

# Health of national service veterans: an analysis of a community-based sample using data from the 2007 Adult Psychiatric Morbidity Survey of England

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## Abstract

**Purpose** In the context of increasing concerns for the health of UK armed forces veterans, this study aims to compare the prevalence of current mental, physical and behavioural difficulties in conscripted national service veterans with population controls, and to assess the impact of length of service in the military. The compulsory nature of national service sets these veterans apart from younger veterans.

**Method** Data are drawn from a nationally representative community-dwelling sample of England. We compared 484 male national service veterans to 301 male non-veterans aged 65+ years.

**Results** There were no differences in mental, behavioural or physical outcomes, except that veterans were less likely to have “any mental disorder” than non-veterans (age adjusted OR = 0.56, 95% CI 0.31, 0.99). Longer serving veterans were older but were not different in terms of mental, behavioural or physical outcomes.

**Conclusions** Community-dwelling national service veterans are at no greater risk of current adverse mental, physical or behavioural health than population controls.

**Keywords** Veterans · Health · Mental disorders · National service

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## Introduction

Men were conscripted into the UK armed forces between 1939 and 1960 [1], but little is known about their current health. A proportion of veterans are likely to have been involved in World War II and the Korean War, but could also have been involved in operations in Palestine (1945–1948), Malaya (1948–1960), Suez (1956) and the Arabian Peninsula (1957–1960) [1]. Previous studies of World War II and Korean War veterans report that these deployments could have both positive effects upon their mental and physical health, for example in terms of increased resilience and enduring social bonds [2, 3], and, negative impacts, in terms of psychiatric problems such as post-traumatic stress disorder [4–6]. However, differing methodologies make comparisons problematic, and most studies used treatment-seeking samples so it is not possible to generalise their findings. Some research has suggested that post-traumatic stress disorder (PTSD) can surface in later life many years after experiencing trauma [7].

This study takes advantage of a nationally representative survey of community-dwelling adults in England, the 2007 Adult Psychiatric Morbidity Survey (APMS) [8]. It aims: (a) to compare the socio-demographic characteristics of national service veterans with non-veterans of the same age; (b) to assess and compare the prevalence of mental, physical and behavioural health outcomes in national service veterans and non-veterans of the same age; and, (c) to determine whether these outcomes differ between veterans who served for more than 2 years ('career veterans') and for 2 years or less ('conscripts').

## Methods

### Study participants and data collection

Analyses were carried out using data collected for the 2007 Adult Psychiatric Morbidity Survey (APMS), a representative sample of community-dwelling adults (aged 16+ years) in England. Ethical approval for APMS 2007 was obtained from the Royal Free Hospital and Medical School Research Ethics Committee [8]. Data were collected by face-to-face interview, although questions deemed to be sensitive (e.g. relating to self-harm) were self-completed. The APMS used a multi-stage stratified sampling design, stratified according to socio-economic status and geographical region (full details of the survey methodology are available elsewhere) [8]. 7,461 adults responded to the first stage of the survey, corresponding to a response rate of 57%.

### Sample used for analysis

From the original study sample ( $N = 7,461$ ), two groups were identified: male national service veterans [those who reported ever serving in the armed forces, were no longer serving and were  $\geq 65$  years (since conscription ended in 1960 and individuals had to be 18 years old to sign up)] and male non-veterans (those aged  $\geq 65$  years who had not served in the military). Further exclusions included: proxy interviews; non-white ethnic groups (as all veterans were white); and, veterans reporting improbable ages at joining and leaving the military (e.g. under 16 years or over 55 years of age). This led to the identification of 484 veterans and 301 non-veterans aged  $\geq 65$  years. Women were excluded from these analyses as they were not compulsorily called up for combat duties, although in 1941 women aged 20–30 years were required to do some kind of war service [9].

Veterans who had served more than 2 years (termed 'career service') were distinguished from those who served 2 years or less (termed 'conscripts'). Two years was the

minimum service required from 1949 onward (although the minimum length of service did fluctuate throughout the conscription years) [1]. The number of years since veterans had last served was calculated from the difference between 2007 (the year the APMS was conducted) and the year the individual reported leaving the services, the distribution was grouped into quartiles.

