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Travel time and attrition from VHA care among women Veterans: How far is too far?

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Abstract

Background—Travel time, an access barrier, may contribute to attrition of women veterans from Veterans Health Administration (VHA) care.

Objective—We examined whether travel time influences attrition a) among women veterans overall, b) among new vs. established patients, and c) among rural versus urban patients.

Research Design—This retrospective cohort study used logistic regression to estimate the association between drive time and attrition, overall and for new/established and rural/urban patients.

Subjects—266,301 women veteran VHA outpatients in Fiscal year 2009.

Measures—An “attriter” did not return for VHA care during the 2nd through 3rd years after her first 2009 visit (T_0). Drive time (log minutes) was between the patient’s residence and her regular source of VHA care. “New” patients had no VHA visits within three years before T_0 . Models included age, service-connected disability, health status and utilization as covariates.

Results—Overall, longer drive times were associated with higher odds of attrition: drive time Adjusted Odds Ratio=1.11 (99% CI 1.09-1.14). The relationship between drive time and attrition was stronger among new patients but was not modified by rurality.

Conclusion—Attrition among women veterans is sensitive to longer drive time. Linking new patients to VHA services designed to reduce distance barriers (telemedicine, community-based clinics, mobile clinics) may reduce attrition among women new to VHA.

Keywords

Women veterans; Access to Health Care; Rural Communities

INTRODUCTION

Over the past decade, attrition from Veterans Health Administration (VHA) care has been more than three times as common among women new to VHA than among established women veteran patients.¹ This pattern thwarts VHA’s goal to be a medical home² providing coordinated, longitudinal care to many of its new women patients. Attrition may compromise receipt of recommended preventive care and chronic disease management in the short run, magnifying disease burden over the longer term. With the rapid influx of women veterans into VHA in recent years,³ it is critical to understand patient-level factors governing women’s decisions to drop VHA care, so that VHA programs and policies can strive to engage subgroups of women at particular risk of attrition.

Enabling factors—as well as predisposing and need factors—predict health care utilization choices.^{4,5} As a barrier to care, greater distance (or travel time, a correlate of distance⁶) from

a patient's residence to a health care provider can inhibit care-seeking.⁷ Travel time incurs monetary costs (petrol expense, lost wages) and opportunity costs (reducing time available for other activities, e.g., attending school, caring for family). In survey data, distance emerged as a primary reason for women veterans' attrition from VHA.⁸

Associations between travel time and attrition may differ in subgroups of women. Prior work documented high attrition among new patients, who have not yet established a long-term relationship with VHA providers;¹ this subgroup may be particularly sensitive to travel time. Associations between travel time and attrition might also vary by population density (i.e., rural/urban status) of the woman's residence, which could, for example, influence availability of non-VHA providers as alternatives.^{9,10}

As part of a larger study on attrition of women veterans from VHA, we examined whether travel time is a factor in women's decision to attrit. Controlling for other relevant patient characteristics, we asked:

1. Are women with longer travel times to VHA more likely than those with shorter travel times to attrit from VHA?
2. Is the relationship between travel time and attrition stronger among new versus established VHA patients and among urban versus rural patients?

METHODS

Data sources

This retrospective cohort study draws upon the Women's Health Evaluation Initiative (WHEI) Master Database which contains variables created from Fiscal Year (FY)2000-2012 VHA clinical/administrative data source files, including VHA Enrollment Files and VHA outpatient encounter data;¹¹ key study variables in the Database included patients' socio-demographic characteristics, VHA utilization, and health status. This analysis additionally used files from VHA's Planning Systems Support Group (PSSG), including FY2009 VHA sites' latitude/longitude coordinates, and drive time estimates from a patient's last known address to her closest VHA provider, calculated using Environmental Systems Research Institute (ESRI) mapping software based on expected driving routes given street and road configurations.¹² The Google Maps^{©13} website was used to supplement PSSG drive time data.

