
Veterans Health Administration Hospitals Outperform Non-Veterans Health Administration Hospitals in Most Health Care Markets

Background: Recent studies have reported that health care provided by the Veterans Health Administration (VHA) is at least as good as that provided in the private sector (1-4). These studies tended to compare a representative sample of VHA patients or hospitals with a representative sample not in the VHA system, after adjusting for known differences that might cause misleading results. Several circumstances could explain these findings. The VHA may provide better care than the private sector in every local area. Alternatively, non-VHA care may be better than VHA care in more local areas but by a small amount, whereas VHA care may be better than non-VHA care in fewer local areas but by a large amount in each area. The average across all patients and hospitals would favor the VHA in the former circumstance and might favor the VHA in the latter. The possibility of different explanations matters, because these explanations have different implications for veterans seeking health care. For these veterans, comparisons that provide a national average may be less useful than a local comparison. For example, individual veterans probably don't care whether VHA or non-VHA hospitals provide better care on average but whether the nearest VHA hospital or the local non-VHA hospital is better for them.

Objective: To determine whether several important outcomes of VHA and non-VHA care in the same region differ.

Methods and Findings: We identified 15 outcome measures that were reported by VHA and non-VHA hospitals by

Table 1. Data Sources and Time Spans Covered*

Variable	VHA	Non-VHA
30-d RAMRs for acute myocardial infarction, COPD, heart failure, or pneumonia		
Reporting period	7/1/14–6/30/17	7/1/14–6/30/17
Files used†	Readmissions and Deaths - VA_07_10_2018.csv and Readmissions and Deaths - COPD - VA.csv	Complications and Deaths - Hospital.csv
PSI 3, 4, 6, 8, 9, 10, 11, 12, 13, 14, and 15‡		
Reporting period	10/1/15–6/30/17	10/1/15–6/30/17
Files used†	VA_PSI_07_10_18.csv	Complications and Deaths - Hospital.csv
Data source for the crosswalk between ZIP code and HRR	ZipHsaHrr16.xls, accessed at www.dartmouthatlas.org/tools/downloads.aspx?tab=39#zip_crosswalks under ZIP code crosswalks, 2016	ZipHsaHrr16.xls, accessed at www.dartmouthatlas.org/tools/downloads.aspx?tab=39#zip_crosswalks under ZIP code crosswalks, 2016
Hospitals reporting ≥1 measure, <i>n</i>	135	2988
Range of hospitals reporting in each HRR, <i>n</i>	1–2	1–78
HRR-defined health care markets represented, <i>n</i>	121	121

COPD = chronic obstructive pulmonary disease; HRR = hospital referral region; PSI = patient safety indicator; RAMR = risk-adjusted mortality rate; VHA = Veterans Health Administration.

* Data are for VHA and non-VHA hospitals in the 50 states and the District of Columbia that reported to the Centers for Medicare & Medicaid Service's Hospital Compare Web site and were in HRR-defined health care markets that included ≥1 VHA and 1 non-VHA reporting hospital.

† Available from the zipped 2018 HOSArchive_Revised_FlatFiles folder at <https://data.medicare.gov/data/hospital-compare>.

‡ See **Table 2** for an explanation of PSIs.

using data from the Hospital Compare Web site (<https://data.medicare.gov/data/archives/hospital-compare>) (**Table 1**). These measures included 30-day risk-adjusted mortality rates for 4 common diseases plus 11 additional patient safety indicators. We used each hospital's ZIP code to assign the hospital to 1 of 306 hospital referral regions. *The Dartmouth Atlas of Health Care* defines these regions as distinct health care

markets. We limited our analyses to the 121 regions in which at least 1 VHA and 1 non-VHA hospital reported at least 1 of the measures. Dartmouth College has determined that analyses of publicly available data from Hospital Compare are not considered human subjects research (Dartmouth College Committee for the Protection of Human Subject number CPHS00028121).

