



5-2011

## **Battle Scars? The Puzzling Decline in Employment and Rise in Disability Receipt Among Vietnam Era Veterans**

David H. Autor

Mark Duggan  
*University of Pennsylvania*

David S. Lyle

Follow this and additional works at: [https://repository.upenn.edu/hcmg\\_papers](https://repository.upenn.edu/hcmg_papers)

 Part of the [Disability Law Commons](#), and the [Finance Commons](#)

---

### **Recommended Citation**

Autor, D. H., Duggan, M., & Lyle, D. S. (2011). Battle Scars? The Puzzling Decline in Employment and Rise in Disability Receipt Among Vietnam Era Veterans. *American Economic Review*, 101 (3), 339-344.  
<http://dx.doi.org/10.1257/aer.101.3.339>

This paper is posted at ScholarlyCommons. [https://repository.upenn.edu/hcmg\\_papers/76](https://repository.upenn.edu/hcmg_papers/76)  
For more information, please contact [repository@pobox.upenn.edu](mailto:repository@pobox.upenn.edu).

---

## Battle Scars? The Puzzling Decline in Employment and Rise in Disability Receipt Among Vietnam Era Veterans

### Abstract

Using Current Population Survey and US Army administrative data, we document that between 2000 and 2010, the employment rate of Vietnam era veterans fell markedly relative to non-veterans of the same cohorts while simultaneously their enrollment increased steeply in the Veterans Disability Compensation (DC) program, which provides healthcare and transfer payments to veterans with service-connected disabilities. Thirty percent of Vietnam era Army veterans enrolled in DC in 2006 received benefits for Post-Traumatic Stress Disorder, with median annual payments of \$25,500. The declining employment and rising transfer payments to Vietnam era veterans underscore the long-term private and public costs of wartime service, potentially stemming from both adverse health consequences and policies that have expanded benefits eligibility.

### Disciplines

Disability Law | Finance

## Battle Scars? The Puzzling Decline in Employment and Rise in Disability Receipt among Vietnam Era Veterans

By DAVID H. AUTOR, MARK G. DUGGAN, AND DAVID S. LYLE\*

The impact of military service in the Vietnam War on the well-being of veterans has been a contentious topic since at least the war's end. A focal point of discussion is the prevalence of post-traumatic stress disorder (PTSD) among Vietnam veterans. According to the influential National Vietnam Veterans Readjustment Study (Richard A. Kulka and William E. Schlenger 1988), 15 percent of Vietnam veterans were suffering from PTSD in 1988 and 31 percent had experienced PTSD cumulatively. More than 30 years after the war's conclusion, this topic has gained renewed salience due to the rapid rise in the number of Vietnam era veterans receiving Disability Compensation (DC) payments for PTSD, which approximately tripled—from 90,695 to 268,865—between 1999 and 2010 (US Department of Veterans Affairs, various years). Only veterans can qualify for the DC program, which provides a monthly stipend, not subject to state or federal taxation, as well as health insurance to veterans with disabilities that were caused or aggravated by military service.<sup>1</sup>

At the heart of the debate regarding PTSD, and the prevalence of disability payments more broadly, is the degree to which high and rising DC claims among Vietnam era veterans reflect the long-term deleterious consequences of

wartime military service versus the incentive and nonincentive effects of the generous DC program.<sup>2</sup> Recently, Joshua D. Angrist, Stacey H. Chen, and Brigham R. Frandsen (2010) exploited exogenous variation in military draft probabilities among men born in the late 1940s and early 1950s to study the causal effect of military service on labor force participation, self-reported disability, and receipt of disability benefits. As of the year 2000, they find that Vietnam era service had little effect on overall employment rates or self-reported health status. Focusing on men with low potential earnings, however, they uncover evidence of a negative causal effect of military service on their employment and a positive causal effect on receipt of disability benefits. They cautiously attribute this reduction in labor supply to the DC program.

