Trends in Medication Prescribing in Patients With PTSD From 2009 to 2018:

A National Veterans Administration Study

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ABSTRACT

Objective: To evaluate longitudinal prescription practice trends for patients diagnosed with posttraumatic stress disorder (PTSD) using a national cohort of veterans who engaged in Veterans Health Administration (VHA) care from 2009 to 2018.

Methods: Using *ICD-9* and *ICD-10* codes to determine diagnoses, 1,353,416 patients diagnosed with PTSD in VHA care were retrospectively identified who were not diagnosed with bipolar or psychotic spectrum disorder. Veterans were included in the analytic sample starting in the year of their first PTSD diagnosis for each year that they were active in VHA care. Outpatient prescription records were examined from 2009 to 2018 for medications that are commonly used as recommended (selective serotonin reuptake inhibitors [SSRIs], serotonin-norepinephrine reuptake inhibitors [SNRIs]) or second-line/adjunctive (atypical antipsychotics [AAPs], mirtazapine, prazosin, trazodone, tricyclic antidepressants, and non-benzodiazepine hypnotics) medications for PTSD. Benzodiazepine prescriptions were also examined.

Results: From 2009 to 2018, the percentage of patients active in VHA care who received at least one of the examined recommended or second-line/adjunctive medications for PTSD in a calendar year declined by 9.0% (absolute change). The largest absolute change in rates of prescribing for medication classes over the last decade were observed among SSRIs (−12.3%) and SNRIs (+6.4%). AAP use decreased 5.4% from 2009 to 2018, with most of this change (−4.3%) occurring from 2009 to 2013.

Conclusions: Consistent with clinical practice guidelines, SSRIs/SNRIs were the most common prescriptions for patients in the current study. Reductions in the percentage of patients receiving PTSD medications may reflect concerns regarding effectiveness, adverse side effects, increases in access to evidence-based psychotherapy for PTSD, and/or symptom improvement such that medication was no longer needed.

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Posttraumatic stress disorder (PTSD) is a debilitating mental health condition associated with numerous biopsychosocial consequences, including poorer physical health functioning, quality of life, and social functioning.[1] Compared to civilians, military veterans are disproportionately likely to be diagnosed with PTSD.[2] As a result, the Veterans Health Administration (VHA), the largest integrated health care system in the United States,[3] has become a national leader in providing effective treatment for PTSD. Well over 600,000 veterans receive treatment for PTSD annually in the VHA,[4] and PTSD is one of the most rapidly growing mental health disorders treated in VHA.[5,6] While both psychotherapy and pharmacotherapy treatments for PTSD are available in the VHA, most veterans diagnosed with PTSD receive pharmacotherapy treatment.[7–9]

Pharmacotherapy treatment options for PTSD are diverse, characterized by multiple medication classes.[10] Selective serotonin reuptake inhibitors (SSRIs) represent the most studied medication class, and two SSRIs (sertraline and paroxetine) are the only medications to date approved by the United States Food and Drug Administration for the treatment of PTSD.[10] Other antidepressant medications, including serotonin-norepinephrine reuptake inhibitors (SNRIs), tricyclic antidepressants (TCAs), and mirtazapine, may also be prescribed for the treatment of PTSD.[11] SSRIs/SNRIs are typically the most strongly recommended pharmacotherapy treatments for PTSD, with sertraline, paroxetine, fluoxetine, and venlafaxine being the current first-line pharmacotherapies.[12] Other antidepressant medications are options to augment initial treatment (ie, mirtazapine) or to use if there is no response or intolerance to first-line options (ie, TCAs).[11,13] Atypical antipsychotic medications (AAPs) have also been widely discussed as adjunctive

Clinical Points

- From 2008 to 2019, the proportion of veterans with posttraumatic stress disorder (PTSD) receiving at least one medication for PTSD symptoms declined.
- Serotonin reuptake inhibitors, which are recommended as first-line pharmacotherapies, were the most commonly prescribed PTSD medications in all years.

medications or as monotherapy for individuals who do not respond to first-line interventions,[14] with support for these approaches decreasing over time.[11] Other medications may be less effective in treating PTSD globally, but may be effective in treating specific PTSD-related sleep symptoms. Specifically, trazodone and non-benzodiazepine hypnotics such as zolpidem may be beneficial for treating insomnia,[13] and prazosin, an α_1-adrenergic antagonist, may be beneficial in the treatment of trauma-related nightmares and sleep disturbance.[13] Although clinical practice guidelines recommend against prescription of benzodiazepines for those diagnosed with PTSD, an estimated 30.6% of veterans diagnosed with PTSD were prescribed a benzodiazepine in 2009.[15] Overall, selecting effective pharmacotherapy for PTSD is a complex decision-making process, characterized by consideration of numerous medications to best manage diverse symptom presentations while balancing against potential adverse side effects.

Due to the complexity of this decision-making process, there is interest in understanding providers' prescription practices for the treatment of PTSD. One of the most effective ways to describe trends in PTSD prescription practices is through retrospective analysis of longitudinal data from national samples encompassing diverse medication classes. With the large number of patients diagnosed with PTSD receiving treatment in the VHA, this population represents a natural choice for understanding PTSD prescription practices. To date, two studies[8,15] have published data on longitudinal trends in prescription practices for veterans diagnosed with PTSD. Although the Departments of Veterans Affairs and Defense (VA/DoD) published an updated clinical practice guideline in 2010[16] and 2017,[12] existing studies of longitudinal prescription trends have described only 1 year of prescription data following the publication of the 2010 guideline.[8] Since that time, the results of multiple seminal randomized controlled trials and other research reports investigating pharmacotherapy for PTSD have also been published,[8] with some findings that have had the potential to change prescribing trends (eg, large VA multisite trials of risperidone[17] and prazosin[18] that were negative). Therefore, it is important to reexamine prescription trends among patients diagnosed with PTSD in VHA care. The current study aimed to provide an update of longitudinal trends in PTSD prescription practices among VHA providers using a national cohort of patients diagnosed with PTSD who engaged in VHA care from 2009 to 2018.

METHODS

Data Source and Patients

We obtained inpatient visit, outpatient visit, and pharmacy data from the VHA Corporate Data Warehouse. The study was reviewed by the Institutional Review Board of the University of California, San Francisco, and the Research and Development Committee of the San Francisco VA Health Care System. Our goal was to focus on medication use during a 10-year period from 2009 to 2018. As PTSD may not be coded at each visit, we looked for diagnoses starting in 2006 to better capture patients with PTSD, which identified 1,454,910 patients. We identified patients who had received at least 1 inpatient diagnosis or 2 outpatient diagnoses of PTSD based on *International Classification of Diseases, Ninth Revision* or *Tenth Revision* (*ICD-9* or *ICD-10*) codes, including *ICD-9* code 309.81 or *ICD-10* code F43.1. This method has shown good agreement (79.4%) when compared to lifetime diagnoses obtained from structured clinical interviews.[19,20] Next, we excluded patients (n = 101,494) with a diagnosis of bipolar (*ICD-9*: 296.0x, 296.1x, 296.4x, 296.5x, 296.6x, 296.7, 296.8x; *ICD-10*: F30.xx, F31.xx) or psychotic spectrum disorder (*ICD-9*: 295.xx, 298.0, 298.1, 298.4, 298.8, 298.9, 293.81, 293.82, 296.24, 296.34; *ICD-10*: F06.0, F06.2, F20.xx, F22, F23, F24, F25.x, F28, F29, F32.3, F33.3, F53) on at least 1 inpatient or 2 outpatient visits, as these are specific indications for use of antipsychotic medications and we wanted to focus the sample on use of these medications for treatment of PTSD. This exclusion resulted in an analytic sample of 1,353,416 patients.

Patients were included in analyses starting in the year of their first PTSD diagnosis, and patients whose first available PTSD diagnosis was between 2006–2009 were eligible for inclusion in the first year of analysis (ie, 2009). However, as patients may have providers outside of the VA and may transition in and out of VA care over time, we restricted our analyses to "active" patients (ie, those with any VA inpatient or outpatient visits in that calendar year and/or those who filled one of the study medications in that calendar year). Little change in the age of the cohort of veterans who were active in VHA care was observed (see Table 1) between 2009 (mean [SD] = 54.7 [15.0] years) and 2018 (mean [SD] = 54.7 [16.2] years).

Medication Use

We examined outpatient prescription records in each calendar year from 2009 to 2018 for several classes of medications that are commonly used as recommended (SSRIs and SNRIs) or second-line/adjunctive (AAPs, prazosin, mirtazapine, TCAs, trazodone, and non-benzodiazepine hypnotics) medications in PTSD as well as benzodiazepines, which are recommended against but commonly prescribed. SSRIs included citalopram, escitalopram, fluoxetine, fluvoxamine, paroxetine, and sertraline. SNRIs included desvenlafaxine, duloxetine, and venlafaxine. AAPs included aripiprazole, clozapine, lurasidone, olanzapine, paliperidone, quetiapine, risperidone, and ziprasidone.

Table 1. PTSD Treatment Among Veterans Diagnosed With PTSD by Year (2009–2018)[a]