Study cohort

The study cohort was drawn from all women veterans with at least one VHA outpatient face-to-face encounter during FY2009 (n=287,072), as described elsewhere.¹⁴ We excluded 10,823 patients with invalid zip codes or with a residence or most frequent site of care outside the continental United States (due to concerns about completeness of data capture). From the remainder, we excluded those who died during the three-year study period (n=5,556), and then those with missing data (n=3,555): attrition (211 due to missing vital status), travel time (672 missing), age (11), service-connected disability status (751), or rural/urban status (2,462). Finally we excluded women with drives times longer than 12 hours (n=837): such lengthy times may reflect airplane travel for specialty care or an

undetected long-distance move, rather than the routine care that is the focus of this study. The final cohort included 266,301 women.

Variables

We identified the “index visit” (T_0) as the patient’s first VHA face-to-face outpatient visit in FY2009 (Figure 1). In our patient-specific timeline, the first 365 days from T_0 were “Year 1,” the second 365 days were “Year 2” and the third 365 days were “Year 3;” for each patient, Year 3 ended some time during FY2012. We examined the study outcome -- attrition from VHA -- over an “Attrition Ascertainment Period,” which began at the start of Year 2 and ended at the end of Year 3. A patient was considered to have attrited from VHA outpatient care if she did not return to VHA for outpatient care during Year 2 through Year 3. Otherwise, if she received any outpatient VHA care during Year 2 and/or Year 3, she was considered not to have attrited. Even a healthy woman might be expected to visit her primary care doctor for regular preventive care during the two year attrition ascertainment period;¹⁵ this definition thus represents a clinically meaningful absence from VHA.

The main predictor was average drive time (as a proxy for patients’ travel to obtain VHA care),^{16,17} defined as number of minutes between a patient’s residence at the end of Year 1 and the address of her “home site” at the end of Year 1. Home site was the VHA site the patient visited most frequently (or in a tie, most recently) for primary care (91%), or, if no primary care, then specialty care (5%) or, if none, then other face-to-face outpatient care (4%). For patients who changed zip codes during Year 1 (indicating a move), only sites associated with the last residential zip code in Year 1 were potential home sites. FY2009 and FY2010 PSSG files report drive time (in minutes) between the patient’s home address and the VHA sites closest to this address that offer primary, secondary and tertiary care, whether or not the patient actually received any care at those sites. When a patient’s home site (identified based upon the patient’s actual utilization patterns) matched the VHA site that PSSG identified as the site closest to the patient’s residence that offers primary care, then the drive time variable was set as minutes to that site ($n=160,482$). Otherwise, if the patient’s home site matched the site PSSG identified as the closest secondary care site then drive time was minutes to that site ($n=62,102$), and similarly for the site PSSG identified as the closest tertiary care site ($n=3,643$). When the patient’s home site did not match the closest PSSG primary, secondary or tertiary care site ($n=40,074$), we used Google Maps^{©13} to calculate drive time between the patient’s residential zip code centroid and the latitude/longitude of the VHA home site. Google Maps© appears to be a reasonable drive time proxy: among those with PSSG data, Spearman correlation coefficient between PSSG and Google Maps© drive time was 0.86. Drive time values were log transformed for a more normal distribution.

A woman was considered “new” if she had no VHA outpatient use in the three years prior to T_0 . All others were “established” VHA patients. The three-year period is consistent with VHA and Centers for Medicare & Medicaid Services guidelines for identifying new patients.^{18,19} A woman’s residence was “rural” if it was highly rural or other rural in the PSSG FY2009 file.²⁰ All others were “urban”.

Additional variables were included as covariates.²¹ Age in Year 1 was considered a predisposing factor. Enabling factors (from the FY2009 WHEI Master database^{11,14}) were service-connected disability rating, and counts of Year 1 visits to VHA primary care, mental health, and other clinics. To estimate need, we counted medical and mental health comorbidities for Year 1 using the Selim Comorbidity Index, a validated predictor of VHA ambulatory care use.²² We modeled utilization and comorbidity using categorical variables, with thresholds selected to approximate a linear relationship between that variable and log odds of attrition.