### Socio-demographic characteristics

Information was collected on age, sex, marital status, ethnic group and educational qualifications. Childhood adversity was defined in line with a previous study of UK military personnel, [10] and was identified from 20 questions relating to the assessment of personality disorder, child abuse, stressful life events and parenting [8]. Responses were grouped into three categories (0, 1, 2+).

Perceived social support was assessed from seven questions which followed the stem statement, 'There are people I know amongst my family and friends who...' (for example, 'do things to make me feel happy'). Responses were scored 1–3, total scores ranged from 7 to 21 and were divided into three groups in line with previous research [11]: no lack (21), moderate lack (18–20) and severe lack of social support ( $\leq 17$ ). Financial problems were identified from three questions on debt and borrowing; a binary variable (none vs. at least one problem) was generated for analysis. Respondents were asked whether they had experienced homelessness and whether they had been exposed to trauma in adulthood. Trauma was defined as an experience of an event since age 16 that had endangered participants' lives or the lives of someone close, or had put them at serious risk, such as a natural disaster, seeing people killed or being raped. Veterans reporting trauma were asked whether this was military-related.

### Health and related behaviours

Symptoms of neurotic illness were evaluated using the Revised Clinical Interview Schedule (CIS-R) [12]; the outcome of interest was the identification of any neurotic disorder in the past week. Alcohol consumption was assessed with the World Health Organization's Alcohol Use Disorders Identification Test (AUDIT). A score of 16 or more identified 'heavy alcohol use' [13, 14]. Alcohol dependence was assessed only for those with an AUDIT score of 10+, using the Severity of Alcohol Dependence Questionnaire (SAD-Q) [15]. For the purposes of this study, a binary variable (no dependence vs. any dependence in the past 6 months) was generated (score 0–3 vs. 4+). PTSD was examined for those who reported experiencing a major trauma since age 16 using the Trauma

Screening Questionnaire (TSQ) [16]; a score of six or more indicated a positive screen for current symptoms. Drug dependence in the past year was indicated for those currently using a drug by a positive response to any of five questions based on the Diagnostic Interview Schedule, such as daily use for 2 weeks or more. A binary variable indicating the presence of *any* mental disorder (of those assessed) was created.

Questions on self-harm were included in the self-completion module, asking about lifetime experience of suicidal thoughts, attempts and self-harm. For analysis, a binary variable (any self-harm vs. none) was created. Violent behaviour was also assessed in the self-completion module, using six questions assessing personality disorder [8] and were divided into three categories (0, 1, 2+ behaviours).

Physical health was assessed as the number of health problems experienced both in the last year and since age 16. Conditions included, for example, diabetes, cancer, cardiovascular disease, Alzheimer's disease and epilepsy; in total 22 conditions were asked about. The number of health problems was grouped into binary variables divided around the median. These self-reported variables have been used to assess physical health conditions elsewhere [17]. Perceived health was measured on a five point scale using an item taken from the Short-Form Health Survey (SF-36) which was grouped for analysis into a binary variable in accordance with previous research [18–20].

### Statistical analysis

Cross tabulations and Pearson's  $\chi^2$  tests with Rao and Scott second order corrections for survey design were used to assess the association of each socio-demographic characteristic and outcome with veteran status and with career/conscript status. Associations between time since leaving the services and mental health outcomes were also examined. Odds ratios (OR) with 95% confidence intervals (CI) were obtained with logistic regression. Violent behaviours were investigated with ordinal logistic regression. Models were adjusted for factors associated both with being a veteran and with the outcome being analysed, that were not considered to be on the causal pathway between veteran status and outcome.

All analyses account for weighting, clustering and stratification inherent in the survey design. Weighting accounted for non-response based on the difference between the sample and the mid-census estimates, clusters were postcode sectors, and were stratified on the basis of socio-economic status within regional areas [8]. Analyses were undertaken using the statistical software package, STATA (version MP10.1).

## Results

### Socio-demographic characteristics

Four hundred and eighty-four male national service veterans and 301 male non-veterans were identified from the 2007 Adult Psychiatric Morbidity Survey of England. Based on the years of serviced reported, we estimate that approximately 27 and 34% of these veterans could have been involved in World War II and the Korean War, respectively but that only a small proportion (1.6%) of the veterans were likely to have served at some time during both conflicts.