Variable	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Absolute Change
Active veterans with PTSD, n	499,143	571,374	639,019	703,523	767,780	834,947	905,822	970,852	1,028,408	1,073,183	574,040
Age, mean (SD), y	54.7 (15.0)	54.6 (15.2)	54.6 (15.4)	54.5 (15.7)	54.4 (15.9)	54.2 (16.1)	54.1 (16.2)	54.1 (16.3)	54.3 (16.3)	54.7 (16.2)	0.0
Any psychotherapy	65.2	63.5	61.8	60.2	51.3	47.5	47.2	46.5	46.2	46.2	−19.0
Any PTSD medication	67.0	65.6	64.2	62.8	61.6	60.7	60.3	59.5	58.7	58.0	−9.0
SSRI or SNRI	51.9	50.4	49.1	47.4	46.3	45.8	46.0	45.8	45.5	44.9	−7.0
SSRI	46.7	45.1	43.5	41.3	39.6	38.7	38.0	36.5	35.3	34.4	−12.3
Citalopram	21.9	21.1	19.5	14.3	11.0	9.5	7.7	6.2	5.2	4.5	−17.4
Escitalopram	0.3	0.3	0.3	0.4	0.4	0.9	2.9	4.1	4.7	5.2	4.9
Fluoxetine	8.4	7.8	7.7	8.0	8.0	8.0	7.7	7.3	7.1	6.9	−1.5
Fluvoxamine	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1	0.1	0.1	0.0
Paroxetine	4.6	4.1	4.0	4.2	4.1	4.0	3.8	3.4	3.1	2.9	−1.7
Sertraline	14.6	14.4	15.4	17.7	18.4	18.7	18.3	17.6	17.1	16.6	2.0
SNRI	7.2	7.2	7.6	8.2	8.8	9.1	10.5	12.0	13.0	13.6	6.4
Duloxetine	1.2	1.2	1.2	1.3	1.4	1.5	3.3	5.4	6.8	7.6	6.4
Venlafaxine	6.1	6.1	6.5	7.0	7.5	7.8	7.6	7.0	6.6	6.3	0.2
Atypical antipsychotic	12.4	11.2	9.9	8.8	8.1	7.7	7.2	7.0	6.9	7.0	−5.4
Aripiprazole	2.2	2.2	2.2	2.0	1.8	1.7	1.5	1.4	1.5	1.5	−0.7
Olanzapine	0.7	0.6	0.5	0.4	0.4	0.4	0.3	0.3	0.4	0.4	−0.3
Quetiapine	7.7	6.6	5.6	4.9	4.5	4.3	4.2	4.1	4.1	4.1	−3.6
Risperidone	2.4	2.2	2.0	1.8	1.7	1.5	1.2	1.1	1.0	1.0	−1.4
Ziprasidone	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	−0.3
Tricyclic antidepressant	5.4	4.9	4.6	4.3	4.2	4.1	4.0	3.8	3.5	3.4	−2.0
Amitriptyline	3.5	3.2	3.0	2.8	2.8	2.7	2.6	2.5	2.3	2.2	−1.3
Desipramine	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	−0.2
Imipramine	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	−0.1
Nortriptyline	1.5	1.4	1.3	1.3	1.3	1.3	1.2	1.2	1.1	1.1	−0.4
Mirtazapine	8.2	8.1	8.1	8.1	8.0	8.0	8.0	7.8	7.6	7.5	−0.7
Prazosin	7.6	8.8	10.0	11.3	12.4	13.5	14.4	14.6	14.5	14.1	6.5
Trazodone	21.4	20.6	19.9	19.3	19.0	19.0	18.8	18.2	17.5	17.1	−4.3
Non-benzodiazepine hypnotics	11.2	11.8	11.9	11.6	10.6	9.5	8.7	7.7	6.8	6.0	−5.2
Eszopiclone	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.4
Ramelteon	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.1	0.1	0.1	0.1	0.1
Zaleplon	<0.1	<0.1	<0.1	<0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Zolpidem	11.1	11.7	11.8	11.5	10.4	9.3	8.3	7.3	6.3	5.5	−5.6
Benzodiazepines	24.5	23.2	22.1	21.0	19.4	17.4	15.1	12.6	10.3	8.7	−15.8
Alprazolam	4.6	4.4	4.3	4.1	3.8	3.5	3.0	2.6	2.2	1.9	−2.7
Chlorodiazepam	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	−0.2
Chlorazepate	8.4	8.0	7.6	7.2	6.7	6.0	5.2	4.3	3.5	3.0	−5.4
Diazepam	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	−0.1
Lorazepam	3.5	3.2	3.0	2.8	2.6	2.3	2.0	1.7	1.3	1.1	−2.4
Oxazepam	6.4	6.0	5.7	5.4	5.0	4.4	3.8	3.2	2.6	2.2	−4.2
Temazepam	0.2	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.1	−0.2
Triazolam	4.4	4.0	3.8	3.5	3.1	2.7	2.1	1.6	1.2	1.0	−3.4

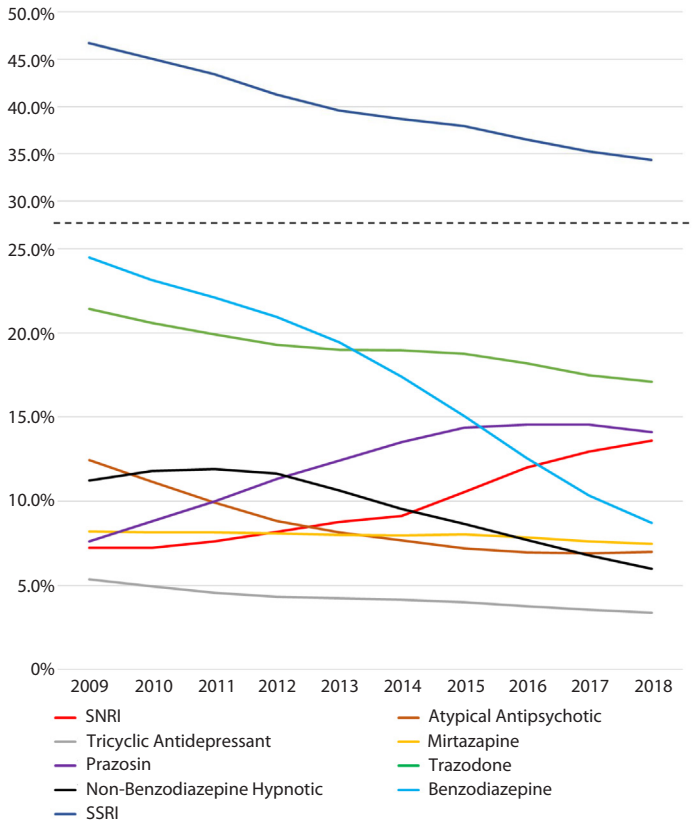
[a]Values shown as percentages unless otherwise noted.
Abbreviations: PTSD = posttraumatic stress disorder, SNRI = serotonin-norepinephrine reuptake inhibitor, SSRI = selective serotonin reuptake inhibitor.

TCAs included amitriptyline, desipramine, imipramine, and nortriptyline. Non-benzodiazepine hypnotics included zolpidem, eszopiclone, zaleplon, zopiclone, suvorexant, tasimelteon, and ramelteon. Benzodiazepines included alprazolam, chlordiazepoxide, clonazepam, clorazepate, diazepam, estazolam, flurazepam, halazepam, lorazepam, midazolam, oxazepam, prazepam, quazepam, temazepam, and triazolam. With the exception of benzodiazepines, we classified medications as being used by a patient in a given calendar year if a prescription of any number of days, supply, and dose was filled at least once.[7,15] For benzodiazepines, we required a minimum of 7 days supply due to common use for other indications (eg, prior to outpatient imaging or procedure). Finally, we examined trends in receipt of psychotherapy throughout the study period. Patients were coded as having received psychotherapy if they had a VHA visit with a corresponding psychotherapy procedure code (ie, 90804, 90805, 90806, 90807, 90808, 90809, 90810, 90811, 90812, 90813, 90814, 90815, 90816, 90817, 90818, 90819, 90821, 90822, 90823, 90824, 90826, 90827, 90828, 90829, 90832, 90833, 90834, 90836, 90837, 90838, 90841, 90843, 90844, 90853, 90855, 90857). For additional details on procedure codes, see Maguen and colleagues.[21]

Statistical Analysis

For each calendar year from 2009 through 2018, we calculated the proportion of active patients utilizing specific medications and medication classes. Two medication categories were assessed: (1) the proportion of patients filling any prescription for a specific medication and medication class and (2) the proportion of patients filling a new prescription for specific medication and medication classes, defined as not having been filled in the last 180 days. Considering our sample utilized the entire population

Figure 1. PTSD Pharmacotherapy Among Veterans Diagnosed With PTSD by Year (2009–2018)



Abbreviations: PTSD = posttraumatic stress disorder, SNRI = serotonin-norepinephrine reuptake inhibitor, SSRI = selective serotonin reuptake inhibitor.

of patients diagnosed with PTSD in the VHA, inferential statistics are not reported. We conducted similar analyses for each year stratified by gender, race, ethnicity, and service era (veteran of Iraq and Afghanistan war vs other service era). All changes in percentages over time are reported as absolute changes.

RESULTS

Over the past decade, the number of patients diagnosed with PTSD who were active in VHA care more than doubled, reaching a total of 1,073,183 patients in 2018 (see Table 1). However, the percentage of patients who received at least one of the examined medications that are recommended or second-line/adjunctive treatments for PTSD in a calendar year declined by 9.0% over this same period of time, from 67.0% in 2009 to 58.0% in 2018. Overall prescription trends are reported in Table 1 and Figure 1, with new medication trends shown in Table 2.

The largest absolute change in rates of prescribing of a medication class over the last decade was observed among SSRIs, with the percentage of patients being prescribed an SSRI decreasing 12.3% from 46.7% in 2009 to 34.4% in 2018 (Table 1). SNRI use increased 6.4% during this same period. Each of these trends was consistent with changes in new prescription practices, with new SSRI prescriptions decreasing by 1.5% over the study period and new SNRI prescriptions increasing by 2.3% over the study period (Tables 1 and 2). When evaluating SSRIs and SNRIs as a combined class (ie, serotonin reuptake inhibitors [SRIs]), which represents first-line medication options for PTSD, trends were less pronounced. Overall SRI prescriptions reduced by 7.0% over the study period, with new prescriptions remaining fairly constant throughout the study period (Tables 1 and 2). Among specific medications in these classes, citalopram showed a marked reduction in use (−17.4%), whereas duloxetine showed a marked increase in use (+6.4%; Table 1).Other antidepressant medications, including trazodone, TCAs, and mirtazapine, had modest reductions in use between 2009 and 2018. Trazodone use decreased by 4.3%, with TCA use decreasing by 2.0% and mirtazapine use decreasing by 0.7% (Table 1). Changes in new prescriptions over time for these medications were small, ranging from a decrease of 0.6% (trazodone) to a decrease of 0.1% (mirtazapine; Table 2).

AAP, non-benzodiazepine hypnotic, and benzodiazepine use all decreased over the study period. AAP use decreased 5.4% from 12.4% in 2009 to 7.0% in 2018 (Table 1). A majority of this change (4.3%) took place between 2009 and 2013, the same time period in which new AAP use decreased by 1.8% (Table 2). Very little change in new AAP prescription was observed between 2013 and 2018 (Table 2). Non-benzodiazepine hypnotic prescriptions reduced by almost half over the study period, from 11.2% in 2009 to 6.0% in 2018 (Table 1). Benzodiazepine use also reduced dramatically over the study period, from 24.5% in 2009 to 8.7% in 2018 (Table 1). Reductions were observed in each of the studied benzodiazepine medications in both overall prescriptions and new prescriptions except for diazepam and temazepam, which were rarely prescribed and therefore showed no change in new prescriptions over time (Tables 1 and 2).