Analyses

After calculating descriptive statistics for main variables, we examined unadjusted percent of the cohort who attrited overall and then by age group, by new/established status, by rural/urban status, and by drive time (< 40 minutes versus ≥ 40 minutes). We also graphed percent attrition by ordinal drive time category, stratified by new versus established status and then by rural versus urban status.

We estimated adjusted odds ratios (AOR) and 99% Confidence Interval (CI) to summarize the association between attrition (dependent variable) and drive time (main predictor) after controlling for covariates, using three logistic regression models. Model 1 (main model) estimated the AOR without interaction terms. Using this fitted logistic regression model, we calculated point estimates of the predicted probabilities of attrition in patients with assumed drive times of 20, 40, and 60 minutes given their observed characteristics.

Models 2 and 3 assessed effect measure modification of the odds ratio between drive time and attrition by adding an interaction term to the main model: Model 2 added an interaction between drive time and the indicator for new patient status, allowing us to examine whether the relationship between attrition and drive time differed for new versus established patients, whereas Model 3 added an interaction between drive time and the rural/urban indicator. For Model 2, we used the fitted model to predict the probability of attrition for patients with drive time of 20 versus 40 minutes for new versus established patients, and calculated the bootstrapped 99% confidence interval of the difference between new versus established patients in the effect of this 20 minute increment of additional drive time.

We conducted several sensitivity analyses (SA) to assess robustness of main results. SA1: To assess sensitivity to the method of calculating drive time, we re-ran Model 1 using the Google Maps © drive time for the full study cohort. SA2: To address the fact that some women bypass their closest VHA provider for most of their VHA care, we re-ran Model 1 stratified by whether or not the women's VHA home site was the same as the primary, secondary, or tertiary care VHA site closest to her residence. SA3: Since some women moved during the attrition ascertainment period, we re-ran Model 1 excluding those who moved (i.e., with different zip codes in FY2009 versus FY2011) or who had ambiguous move status (FY2011 zip code was missing for 6% of attriters and 4% of others). SA4: We also re-ran Model 1 on the full cohort including indicators of move status (no move, move, or ambiguous move status). SA5: We re-ran Model 1 using a more granular rural/urban variable with 4 levels: highly rural (< 7 residents per square mile), other rural, small urban (counties in MSAs with < 500,000 residents) and large urban. SA6: Because utilization may

be a function of attrition (i.e., people who attrit early in Year 1 may have fewer visits), we re-ran Model 1 excluding utilization covariates. SA7: We re-ran Model 1 controlling for home site fixed effects.

All analyses used SAS version 9.2.²³

RESULTS

Descriptive analyses

As Table 1 shows, women drove an average of 31 minutes between their residence and VHA home site (median: 20 minutes); 14% of women were new patients in FY2009, and 36% had rural residence. Overall 8% attrited (i.e., did not return for VHA outpatient care during Year 2 through Year 3 of the person-specific timeline), but this varied by subgroup: 11%, 5% and 8% respectively of women 18-44, 45-64 and 65 years old attrited, 25% versus 6% of new versus established patients attrited, 8% versus 8% of rural versus urban patients attrited, and 8% versus 11% of women with drive time < 40 versus 40 minutes attrited (not shown in table).

In unadjusted analyses, higher proportions of new than established patients attrited, regardless of drive time values (Figure 2, top panel). However, with increasing drive times, attrition among new patients increased while attrition among established patients was nearly constant. Regarding rural/urban status (Figure 2, bottom panel), at drive times of 11 minutes and longer, higher proportions of urban than rural patients attrited. At many points in this descriptive graph, the slope is steeper for urban than rural patients.

Main model

The main model reveals that longer drive times were associated with higher odds of attrition (Model 1: drive time AOR=1.11; CI: 1.09-1.14), controlling for other factors (Table 2). Average predicted probability of attrition was 8.2%, 8.7% and 9.0% for drive times of 20, 40 and 60 minutes, respectively.

Table 2 also reports that new patients were much more likely to attrit from VHA than established patients (Model 1: new patient AOR=3.91; CI: 3.73-4.09). Women residing in rural areas were less likely to attrit than urban residents (Model 1: rural AOR=0.83; CI: 0.80-0.87).

