Risk Factors for Becoming Homeless Among a Cohort of Veterans Who Served in the Era of the Iraq and Afghanistan Conflicts

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Objectives. In this population-based cohort study, we assessed baseline risk factors for homelessness, including the role of service in the Iraq or Afghanistan conflicts, among a large cohort of recent veterans.

Methods. Data for this study came from administrative records for 310 685 veterans who separated from active military duty from July 1, 2005, to September 30, 2006. We used survival analysis methods to determine incidence rates and risk factors for homelessness, based on baseline data for military factors, demographic characteristics, and diagnoses of behavioral health disorders and traumatic brain injury.

Results. Service in Iraq or Afghanistan and, more specifically, posttraumatic stress disorder among veterans deployed there, were significant risk factors of modest magnitude for homelessness, and socioeconomic and behavioral health factors provided stronger indicators of risk. Gender was not a significant indicator of differential risk.

Conclusions. Although service in Iraq and Afghanistan was significant, socioeconomic and behavioral health indicators show more promise in efforts to use administrative data to inform prevention efforts by identifying veterans who are at elevated risk for becoming homeless upon their return to civilian life. (*Am J Public Health*. Published online ahead of print October 22, 2013: e1–e7. doi:10.2105/AJPH.2013.301432)

Soldiers have been returning from the conflicts in Iraq and Afghanistan for more than a decade, and popular support for the soldiers has manifested itself in concern for their well-being as they reenter civilian life. One focal point of this concern has been an increased vulnerability to homelessness among veterans of these conflicts, known by their military designations as Operations Enduring Freedom (OEF; i.e., Afghanistan conflict), Iraqi Freedom (OIF; i.e., Iraq conflict), and New Dawn (OND; i.e., Iraq conflict after August 2010). Media and advocacy accounts have pointed out how the increased incidence of homelessness has its roots in service-connected factors, particularly posttraumatic stress disorder (PTSD) and traumatic brain injury (TBI), in addition to the more general economic conditions they face on reentering civilian life.[1–4]

The research on this topic has lagged behind the media accounts. Veterans, and especially female veterans, have been found to be at higher risk for homelessness than their nonveteran counterparts,[5] although the correlates associated with homelessness are largely the same regardless of veteran status.[6] Among veterans, behavioral health disorders, particularly substance abuse disorders and, to a lesser extent, mental health disorders, have consistently been linked with increased incidence of homelessness, and the associations between PTSD and combat experience and homelessness have been much more tenuous.[7,8] Because women have made up increasing proportions of recent veteran populations, the focus on the role of gender differences in military and veteran experiences as they have related to outcomes such as homelessness has increased.[9–11] Other factors, such as poverty and social isolation, have also been linked to homelessness among veterans and may mitigate links between behavioral health disorders and homelessness.[6,12]

Two large cross-sectional studies have examined homelessness among the OEF–OIF veteran cohort (OND commenced subsequent to the service period covered in these studies). Blackstock et al.[13] identified 7431 OEF–OIF veterans as having been homeless, constituting 1.7% of the 445 319 records from the US Department of Veterans Affairs (VA) that they examined. They found no difference in gender-specific incidence of homelessness, but they did find associations between homelessness and a range of socioeconomic and demographic factors (lower educational attainment, Black race, Hispanic ethnicity, unmarried, enlisted rank, urban location) as well as disability rating and various behavioral health diagnoses, including PTSD. In the second study, Edens et al.[14] assessed homelessness, based on VA records, for 1.1 million veterans from all eras who received mental health services in 2009. Of the overall study group, 10% were identified as having experienced homelessness, whereas only 4% of the OEF–OIF veterans in this group were so identified. By contrast with Blackstock et al., Edens et al. found significant protective associations with having a service-connected disability rating and a PTSD diagnosis. Both studies were cross-sectional and thus had problems with temporal sequencing in that the assessment of homelessness occurred simultaneously with assessments of behavioral health and disability.