This brief paper makes three contributions to our understanding of employment and disability among Vietnam era veterans. It documents a substantial divergence in overall labor force participation and disability benefits receipt between Vietnam era veterans and their nonveteran contemporaries in the ten years since the time period considered by Angrist et al. (2010). It next uses unique administrative records from the US Army to better inform the debate about causes and consequences of PTSD, offering detailed comparisons of the military service and human capital attributes of Vietnam era veterans according to their DC status. Finally, it highlights the difficulty in distinguishing between deteriorating health and the direct consequences of the DC program in causing the relative declines in labor force participation among Vietnam era veterans.

\*Autor: Department of Economics, Massachusetts Institute of Technology, 50 Memorial Drive, E52-371, Cambridge, MA 02142, and National Bureau of Economic Research (e-mail: [dautor@mit.edu](mailto:dautor@mit.edu)); Duggan: Department of Economics, University of Maryland, College Park, MD 20742, and NBER (e-mail: [duggan@econ.umd.edu](mailto:duggan@econ.umd.edu)); Lyle: Office of Economic and Manpower Analysis, United States Military Academy, West Point, NY 10996 (e-mail: [David.Lyle@usma.edu](mailto:David.Lyle@usma.edu)). We thank Joshua Angrist, Manasi Deshpande, and Joseph Doyle for valuable suggestions. Autor acknowledges support from the National Science Foundation (CAREER SES-0239538). The views expressed herein are those of the authors and do not reflect the position of the United States Military Academy, the Department of the Army, or the Department of Defense.

<sup>1</sup> For dissenting viewpoints on the prevalence of PTSD among Vietnam veterans, see B. G. Burkett and Glenna Whitley (1998) and Bruce P. Dohrenwend et al. (2006)

<sup>2</sup> As discussed in Autor and Duggan (2007), DC benefits may reduce labor supply through two channels: a nonincentive income effect, which raises demand for leisure; and an incentive effect, whereby veterans with significant disabilities may qualify for substantially enhanced payments if the VA determines that their disabilities preclude work. Melissa A. Boyle and Joanna N. Lahey (2010) also find that access to VA health insurance may reduce labor force participation among veterans.

### I. Rising Disability Compensation Receipt among Vietnam Era Veterans

After remaining fairly stable at about 9 percent in the late 1990s through September 2000, DC enrollment among Vietnam era veterans has since increased rapidly, and stood at 15.1 percent by September 2010. During that same period, the average annual benefit received by Vietnam era DC recipients increased by 44 percent, from \$10,200 in 2000 to \$14,700 by 2010. Because of this rapid growth among Vietnam era veterans and a similar surge among veterans from the Gulf War and the Global War on Terror (GWOT), total DC expenditures approximately doubled in the past decade, from \$18.7 billion in 2000 to \$36.5 billion in 2010.<sup>3</sup>

The recent rise in DC enrollment and benefit payments among Vietnam era veterans has two proximate causes. One is a policy change in July 2001 that allowed Vietnam veterans with diabetes mellitus who had served with “boots on the ground” (BOG)—that is, in the combat theatre—to qualify for DC benefits. This policy was prompted by a 2000 National Institute of Medicine study that suggested that exposure to Agent Orange and other herbicides used in Vietnam may have increased veterans’ risk of developing diabetes. The share of Vietnam era veterans receiving DC benefits for diabetes surged immediately after this policy change. By 2010, slightly more than 8 percent of BOG veterans were receiving DC benefits for diabetes, a rate that is similar to the estimated prevalence of diabetes among US adults in the relevant age bracket.

The second key factor is a steady increase in the fraction of Vietnam era veterans qualifying for DC with a condition of PTSD. From 1999 to 2010, the fraction of Vietnam era veterans on DC with a PTSD diagnosis more than tripled. The belated rise in PTSD is unprecedented. Among Korean War veterans, for example, PTSD was not among the top ten service-connected disability diagnoses in 2000, approximately 40 years after that war’s conclusion.