Models with interaction terms

Model 2 examines modifying effects of new/established status (Table 2). The adjusted odds ratio of drive time for new patients was 1.16 (CI: 1.08, 1.24), while the adjusted odds ratio of drive time for established patients was 1.09 (CI: 1.07, 1.12). Thus, women's decisions about whether to attrit from VHA were more sensitive to drive time for new than for established patients – having to drive additional minutes increased odds of attrition more for new than for established patients. The estimated difference in probability of attrition for women living 40 minutes versus 20 minutes from VHA was 0.84 percentage points higher for women new in FY09 than for established patients, controlling for other factors (CI: 0.83-0.84) (not reported in table). Model 3 (not reported in table) revealed the drive time-

attrition association did not significantly differ between patients residing in rural versus urban areas (i.e., rural status-drive time interaction term was not significant).

Effect of covariates on attrition

Also noteworthy in Models 1 and 2 (Table 2) were significant associations between multiple covariates and attrition. Women with lower service-connected disability (and thus with lower levels of VHA benefits), younger women, women with fewer comorbidities, and women with lower numbers of primary care, mental health, or other face-to-face visits during Year 1 had higher odds of attrition, except that patients with exactly 1 mental health visit had higher odds of attrition than those with zero visits.

Sensitivity analyses

SA1: Magnitude of the drive time effect did not change when we replaced the drive time variable with the Google Maps© drive time in Model 1 (AOR=1.11; CI: 1.08-1.14). SA2: For patients receiving most of their VHA care at their closest VHA site, longer drive time was associated with higher odds of attrition (AOR=1.10; CI: 1.07-1.12), reinforcing main results. In contrast, for patients bypassing their closest site for most of their VHA care, drive time was not significantly associated with attrition (AOR=0.99; CI: 0.95-1.04). SA3: Limiting the cohort to patients who did not move between FY2009 and FY2011 resulted in a slightly higher AOR for Model 1 drive time (AOR=1.14; CI: 1.11-1.17). SA4: However, adding move indicators to Model 1 did not change the AOR for drive time. Together, SA3 and SA4 suggest there may be measurement error biasing the AOR for drive time towards the null, but omitting “move” status as a covariate does not bias Model 1 main effects. SA5: Using a more granular rural/urban status variable in Model 1, the drive time AOR was nearly identical (AOR=1.12; CI: 1.09-1.14). SA6: After dropping the utilization variables from Model 1, the AOR for drive time increased marginally (AOR=1.25; CI: 1.22-1.28). SA7: Controlling for home site as a fixed effect did not affect the AOR for drive time in Model 1.

DISCUSSION

We found that attrition of women veterans from VHA is sensitive to longer drive times. However, examination of key subpopulations of interest yields a more nuanced story. Specifically, while rural/urban status did not modify the relationship between attrition and drive time, new versus established patient status did: longer drive time was more strongly associated with attrition in new than in established patients.

The overall positive association between travel time and attrition identified in this paper is consistent with findings from both the private sector²⁴ and VHA²⁵ that longer distances to care can pose a barrier to access. Prior work on the relationship between distance to care and initiation of VHA services have found sizable associations.⁷ The comparatively smaller associations identified in this paper may be explained by the fact that existing VHA patients have already demonstrated willingness to travel to VHA care; decisions about attrition from VHA may be less sensitive to travel times than are decisions about initiation of VHA care.

Odds of attrition for new patients, who had almost four-fold higher attrition than established patients overall, were magnified for those with longer drive times. New patients tend to be younger than established patients and may have fewer chronic health problems,¹ so many may have lower perceived need for health care services. For new patients who exhibit these characteristics, younger age and better health could lead to infrequent visits over time, and, in some cases, may be a reason for their higher attrition.

An alternative theory is that, having recently established a relationship with VHA, new patients may tend to be less committed to their VHA providers: perhaps if they can obtain care with a closer, non-VHA provider at comparable cost and quality, they do.²⁶ In a more concerning scenario, attrition of a new patient may end in unmet need if she lacks non-VHA alternative providers.