The most extensive study to date, from the VA's Office of Inspector General (OIG), is the only population-based cohort study to estimate the incidence of and assess potential risk factors for homelessness among OEF–OIF era veterans.[15] The study population, 310 685 veterans who separated from the military between July 1, 2005, and September 30, 2006, had no prior history of homelessness and used VA or Department of Defense (DoD) services after discharge. They were followed from the point of military separation through September 30, 2010, for any occurrence of homelessness. Their 5-year (Kaplan-Meier) homeless incidence rate was 3.7%, with the highest incidence rate found among women who were deployed in OEF–OIF (4.0%) and the lowest

found among men who were not deployed there (3.2%). The report also found differential rates of homelessness on the basis of numerous bivariate relationships related to military, behavioral health, and demographic characteristics. The study did not control for differences in characteristics other than gender and OEF–OIF service (55% of the study population).

We extend OIG's descriptive study by simultaneously assessing multiple risk factors at or before separation from the military (baseline) for subsequently becoming homeless among OEF- and OIF-era veterans in this cohort. Particular foci are OEF–OIF service and gender differences, in the context of broader socioeconomic, behavioral health, and military factors at separation from the military. In identifying baseline risk factors for homelessness, this study offers a prototype for using administrative data available at military discharge to more efficiently identify and target veterans who would benefit from homeless prevention services.

METHODS

Data for this study came from an analytical database (referred to as the "LC database") established and maintained by the OIG to quantitatively characterize the care transition process for all 494 147 service members who separated from active military duty from July 1, 2005, to September 30, 2006. The LC database is derived from more than 100 files acquired from the VA and DoD and offers an integrated, population-based database for veterans who separated during this time period. In addition to VA data sources, we also used Social Security Administration death files in tracking veterans' vital status.[15–17]

This study included the 310 685 veterans (63% of those in the LC database) aged 17 to 64 years at their separation from military service who had no indication of a homeless episode in the DoD and VA records before their separation from the military and who used VA or DoD services after separation. All data used in the analyses pertained to information at or before separation, except for dates of homelessness.

We calculated the time to becoming homeless as the time span between the separation date from military service and the first recorded date of a homeless episode. We determined incidence of homelessness on the basis of the earliest VA or DoD health record, or the earliest VA homeless services record, after the date of separation. More specifically, homelessness was indicated when a post-separation DoD or VA health services record contained an *International Classification of Diseases, Ninth Revision, Clinical Modification*[18] (*ICD-9-CM*) designation of V60.0, which signifies a lack of stable housing, or if the veteran had a record of receiving homeless services administered by the VA.[15] In the absence of a record of homelessness, the risk period for each veteran in the study ended on the earliest among 3 dates: the date the veteran was last seen by VA or DoD, date of death, or September 30, 2010. The maximum observation time accrued was 5 years, 3 months.

Baseline factors included military service characteristics, demographic characteristics, behavioral health diagnosis categories, and diagnosis of TBI. Data elements related to military service included an indicator for OEF–OIF deployment, branch of service, character of discharge from service, military pay grade (at separation), and whether service was in the context of active duty or Reserve or National Guard duty. We limited demographic characteristics to gender and age; we did not use race and ethnicity because 48% of the veterans had missing data for this characteristic. We took baseline behavioral health (i.e., substance use and mental health) and TBI diagnoses from DoD and VA health records within a year before military separation. Behavioral health diagnosis categories followed criteria used previously for more general assessment of behavioral health disorders in a military population,[19] and TBI diagnosis followed criteria outlined by the OIG.[16]

We used survival analysis techniques for our data analysis. We used Kaplan-Meier estimation methods to calculate unadjusted and adjusted incidence rates[20] and Cox regression[21] to assess baseline factors on risk of homeless incidence, with the veteran cohort separated into 4 subpopulations on the basis of OEF–OIF service and gender. We categorized age at separation from the military because, when used as a continuous variable, it seriously deviated from the proportionality assumption of the Cox model. We then evaluated OEF–OIF and gender effects on homeless incidence by means of Cox regression using the entire cohort population, controlling for all other factors used in the OEF–OIF and gender-specific assessments. We performed all analyses using SAS version 9.3.[22]

RESULTS

Table 1 provides descriptive statistics that compare the baseline characteristics of those who subsequently became homeless with those who did not. Among the cohort, 5574 (1.8%) experienced a homeless episode, yielding an overall (unadjusted Kaplan–Meier) 5-year incidence rate of 3.8% (not shown). Persons who subsequently became homeless were disproportionately among those with the lowest pay (72% of the homeless came from the 44% who had the lowest pay grades) and among those diagnosed with behavioral health disorders before separation from the military (44% of the homeless came from the 18% who were so diagnosed). The disparities in the rates of specific behavioral health disorders, as well as TBI and problematic military discharges, were also very high, but the proportions of the cohort in these categories were substantially smaller as well. A higher proportion of the homeless group (65%) than the nonhomeless group (55%) had served in OEF–OIF. Both of these subgroups were roughly 85% male.