Using US Army personnel records for the period 1998–2006 (detailed below), Figure 1 documents the contribution of diabetes and

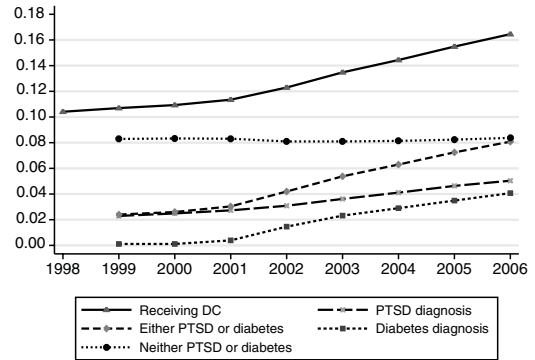


FIGURE 1. DISABILITY COMPENSATION RECEIPT AMONG VIETNAM ERA ARMY VETERANS, 1998–2006: OVERALL RATE AND RATE BY DIAGNOSIS

PTSD diagnoses to rising DC receipt among Vietnam era veterans. Between 1999 and 2006, the fraction of all Vietnam Army veterans receiving DC rose from 10.7 to 16.5 percent. Excluding those with a diagnosis of either diabetes or PTSD, this fraction remained stable at approximately 8 percent throughout the 1998–2006 period. These numbers are even more pronounced among BOG Vietnam Army veterans. Between 1998 and 2006, their rate of DC benefit receipt rose from 13.3 to 22.7 percent. Excluding BOG veterans with PTSD and diabetes, however, this fraction declined slightly, from 10.0 to 9.6 percent.<sup>4</sup>

### II. Diverging Disability and Employment Rates between Veterans and Nonveterans, 2000–2010

We use individual-level data from the March 2000 and March 2010 Current Population Survey to document changes in the relationship between Vietnam era military service and labor market outcomes. We estimate the following linear probability model for labor force nonparticipation, self-reported disability, and receipt of disability transfer income for Vietnam era veterans and males of the same cohorts who did not serve, focusing on males born between 1945 and

<sup>3</sup> Figures inflated to real 2010 dollars using the CPI-U price series.

<sup>4</sup> Of course, some of those receiving benefits for diabetes or PTSD would have received DC even absent these diagnoses.

TABLE 1—THE RELATIONSHIP BETWEEN VIETNAM ERA MILITARY SERVICE, LABOR SUPPLY, AND DISABILITY IN 2000 AND 2010

	Not in labor force	Disability self-report	Disability benefits
<i>Panel A. March 2000 CPS: Ages 49–54</i>			
Vietnam era veteran	0.018 (0.012)	0.026** (0.011)	0.081*** (0.011)
Mean of outcome	0.130	0.107	0.089
<i>Panel B. March 2010 CPS: Ages 59–64</i>			
Vietnam era veteran	0.059*** (0.017)	0.038*** (0.014)	0.116*** (0.013)
Mean of outcome	0.358	0.183	0.134

Notes: Robust standard errors in parentheses.  $N = 4,635$  in 2000 and 4,347 in 2010. Variable definitions: disability self-report equals one if respondent reports “a health problem or disability that prevents work or limits the kind or amount of work”; disability benefits equals one if income is received from SSDI, VA disability compensation or pension, or other disability benefits; NILF equals one if respondent is out of the labor force ( $a\_lfsr = 7$ ).

\*\*\*Significant at the 1 percent level.

\*\*Significant at the 5 percent level.

\*Significant at the 10 percent level.