The overall percentage of patients who received psychotherapy declined by 19.0% throughout the study period from 65.2% in 2009 to 46.2% in 2018. However, first-time receipt of psychotherapy showed less change, actually increasing by 5.4% from 70.3% in 2009 to 75.6% in 2018. Differences in trends based on gender, race, ethnicity, and service era (Iraq and Afghanistan war veterans vs veterans of other eras) are shown in Supplementary Tables 1–8. Overall, the magnitude of differences in prescription practices based on these characteristics was substantially smaller than

Table 2. New PTSD Treatment Among Veterans Diagnosed With PTSD by Year (2009–2018)[a]

Variable	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Absolute Change
Active veterans with PTSD, n	499,143	571,374	639,019	703,523	767,780	834,947	905,822	970,852	1,028,408	1,073,183	574,040
Any psychotherapy	70.3	70.7	70.9	71.3	65.6	64.9	66.1	66.6	69.3	75.6	5.3
SSRI or SNRI	12.0	11.6	12.2	12.7	11.6	11.7	12.6	12.7	12.6	12.4	0.4
SSRI	10.1	9.8	10.2	10.5	9.3	9.3	9.4	8.9	8.7	8.6	−1.5
Citalopram	4.5	4.4	3.8	2.5	2.1	1.9	1.4	1.1	0.9	0.8	−3.7
Escitalopram	0.1	0.1	0.1	0.1	0.1	0.4	1.7	1.8	1.8	1.9	1.8
Fluoxetine	1.8	1.8	1.9	2.2	2.0	2.1	1.9	1.8	1.8	1.8	0.0
Fluvoxamine	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.0
Paroxetine	1.0	0.9	1.0	1.2	1.1	1.1	1.0	0.8	0.8	0.7	−0.3
Sertraline	3.3	3.2	4.0	5.1	4.5	4.4	4.1	4.0	3.9	3.8	0.5
SNRI	2.2	2.2	2.4	2.6	2.7	2.8	3.9	4.4	4.5	4.5	2.3
Duloxetine	0.4	0.4	0.4	0.4	0.4	0.4	1.9	2.7	2.9	2.9	2.5
Venlafaxine	1.9	1.9	2.1	2.3	2.3	2.4	2.1	1.8	1.7	1.6	−0.3
Atypical antipsychotic	4.4	3.9	3.2	2.8	2.6	2.5	2.4	2.5	2.5	2.6	−2.2
Aripiprazole	1.2	1.1	0.9	0.8	0.6	0.6	0.5	0.5	0.5	0.6	−0.6
Olanzapine	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.0
Quetiapine	2.3	1.9	1.6	1.4	1.4	1.4	1.4	1.4	1.4	1.4	−0.9
Risperidone	0.8	0.8	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.4	−0.4
Ziprasidone	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	−0.1
Tricyclic antidepressant	1.8	1.7	1.6	1.6	1.6	1.6	1.5	1.4	1.4	1.3	−0.5
Amitriptyline	1.2	1.1	1.1	1.0	1.0	1.0	1.0	1.0	0.9	0.9	−0.3
Desipramine	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	−0.1
Imipramine	0.1	0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	−0.1
Nortriptyline	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	−0.2
Mirtazapine	2.8	2.9	2.9	2.8	2.8	2.8	2.9	2.8	2.7	2.7	−0.1
Prazosin	2.9	3.4	3.7	4.2	4.4	4.7	4.8	4.7	4.6	4.1	1.2
Trazodone	5.8	5.9	5.7	5.7	5.7	5.9	5.7	5.6	5.3	5.2	−0.6
Non-benzodiazepine hypnotics	2.6	2.8	2.8	2.7	2.3	2.2	2.0	1.7	1.5	1.3	−1.3
Eszopiclone	<0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
Ramelteon	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.0
Zaleplon	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.0
Zolpidem	2.6	2.7	2.7	2.6	2.2	2.1	1.8	1.5	1.3	1.1	−1.5
Benzodiazepines	5.1	5.1	5.0	4.7	4.3	3.8	3.2	2.7	2.3	2.0	−3.1
Alprazolam	0.8	0.9	0.8	0.8	0.7	0.7	0.6	0.5	0.4	0.4	−0.4
Chlorodiazepam	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	−0.1
Chlorazepate	1.5	1.5	1.4	1.4	1.2	1.1	0.9	0.7	0.6	0.6	−0.9
Diazepam	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.0
Lorazepam	0.7	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.3	0.3	−0.4
Oxazepam	1.4	1.4	1.4	1.3	1.2	1.1	0.9	0.8	0.7	0.6	−0.8
Temazepam	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.0
Triazolam	1.0	1.0	1.0	0.9	0.8	0.7	0.5	0.4	0.3	0.2	−0.8

[a]Values shown as percentages unless otherwise noted.
Abbreviations: PTSD = posttraumatic stress disorder, SNRI = serotonin-norepinephrine reuptake inhibitor, SSRI = selective serotonin reuptake inhibitor.

trends observed over time. Female veterans were prescribed medications recommended to treat PTSD, particularly SRIs, at a higher rate throughout the study period (Supplementary Table 1). Prazosin was prescribed at somewhat higher rates to racial/ethnic minority veterans in comparison to White veterans (Supplementary Table 2). Meaningful differences in prescription practices based on ethnicity and service era were not observed.

DISCUSSION

The current study provides a depiction of longitudinal trends in PTSD prescription practices among VHA providers using a national cohort of patients diagnosed with PTSD who engaged in VHA care between 2009 and 2018 (Figure 1). This multiyear investigation of prescription practices in VHA care is the first since publication of the 2010[16] and 2017[12] VA/DoD PTSD Clinical Practice Guideline. Between 2009 and 2018, the number of veterans with a PTSD diagnosis active in VHA care more than doubled, with over a million patients diagnosed with PTSD and active in VHA care in 2018. The percentage of patients receiving the examined pharmacotherapies for PTSD decreased by 9.0% over the study period, a shift from consistency in prescribing practices between 1999 and 2009.[15]

Medication effectiveness, ineffectiveness, and tolerability as well as availability of alternative treatment options may all contribute to reduction in the percentages of patients receiving the examined medications over time. The trend of decreased medication use may reflect successful treatment of PTSD such that some patients no longer require medication. However, for other patients, medications may produce modest reductions in symptom severity rather than treat the disorder to remission.[8] These PTSD medications can be associated with adverse side effects, including sexual side effects and metabolic side effects, which likely also contribute

to discontinuation.[22] For some patients, treatment gains may not outweigh the negative side effects of PTSD medications, resulting in medication discontinuation.

Data also suggest that patients prefer to receive psychotherapy rather than pharmacotherapy to treat PTSD,[23] and access to evidence-based psychotherapy interventions for PTSD has increased substantially in the VHA in recent years.[24] Although we were not able to specifically assess trends in evidence-based psychotherapy in this sample, the number of patients receiving first-time psychotherapy treatment in a calendar year was relatively constant over the study period, before increasing from 2017 to 2018 (Table 2). The percentage of patients receiving any psychotherapy declined considerably over the study period by 19.0% (Table 1). This trend may reflect a shift toward time-limited psychotherapies, such as the evidence-based psychotherapies that are recommended in the clinical practice guideline.[12,16] Therefore, an increase in patients electing to receive available time-limited psychotherapy may contribute to fewer patients receiving pharmacotherapy.

Consistent with earlier evaluations of prescription trends[8,15] and current clinical practice guideline recommendations,[12] the most common prescriptions for patients in the current study were SRIs; however, the use of SRIs did decrease by 7.0% over time. Interestingly, this trend was not precipitated by reductions in new prescribing of SRIs, which increased slightly over the study period. Therefore, the reduction in SRI use over time may not be driven by changes in provider preferences, but rather by patients discontinuing these medications after initial prescription. Among SRIs, there was a shift toward reduced use of SSRIs and an increased use of SNRIs. Reductions in SSRI use were largely driven by decreased prescribing of citalopram beginning in 2011, which coincides with US Food and Drug Administration warnings of QT prolongation.[25] Within the SNRI class, duloxetine showed the greatest increase in use. A substantial increase in prescriptions of duloxetine was observed from 2014 to 2015. This increase coincides with the availability of a generic formulation of duloxetine.[26] Additionally, the increase coincides with the release of recommendations by the VHA for the use of duloxetine in the treatment of chronic pain conditions.[27] As chronic pain conditions are frequently comorbid with PTSD,[28] providers may be more likely to select duloxetine as a medication option over other SRIs due to potential benefits in the treatment of chronic pain.

Trends toward increased rates of prazosin use observed between 1999 and 2009[8,15] continued, reaching a peak use in 14.6% of veterans in 2016. From 2017 to 2018, prazosin showed the greatest decline (−0.5%) in new prescriptions of any medication investigated. Slowed prescription of prazosin could reflect provider awareness of results of a large, multisite randomized controlled trial published in early 2018[18] that found no significant differences in symptom improvement between prazosin and placebo among veterans with PTSD. In addition, changes to the 2017 VA/DoD PTSD Clinical Practice Guideline[12] regarding the benefits of prazosin have increasingly dissuaded use as a primary pharmacotherapy for PTSD. Importantly, various medication classes showed decreases in prescribing from 2017 to 2018, and changes in prazosin prescribing may be related to more general trends toward reduced prescribing rather than specifically to changes in the clinical practice guideline or results of a randomized controlled trial. It may be particularly important to continue to monitor longitudinal trends in prazosin use, considering these changes in recommendations have been more recent.

While reductions in the use of AAP medication as a treatment for PTSD were not observed from 1999 to 2009 in a prior study,[15] prescriptions decreased 5.4% during the current study period, with the majority of change occurring between 2009 and 2013. Quetiapine was the most commonly prescribed AAP throughout the study period. Particularly for patients diagnosed with PTSD, quetiapine may be prescribed for its sedating effects.[10,29] A large, multisite randomized controlled trial examining the effectiveness of risperidone as an adjunctive medication for PTSD[17] was published in 2011, in the middle of these trends. While this work could have influence on practice, change in AAP prescription was greater from before publication (−2.5% from 2009 to 2011) than after publication (−1.8% from 2011 to 2013). Further, little change in the rates of any AAP prescription or new AAP prescriptions was observed between 2013 and 2018, suggesting a plateau in provider behavior change that may result from these findings. Considering the substantial metabolic side effects and limited evidence of effectiveness, it is particularly important for providers to be cautious in prescribing these medications,[14] and continued evaluation of trends in prescription of AAP medication is warranted.

Benzodiazepine use declined substantially over the study period, both in any prescription and in new prescriptions. Trends extend the observation by Bernardy and colleagues that benzodiazepine prescribing for patients with PTSD in the VA decreased from 1999 to 2009.[15] Benzodiazepine use in the treatment of PTSD is contraindicated due to the lack of evidence of benefit, potential for causing impairment in cognitive functioning, high risk for tolerance and dependence, and potential to inhibit PTSD recovery.[12,13,30] For these reasons, the continued, extensive reduction in benzodiazepine use observed in the current study is promising.