Table 2 presents the adjusted risk of becoming homeless subsequent to military separation controlling for baseline military, demographic, and behavioral health factors and broken down by OEF–OIF deployment and gender. Low pay grade was a significant risk factor for subsequently becoming homeless in all 4 subpopulations after controlling for all other factors. The risk of becoming homeless among those in the higher pay grade categories was 9% compared with 43% among those in the lowest pay grade category (E1–E4). Service branch and character of service significantly affected, at varying magnitude, the risk of becoming homeless for all subpopulations except OIF–OEF women. Among the veterans who served in OEF–OIF, the risk of homelessness was 21% (men) and 26% (women) lower for those who served in the Reserves and Guard than for their counterparts in active duty. Compared with veterans who were

TABLE 1—Military Information, Demographics, and Behavioral Health Diagnoses, Before or at Military Discharge, by Subsequent Homeless Status: US VA- or DoD-Enrolled Veterans Who Separated From the Military Between July 1, 2005, and September 30, 2006

Characteristic	Total (n = 310 685), %	Homeless[a] (n = 5574), %	Nonhomeless (n = 305 111), %
OEF–OIF deployment[b]	55.1	65.0	54.9
Military pay grade[c]			
E1–E4	44.1	72.4	43.5
E5–E9	43.4	25.5	43.7
O1–O3	5.2	1.1	5.3
O4–O10	6.0	0.7	6.1
Other	1.3	0.4	1.3
Service branch			
Army	60.2	64.3	60.1
Navy	13.7	16.1	13.6
Air Force	13.8	7.0	13.9
Marines	11.4	11.7	11.4
Other	1.0	0.8	1.0
Character of service			
Honorable or general	90.6	90.1	90.6
Other than honorable	0.5	3.3	0.5
Bad conduct or dishonorable	0.0	0.2	0.0
Uncharacterized or missing	8.9	6.4	8.9
Reserve or Guard (nonactive duty)	34.8	28.2	34.9
Age at separation, y			
17–24	36.8	45.2	36.7
25–34	29.4	34.5	29.3
35–44	22.9	14.9	23.0
45–54	9.4	5.0	9.4
55–64	1.6	0.4	1.6
Male	84.8	84.6	84.8
Traumatic brain injury[d]	1.0	3.0	1.0
Behavioral health disorders			
Any behavioral health disorder[e]	17.8	43.8	17.4
PTSD	2.4	9.3	2.3
Adjustment disorders	5.2	17.2	4.9
Anxiety disorders (excludes PTSD)	3.6	11.1	3.5
Mood disorders	5.9	20.0	5.6
Major depression	2.3	8.5	2.2
Personality disorders	1.6	7.5	1.5
Psychotic disorders	0.3	2.9	0.3
Substance use	3.3	17.7	3.1

Note. DoD = US Department of Defense; *ICD-9-CM* = *International Classification of Diseases, Ninth Revision, Clinical Modification*; OEF = Operation Enduring Freedom; OIF = Operation Iraqi Freedom; PTSD = posttraumatic stress disorder; VA = Department of Veterans Affairs. Because of the size of the data set, virtually all of the differences between the 2 subgroups were statistically significant (regardless of a substantive significance), and thus significance levels are not reported here.

[a]Homelessness reflects either a record of a diagnosis indicator for lack of stable housing (*ICD-9-CM*[18] code V60.0) or of receiving a VA homeless service. Percentage shown here reflects 5-year postdischarge incidence rates.

[b]OIF and OEF signify deployment to conflict areas of Iraq and Afghanistan, respectively. Operation New Dawn, signifying participation in the latter period of the Iraqi conflict, commenced after the service period covered here.