1950 inclusive (the cohorts with the highest rate of Vietnam service):

$$Y_{it} = \alpha_t + \beta_{1t} VEV_i + \mathbf{X}_i \beta_{2t} + e_{it}.$$

Controls included in vector  $\mathbf{X}$  in this model are age (six single year-of-age indicators), education (four indicators), race, ethnicity, and marital status. The parameter of interest,  $\beta_{1t}$ , estimates the conditional mean difference in outcomes between Vietnam era veterans and demographically similar nonveterans of the same cohorts. The parameter estimates are subscripted by  $t$  because the model is estimated separately by year.

Table 1 shows that the relationship between Vietnam era military service and employment outcomes has changed substantially in the past ten years. Consistent with Angrist et al. (2010), we find no significant relationship between Vietnam era military service and labor force participation in the year 2000, while veterans had a moderately higher incidence of self-reported disability.<sup>5</sup> Simultaneously, veterans were

substantially more likely (8.1 percentage points) to receive disability-related transfer income, with the bulk of this difference accounted for by their receipt of VA benefits.

The disparities between veterans and non-veterans increased substantially in the ensuing decade. Unexpectedly, we find that in 2010 Vietnam era veterans were 5.9 percentage points less likely to participate in the labor force than nonveterans of the same cohorts. This contrast is highly significant and more than three times as large as the (insignificant) difference of 1.8 percentage points in 2000. Self-reported disability also rose differentially among veterans from 2000 to 2010. But this rise of 1.2 percentage points is smaller than the differential increase in labor force nonparticipation. We finally find a differential increase of 3.5 percentage points in the receipt of disability-related transfer income among Vietnam-era veterans between 2000 and 2010. This rise is on par with the simultaneous decline of 4.1 percentage points in the labor force participation of veterans relative to nonveterans.

### III. Which Veterans Receive DC Benefits?

The falling relative employment and rising DC receipt among Vietnam era veterans between 2000 and 2010 is consistent with the possibility that veterans' health differentially declined in this decade, presumably due to battle scars acquired decades earlier. Alternatively, the DC program itself—particularly the expansion of diabetes and PTSD awards for BOG veterans—may have caused a significant fraction of veterans to exit the labor force prematurely. Disentangling these explanations is intrinsically challenging since both combat exposure and eligibility for DC benefits result from military service. But the distinction is critical. The health consequences of combat service are largely outside of policymakers' control, whereas benefits programs for service members are potentially subject to redesign.

In Table 2, we use unique Army personnel data to explore the characteristics of Vietnam era veterans receiving DC and to consider whether either of these interpretations receives immediate

<sup>5</sup> The Angrist et al. (2010) estimates for the year 2000 should be interpreted as causal effects since they are identified by the draft lottery quasi-experiment. Our OLS estimates for the year 2000 are comparable to their causal

effects estimates, but we have no means to ascertain whether the OLS and causal effects continue to coincide in 2010.

TABLE 2—CHARACTERISTICS OF VIETNAM ARMY VETERANS BY DISABILITY COMPENSATION STATUS IN 2006

	Full sample	Boots on ground	Not DC enrolled	DC enrolled	PTSD award
Nonwhite	0.11	0.12	0.10	0.16	0.17
Boots on ground	0.59	1.00	0.54	0.81	0.94
Combat occupation	0.36	0.39	0.34	0.47	0.60
HS dropout	0.28	0.28	0.27	0.31	0.39
AFQT $\leq$ 40th percentile	0.40	0.41	0.38	0.48	0.55
DC enrolled	0.17	0.23	0.00	1.00	1.00
PTSD award	0.05	0.08	NA	0.30	1.00
Diabetes award	0.04	0.07	NA	0.24	0.21
DC payment	2,067	2,893	NA	11,358	19,017
(SD)	(6,267)	(7,303)	NA	(11,031)	(9,815)
Median	0	0	NA	5,757	25,557
Fraction of sample	1.00	0.59	0.83	0.17	0.05

support. These data, developed in cooperation with the US Army Office of Economic and Manpower Analysis and the US Social Security Administration (SSA), combine US Army personnel records with Veterans Administration records on Disability Compensation and Social Security data on earnings and SSA administered benefits. Of particular interest is information on the military service conditions of veterans, including military occupation and BOG status, as well as human capital characteristics recorded at the time of enlistment.<sup>6</sup>