Compared to non-veterans, national service veterans were older, and more likely to report a major trauma in adulthood (Table 1). Of 184 veterans who reported a major trauma, 24.2% described their most recent one as military-related.

### Health and related behaviours

National service veterans were less likely than non-veterans to be classed as having any mental disorder, and there was some evidence to suggest they were less likely to report any neurotic disorder as the association was of borderline significance (Table 2). There was no difference between veterans and non-veterans in the endorsement of violent or self-harm behaviours (Table 2). Veterans with a military-related trauma reported more violent behaviours than veterans who reported their trauma experience as non-military (adjusted ordinal OR 3.70; 95% CI 1.53, 8.95,  $P = 0.004$ ) (data not shown). No differences in reported physical health since age 16 or in the last year were found (Table 3).

### Length of military service

Career veterans were older than conscripts (Table 4) and there was a borderline association suggesting that they may be less likely to have experienced financial problems (age adjusted OR 0.40; 95% CI 0.16, 1.02,  $P = 0.055$ ). Due to small numbers, only the most prevalent outcomes were assessed; no differences were found between career and conscript veterans for any neurotic (age adjusted OR 1.53; 95% CI 0.59, 3.98,  $P = 0.377$ ) or any mental disorder (age adjusted OR 2.01; 95% CI 0.89, 4.53,  $P = 0.092$ ), nor were any differences identified in violent behaviours (age adjusted OR 1.57; 95% CI 0.90, 2.72,  $P = 0.111$ ), any self-harm behaviour (age adjusted OR 1.12; 95% CI 0.47, 2.64,  $P = 0.798$ ) or any measure of physical health (data not shown). Analyses by time since leaving the services showed no notable associations (data not shown).

**Table 1** Demographic characteristics, social support, experience of trauma and childhood adversity, among male national service veterans and male non-veterans

	Non-veterans ( <i>n</i> = 301)		National service veterans ( <i>n</i> = 484)		<i>P</i> *
	<i>n</i>	%	<i>n</i>	%	
Age group (years)					<0.001
65–74	213	74.3	215	46.4	
75+	88	25.7	269	53.6	
Marital status					0.128
Married/cohabiting	200	78.9	304	75.9	
Single	21	4.7	22	3.1	
Widowed/divorced/separated	80	16.5	158	21.1	
Educational qualifications					0.635
Any qualifications	134	49.5	212	47.7	
No qualifications	150	50.5	256	52.3	
Childhood adversity factors					0.511
0	218	71.0	343	69.9	
1	52	18.7	82	17.0	
2–11	31	10.3	59	13.1	
Perceived social support					0.552
Severe lack ( $\leq 17$ )	26	7.1	43	7.6	
Moderate lack (18–20)	74	25.7	107	22.3	
No lack (21)	195	67.2	330	70.0	
Ever experienced homelessness	5	1.1	8	1.5	0.701
Debt/money problems	11	3.4	20	4.0	0.698
Experienced major trauma since age 16 years	84	27.7	184	37.6	0.010

Percentages are weighted to account for survey design and figures may not add up to totals due to missing data

\* Pearson's  $\chi^2$  with Rao and Scott second order correction for survey data

## Discussion

### Main findings

This is the first time that the community-dwelling population of national service veterans in England has been examined. This study suggests that community-dwelling male veterans aged 65 years and over showed relatively low levels of mental disorder. National service veterans were less likely to have any mental health problem compared to non-veterans. No other differences in mental, behavioural or physical outcomes were found. Those who served for longer than 2 years (career veterans) were older than those who served for two or less years (conscripts), but there were no differences in mental, behavioural or physical outcomes.

### Possible explanations and comparisons with other research

Conscription was compulsory, although certain groups were exempt (for example, clergymen, the 'physically or mentally unfit', government employees working abroad,

miners, agricultural workers, and merchant seamen) leading to fundamental differences between the veteran and non-veteran groups. Also, there were conscientious objectors who refused to serve on political or religious grounds [1]. Therefore, the veteran and non-veteran groups are likely to be different. While the medical fitness thresholds determining eligibility for exemption varied over the conscription period [1], the veteran group would have been mentally and physically fitter than the non-veteran group overall at the time of their call-up. The lack of difference between the two groups may, therefore, be partly explained because the non-veteran group was worse off to start with, and this initial difference would then mask any impact of national service in the veteran group. The non-veteran group could include a proportion of white migrant groups and may differ systematically from the veteran group in ways relating to health.