[c]Military pay is broken down into E grades for enlisted personnel (E1–E9) and into O grades (O1–O10) for officers.

[d]Diagnosis criteria for traumatic brain injury are presented in detail in the Office of Inspector General report[16] on the analytical database and are based on the presence of *ICD-9-CM*[18] diagnoses of 310.2 (posttraumatic encephalopathy, postconcussion), 800.xx–804xx (skull fracture), 850.xx (concussion), 851.xx (cerebral laceration and contusion), 852.xx (subarachnoid, subdural, and extradural hemorrhage), 853.xx (other and unspecified intracranial hemorrhage following injury), 854.xx (intracranial injury of other and nonspecified injury), and 950.xx (injury to optic nerve and pathways).

[e]All diagnoses were made in the 1-year period before separation from the military. The behavioral health categories used here are based on groupings of *ICD-9-CM* diagnoses, following the conventions used in Hoge et al.[19]: any behavioral health disorder (290–319), adjustment disorders (309.0, 309.24, 309.28, 309.3, 309.4, 309.9), anxiety disorders (excluding PTSD; 300.01–300.03, 300.21, 300.22, 300.23, 300.29, 300.3, 308.3), PTSD (309.81), mood disorders (296.0, 296.2–296.7, 296.80, 296.89, 296.90, 300.4, 301.13, 311), major depression (296.2 and 296.3), personality disorders (301.0, 301.2, 301.4, 301.50, 301.6, 301.7, 301.81–301.84, 301.89, 301.9), psychotic disorders (295.1–295.4, 295.6, 295.7, 295.9, 297.1, 297.3, 298.8, 298.9), and substance use (291; 292, except 292.2; 303–305, except 305.1 and 305.8).

TABLE 2—Risk of Becoming Homeless Subsequent to Military Separation (Between July 1, 2005, and September 30, 2006) by Deployment in OEF-OIF and Gender: US VA- or DoD-Enrolled OEF- and OIF-Era Veterans (n = 310 685), Separation Through September 30, 2010