The comparisons in Table 2 reveal that DC recipients differ from other Vietnam era veterans along two key dimensions. A first is their conditions of military service. DC recipients were substantially more likely to have seen combat in Vietnam; while 59 percent of the Army sample served with boots on the ground, this fraction is 81 percent among those receiving DC benefits, and 94 percent among those with a PTSD diagnosis. A similar contrast is seen in military occupational specialty. Whereas 36 percent of the Army sample served in a combat

occupation, this fraction is 39 percent among BOG veterans, 47 percent among all DC enrollees, and 60 percent among those with PTSD. The prevalence of service-connected disabilities—and PTSD in particular—is clearly overwhelmingly concentrated among veterans who were likely exposed to combat in Vietnam.

The second critical dimension along which DC recipients differ from the full sample of Army veterans is in their human capital. Whereas 28 percent of the Vietnam veterans in our sample had not completed high school at the time of enlistment, this fraction is 31 percent among DC beneficiaries, and 39 percent among those with a PTSD diagnosis. Many of these veterans may have obtained further education after the war, of course, so these education categories may not provide a measure of “permanent” skills. The AFQT test data tell a similar story, however. While 40 percent of the Army sample had an AFQT score in the bottom two quintiles of the national AFQT testing distribution, this fraction was 48 percent among DC recipients, and 55 percent among those with a PTSD diagnosis. Even among BOG veterans, who comprise the vast majority of all PTSD claimants, the PTSD diagnosis is concentrated among veterans with low education and AFQT scores.

The data in Table 2 can be read as supportive of either the health or the program-effect explanations for the diverging disability and employment rates of Vietnam era veterans and their civilian contemporaries. On the one hand, overall DC enrollment, and PTSD in particular,

<sup>6</sup> We use a 10 percent sample (170,395 records) of Vietnam era Army veterans who were born between 1942 and 1953, commenced military service between 1966 and 1971, and survived to 2006. The following variables contain missing values: nonwhite (0.15 percent); combat occupation (8 percent); high school dropout (7 percent); Armed Forces Qualification Test (AFQT) score (37 percent). Missing values are treated as missing at random in Table 2. Further details are provided in Autor and Duggan (2007), and Autor, Duggan, and Lyle (2010).

are disproportionately prevalent among Vietnam era veterans who had completed no postsecondary education at enlistment and tested in the bottom two quintiles of AFQT. Veterans with these characteristics would be expected to have comparatively low earnings and labor force participation, and hence their rising rates of DC receipt and declining employment are potentially consistent with behavioral changes induced by the availability of DC benefits.

On the other hand, veterans receiving DC benefits—and particularly those with PTSD diagnoses—had comparatively high rates of wartime combat exposure, which may plausibly have had long-term adverse impacts on their physical and mental health. Moreover, the lower educational attainments and AFQT scores of this subset of veterans are considered risk factors for PTSD (Michael L. Macklin et al. 1998), presumably because individuals with limited cognitive skills may have less capacity for absorbing combat's psychic toll. Thus, the rising rates of DC receipt and declining employment among BOG veterans is consistent with adverse health consequences of combat exposure.

#### IV. Discussion

The growth in DC enrollment among Vietnam era veterans appears poised to continue in the upcoming years due to both ongoing military activity and recent further liberalizations in the DC program's medical eligibility criteria. A significant issue for policy in the years ahead is the growth of the DC program due to the Gulf War and the GWOT. At nearly 20 percent, DC enrollment among the 5.1 million veterans who have served since August 1990 is substantially higher than it has been among veterans from previous service eras such as Vietnam or the Korean Conflict. Additionally, the average monthly benefit for Gulf War/GWOT era DC recipients has risen by almost 70 percent since 1999. The unexpected growth in DC enrollment among Vietnam era veterans occurred while most were in their fifties and early sixties, but the average age of a Gulf War/GWOT era veteran is just 37. Thus, the potential life-years of DC benefits receipt for the typical Gulf War/GWOT era DC recipient is much greater than for their Vietnam era counterparts.