The 'healthy survivor' effect, whereby the current sample reflects those in the best health having survived to age 65 years, applies to both veteran and non-veteran groups, and may help to explain the lack of service-related ill health reported in other veteran studies carried out years after service [4]. This is supported by reports suggesting

**Table 2** Comparison of mental health outcomes, and violent and self-harm behaviours among male national service veterans and male non-veterans

	Non-veterans ( <i>n</i> = 301)		National service veterans ( <i>n</i> = 484)		Unadjusted OR (95% CI)	Adjusted OR (95% CI) <sup>a</sup>	<i>P</i> <sup>c</sup>
	<i>n</i>	% (95% CI)	<i>n</i>	% (95% CI)			
PTSD (TSQ 6+)	2	0.6 (0.1, 2.7)	2	0.5 (0.1, 1.9)	0.78 (0.10, 5.96)	2.14 (0.10, 45.5)	0.624
Severe alcohol (AUDIT 16+)	6	1.7 (0.7, 3.9)	8	1.4 (0.7, 2.8)	0.79 (0.26, 2.38)	1.43 (0.30, 6.70)	0.650
Alcohol dependence (mild to severe) (SAD-Q)	10	3.7 (1.8, 7.3)	5	1.1 (0.4, 2.6)	0.28 (0.09, 0.89)	0.56 (0.12, 2.60)	0.454
Any drug dependence	0	0	1	0.2 (0.03, 1.7)	N/A	N/A	N/A
Any neurotic disorder	31	9.0 (6.0, 13.2)	25	4.9 (3.3, 7.2)	0.53 (0.29, 0.97)	0.51 (0.26, 1.02)	0.056
Any mental disorder <sup>d</sup>	42	12.8 (9.3, 17.3)	35	6.8 (4.9, 9.5)	0.50 (0.30, 0.83)	0.56 (0.31, 0.99)	0.047
Violent characteristics <sup>e</sup>							
None	231	77.1 (71.5, 81.9)	394	81.7 (77.4, 85.3)			
1	57	18.5 (14.1, 23.8)	72	14.6 (11.5, 18.4)	0.76 (0.53, 1.09) <sup>b</sup>	1.07 (0.72, 1.59) <sup>b</sup>	0.731
2+	13	4.5 (2.6, 7.7)	18	3.7 (2.2, 6.2)			
Any self-harm behaviours <sup>f</sup>	18	5.5 (3.4, 8.8)	30	5.8 (4.0, 8.3)	1.05 (0.56, 1.96)	1.34 (0.67, 2.71)	0.407

Number (*n*), percentages (%), unadjusted and adjusted odds ratios (OR) with 95% confidence intervals (CI) are shown, with non-veterans as reference group (OR = 1.00). Percentages are weighted to account for survey design

<sup>a</sup> Adjusted for age (as a continuous variable); <sup>b</sup> Ordinal logistic regression; <sup>c</sup> Wald test; <sup>d</sup> Includes any neurotic disorder, PTSD, severe alcohol use, any drug dependence and any alcohol dependence; <sup>e</sup> Six possible characteristics, for example: 'Have you ever hit or thrown things at your spouse or partner?', 'Have you been in a physical fight since age 15?', 'Do you often have temper outbursts or get so angry that you lose control?' <sup>f</sup> Responded positively to any of the following: have ever thought of taking their own life, have ever made an attempt to take their life, have ever deliberately harmed themselves in any way but without the intention of killing themselves

**Table 3** Comparison of the total number of health problems (out of a maximum of 22, including cancer diabetes, liver problems, Alzheimer's disease and arthritis) experienced since age 16 and in the past year, and perceived health between male national service veterans and male non-veterans