Variable	OEF–OIF		Not OEF–OIF	
	Male (n = 152 592), HR (95% CI)	Female (n = 18 638), HR (95% CI)	Male (n = 110 974), HR (95% CI)	Female (n = 28 481), HR (95% CI)
Military pay grade	**	**	**	**
E1–E4 (Ref)	1.00	1.00	1.00	1.00
E5–E9	0.40 (0.37, 0.44)	0.33 (0.26, 0.42)	0.27 (0.23, 0.32)	0.43 (0.32, 0.56)
01–010	0.13 (0.09, 0.20)	0.14 (0.06, 0.34)	0.23 (0.16, 0.35)	0.24 (0.13, 0.46)
Other	0.09 (0.06, 0.14)	0.20 (0.09, 0.49)	0.13 (0.08, 0.21)	0.22 (0.10, 0.48)
Branch	**		**	**
Army (Ref)	1.00	1.00	1.00	1.00
Air Force	0.52 (0.43, 0.62)	0.67 (0.48, 0.94)	0.75 (0.62, 0.89)	0.94 (0.72, 1.22)
Marines	0.83 (0.75, 0.93)	0.80 (0.48, 1.34)	0.81 (0.68, 0.96)	0.75 (0.46, 1.21)
Navy	1.20 (1.07, 1.34)	1.05 (0.79, 1.38)	1.35 (1.18, 1.56)	1.65 (1.32, 2.08)
Other	0.63 (0.16, 2.52)	[a]	1.34 (0.97, 1.86)	1.19 (0.56, 2.53)
Character of service	**		**	*
Honorable (Ref)	1.00	1.00	1.00	1.00
BC or dishonorable	1.79 (0.25, 12.70)	[a]	8.18 (4.07, 16.45)	3.40 (0.47, 24.41)
Other than honorable	2.37 (1.93, 2.92)	0.76 (0.11, 5.42)	5.39 (4.23, 6.87)	2.91 (1.43, 5.95)
Uncharacterized or missing	1.06 (0.91, 1.24)	1.34 (0.88, 2.04)	0.81 (0.67, 0.99)	0.74 (0.51, 1.05)
Duty type				
Active duty (Ref)	1.00	1.00	1.00	1.00
Reserve or Guard	0.79** (0.73, 0.86)	0.74* (0.58, 0.94)	1.14 (0.97, 1.35)	1.34 (0.96, 1.87)
Age, y	**	*	**	*
18–24 (Ref)	1.00	1.00	1.00	1.00
25–34	1.20 (1.10, 1.30)	1.50 (1.20, 1.88)	1.36 (1.20, 1.54)	1.37 (1.10, 1.70)
35–44	1.26 (1.12, 1.42)	1.57 (1.12, 2.22)	1.46 (1.21, 1.77)	0.92 (0.64, 1.32)
45–54	1.37 (1.14, 1.64)	1.34 (0.75, 2.40)	1.32 (0.99, 1.77)	1.06 (0.62, 1.80)
55–64	0.64 (0.36, 1.13)	3.45 (1.04, 11.45)	0.83 (0.40, 1.70)	0.35 (0.05, 2.60)
Traumatic brain injury	1.20 (0.98, 1.46)	1.23 (0.54, 2.79)	1.59* (1.18, 2.15)	1.64 (0.85, 3.20)
Behavioral health disorders[b]				
PTSD	1.24** (1.09, 1.41)	1.57* (1.09, 2.26)	0.78 (0.54, 1.13)	0.86 (0.55, 1.34)
Adjustment disorders	1.53** (1.37, 1.71)	1.28 (0.96, 1.71)	1.45** (1.23, 1.72)	1.60** (1.26, 2.05)
Anxiety disorders[c]	1.03 (0.90, 1.18)	0.92 (0.65, 1.31)	1.38** (1.15, 1.67)	1.02 (0.77, 1.36)
Mood disorders	1.41** (1.25, 1.59)	1.31 (0.96, 1.77)	1.62** (1.37, 1.92)	1.79** (1.40, 2.29)
Personality disorders	1.46** (1.24, 1.72)	1.49 (1.00, 2.22)	1.39* (1.12, 1.73)	1.05 (0.74, 1.49)
Psychotic disorders	1.57** (1.22, 2.04)	4.22** (2.16, 8.23)	2.66** (2.04, 3.47)	3.18** (1.87, 5.39)
Substance use	2.59** (2.33, 2.87)	1.85** (1.28, 2.67)	2.72** (2.34, 3.16)	2.03** (1.47, 2.82)

Note. BC = bad conduct discharge; CI = confidence interval; DoD = US Department of Defense; E = enlisted; HR = hazard ratio; *ICD-9-CM* = *International Classification of Diseases, Ninth Revision, Clinical Modification*; NS = nonsignificant (i.e., $P > .05$); O = officer; OEF = Operation Enduring Freedom; OIF = Operation Iraqi Freedom; PTSD = posttraumatic stress disorder; VA = Department of Veterans Affairs. 5-year adjusted incidence rates (%) are as follows: for OEF–OIF, 4.9 and 4.8 for men and women, respectively, and for not OEF–OIF, 3.7 and 4.1 for men and women, respectively.

[a]Insufficient number of observations to generate a valid coefficient.

[b]All diagnoses were made in the 1-year period before separation from the military. The behavioral health categories used here are based on groupings of *ICD-9-CM* diagnoses, following the conventions used in Hoge et al.[19]: any behavioral health disorder (290–319), adjustment disorders (309.0, 309.24, 309.28, 309.3, 309.4, 309.9), anxiety disorders (excluding PTSD; 300.01–300.03, 300.21, 300.22, 300.23, 300.29, 300.3, 308.3), PTSD (309.81), mood disorders (296.0, 296.2–296.7, 296.80, 296.89, 296.90, 300.4, 301.13, 311), major depression (296.2 and 296.3), personality disorders (301.0, 301.2, 301.4, 301.50, 301.6, 301.7, 301.81–301.84, 301.89, 301.9), psychotic disorders (295.1–295.4, 295.6, 295.7, 295.9, 297.1, 297.3, 298.8, 298.9), and substance use (291; 292, except 292.2; 303–305, except 305.1 and 305.8).

[c]Anxiety disorder category does not include PTSD diagnosis (309.81).