Only minor differences were observed in prescription practices on the basis of gender, race, ethnicity, and service era (Supplementary Tables 1–8). For example, prazosin use was somewhat higher in racial minority veterans compared to White veterans, and female veterans tended to receive medications for PTSD (particularly SRIs) at higher rates than their male counterparts. However, the differences in prescription practices observed in the current study were modest in comparison to the larger longitudinal prescription trends, consistent with earlier investigations of differences in prescribing practices on the basis of gender[31] and service era.[7]

There are numerous strengths of the current study, including use of a large, national sample of veterans;

identification of prescribing trends for new medications as well as overall prescription trends; and the requirement that patients be actively engaged in VHA care to be reflected in the longitudinal trends. However, the results of the study should be considered within the context of its limitations. Medication use was identified based on filled prescriptions. As a result, patients may or may not have taken these medications. Similarly, it is unknown whether dose and/or duration of the medications was sufficient for therapeutic effect. We did not have any information on patient or provider preferences, side effects, or why medications were discontinued. While medications investigated are recommended or commonly utilized to treat PTSD, these medications also have alternate indications (eg, depression, chronic pain, hypertension). As a result, medications may have been prescribed to treat conditions other than PTSD. Additionally, PTSD status was defined on the basis of chart diagnoses. While this method has shown strong validity,[19,20] it is possible that some patients were misclassified. Finally, medication use trends are highly dependent on methodology used to identify both medications and cohort. As a result, there may be discrepancies between medication prevalence rates estimated in the current study and other work.[8,15]

The current study identified longitudinal trends in prescription practices among a national sample of veterans receiving VHA care between 2009 and 2018. While the number of veterans diagnosed with PTSD more than doubled during this time, the percentage of veterans who received pharmacotherapy declined. Longitudinal trends suggest modest changes in provider behavior over time. Overall, medications with the strongest guideline recommendations (ie, SSRIs, SNRIs) continued to be most often prescribed. Future research should continue to evaluate longitudinal trends in PTSD treatment practices and may benefit from evaluating pharmacotherapy and psychotherapy trends concurrently.

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Additional information: VA data reside in the VA Corporate Data Warehouse, and VA data are not publicly available. VA investigators can apply to get access through the VA Informatics and Computing Infrastructure (VINCI): https://www.hsrd.research.va.gov/for_researchers/vinci/.

Supplementary material: Available at PSYCHIATRIST.COM.

REFERENCES

1. Arenson MB, McCaslin SE, Cohen BE. Predictors of multiple domains of functioning in Veterans with posttraumatic stress disorder: Results from the Mind Your Heart Study. *Depress Anxiety*. 2019;36(11):1026–1035.
2. Lehavot K, Katon JG, Chen JA, et al. Post-traumatic stress disorder by gender and veteran status. *Am J Prev Med*. 2018;54(1):e1–e9.
3. Oliver A. The Veterans Health Administration: an American success story? *Milbank Q*. 2007;85(1):5–35.
4. Harpaz-Rotem I, Hoff R. *2014 PTSD Data Sheet*. West Haven, CT: Northeast Program Evaluation Center; 2014.
5. Hunt MG, Cuddeback GS, Bromley E, et al. Changing rates of mental health disorders among veterans treated in the VHA during troop drawdown, 2007–2013. *Community Ment Health J*. 2019;55(7):1120–1124.
6. Hermes ED, Rosenheck RA, Desai R, et al. Recent trends in the treatment of posttraumatic stress disorder and other mental disorders in the VHA. *Psychiatr Serv*. 2012;63(5):471–476.
7. Vojvoda D, Stefanovics EA, Rosenheck RA. Psychotropic medication prescribing in Iraq/Afghanistan veterans and Vietnam era veterans with posttraumatic stress disorder. *J Nerv Ment Dis*. 2017;205(11):848–854.
8. Krystal JH, Davis LL, Neylan TC, et al. It is time to address the crisis in the pharmacotherapy of posttraumatic stress disorder: a consensus statement of the PTSD psychopharmacology working group. *Biol Psychiatry*. 2017;82(7):e51–e59.
9. Haller M, Myers US, McKnight A, et al. Predicting engagement in psychotherapy, pharmacotherapy, or both psychotherapy and pharmacotherapy among returning veterans seeking PTSD treatment. *Psychol Serv*. 2016;13(4):341–348.
10. Sauve WM, Stahl SM. Psychopharmacological and Neuromodulation Treatment. In: Moore BA, Penk WE, eds. *Treating PTSD in Military Personnel*. 2nd ed. New York, NY: Guilford Press; 2019:191–213.
11. Friedman MJ, Bernardy NC. Considering future pharmacotherapy for PTSD. *Neurosci Lett*. 2017;649:181–185.
12. Departments of Veterans Affairs and Defense. VA/DOD Clinical Practice Guideline for the Management of Posttraumatic Stress Disorder and Acute Stress Disorder. Washington, DC: Departments of Veterans Affairs and Defense; 2017.
13. Friedman MJ. PTSD: Pharmacotherapeutic approaches. *Focus*. 2013;11(3):315–320.
14. Cohen BE, Shi Y, Neylan TC, et al. Antipsychotic prescriptions in Iraq and Afghanistan veterans with posttraumatic stress disorder in Department of Veterans Affairs healthcare, 2007–2012. *J Clin Psychiatry*. 2015;76(4):406–412.
15. Bernardy NC, Lund BC, Alexander B, et al. Prescribing trends in veterans with posttraumatic stress disorder. *J Clin Psychiatry*. 2012;73(3):297–303.
16. Departments of Veterans Affairs and Defense. *VA/DoD Clinical Practice Guideline for the Management of Posttraumatic Stress Disorder*. Washington, DC: Departments of Veterans Affairs and Defense; 2010.
17. Krystal JH, Rosenheck RA, Cramer JA, et al; Veterans Affairs Cooperative Study No. 504 Group. Adjunctive risperidone treatment for antidepressant-resistant symptoms of chronic military service-related PTSD: a randomized trial. *JAMA*. 2011;306(5):493–502.
18. Raskind MA, Peskind ER, Chow B, et al. Trial of prazosin for post-traumatic stress disorder in military veterans. *N Engl J Med*. 2018;378(6):507–517.
19. Gravely AA, Cutting A, Nugent S, et al. Validity of PTSD diagnoses in VA administrative data: comparison of VA administrative PTSD diagnoses to self-reported PTSD Checklist scores. *J Rehabil Res Dev*. 2011;48(1):21–30.
20. Holowka DW, Marx BP, Gates MA, et al. PTSD diagnostic validity in Veterans Affairs electronic records of Iraq and Afghanistan veterans. *J Consult Clin Psychol*. 2014;82(4):569–579.
21. Maguen S, Madden E, Patterson OV, et al. Measuring use of evidence based psychotherapy for posttraumatic stress disorder in a large national healthcare system. *Adm Policy Ment Health*. 2018;45(4):519–529.
22. Friedman MJ, Donnelly CL, Mellman TA. Pharmacotherapy for PTSD. *Psychiatr Ann*. 2003;33(1):57–62.
23. Simiola V, Neilson EC, Thompson R, et al. Preferences for trauma treatment: a systematic review of the empirical literature. *Psychol Trauma*. 2015;7(6):516–524.
24. Maguen S, Holder N, Madden E, et al. Evidence-based psychotherapy trends among posttraumatic stress disorder patients in a national healthcare system, 2001–2014. *Depress Anxiety*. 2020;37(4):356–364.
25. US Food and Drug Administration. FDA Drug Safety Communication: Revised

recommendations for Celexa (citalopram hydrobromide) related to a potential risk of abnormal heart rhythms with high doses. FDA US Food and Drug Admin website. https://www.fda.gov/drugs/drug-safety-and-availability/fda-drug-safety-communication-revised-recommendations-celexa-citalopram-hydrobromide-related. August 24, 2011. Updated March 28, 2012. Accessed January 3, 2020.
26. Watts V. Med check: cymbalta generics approved for US market. *Psychiatr News*. 2014;49(3):32.
27. Pharmacy Benefits VA. Management Services, Medical Advisory Panel, VISN Pharmacist Executives. Duloxetine for Chronic Pain Conditions: Recommendations for Use. https://www.pbm.va.gov/PBM/clinicalguidance/clinicalrecommendations/Duloxetine_for_Chronic_Pain_Conditions_Recommendations_for_Use.pdf. 2015. February, 2015. Accessed January 3, 2020.
28. Lew HL, Otis JD, Tun C, et al. Prevalence of chronic pain, posttraumatic stress disorder, and persistent postconcussive symptoms in OIF/OEF veterans: polytrauma clinical triad. *J Rehabil Res Dev*. 2009;46(6):697–702.
29. Hermes E, Sernyak M, Rosenheck R. The use of second generation antipsychotics for post-traumatic stress disorder in a US Veterans Health Administration Medical Center. *Epidemiol Psychiatr Sci*. 2014;23(3):281–288.
30. Guina J, Rossetter SR, DeRhodes BJ, et al. Benzodiazepines for PTSD: a systematic review and meta-analysis. *J Psychiatr Pract*. 2015;21(4):281–303.
31. Bernardy NC, Lund BC, Alexander B, et al. Gender differences in prescribing among veterans diagnosed with posttraumatic stress disorder. *J Gen Intern Med*. 2013;28(suppl 2):S542–S548.

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Supplementary Material

Article Title: Trends in Medication Prescribing in Patients With PTSD From 2009 to 2018: A National Veterans Administration Study

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List of Supplementary Material for the article

1. Table 1 — Gender Differences in Pharmacotherapy Among Veterans Diagnosed with PTSD by Year (2009-2018)
2. Table 2 — Race Differences in Pharmacotherapy Among Veterans Diagnosed with PTSD by Year (2009-2018)
3. Table 3 — Ethnicity Differences in Pharmacotherapy Among Veterans Diagnosed with PTSD by Year (2009-2018)
4. Table 4 — Service Era Differences in Pharmacotherapy Among Veterans Diagnosed with PTSD by Year (2009-2018)
5. Table 5 — Gender Differences in New Prescriptions Among Veterans Diagnosed with PTSD by Year (2009-2018)
6. Table 6 — Race Differences in New Prescriptions Among Veterans Diagnosed with PTSD by Year (2009-2018)
7. Table 7 — Ethnicity Differences in New Prescriptions Among Veterans Diagnosed with PTSD by Year (2009-2018)

Disclaimer

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Supplementary Table 1. *Gender Differences in Pharmacotherapy Among Veterans Diagnosed with PTSD by Year (2009-2018)*