Table 2. Measures of VHA Care

Measure Using Descriptions Provided in Hospital Compare	HRRs in Which ≥1 VHA and 1 Non-VHA Hospital Provided Data, <i>n</i>	HRRs According to a VHA Hospital's Performance Score, %			Mean Aggregated Performance Scores for All 121 Markets (SD)		P for Difference*
		Best	Above Average	Worst	VHA	Non-VHA	
30-d RAMRs							
Acute myocardial infarction	83	15.7	74.7	2.4	12.48 (1.05)	13.14 (1.22)	<0.001
COPD	116	94.0	100	0	4.89 (0.91)	8.35 (1.11)	<0.001
Heart failure	116	42.2	91.4	0.9	10.04 (1.59)	11.71 (1.69)	<0.001
Pneumonia	116	25.0	84.5	2.6	13.93 (1.67)	15.75 (1.98)	<0.001
Other PSIs							
Pressure sores (PSI 3)†	116	43.1	57.8	13.8	0.474 (0.60)	0.399 (0.47)	0.165
Death among patients with serious treatable complications after surgery (PSI 4)†	65	76.9	83.1	10.8	104.5 (57.9)	161.7 (16.8)	<0.001
Collapsed lung due to medical treatment (PSI 6)	116	71.6	77.6	14.7	0.137 (0.21)	0.288 (0.05)	<0.001
Broken hip from a fall after surgery (PSI 8)†	116	74.1	75.0	26.7	0.081 (0.17)	0.111 (0.01)	0.047
Perioperative hemorrhage or hematoma rate (PSI 9)†	101	61.4	77.2	13.9	1.64 (1.8)	2.58 (0.35)	<0.001
Postoperative acute kidney injury requiring dialysis (PSI 10)†	95	67.4	77.9	13.7	0.800 (1.35)	1.31 (0.30)	<0.001
Postoperative respiratory failure (PSI 11)	95	48.4	78.9	8.4	5.96 (7.01)	8.01 (2.87)	0.005
Serious blood clots after surgery (PSI 12)†	101	47.5	70.3	13.9	3.05 (2.4)	3.84 (1.0)	0.001
Bloodstream infection after surgery (PSI 13)	95	62.1	75.8	10.5	3.69 (4.1)	5.22 (1.1)	<0.001
A wound that splits open after surgery on the abdomen or pelvis (PSI 14)	97	87.6	87.6	10.3	0.469 (1.91)	0.856 (0.24)	0.043
Accidental cuts and tears from medical treatment (PSI 15)†	108	86.1	95.4	3.7	0.37 (0.75)	1.29 (0.23)	<0.001

COPD = chronic obstructive pulmonary disease; HRR = hospital referral region; PSI = patient safety indicator; RAMR = risk-adjusted mortality rate; VHA = Veterans Health Administration.

* Equal variances were not assumed.

† In ≥1 HRR in which 2 VHA hospitals were reporting, 1 VHA hospital performed the best in the HRR and the other performed the worst.

For each measure and region, we determined whether the score of a VHA hospital was the best, above average, or the worst among all hospitals in the region. We used the *t* test (with equal variances not assumed) to compare mean VHA scores with mean non-VHA scores for each outcome in all regions. When we considered all regions together, VHA care was significantly better than non-VHA care for 14 of the 15 measures (Table 2), which confirms the findings of previous studies (1-4). A VHA hospital also provided the best care in at least 50% of the regions for 9 of the 15 measures, above-average care in at least 67% of the regions for 14 measures, and the worst care in fewer than 15% of the regions for 14 measures.

Discussion: We sought to use Hospital Compare data in the same manner as a veteran contemplating where to obtain the best local care. We found that VHA hospitals provided the best care in most referral regions and rarely provided the worst care. This finding may indicate that the VHA generally provides truly excellent care; if so, we believe that efforts to outsource VHA care to non-VHA settings solely for patient convenience should be reconsidered.

However, VHA and non-VHA hospitals may report data differently to Hospital Compare. We found that several of the VHA's aggregate mortality and patient safety results were markedly better than those for non-VHA hospitals. Alternatively, analyses that use patient-level data have found these measures to be similar to those that we found in non-VHA hospitals, particularly for acute myocardial infarction and heart failure mortality (3, 5). These findings support the possibility of differential reporting. If so, we believe that the VHA and Centers for Medicare & Medicaid Services should take steps to ensure that the methods they use to calculate Hospital Compare data present fair comparisons to end users who are trying to make informed health care decisions.

Limitations of this study include the cross-sectional nature and use of hospital referral regions from *The Dartmouth Atlas of Health Care* to define health care markets and limited data elements. As such, comparisons using different periods, market definitions, and data elements may produce different results.

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Reproducible Research Statement: Study protocol: See the Supplement (available at Annals.org). Statistical code: SPSS files (IBM) are

available from Dr. Weeks (e-mail, wbw@dartmouth.edu). Data set: See Table 1.

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