*$P < .05$. **$P < .001$.

discharged at ages 18 to 24 years, the risk of homelessness among older age categories varied across the 4 subpopulations. Veterans aged 25 to 34 years had elevated risk of becoming homeless across all 4 subpopulations, and veterans aged 35 to 44 years had elevated risk in all subpopulations except for non-OEF and non-OIF women. Among the OEF–OIF subpopulations, men aged 45 to 54 years and

women aged 55 to 64 years also had elevated risk of homelessness.

After controlling for baseline military and demographic factors, risk differences in becoming homeless among the subpopulations persisted for TBI diagnosis and the behavioral health categories. PTSD significantly increased, albeit modestly, the risk of becoming homeless, but only for OEF–OIF veterans. Both psychotic disorders and substance use significantly increased the risks of becoming homeless across all 4 subpopulations. The magnitudes of risk for these 2 categories differed by gender in that women showed a higher risk of becoming homeless associated with psychotic disorders and a lower risk associated with substance use disorders than their male counterparts. TBI and anxiety disorders (excluding PTSD) significantly increased, though modestly, the risk of becoming homeless only for the male non-OEF and non-OIF subpopulation. Mood disorders (including major depression) and adjustment disorders significantly elevated risk of becoming homeless except for women who served in OEF–OIF. Personality disorders significantly increased the risk of becoming homeless only for male veterans, regardless of OEF–OIF status.

The 5-year adjusted incidence rates based on the Cox regression model showed similar rates of homelessness across genders for those with OEF–OIF service—4.9% for men and 4.8% for women—and lower rates for those without OEF–OIF service—3.7% for men and 4.1% for women.

After controlling for factors listed in Table 2, OEF–OIF service significantly increased the risk for becoming homeless by an additional 34% (HR = 1.34; 95%CI = 1.26, 1.43; $P < .001$), whereas gender did not have a significant effect related to the risk (HR = 0.99; 95% CI = 0.91, 1.07). These results were reflected in the 5-year adjusted incidence rates reported in Table 2.

DISCUSSION

This cohort study is the first to simultaneously examine baseline factors on the risk of becoming homeless among OEF- and OIF-era veterans. The study provides support for assertions by the popular media and by veterans advocates that OEF–OIF service is associated with a higher risk for homelessness. We found that, among the veterans deployed in Iraq and Afghanistan, PTSD was a significant risk factor for homelessness.

This study included all OEF- and OIF-era veterans regardless of whether they served in Iraq or Afghanistan. Given that one third of those identified as homeless had been deployed as part of OEF–OIF and that the increased risk with OEF–OIF deployment and PTSD were modest, interventions aimed at preventing and ending veteran homelessness should target all veterans in this cohort. Pay grade, as a proxy for socioeconomic status, was a strong and consistent risk factor for becoming homeless, regardless of OEF–OIF status. The 44% of the study cohort who were in the lowest pay grade category (E1–E4) accounted for 72% of those becoming homeless. Similarly, we consistently found that substance use and psychotic disorders significantly increased the risk of becoming homeless. The 18% of the cohort who were diagnosed with some type of behavioral health disorder made up 44% of those becoming homeless.

Gender had no impact on risk for becoming homeless after controlling for other baseline factors, although the effect of some behavioral health diagnosis categories (substance abuse, psychotic and personality disorders) on the risk of becoming homeless varied on the basis of gender. These findings are consistent with those of other studies.[10,11,13] In this study, we did not include military sexual trauma, which has been identified as a particularly salient risk factor among female OEF–OIF veterans[9,15] because data available for military sexual trauma were collected only through VA health records after military separation.[16] Both gender and OEF–OIF deployment status mitigated the association between TBI diagnosis and homelessness, because TBI was only significant among men who were not deployed in OEF–OIF, which would indicate against associations between TBI as a combat injury and homelessness.

Links between both socioeconomic and behavioral health factors and homelessness have been made previously[12]; however, this study is one of the few that have assessed factors related to the onset of homelessness among a large, general population in a naturalistic setting.[8,23–26] Assessing incidence of homelessness in a cohort study, as was done in this study, sets the temporal order between baseline conditions and subsequent homelessness. It also precludes persons in the study having any prior history of homelessness and the influence it may have on the risk for homelessness during the study period. This approach thereby informs a focus on preventing new cases of homelessness and minimizes confounding it with risk factors for remaining or relapsing into homelessness.