An equally significant factor affecting the long-term costs of combat service is the lifetime

pattern of labor supply among veterans. While our data do not allow us to determine the degree to which the sharp relative declines in employment among Vietnam era veterans in the past decade are caused by the long-term adverse effects of military service versus the incentive and nonincentive effects of rising cash transfers from the DC program, it is self-evident that their declining employment has large costs in foregone earnings and tax revenue. For those suffering from PTSD, the costs in personal well-being are also likely to be substantially larger. Should similar reductions in labor force participation occur among Gulf War/GWOT era veterans, and if these declines occur earlier in their working lives, as has occurred with DC enrollment, then the long-term costs of the ongoing US military engagements could be (even) larger than has been appreciated.

#### REFERENCES

- Angrist, Joshua D., Stacey H. Chen, and Brigham R. Frandsen.** 2010. "Did Vietnam Veterans Get Sicker in the 1990s? The Complicated Effects of Military Service on Self-Reported Health." *Journal of Public Economics*, 94(11–12): 824–37.
- Autor, David H., and Mark G. Duggan.** 2007. "Distinguishing Income from Substitution Effects in Disability Insurance." *American Economic Review*, 97(2): 119–24.
- Autor, David H., Mark G. Duggan, and David Lyle.** 2010. "The Effect of Transfer Income on Labor Force Participation and Enrollment in Federal Benefits Programs: Evidence from the VA's Disability Compensation Program." Unpublished.
- Boyle, Melissa A., and Joanna N. Lahey.** 2010. "Health Insurance and the Labor Supply Decisions of Older Workers: Evidence from a U.S. Department of Veterans Affairs Expansion." *Journal of Public Economics*, 94(7–8): 467–78.
- Burkett, B. G., and Glenna Whitley.** 1998. *Stolen Valor: How the Vietnam Generation Was Robbed of Its Heroes and History*. Dallas, TX: Verity Press.
- Dohrenwend, Bruce P., J. Blake Turner, Nicholas A. Turse, Ben G. Adams, Karestan C. Koenen, and Randall Marshall.** 2006. "The Psychological Risks of Vietnam for U.S. Veterans: A

Revisit with New Data and Methods.” *Science*, 313(5789): 979–82.

**Kulka, Richard A., and William E. Schlenger.** 1988. *Contractual Report of Findings from the National Vietnam Veterans Readjustment Study*, Volume 1. Washington, DC: Veterans Administration.

**Macklin, Michael L., Linda J. Metzger, Brett T. Litz, Richard J. McNally, Natasha B. Lasko, Scott P. Orr, and Roger K. Pitman.** 1998. “Lower Precombat Intelligence Is a Risk Factor for Posttraumatic Stress Disorder.” *Journal*

*of Consulting and Clinical Psychology*, 66(2): 323–26.

**Centers for Disease Control and Prevention, National Center for Health Statistics.** 2010. *Health, United States, 2009: With Special Feature on Medical Technology*. Washington, DC: United States Government Printing Office.

**United States Department of Veteran Affairs.** Various years. “Veterans Benefits Administration Annual Benefits Report.” <http://www.vba.va.gov/REPORTS/abr/index.asp>.



**This article has been cited by:**

1. David Card,, Ana Rute Cardoso. 2012. Can Compulsory Military Service Raise Civilian Wages? Evidence from the Peacetime Draft in Portugal. *American Economic Journal: Applied Economics* 4:4, 57-93. [[Abstract](#)] [[View PDF article](#)] [[PDF with links](#)]