A sensitivity analysis identified two subgroups with different associations between drive time and attrition. The main subgroup (85%) received most of their VHA care at the primary, secondary, or tertiary VHA site closest to home: greater drive time predicted attrition in this main cohort. The other subgroup (15%) bypassed their closest VHA site in Year 1, instead receiving their VHA care at a more remote facility. For them, distance was not a significant predictor of attrition, perhaps reflecting an active choice on the patient's part to receive care at a specific, more distant location; future research can examine this hypothesis.

The associations between several covariates and attrition merit note. Generally, increasing numbers of outpatient visits were associated with commensurate decreases in odds of attrition, although use of exactly one mental health visit had the opposite association. This could reflect patients receiving mental health screening from a mental health provider, or patients seen for initiation of mental health treatment who decided not to seek further care at VHA. Also notable was that odds of attrition dropped with increasing levels of service-connected disability. This may reflect a combination of enabling, need and predisposing mechanisms: patients with service-connected disability may have lower out-of-pocket costs for VHA care, greater need for VHA care (i.e., for their medical and/or mental health conditions), and a stronger veteran identity drawing them toward a veteran-oriented health care system (although some might avoid health care settings eliciting memories of a military trauma).

Interpretation of these findings is subject to caveats. (1) While drive time generally would be expected to correlate with actual travel time, drive time may correlate less well with travel by public transportation or with drives during high-traffic times of day. Still, ESRI technology, the source of drive time for most of the study cohort, is used by VHA and by published health services researchers.^{27,28} Additionally, variation in drive times due to traffic congestion may effectively average across patients' Year 1 visits to a time close to the PSSG time for all but the patients with the fewest Year 1 visits. (2) Ideally the model would observe drive time at the time of attrition, rather than at the end of Year 1. While we cannot observe exactly when attrition occurs, our sensitivity analysis suggests that such measurement error results in a small conservative bias of the drive time main effect. (3) We could not control for access to non-VHA providers, so our estimates of the association

between drive time and attrition may be confounded by this. The direction of bias is not clear. Greater access to non-VHA providers was likely positively associated with attrition from VHA, but the relationship between greater access to non-VHA providers and drive time could be positively correlated (greater distance increases probability of a closer provider) or negatively correlated (drive times are longer in rural areas, where there may be fewer alternative providers). In the former case we would overestimate and in the latter would underestimate drive time effects.

Conclusion

The present analysis is, to our knowledge, the first to use national data to explore the association between drive time to VHA care and women veterans' decisions about whether to attrit from VHA. For some women, particularly those who are part of the large influx of new patients in recent years, living farther away from care heightens risk of discontinuing VHA use. Understanding that geography can influence access, VHA has already invested in telemedicine, community-based clinics, and mobile clinics as ways to outreach to veterans.²⁹⁶ Targeting such services to women new to VHA may help to reduce attrition, furthering VHA's effectiveness as a long-term medical home for women veterans.

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Figure 1. Illustration of the person-specific time line and how it is used to assess attrition

Notes:

Patient 1 is an attriter because she did not return for VHA outpatient care during Year 2 through Year 3.

Patient 2 is a non-attriter because she returned for VHA outpatient care during the Attrition Ascertainment Period (in this case, she returned during Year 2, but she also would have been a non-attriter had she returned during Year 3 or during both Year 2 and Year 3).

Figure 2. Unadjusted attrition* by drive time, in minutes, between patients' residence and home site, † by new ‡ patient status and by rural § status, FY2009

*A patient was considered to have attrited from VHA outpatient care if she did not return to VHA for outpatient care during Year 2 through Year 3 following her first face-to-face outpatient visit in FY2009. Otherwise, if she received any outpatient VHA care during Year 2 and/or Year 3, she was considered not to have attrited.

†“Home” VHA site refers to the VHA site where the patient received the preponderance of her care.

‡A patient was considered “new” if she had no VHA outpatient use in the three years prior to her first visit in Year 1 of care.