Limitations

We purposely limited ourselves in this study to data that were available at the point of military separation. Doing so permitted the identification of factors that would help assess veterans for risk of subsequent homelessness and thus more efficiently target prevention services. Use of such baseline data also had its limitations, because it missed what was likely to have been a substantial degree of undiagnosed behavioral health disorders. The diagnosed rate of 18% for OEF–OIF veterans in this study with at least 1 behavioral health diagnosis before separation from the military was consistent with that found by Hoge et al.,[27] although they also found that fewer than half of OEF–OIF personnel who screened positive for a mental health disorder sought care while in the military.[28] The OIG homeless study, as well as other research, found that, after separation, the proportion of OEF–OIF veterans with diagnosed behavioral health disorders (including PTSD) increased substantially, particularly among those who sought care through the VA.[15,29,30]

Another limitation of this study was the potential underidentification of the extent of homelessness experienced by this OEF–OIF era cohort. Veterans who had episodes of homelessness but did not use any homeless services, or only used non-VA (i.e., community-based) homeless services, would not have been identified as homeless in this study unless they received a clinical diagnosis (i.e., *ICD-9-CM* diagnosis of V60.0) through the VA or DoD health care systems. This potential is mitigated by the assumption that veterans engaged with the VA, which included all those in this cohort, would likely have sought at least some homeless services through the VA should they have become homeless. Nonetheless, the

number of missed homeless veterans in this study is unknown. If, for example, those with mental illness were less likely to use services and less likely to engage VA services when they became homeless, then our risks would be underestimated. Female veterans might also be underestimated because VA-based homeless services are traditionally aimed at men. This assumption is mitigated by research that has also found that, compared with men, women are more likely to have used VA services and to have used VA services more often.[17]

The study group was also potentially limited in that it included only those veterans who enrolled in VA or DoD health care services. The VA has aggressively sought to enroll OEF- and OIF-era veterans, and especially combat veterans, which (in addition to DoD enrollment) was reflected by the 63% of the entire LC database who were included in this study, a rate higher than more general VA enrollment rates.[31,32] VA eligibility for health care services is preferential, not only to veterans with service-connected conditions, but also to those who are "older, poorer, less educated, and sicker with more disease" [33(p626)]; therefore, those veterans who are vulnerable to becoming homeless would be overrepresented among the study cohort.

One exception to this was the small number of veterans who were dishonorably or other than honorably discharged, who are not typically eligible for VA health care services. Those who were included among this study cohort were found to be at high risk for homelessness. Little is known about homelessness specific to this subgroup or about their particular service needs. Their disproportionate exclusion here should not have involved enough persons to substantially affect the results presented.

Conclusions

This study provides insight into the relationship between military service and homelessness and represents a prototype for using administrative data to identify veterans who are at elevated risk for becoming homeless on their return to civilian life. It follows other recent initiatives that show promise in prospectively screening persons for homelessness risk.[34,35] In this study, broad indicators such as pay grade and diagnosis of a behavioral health disorder substantially pared down the pool of veterans among which the large majority of homelessness occurred. If prevention efforts were to build on this approach by using additional administrative data sources, along with targeted screening instruments, they would become more precise in assessing individual veterans' risks of becoming homeless.

Such refined targeting would not exclude any veteran from receiving homeless services when needed, but it should help narrow those receiving prevention assistance to only those who are most likely to become homeless. This would make more efficient use of the VA's homelessness prevention services, which included $100 million under the Supportive Services for Veterans and Families program in fiscal year 2012, and help make good on the VA's overall commitment to end veteran homelessness by 2015.[36] ■

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Contributors

S. Metraux conceptualized the project, wrote the article, and supervised the other authors' contributions. L. X. Clegg performed data management and data analysis and contributed to the writing of the article. J. D. Daigh contributed to data procurement, conceptualization of the project, and writing of the article. D. P. Culhane contributed to the project's conceptualization and writing of the article. V. Kane provided supervision and contributed to the project's conceptualization and writing of the article.

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Human Participant Protection

This study was approved through expedited review by the institutional review board at the Philadelphia Veterans Medical Center.

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