		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Absolute Change
Any PTSD Medication[a]	M	66.9%	65.4%	64.0%	62.6%	61.3%	60.3%	59.8%	58.9%	58.0%	57.3%	-9.6%
	F	69.7%	68.5%	67.4%	66.2%	65.4%	64.9%	65.5%	65.0%	64.5%	64.5%	-5.2%
SSRI or SNRI	M	51.5%	50.0%	48.6%	46.8%	45.7%	45.0%	45.1%	44.8%	44.5%	44.2%	-7.3%
	F	58.3%	57.0%	55.7%	54.3%	53.7%	53.7%	54.9%	54.9%	54.8%	54.9%	-3.4%
SSRI	M	46.5%	44.9%	43.2%	41.0%	39.3%	38.3%	37.5%	36.0%	34.7%	33.7%	-12.8%
	F	49.4%	48.0%	46.2%	44.3%	43.0%	42.6%	42.6%	41.3%	40.0%	39.4%	-10.0%
SNRI	M	6.8%	6.9%	7.2%	7.8%	8.3%	8.6%	9.9%	11.3%	12.2%	12.9%	6.1%
	F	12.7%	12.6%	13.0%	13.6%	14.3%	14.8%	16.5%	18.2%	19.2%	19.9%	7.2%
Atypical Antipsychotic	M	12.5%	11.2%	10.0%	8.9%	8.2%	7.7%	7.2%	6.9%	6.9%	6.9%	-5.6%
	F	11.0%	10.1%	9.2%	8.4%	7.9%	7.6%	7.3%	7.2%	7.3%	7.6%	-3.4%
Tricyclic Antidepressant	M	5.2%	4.8%	4.4%	4.1%	4.0%	3.9%	3.8%	3.5%	3.3%	3.1%	-2.1%
	F	7.8%	7.5%	7.0%	6.8%	6.6%	6.4%	6.1%	5.9%	5.6%	5.4%	-2.4%
Mirtazapine	M	8.4%	8.3%	8.3%	8.3%	8.2%	8.2%	8.2%	8.0%	7.8%	7.7%	-0.7%
	F	5.8%	5.8%	5.7%	5.7%	5.7%	6.0%	6.1%	6.0%	5.9%	5.7%	-0.1%
Prazosin	M	7.8%	9.0%	10.2%	11.5%	12.6%	13.7%	14.6%	14.8%	14.8%	14.3%	6.5%
	F	5.3%	6.6%	7.4%	8.9%	10.0%	11.3%	12.3%	12.6%	12.6%	12.2%	6.9%
Trazodone	M	21.5%	20.7%	19.9%	19.3%	19.0%	18.9%	18.7%	18.1%	17.4%	17.0%	-4.5%
	F	20.7%	19.9%	19.6%	19.2%	18.9%	19.2%	19.5%	18.9%	18.1%	18.1%	-2.6%
Non-Benzodiazepine Hypnotic	M	11.0%	11.5%	11.7%	11.4%	10.4%	9.3%	8.5%	7.5%	6.6%	5.8%	-5.2%
	F	14.5%	15.2%	15.1%	14.8%	13.2%	11.5%	10.7%	9.5%	8.5%	7.4%	-7.1%
Benzodiazepine	M	24.2%	22.9%	21.8%	20.6%	19.1%	17.0%	14.7%	12.2%	10.0%	8.4%	-15.8%
	F	28.5%	27.3%	26.4%	25.2%	23.8%	21.3%	18.7%	15.6%	13.3%	11.3%	-17.2%

Abbreviations. F, Female; M, Male; PTSD, Posttraumatic Stress Disorder; SNRI, serotonin/norepinephrine reuptake inhibitor; SSRI, selective-serotonin reuptake inhibitor.

Supplementary Table 2. *Race Differences in Pharmacotherapy Among Veterans Diagnosed with PTSD by Year (2009-2018)*

		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Absolute Change
Any PTSD Medication	AI/AN	63.2%	62.0%	61.6%	60.1%	58.9%	57.3%	57.3%	56.5%	55.5%	55.0%	-8.2%
	Asian	57.3%	56.9%	56.6%	55.8%	55.6%	57.0%	57.0%	57.0%	56.6%	57.1%	-0.2%
	Black	66.4%	65.2%	63.8%	62.6%	61.4%	60.8%	60.7%	60.1%	59.5%	58.9%	-7.5%
	NH/OPI	65.1%	64.3%	62.6%	62.0%	60.0%	59.7%	59.6%	58.9%	57.8%	56.9%	-8.2%
	Unknown	60.8%	58.9%	57.3%	56.1%	54.9%	54.2%	54.0%	53.5%	53.1%	53.5%	-7.3%
	White	68.0%	66.5%	65.1%	63.6%	62.4%	61.3%	60.8%	59.9%	59.0%	58.3%	-9.7%
SSRI or SNRI	AI/AN	48.8%	47.6%	47.0%	45.2%	44.0%	43.3%	43.4%	42.8%	42.6%	42.3%	-6.5%
	Asian	42.1%	41.5%	40.8%	40.4%	40.4%	42.5%	43.7%	44.1%	44.3%	45.4%	3.3%
	Black	49.0%	47.9%	46.6%	45.1%	44.1%	44.0%	44.4%	44.6%	44.6%	44.6%	-4.4%
	NH/OPI	50.0%	48.3%	47.4%	46.6%	45.2%	45.0%	45.7%	45.8%	45.1%	44.6%	-5.4%
	Unknown	46.1%	44.5%	43.1%	41.3%	40.3%	40.0%	40.4%	40.5%	40.6%	41.6%	-4.5%
	White	53.4%	51.8%	50.3%	48.7%	47.5%	46.8%	46.9%	46.6%	46.3%	46.0%	-7.4%
SSRI	AI/AN	44.1%	43.0%	42.1%	39.7%	37.8%	36.3%	35.5%	33.6%	32.5%	31.6%	-12.5%
	Asian	39.5%	38.3%	37.7%	36.6%	35.8%	37.2%	37.4%	36.3%	35.4%	35.8%	-3.7%
	Black	46.0%	44.7%	43.0%	41.0%	39.5%	39.0%	38.4%	37.4%	36.1%	35.2%	-10.8%
	NH/OPI	45.7%	43.8%	42.5%	41.5%	39.5%	39.0%	38.5%	37.3%	35.8%	34.5%	-11.2%
	Unknown	41.8%	40.3%	38.5%	36.5%	35.0%	34.5%	33.9%	32.9%	32.2%	32.3%	-9.5%
	White	47.5%	45.8%	44.1%	41.8%	40.1%	39.0%	38.2%	36.6%	35.3%	34.3%	-13.2%
SNRI	AI/AN	6.6%	6.5%	6.7%	7.5%	7.9%	8.9%	10.5%	11.7%	12.7%	13.3%	6.7%
	Asian	4.0%	4.2%	4.6%	5.6%	6.4%	7.4%	8.9%	10.5%	11.5%	12.2%	8.2%
	Black	4.3%	4.5%	4.9%	5.6%	6.1%	6.6%	8.1%	9.6%	10.8%	11.7%	7.4%
	NH/OPI	6.2%	6.0%	6.3%	7.0%	7.5%	7.9%	9.5%	10.9%	11.9%	12.4%	6.2%
	Unknown	5.6%	5.5%	5.8%	6.2%	6.7%	7.0%	8.3%	9.7%	10.6%	11.5%	5.9%
	White	8.2%	8.1%	8.5%	9.1%	9.7%	10.0%	11.4%	12.9%	13.8%	14.5%	6.3%
Atypical Antipsychotic	AI/AN	11.1%	9.6%	8.8%	8.0%	7.4%	6.9%	6.7%	6.2%	6.1%	6.5%	-4.6%
	Asian	9.4%	9.2%	7.8%	6.5%	6.1%	6.0%	5.9%	6.4%	6.9%	7.3%	-2.1%
	Black	13.0%	11.5%	10.2%	9.0%	8.2%	7.9%	7.5%	7.3%	7.3%	7.5%	-5.5%

		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Absolute Change
	NH/OPI	11.5%	10.6%	9.7%	8.7%	7.8%	7.0%	6.8%	6.4%	6.5%	6.6%	-4.9%
	Unknown	8.9%	8.0%	7.1%	6.3%	5.8%	5.6%	5.3%	5.2%	5.3%	5.7%	-3.2%
	White	12.7%	11.4%	10.2%	9.0%	8.3%	7.8%	7.3%	7.0%	6.9%	6.9%	-5.8%
Tricyclic Antidepressant	AI/AN	5.5%	5.4%	4.9%	4.4%	4.4%	4.4%	4.5%	3.9%	3.6%	3.6%	-1.9%
	Asian	4.1%	4.3%	4.1%	3.9%	4.0%	3.7%	3.5%	3.9%	3.7%	3.5%	-0.6%
	Black	5.5%	5.0%	4.6%	4.4%	4.2%	4.1%	4.1%	3.9%	3.7%	3.5%	-2.0%
	NH/OPI	5.2%	4.7%	4.3%	4.4%	4.1%	4.3%	4.0%	3.8%	3.7%	3.4%	-1.8%
	Unknown	4.4%	3.9%	3.7%	3.5%	3.4%	3.4%	3.2%	3.2%	3.0%	3.0%	-1.4%
	White	5.4%	5.0%	4.6%	4.4%	4.3%	4.2%	4.0%	3.8%	3.5%	3.4%	-2.0%
Mirtazapine	AI/AN	6.6%	6.2%	6.2%	6.4%	6.4%	6.5%	7.0%	6.8%	6.7%	6.4%	-0.2%
	Asian	6.8%	6.8%	6.8%	7.2%	6.8%	7.0%	7.2%	7.3%	7.0%	7.2%	0.4%
	Black	9.6%	9.8%	9.9%	9.7%	9.6%	9.6%	9.7%	9.5%	9.1%	9.0%	-0.6%
	NH/OPI	7.5%	7.3%	7.3%	7.4%	6.8%	7.3%	7.2%	7.1%	6.4%	6.5%	-1.0%
	Unknown	7.0%	6.9%	6.8%	6.7%	6.5%	6.5%	6.7%	6.5%	6.4%	6.5%	-0.5%
	White	8.0%	7.9%	7.9%	7.8%	7.8%	7.7%	7.7%	7.5%	7.3%	7.1%	-0.9%
Prazosin	AI/AN	9.7%	11.3%	12.1%	13.4%	14.3%	14.8%	15.2%	15.4%	15.0%	14.5%	4.8%
	Asian	7.6%	10.2%	11.3%	13.1%	14.4%	16.2%	16.8%	17.0%	17.5%	17.4%	9.8%
	Black	7.0%	8.4%	9.9%	11.5%	13.1%	14.8%	16.3%	17.0%	17.4%	17.2%	10.2%
	NH/OPI	7.9%	10.2%	12.1%	13.1%	14.1%	15.5%	16.6%	17.0%	17.2%	16.5%	8.6%
	Unknown	6.6%	7.5%	8.5%	9.9%	10.9%	11.9%	12.9%	13.3%	13.6%	14.1%	7.5%
	White	7.8%	8.9%	10.0%	11.3%	12.3%	13.2%	13.8%	13.8%	13.6%	13.0%	5.2%
Trazodone	AI/AN	19.9%	18.7%	18.4%	18.2%	17.8%	17.7%	17.2%	16.7%	16.3%	16.0%	-3.9%
	Asian	15.9%	15.4%	15.7%	15.8%	15.8%	16.3%	16.2%	15.9%	15.8%	14.8%	-1.1%
	Black	25.5%	24.8%	23.9%	22.9%	22.4%	22.4%	22.2%	21.2%	20.1%	19.6%	-5.9%
	NH/OPI	20.8%	19.6%	18.9%	18.7%	17.9%	17.9%	17.3%	16.9%	16.4%	16.2%	-4.6%
	Unknown	18.0%	17.2%	16.7%	16.5%	16.3%	16.3%	16.2%	15.8%	15.3%	15.3%	-2.7%
	White	20.8%	20.0%	19.3%	18.7%	18.4%	18.3%	18.1%	17.6%	16.9%	16.6%	-4.2%