§A woman's residence was “rural” if it was highly rural or other rural based on the PSSG FY2009 file. All others were considered “urban”.

^{||}Minute ranges include <10 minutes, and then 10 minute intervals between 11 and 80 minutes. Above this range, minutes are broken up into intervals of 81-120, 121-180, and 180+ minutes. These levels are chosen to accommodate lower frequency in these higher ranges as well as hourly cut-points (120 minutes=2 hours, 180 minutes=3 hours).

Table 1

Characteristics of cohort of women veteran VHA outpatients in the study cohort, FY2009

	Full cohort (n=266,301)
Attrition *	8%
Drive time	
Drive time between residence and home VHA site, minutes, mean (SD) [†]	31 (40)
Drive time between residence and home VHA site, <i>log</i> minutes, mean (SD) [†]	3 (1)
Modifying factors	
New, % [‡]	14%
Rural residence, % [§]	36%
Sociodemographic characteristics	
Age, years, mean (SD)	48 (16)
Service-connected disability status, %	
Non Service-connected	44%
Service-connected 0-49 percent	30%
Service-connected 50-99 percent	22%
Service-connected 100 percent	5%
Medical profile during Year 1	
0 diagnoses, %	29%
1 diagnosis, %	21%
2 diagnoses, %	20%
3 diagnoses, %	16%
4-6 diagnoses, %	11%
7 or more diagnoses, %	3%
Utilization during Year 1	
Number of primary care outpatient visits	
0 visits, %	7%
1 visit, %	15%
2 visits, %	18%
3-4 visits, %	29%
5-22 visits, %	31%
23+ visits, %	0%
Number of mental health outpatient visits	
0 visits, %	60%
1 visit, %	8%
2 visits, %	5%
3 visits, %	4%
4 visits, %	3%

	Full cohort (n=266,301)
5-9 visits, %	9%
10-20 visits, %	6%
21-50 visits, %	3%
51+ visits, %	2%
Number of other outpatient visits	
0 visits, %	21%
1 visit, %	14%
2 visits, %	11%
3 visits, %	8%
4-5 visits, %	12%
6-10 visits, %	16%
11-12 visits, %	4%
13-50 visits, %	13%
51+ visits, %	1%

Key: VHA: Veterans Health Administration; FY: Fiscal year; SD: Standard deviation;

* A patient was considered to have attrited from VHA outpatient care if she did not return to VHA for outpatient care during Year 2 through Year 3 following her first face-to-face outpatient visit in FY2009. Otherwise, if she received any outpatient VHA care during Year 2 and/or Year 3, she was considered not to have attrited.

[†] “Home” VHA site refers to the VHA site where the patient received the preponderance of her care. Table 1 reports descriptive statistics for both drive time in minutes and drive time in log minutes. Drive time in log minutes is used for the logistic regressions presented in Tables 2 and 3 because it has a more normal distribution.

[‡] A patient was considered “new” if she had no VHA outpatient use in the three years prior to her first visit in Year 1 of care.

[§] A woman’s residence was “rural” if it was highly rural or other rural based on the PSSG FY2009 file. All others were considered “urban”.

// Service-connected refers to an injury or illness incurred or aggravated while serving in the armed forces. Percent refers to the severity rating for the injury or illness. “0 percent” disability status is a distinct level of service-connected disability level from Non Service-connected.

Table 2

Logistic regression adjusted odds ratios and 99% confidence intervals for predictors of attrition among women veteran VHA outpatients, Model 1 and Model 2

