving care for renal failure in the VA led the rise in spending among all chronic conditions.

TABLE 3. CHANGES IN TOTAL VA SPENDING ON CHRONIC CONDITIONS, 2000–2008

Condition	Change in Total VA Spending 2000–2008*	Percent Due to Change in Population	Percent Due to Change in Costs per Patient	Percent Due to Change in Prevalence
Renal failure	1,565,219,058	46%	–11%	66%
Cancer	1,536,280,238	64%	16%	20%
Depression	984,259,439	55%	9%	36%
Diabetes	820,520,038	84%	–29%	46%
Heart conditions	811,655,930	141%	–32%	–9%
Hypertension	737,599,088	70%	–1%	31%
Drug/alcohol abuse	715,803,368	84%	11%	4%
Arthritis	650,914,360	43%	52%	5%
PTSD	443,470,004	47%	10%	43%
Hepatitis C	312,283,771	51%	–2%	50%
COPD	297,958,658	166%	–32%	–34%
Stroke	209,803,594	80%	–38%	58%
Spinal cord injury	178,636,845	109%	35%	–44%
Asthma	88,918,734	59%	19%	22%
HIV/AIDS	77,122,266	94%	27%	–21%
Dementia	–27,688,416	161%	–187%	–74%

*Change is total spending in 2008 minus total spending in 2000 (2000 dollars were adjusted to 2008 dollars using the consumer price index).
COPD, chronic obstructive pulmonary disease; PTSD, post-traumatic stress disorder; VA, Veterans Affairs.

TABLE 4. ANNUAL CONDITION-ATTRIBUTABLE COSTS PER PATIENT, 2000 AND 2008

Condition	Costs per Patient 2000	Costs per Patient 2008	Percent Change 2000–2008
Spinal cord injury	\$32,035	\$36,654	14
Renal failure	\$21,978	\$16,338	–26
Dementia	\$11,712	\$8,106	–31
Cancer	\$10,416	\$12,065	16
Stroke	\$10,396	\$7,794	–25
HIV/AIDS	\$9,798	\$11,144	14
Drug/alcohol abuse	\$8,671	\$9,255	7
Hepatitis C	\$6,339	\$6,149	–3
Heart conditions	\$6,160	\$5,590	–9
COPD	\$6,114	\$5,648	–8
Depression	\$3,117	\$3,496	12
Diabetes	\$2,815	\$2,311	–18
Asthma	\$1,844	\$2,245	22
PTSD	\$1,564	\$1,900	21
Hypertension	\$938	\$929	–1
Arthritis	\$913	\$2,258	147

COPD, chronic obstructive pulmonary disease; PTSD, post-traumatic stress disorder.

The high risk for mental health problems among recent veterans (eg, depression, PTSD³) is evident in both prevalence and spending. Although veterans of recent conflicts are younger than previous veteran cohorts, it is likely that they will contribute significantly to higher spending for mental health problems as they continue to enroll in the VA upon discharge.

Higher treatment costs did not contribute much to higher spending; instead, lower costs per patient for several conditions may have helped to slow spending. Costs to treat diabetes, COPD, heart conditions, renal failure, and stroke were lower during the time period when the VA continued to expand its outpatient care capacity with community-based outpatient clinics. Better access to outpatient care may have shifted costs away from expensive hospital care and potentially improved outcomes. The decline in costs of heart conditions in the VA is also consistent with national data showing a decrease in hospitalizations for cerebrovascular and heart disease.¹⁸ Early diagnosis, aggressive treatment, and newer drugs to treat risk factors such as hypertension and hyperlipidemia may have contributed to lower spending for these conditions.

Despite the aging of VA patients, there was a significant decline in spending for dementia. Although the reasons for lower costs and prevalence of dementia among VA patients could not be determined in our study, other research has found that patients with dementia received more care from Medicare and less care from the VA over time.¹⁹ Better overall health appears to have reduced cognitive decline in older adults as well.²⁰

Several conditions had higher treatment costs over time that contributed to higher spending. Costs for arthritis rose at a time when new, expensive biologic drugs became available to treat arthritis.²¹ Greater treatment costs for spinal injury are likely related to the VA's investment in new polytrauma rehabilitation centers that provide greater specialty care for spinal cord injury.²²

Limitations

This analysis was limited to common conditions although there are other chronic conditions that contribute significantly to annual spending; however, the conditions selected were meant to represent a broad range of conditions in the VA system.

In this article, chronic conditions were identified based on 2 diagnoses within a fiscal year although an earlier paper used a single diagnosis.¹ Some patients have only a single diagnosis during the year, so the methods employed may have eliminated patients who rarely seek VA care or who use a combination of both VA and non-VA care. However, the methods used limit false positives or patients who had diagnoses listed as “rule out” codes.

Another limitation of this analysis is that the estimates are limited to care provided by the VA directly or through contract; therefore, conclusions cannot be drawn about chronic condition spending on non-VA care over the study period. Liu et al found that patients who were eligible for Medicare received less care from the VA from 2001 to 2004²³; it is possible that less reliance on VA care contributed to slower VA chronic condition spending during the study period.

Conclusion

As the VA patient population continues to age and develops more comorbidities, and returning veterans seek care for service-related problems, higher spending on chronic conditions becomes a more prominent issue for the VA health care system. Although the VA has been successful at shifting treatment from inpatient to outpatient settings over the years, the VA must continue to find other ways to manage patients with chronic conditions effectively and efficiently. Future advances in chronic care management may have the most impact by providing care that improves both quality and value through new initiatives such as health coaches for patients with complex conditions and the use of telemedicine for routine care.

Lowering treatment costs per patient for common conditions can help slow spending for chronic conditions; however, most of the increase in spending during the study period was related to more patients seeking care from VA providers and a higher prevalence of conditions among patients. As the VA population ages, these trends will likely continue unabated. Other health systems like Medicare have found that a greater number of people require treatment for chronic conditions over time.⁴ Therefore, both public and private providers will find care for chronic conditions consuming a growing share of health care resources. The recent focus on comparative effectiveness research by policy makers is one promising approach to guiding resources toward the most effective treatments for chronic conditions and the best outcomes for patients. Within the VA, emphasis on highly effective care, the expansion of community-based outpatient clinics, and the use of technology to reach patients in nontraditional ways can help ensure that the VA system is ready to meet the ongoing need for health care services.

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