		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Absolute Change
Non-Benzodiazepine Hypnotics	AI/AN	11.3%	12.1%	12.6%	12.1%	10.9%	9.5%	8.8%	7.5%	6.5%	5.8%	-5.5%
	Asian	11.9%	12.6%	12.9%	13.0%	12.3%	11.2%	10.1%	8.8%	8.1%	7.4%	-4.5%
	Black	9.1%	9.6%	9.9%	9.8%	8.9%	8.0%	7.2%	6.5%	5.7%	5.1%	-4.0%
	NH/OPI	11.5%	12.1%	12.8%	12.0%	11.4%	10.2%	9.4%	8.2%	7.4%	6.7%	-4.8%
	Unknown	9.7%	10.3%	10.5%	10.4%	9.5%	8.5%	7.8%	7.0%	6.1%	5.5%	-4.2%
	White	11.9%	12.4%	12.5%	12.2%	11.1%	10.0%	9.1%	8.1%	7.1%	6.3%	-5.6%
Benzodiazepines	AI/AN	22.5%	20.8%	20.1%	19.4%	18.2%	16.5%	14.0%	11.5%	9.3%	7.8%	-14.7%
	Asian	17.1%	16.1%	15.9%	15.0%	13.7%	12.6%	11.0%	9.1%	7.9%	7.1%	-10.0%
	Black	15.1%	14.2%	13.3%	12.5%	11.4%	10.0%	8.7%	7.1%	5.8%	4.9%	-10.2%
	NH/OPI	21.8%	20.8%	19.7%	19.0%	17.4%	15.6%	13.4%	11.2%	8.8%	7.4%	-14.4%
	Unknown	22.5%	21.4%	20.3%	19.0%	17.5%	15.6%	13.6%	11.4%	9.4%	7.5%	-15.0%
	White	27.2%	25.7%	24.7%	23.5%	21.9%	19.7%	17.1%	14.4%	11.9%	10.1%	-17.1%

Abbreviations. AI/AN, American Indian or Alaska Native; NH/OPI, Native Hawaiian or Other Pacific Islander; PTSD, Posttraumatic Stress Disorder; SNRI, serotonin/norepinephrine reuptake inhibitor; SSRI, selective-serotonin reuptake inhibitor.

Supplementary Table 3. *Ethnicity Differences in Pharmacotherapy Among Veterans Diagnosed with PTSD by Year (2009-2018)*

		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Absolute Change
Any PTSD Medication	H/L	65.8%	64.4%	63.3%	62.1%	61.2%	60.6%	60.3%	59.6%	59.0%	58.2%	-7.6%
	Not H/L	67.5%	66.0%	64.6%	63.1%	61.9%	60.9%	60.5%	59.6%	58.8%	58.2%	-9.3%
SSRI or SNRI	H/L	51.2%	49.8%	48.7%	46.9%	46.5%	46.2%	46.4%	46.5%	46.4%	46.2%	-5.0%
	Not H/L	52.3%	50.7%	49.3%	47.6%	46.5%	45.9%	46.1%	45.8%	45.6%	45.4%	-6.9%
SSRI	H/L	47.1%	45.4%	44.0%	41.9%	40.7%	39.9%	39.3%	38.1%	36.9%	35.8%	-11.3%
	Not H/L	47.0%	45.3%	43.6%	41.4%	39.7%	38.7%	37.9%	36.5%	35.2%	34.3%	-12.7%
SNRI	H/L	5.7%	5.9%	6.4%	6.8%	7.7%	8.2%	9.7%	11.2%	12.3%	13.1%	7.4%
	Not H/L	7.4%	7.4%	7.7%	8.3%	8.9%	9.3%	10.6%	12.1%	13.1%	13.7%	6.3%
Atypical Antipsychotic	H/L	12.1%	10.7%	9.4%	8.2%	7.7%	7.2%	6.6%	6.5%	6.5%	6.5%	-5.6%
	Not H/L	12.6%	11.3%	10.1%	9.0%	8.3%	7.8%	7.3%	7.1%	7.0%	7.1%	-5.6%
Tricyclic Antidepressant	H/L	4.6%	4.1%	3.9%	3.7%	3.8%	3.8%	3.6%	3.5%	3.3%	3.3%	-1.3%
	Not H/L	5.4%	5.0%	4.6%	4.4%	4.3%	4.2%	4.0%	3.8%	3.6%	3.4%	-2.0%
Mirtazapine	H/L	7.6%	7.2%	7.5%	7.3%	7.4%	7.4%	7.7%	7.7%	7.5%	7.1%	-0.5%
	Not H/L	8.3%	8.3%	8.3%	8.2%	8.1%	8.1%	8.1%	7.9%	7.7%	7.5%	-0.8%
Prazosin	H/L	8.7%	10.0%	11.3%	13.0%	14.4%	15.7%	16.8%	16.9%	16.9%	16.5%	7.8%
	Not H/L	7.6%	8.8%	9.9%	11.2%	12.3%	13.4%	14.2%	14.4%	14.4%	13.9%	6.3%
Trazodone	H/L	21.3%	20.3%	19.7%	19.4%	19.0%	19.1%	18.9%	18.4%	17.6%	16.9%	-4.4%
	Not H/L	21.6%	20.8%	20.0%	19.4%	19.1%	19.0%	18.8%	18.2%	17.5%	17.2%	-4.4%
Non-Benzodiazepine Hypnotics	H/L	10.6%	12.1%	12.5%	12.8%	11.7%	10.3%	9.4%	8.4%	7.5%	6.8%	-3.8%
	Not H/L	11.4%	11.8%	11.9%	11.6%	10.6%	9.5%	8.6%	7.7%	6.7%	5.9%	-5.5%
Benzodiazepines	H/L	22.4%	21.1%	20.2%	19.2%	18.0%	16.0%	13.6%	11.0%	8.8%	7.4%	-15.0%
	Not H/L	24.7%	23.4%	22.3%	21.1%	19.6%	17.6%	15.2%	12.7%	10.5%	8.9%	-15.8%

Abbreviations. H/L, Hispanic or Latino; PTSD, Posttraumatic Stress Disorder; SNRI, serotonin/norepinephrine reuptake inhibitor; SSRI, selective-serotonin reuptake inhibitor.

Supplementary Table 4. *Service Era Differences in Pharmacotherapy Among Veterans Diagnosed with PTSD by Year (2009-2018)*

		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Absolute Change
Any PTSD Medication	OEF/OIF/OND	63.2%	61.9%	60.8%	60.0%	59.5%	59.1%	59.1%	58.3%	57.3%	56.3%	-6.9%
	Not OEF/OIF/OND	67.9%	66.5%	65.2%	63.7%	62.3%	61.3%	60.8%	60.0%	59.3%	58.8%	-9.1%
SSRI or SNRI	OEF/OIF/OND	49.0%	47.3%	46.2%	45.3%	45.1%	45.3%	46.1%	45.9%	45.5%	44.9%	-4.1%
	Not OEF/OIF/OND	52.6%	51.2%	49.8%	48.0%	46.7%	45.9%	45.9%	45.7%	45.6%	45.5%	-7.1%
SSRI	OEF/OIF/OND	45.0%	43.0%	41.4%	39.8%	38.9%	38.5%	38.3%	36.9%	35.6%	34.5%	-10.5%
	Not OEF/OIF/OND	47.1%	45.6%	44.0%	41.7%	39.9%	38.7%	37.8%	36.4%	35.1%	34.3%	-12.8%
SNRI	OEF/OIF/OND	6.2%	6.5%	7.1%	7.8%	8.7%	9.3%	10.8%	12.1%	12.9%	13.4%	7.2%
	Not OEF/OIF/OND	7.4%	7.4%	7.7%	8.3%	8.8%	9.1%	10.4%	11.9%	13.0%	13.7%	6.3%
Atypical Antipsychotic	OEF/OIF/OND	11.5%	10.5%	9.4%	8.5%	8.0%	7.7%	7.2%	7.0%	7.1%	7.1%	-4.4%
	Not OEF/OIF/OND	12.6%	11.3%	10.1%	8.9%	8.2%	7.7%	7.2%	6.9%	6.8%	6.9%	-5.7%
Tricyclic Antidepressant	OEF/OIF/OND	5.0%	4.6%	4.3%	4.1%	4.3%	4.2%	4.0%	3.8%	3.6%	3.4%	-1.6%
	Not OEF/OIF/OND	5.4%	5.0%	4.6%	4.4%	4.2%	4.1%	4.0%	3.7%	3.5%	3.4%	-2.0%
Mirtazapine	OEF/OIF/OND	7.3%	7.2%	7.1%	7.1%	7.0%	7.2%	7.3%	7.0%	6.6%	6.3%	-1.0%
	Not OEF/OIF/OND	8.4%	8.4%	8.4%	8.4%	8.3%	8.3%	8.3%	8.2%	8.1%	8.0%	-0.4%
Prazosin	OEF/OIF/OND	10.3%	12.1%	13.5%	15.1%	16.5%	17.9%	18.7%	18.5%	17.9%	16.9%	6.6%
	Not OEF/OIF/OND	7.1%	8.0%	9.0%	10.2%	11.0%	11.9%	12.6%	12.9%	13.1%	12.8%	5.7%
Trazodone	OEF/OIF/OND	20.0%	18.9%	18.0%	17.7%	17.7%	17.9%	17.7%	16.8%	15.8%	15.4%	-4.6%
	Not OEF/OIF/OND	21.8%	21.0%	20.4%	19.8%	19.4%	19.4%	19.2%	18.8%	18.2%	17.9%	-3.9%
Non-Benzodiazepine Hypnotics	OEF/OIF/OND	15.1%	15.2%	14.9%	14.1%	12.6%	11.0%	9.9%	8.7%	7.7%	6.7%	-8.4%
	Not OEF/OIF/OND	10.4%	10.9%	11.1%	10.9%	10.0%	9.0%	8.2%	7.3%	6.4%	5.7%	-4.7%
Benzodiazepines	OEF/OIF/OND	17.2%	16.6%	16.2%	15.4%	14.5%	12.8%	10.9%	8.9%	7.3%	6.3%	-10.9%
	Not OEF/OIF/OND	26.1%	24.7%	23.7%	22.6%	21.1%	19.1%	16.7%	14.1%	11.7%	9.8%	-16.3%

Abbreviations. OEF/OIF/OND, Operation Enduring Freedom/Operation Iraqi Freedom/Operation New Dawn; PTSD, Posttraumatic Stress Disorder; SNRI, serotonin/norepinephrine reuptake inhibitor; SSRI, selective-serotonin reuptake inhibitor.