	AOR (99% CI) (n=266,301)	
	Model 1	Model 2
Drive time in log minutes between patients' residence and home VHA site	1.11 (1.09, 1.14)	
Drive time in log minutes, <i>new patients</i>*		1.16 (1.08, 1.24)
Drive time in log minutes, <i>established patients</i>*		1.09 (1.07, 1.12)
New status	3.91 (3.73, 4.09)	3.27 (2.82, 3.78)
Rural residence (REF=Urban residence)	0.83 (0.80, 0.87)	0.83 (0.80, 0.87)
Age	0.10 (0.99, 0.10)	0.10 (0.99, 0.10)
Service-connected disability status [†] (REF=Non service-connected status)		
Service-connected status (0-49 percent)	0.85 (0.81, 0.89)	0.85 (0.81, 0.89)
Service-connected status (50-99 percent)	0.69 (0.64, 0.73)	0.69 (0.64, 0.73)
Service-connected status (100 percent)	0.59 (0.50, 0.69)	0.59 (0.50, 0.69)
Number of medical and mental health conditions (REF=0 diagnoses)		
1 diagnosis	0.68 (0.64, 0.71)	0.68 (0.64, 0.71)
2 diagnoses	0.57 (0.53, 0.60)	0.57 (0.53, 0.61)
3 diagnoses	0.55 (0.51, 0.60)	0.55 (0.51, 0.60)
4-6 diagnoses	0.53 (0.47, 0.59)	0.53 (0.47, 0.60)
7 or more diagnoses	0.82 (0.60, 1.13)	0.83 (0.60, 1.13)
Number of primary care outpatient visits (REF=0 visits)		
1 visit	0.63 (0.60, 0.67)	0.63 (0.59, 0.67)
2 visits	0.29 (0.27, 0.31)	0.29 (0.27, 0.31)
3-4 visits	0.16 (0.15, 0.17)	0.16 (0.15, 0.17)
5-22 visits	0.08 (0.08, 0.09)	0.08 (0.08, 0.09)
23+ visits	0.07 (0.02, 0.23)	0.07 (0.02, 0.23)
Number of mental health outpatient visits (REF=0 visits)		
1 visit	1.14 (1.07, 1.22)	1.14 (1.07, 1.22)
2 visits	0.77 (0.69, 0.85)	0.77 (0.69, 0.85)
3 visits	0.64 (0.56, 0.73)	0.64 (0.56, 0.73)
4 visits	0.51 (0.43, 0.61)	0.51 (0.43, 0.61)
5-9 visits	0.42 (0.37, 0.48)	0.42 (0.37, 0.48)
10-20 visits	0.26 (0.22, 0.32)	0.26 (0.22, 0.32)
21-50 visits	0.15 (0.10, 0.22)	0.15 (0.10, 0.22)
51+ visits	0.20 (0.11, 0.39)	0.20 (0.11, 0.38)
Number of other outpatient visits (REF=0 visits)		
1 visit	0.73 (0.69, 0.77)	0.73 (0.69, 0.77)
2 visits	0.54 (0.5, 0.57)	0.54 (0.50, 0.57)

	AOR (99% CI) (n=266,301)	
	Model 1	Model 2
3 visits	0.43 (0.39, 0.46)	0.43 (0.39, 0.47)
4-5 visits	0.32 (0.30, 0.35)	0.32 (0.30, 0.35)
6-10 visits	0.24 (0.22, 0.27)	0.24 (0.22, 0.27)
11-12 visits	0.17 (0.13, 0.21)	0.17 (0.13, 0.22)
13-50 visits	0.14 (0.12, 0.17)	0.14 (0.12, 0.17)
51+ visits	0.16 (0.07, 0.35)	0.16 (0.07, 0.35)

Key: VHA: Veterans Health Administration; FY: Fiscal year; REF: Reference group; AOR: adjusted odds ratio; 99% CI: 99% confidence interval

Note: A patient was considered to have attrited from VHA outpatient care if she did not return to VHA for outpatient care during Year 2 through Year 3 following her first face-to-face visit in FY09. Otherwise, if she received any outpatient VHA care during Year 2 and/or Year 3, she was considered not to have attrited.

* AOR of drive time for established patients = AOR for drive time. AOR of drive time for new patients = AOR drive time * AOR new-by-drive time interaction term. The 99% confidence intervals were calculated in an analogous way.

[†] Service-connected refers to an injury or illness incurred or aggravated while serving in the armed forces. Percent refers to the severity rating for the injury or illness. "0 percent" disability status is a distinct level of service-connected disability level from Non Service-connected.