Supplementary Table 5. *Gender Differences in New Prescriptions Among Veterans Diagnosed with PTSD by Year (2009-2018)*

		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Absolute Change
SSRI or SNRI	M	11.6%	11.3%	11.9%	12.3%	11.2%	11.2%	12.1%	12.1%	11.9%	11.8%	0.2%
	F	17.0%	16.2%	16.9%	16.8%	16.5%	16.8%	18.0%	18.2%	18.0%	17.9%	0.9%
SSRI	M	9.9%	9.6%	10.0%	10.3%	9.1%	9.0%	9.1%	8.5%	8.3%	8.1%	-1.8%
	F	13.6%	12.9%	13.4%	13.1%	12.6%	12.9%	13.0%	12.7%	12.3%	12.3%	-1.3%
SNRI	M	2.1%	2.1%	2.3%	2.5%	2.5%	2.6%	3.6%	4.2%	4.2%	4.2%	2.1%
	F	4.2%	4.1%	4.4%	4.6%	4.8%	4.9%	6.1%	6.8%	6.8%	6.7%	2.5%
Atypical Antipsychotic	M	4.4%	3.8%	3.2%	2.8%	2.6%	2.5%	2.4%	2.4%	2.5%	2.5%	-1.9%
	F	4.8%	4.2%	3.7%	3.4%	3.1%	3.1%	3.0%	3.0%	3.1%	3.3%	-1.5%
Tricyclic Antidepressant	M	1.7%	1.7%	1.5%	1.5%	1.5%	1.5%	1.4%	1.3%	1.2%	1.2%	-0.5%
	F	3.3%	3.1%	3.0%	3.0%	2.8%	2.8%	2.6%	2.5%	2.5%	2.5%	-0.8%
Mirtazapine	M	2.8%	2.9%	2.9%	2.9%	2.8%	2.9%	2.9%	2.8%	2.7%	2.7%	-0.1%
	F	2.5%	2.7%	2.6%	2.5%	2.5%	2.8%	2.7%	2.7%	2.7%	2.6%	0.1%
Prazosin	M	3.0%	3.4%	3.8%	4.3%	4.4%	4.7%	4.8%	4.7%	4.6%	4.1%	1.1%
	F	2.3%	3.1%	3.3%	3.9%	4.2%	4.6%	4.8%	4.9%	4.7%	4.4%	2.1%
Trazodone	M	5.7%	5.8%	5.6%	5.6%	5.6%	5.7%	5.6%	5.4%	5.1%	5.0%	-0.7%
	F	7.1%	6.9%	7.0%	6.9%	6.9%	7.1%	7.0%	6.7%	6.5%	6.7%	-0.4%
Non-Benzodiazepine Hypnotics	M	2.6%	2.7%	2.7%	2.6%	2.2%	2.1%	1.9%	1.6%	1.4%	1.3%	-1.3%
	F	3.9%	4.2%	4.0%	3.9%	3.4%	3.2%	2.9%	2.4%	2.3%	2.0%	-1.9%
Benzodiazepines	M	4.9%	4.9%	4.7%	4.5%	4.1%	3.6%	3.0%	2.5%	2.1%	1.8%	-3.1%
	F	7.8%	7.7%	7.9%	7.5%	6.9%	6.2%	5.3%	4.4%	4.0%	3.4%	-4.4%

Abbreviations. F, Female; M, Male; PTSD, Posttraumatic Stress Disorder; SNRI, serotonin/norepinephrine reuptake inhibitor; SSRI, selective-serotonin reuptake inhibitor.

Supplementary Table 6. *Race Differences in New Prescriptions Among Veterans Diagnosed with PTSD by Year (2009-2018)*

		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Absolute Change
SSRI or SNRI	AI/AN	12.3%	11.7%	12.4%	12.9%	11.3%	11.7%	13.1%	12.6%	13.0%	12.7%	0.4%
	Asian	9.8%	10.5%	10.6%	11.5%	11.0%	11.2%	12.9%	12.9%	12.7%	13.0%	3.2%
	Black	13.3%	13.3%	13.6%	13.9%	12.9%	13.2%	14.1%	14.2%	14.1%	14.2%	0.9%
	NH/OPI	11.8%	11.3%	12.0%	12.8%	12.0%	11.8%	13.0%	12.9%	12.7%	12.7%	0.9%
	Unknown	9.7%	9.7%	10.0%	10.6%	9.8%	9.7%	10.4%	10.8%	10.8%	10.4%	0.7%
	White	11.9%	11.4%	12.0%	12.5%	11.4%	11.4%	12.4%	12.4%	12.2%	12.0%	0.1%
SSRI	AI/AN	10.4%	10.0%	10.6%	10.7%	8.9%	9.4%	9.6%	9.0%	9.1%	8.7%	-1.7%
	Asian	8.6%	9.4%	9.3%	10.0%	9.2%	9.1%	10.0%	9.4%	9.4%	9.5%	0.9%
	Black	12.0%	11.9%	12.0%	12.1%	11.0%	11.1%	11.1%	10.7%	10.3%	10.4%	-1.6%
	NH/OPI	10.1%	9.7%	10.2%	10.8%	9.9%	9.7%	9.9%	9.5%	9.1%	9.1%	-1.0%
	Unknown	8.4%	8.4%	8.6%	9.0%	8.1%	8.0%	7.9%	7.8%	7.7%	7.3%	-1.1%
	White	9.8%	9.4%	9.9%	10.2%	9.0%	8.9%	9.0%	8.5%	8.3%	8.1%	-1.7%
SNRI	AI/AN	2.3%	2.1%	2.2%	2.7%	2.7%	2.9%	4.2%	4.2%	4.5%	4.5%	2.2%
	Asian	1.3%	1.3%	1.5%	2.0%	2.4%	2.6%	3.5%	4.2%	3.9%	4.1%	2.8%
	Black	1.6%	1.7%	1.9%	2.1%	2.3%	2.5%	3.6%	4.1%	4.3%	4.4%	2.8%
	NH/OPI	2.1%	1.9%	2.1%	2.4%	2.4%	2.5%	3.6%	4.1%	4.2%	4.2%	2.1%
	Unknown	1.5%	1.6%	1.7%	1.9%	2.0%	2.1%	2.9%	3.5%	3.7%	3.6%	2.1%
	White	2.5%	2.4%	2.6%	2.8%	2.9%	2.9%	4.0%	4.6%	4.6%	4.6%	2.1%
Atypical Antipsychotic	AI/AN	4.3%	3.5%	2.9%	2.6%	2.5%	2.4%	2.6%	2.2%	2.4%	2.8%	-1.5%
	Asian	3.0%	3.4%	2.6%	2.2%	2.1%	2.2%	2.3%	2.5%	3.0%	3.1%	0.1%
	Black	4.6%	4.1%	3.4%	3.0%	2.8%	2.8%	2.7%	2.7%	2.8%	2.9%	-1.7%
	NH/OPI	4.3%	3.7%	2.9%	2.7%	2.4%	2.2%	2.2%	2.3%	2.5%	2.5%	-1.8%
	Unknown	2.8%	2.7%	2.1%	1.9%	1.8%	1.7%	1.7%	1.7%	2.0%	2.0%	-0.8%
	White	4.5%	3.9%	3.3%	2.9%	2.6%	2.5%	2.4%	2.4%	2.5%	2.5%	-2.0%
Tricyclic Antidepressant	AI/AN	2.1%	2.1%	1.7%	1.5%	1.6%	1.9%	1.8%	1.5%	1.4%	1.4%	-0.7%
	Asian	1.7%	1.6%	1.8%	1.5%	1.4%	1.2%	1.2%	1.5%	1.5%	1.4%	-0.3%
	Black	2.1%	2.0%	1.9%	1.8%	1.8%	1.7%	1.8%	1.6%	1.5%	1.5%	-0.6%

		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Absolute Change
	NH/OPI	2.0%	1.5%	1.6%	1.7%	1.4%	1.8%	1.4%	1.4%	1.6%	1.3%	-0.7%
	Unknown	1.3%	1.2%	1.2%	1.2%	1.2%	1.3%	1.2%	1.2%	1.1%	1.1%	-0.2%
	White	1.8%	1.7%	1.6%	1.6%	1.6%	1.6%	1.5%	1.4%	1.3%	1.3%	-0.5%
Mirtazapine	AI/AN	2.4%	2.5%	2.5%	2.5%	2.2%	2.5%	2.8%	2.6%	2.6%	2.4%	0.0%
	Asian	2.0%	2.3%	2.3%	2.7%	2.1%	2.5%	2.5%	2.7%	2.5%	2.6%	0.6%
	Black	3.4%	3.6%	3.6%	3.5%	3.4%	3.6%	3.7%	3.4%	3.3%	3.3%	-0.1%
	NH/OPI	2.6%	2.4%	2.7%	2.6%	2.4%	2.7%	2.7%	2.8%	2.5%	2.6%	0.0%
	Unknown	2.2%	2.1%	2.1%	2.2%	2.1%	2.1%	2.3%	2.1%	2.2%	2.2%	0.0%
	White	2.7%	2.8%	2.8%	2.7%	2.7%	2.7%	2.8%	2.7%	2.6%	2.5%	-0.2%
Prazosin	AI/AN	3.5%	4.5%	4.5%	4.8%	5.0%	5.2%	5.0%	5.0%	4.9%	4.6%	1.1%
	Asian	2.5%	3.4%	3.5%	4.4%	4.5%	5.0%	5.2%	5.3%	5.3%	5.1%	2.6%
	Black	2.9%	3.5%	4.0%	4.5%	4.8%	5.4%	5.7%	5.7%	5.7%	5.3%	2.4%
	NH/OPI	3.1%	3.9%	4.6%	4.6%	5.1%	5.1%	5.2%	5.5%	4.9%	4.8%	1.7%
	Unknown	2.3%	2.7%	3.1%	3.7%	3.7%	3.9%	4.1%	4.2%	4.1%	3.8%	1.5%
	White	3.0%	3.4%	3.7%	4.2%	4.3%	4.5%	4.5%	4.4%	4.3%	3.8%	0.8%
Trazodone	AI/AN	6.0%	5.6%	5.7%	5.8%	5.5%	5.8%	5.8%	5.4%	5.5%	5.3%	-0.7%
	Asian	4.2%	4.4%	4.9%	4.9%	5.4%	5.4%	5.2%	5.6%	5.4%	5.2%	1.0%
	Black	8.0%	8.1%	7.7%	7.6%	7.5%	7.7%	7.4%	7.1%	6.6%	6.7%	-1.3%
	NH/OPI	6.0%	5.7%	5.4%	6.3%	5.6%	5.9%	5.2%	5.3%	4.8%	5.1%	-0.9%
	Unknown	4.5%	4.7%	4.6%	4.7%	4.6%	4.9%	4.7%	4.5%	4.5%	4.4%	-0.1%
	White	5.4%	5.5%	5.3%	5.3%	5.3%	5.4%	5.4%	5.2%	4.9%	4.8%	-0.6%
Non-Benzodiazepine Hypnotics	AI/AN	2.5%	3.1%	2.9%	3.0%	2.3%	2.3%	2.2%	1.6%	1.5%	1.4%	-1.1%
	Asian	2.5%	2.7%	2.5%	3.1%	2.9%	2.9%	2.8%	2.3%	2.1%	1.9%	-0.6%
	Black	2.0%	2.2%	2.3%	2.4%	2.0%	1.9%	1.7%	1.5%	1.3%	1.2%	-0.8%
	NH/OPI	2.4%	3.1%	3.0%	2.8%	2.8%	2.5%	2.2%	2.0%	1.8%	1.7%	-0.7%
	Unknown	2.2%	2.3%	2.3%	2.4%	1.9%	1.9%	1.6%	1.3%	1.3%	1.1%	-1.1%
	White	2.9%	3.0%	2.9%	2.8%	2.4%	2.2%	2.0%	1.8%	1.6%	1.4%	-1.5%

		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Absolute Change
Benzodiazepines	AI/AN	5.2%	4.9%	5.1%	4.9%	4.3%	3.9%	3.2%	2.7%	2.2%	2.0%	-3.2%
	Asian	4.1%	4.1%	5.3%	4.3%	4.2%	3.7%	3.1%	2.9%	2.4%	2.2%	-1.9%
	Black	3.3%	3.4%	3.3%	3.1%	2.8%	2.5%	2.1%	1.7%	1.4%	1.3%	-2.0%
	NH/OPI	4.8%	4.7%	4.8%	4.7%	3.8%	3.7%	2.8%	2.5%	1.9%	1.8%	-3.0%
	Unknown	4.2%	4.4%	4.2%	3.9%	3.7%	3.3%	2.8%	2.3%	2.0%	1.5%	-2.7%
	White	5.6%	5.6%	5.4%	5.2%	4.8%	4.2%	3.6%	3.0%	2.6%	2.3%	-3.3%

Abbreviations. AI/AN, American Indian or Alaska Native; NH/OPI, Native Hawaiian or Other Pacific Islander; PTSD, Posttraumatic Stress Disorder; SNRI, serotonin/norepinephrine reuptake inhibitor; SSRI, selective-serotonin reuptake inhibitor.

Supplementary Table 7. *Ethnicity Differences in New Prescriptions Among Veterans Diagnosed with PTSD by Year (2009-2018)*

		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Absolute Change
SSRI or SNRI	H/L	12.6%	12.9%	13.3%	13.6%	13.0%	13.1%	13.9%	14.4%	14.3%	14.1%	1.5%
	Not H/L	12.0%	11.6%	12.2%	12.7%	11.5%	11.6%	12.6%	12.6%	12.5%	12.4%	0.4%
SSRI	H/L	11.2%	11.3%	11.5%	11.7%	10.7%	10.8%	10.8%	10.7%	10.3%	10.1%	-1.1%
	Not H/L	10.1%	9.8%	10.2%	10.5%	9.3%	9.2%	9.3%	8.8%	8.6%	8.5%	-1.6%
SNRI	H/L	1.7%	2.0%	2.2%	2.3%	2.7%	2.8%	3.8%	4.4%	4.7%	4.7%	3.0%
	Not H/L	2.3%	2.2%	2.4%	2.7%	2.7%	2.8%	3.9%	4.4%	4.5%	4.5%	2.2%
Atypical Antipsychotic	H/L	4.4%	3.8%	3.1%	2.7%	2.6%	2.5%	2.3%	2.5%	2.6%	2.7%	-1.7%
	Not H/L	4.4%	3.9%	3.2%	2.9%	2.6%	2.6%	2.4%	2.5%	2.6%	2.6%	-1.8%
Tricyclic Antidepressant	H/L	1.8%	1.5%	1.6%	1.5%	1.5%	1.6%	1.6%	1.4%	1.5%	1.5%	-0.3%
	Not H/L	1.9%	1.8%	1.6%	1.6%	1.6%	1.6%	1.5%	1.4%	1.4%	1.3%	-0.6%
Mirtazapine	H/L	2.6%	2.6%	2.9%	2.7%	2.8%	2.9%	3.0%	3.0%	2.9%	2.7%	0.1%
	Not H/L	2.8%	2.9%	2.9%	2.9%	2.8%	2.9%	2.9%	2.8%	2.7%	2.7%	-0.1%
Prazosin	H/L	3.3%	3.9%	4.4%	4.8%	5.3%	5.5%	5.7%	5.6%	5.6%	5.1%	1.8%
	Not H/L	2.9%	3.4%	3.7%	4.2%	4.3%	4.6%	4.7%	4.6%	4.5%	4.1%	1.2%
Trazodone	H/L	5.9%	6.2%	6.3%	6.4%	6.3%	6.5%	6.4%	6.3%	6.0%	5.9%	0.0%
	Not H/L	5.9%	5.9%	5.7%	5.7%	5.6%	5.8%	5.7%	5.5%	5.2%	5.2%	-0.7%
Non-Benzodiazepine Hypnotics	H/L	2.4%	2.9%	3.0%	3.2%	2.7%	2.5%	2.2%	2.0%	1.8%	1.7%	-0.7%
	Not H/L	2.7%	2.8%	2.8%	2.7%	2.3%	2.1%	1.9%	1.7%	1.5%	1.3%	-1.4%
Benzodiazepines	H/L	5.1%	5.2%	4.9%	4.8%	4.4%	4.0%	3.1%	2.7%	2.2%	1.9%	-3.2%
	Not H/L	5.1%	5.1%	5.0%	4.7%	4.3%	3.8%	3.3%	2.7%	2.3%	2.0%	-3.1%

Abbreviations. H/L, Hispanic or Latino; PTSD, Posttraumatic Stress Disorder; SNRI, serotonin/norepinephrine reuptake inhibitor; SSRI, selective-serotonin reuptake inhibitor.

Supplementary Table 8. *Service Era Differences in New Prescriptions Among Veterans Diagnosed with PTSD by Year (2009-2018)*

		2009	2010	2011	2013	2014	2015	2016	2017	2018	Absolute Change
SSRI or SNRI	OEF/OIF/OND	13.8%	14.0%	14.6%	15.0%	14.4%	14.8%	15.8%	15.9%	15.7%	1.9%
	Not OEF/OIF/OND	11.6%	11.0%	11.6%	12.0%	10.7%	10.5%	11.3%	11.3%	11.2%	-0.4%
SSRI	OEF/OIF/OND	12.0%	12.1%	12.4%	12.6%	11.8%	12.1%	12.2%	11.8%	11.5%	-0.5%
	Not OEF/OIF/OND	9.7%	9.3%	9.7%	9.9%	8.5%	8.3%	8.3%	7.7%	7.5%	-2.2%
SNRI	OEF/OIF/OND	2.3%	2.5%	2.7%	3.0%	3.2%	3.4%	4.5%	5.0%	5.1%	2.8%
	Not OEF/OIF/OND	2.2%	2.1%	2.3%	2.5%	2.5%	2.6%	3.6%	4.2%	4.2%	2.0%
Atypical Antipsychotic	OEF/OIF/OND	4.8%	4.6%	3.8%	3.5%	3.2%	3.2%	3.1%	3.1%	3.2%	-1.6%
	Not OEF/OIF/OND	4.3%	3.7%	3.0%	2.6%	2.4%	2.3%	2.1%	2.2%	2.3%	-2.0%
Tricyclic Antidepressant	OEF/OIF/OND	2.0%	2.0%	1.9%	1.8%	1.9%	1.9%	1.8%	1.7%	1.7%	-0.3%
	Not OEF/OIF/OND	1.8%	1.7%	1.6%	1.5%	1.5%	1.5%	1.4%	1.3%	1.2%	-0.6%
Mirtazapine	OEF/OIF/OND	2.9%	2.9%	3.0%	3.1%	3.0%	3.2%	3.3%	3.1%	2.9%	0.0%
	Not OEF/OIF/OND	2.8%	2.8%	2.8%	2.8%	2.7%	2.7%	2.8%	2.7%	2.6%	-0.2%
Prazosin	OEF/OIF/OND	3.9%	4.8%	5.2%	5.8%	6.1%	6.5%	6.7%	6.6%	6.4%	2.5%
	Not OEF/OIF/OND	2.7%	3.1%	3.3%	3.8%	3.8%	4.0%	4.0%	3.9%	3.8%	1.1%
Trazodone	OEF/OIF/OND	6.2%	6.5%	6.4%	6.6%	6.5%	6.8%	6.6%	6.4%	6.1%	-0.1%
	Not OEF/OIF/OND	5.8%	5.7%	5.5%	5.5%	5.4%	5.5%	5.4%	5.2%	4.9%	-0.9%
Non-Benzodiazepine Hypnotics	OEF/OIF/OND	2.9%	3.5%	3.6%	3.5%	3.0%	2.8%	2.5%	2.2%	2.0%	-0.9%
	Not OEF/OIF/OND	2.6%	2.6%	2.6%	2.5%	2.1%	1.9%	1.7%	1.5%	1.3%	-1.3%
Benzodiazepines	OEF/OIF/OND	4.4%	4.8%	4.9%	4.7%	4.3%	3.8%	3.2%	2.6%	2.2%	-2.2%
	Not OEF/OIF/OND	5.2%	5.1%	5.0%	4.7%	4.3%	3.8%	3.2%	2.7%	2.4%	-2.7%

Abbreviations. OEF/OIF/OND, Operation Enduring Freedom/Operation Iraqi Freedom/Operation New Dawn; PTSD, Posttraumatic Stress Disorder; SNRI, serotonin/norepinephrine reuptake inhibitor; SSRI, selective-serotonin reuptake inhibitor.