	Non-veterans ( <i>n</i> = 301)		National service veterans ( <i>n</i> = 484)		Unadjusted OR (95% CI)	Adjusted OR (95% CI) <sup>a</sup>	<i>P</i> <sup>b</sup>
	<i>n</i>	% (95% CI)	<i>n</i>	% (95% CI)			
Health problems since age 16 years							
0–3	176	59.6 (53.8, 65.1)	246	50.6 (46.0, 55.2)	1.44 (1.08, 1.91)	1.28 (0.94, 1.73)	0.113
4+	125	40.4 (34.9, 46.2)	238	49.4 (44.8, 54.0)			
Health problems in last year							
0–4	172	58.5 (52.5, 64.2)	260	53.5 (48.9, 58.1)	1.22 (0.92, 1.64)	1.07 (0.79, 1.46)	0.666
5+	129	41.5 (35.8, 47.5)	224	46.5 (42.0, 51.1)			
Perceived health							
Fair/poor	109	34.3 (29.1, 40.0)	167	33.6 (29.3, 38.2)	0.97 (0.70, 1.34)	0.79 (0.56, 1.11)	0.168

Number (*n*), percentages (%), unadjusted and adjusted odds ratios (OR) with 95% confidence intervals (CI) are shown, with non-veterans as reference group (OR = 1.00). Totals may not add up due to missing data. Percentages are weighted to account for survey design

<sup>a</sup> Adjusted for age (as a continuous variable)

<sup>b</sup> Wald test

that veterans with PTSD or depression are more likely to 'leave the general population' than 'healthy' veterans as a result of natural death, suicide or imprisonment [21, 22]. Another study [23] found that veterans with the most combat experiences (who were also most at risk of experiencing PTSD symptoms) were more likely to have poor physical health, and that a large proportion (59%) of those with heavy combat exposure were chronically ill, or dead.

While this might contribute to an explanation for the current findings, (and of others) [4, 24], it would not clarify why another study found Korean War veterans 50 years after the Korean War had high rates of PTSD compared to a comparable group of non-veterans [6].

Elder and Clipp [2, 3] suggested that the experiences of World War II veterans may have helped to maintain friendships from this time, and to build resilience and

**Table 4** Demographic characteristics, social support, experience of trauma and childhood adversity, among male national service veterans by length of service

	Conscripts ( $\leq 2$ years) ( $n = 236$ )		Career service ( $> 2$ years) ( $n = 234$ )		$P^a$
	$n$	%	$n$	%	
Age group (years)					<0.001
65–74	135	56.8	72	34.3	
75+	101	43.2	162	65.7	
Marital status					0.154
Married/cohabiting	159	78.8	135	72.5	
Single	12	3.4	10	3.0	
Widowed/divorced/separated	65	17.8	89	24.6	
Educational qualifications					0.595
Any qualifications	110	51.3	96	53.8	
No qualifications	123	48.7	126	46.2	
Childhood adversity factors					0.740
0	168	70.0	165	69.9	
1	41	17.8	38	15.8	
2–11	27	12.3	31	14.3	
Perceived social support					0.873
Severe lack ( $\leq 17$ )	22	7.9	21	7.9	
Moderate lack (18–20)	47	20.7	55	22.8	
No lack (21)	166	71.4	155	69.3	
Ever experienced homelessness	2	0.7	6	2.4	0.163
Debt/money problems	13	5.5	6	2.1	0.050
Experienced major trauma since age 16 years	76	32.2	97	40.2	0.097

Percentages are weighted to account for survey design and non-response. Numbers may not add to totals due to missing data

<sup>a</sup> Pearson's  $\chi^2$  test with Rao and Scott second order correction for survey data

internal strength, which may in turn help to ameliorate any adverse impacts of these experiences. Furthermore, the concept of PTSD did not emerge until after the end of national service, in the wake of the Vietnam War, after which many studies reporting ill health among veterans were carried out [25]. At the time of World War II and the Korean War, post-combat disorders were often labelled as 'exhaustion' in the short term or 'psycho- or cardiac neuroses' in the long term [26]. In addition, it is possible that the stigma of mental disorders was greater for this generation, and/or that there was a greater emphasis given to collective resilience as opposed to 'individual distress'. This may be particularly so for military personnel, leading to an underreporting among veterans of both symptoms of distress and experiences of trauma.

Studies estimating the prevalence of PTSD among veterans of the same era differ greatly in methodology, population groups and definitions of PTSD. For example some studies including selected samples of Korean War and World War II veterans have found much higher rates of PTSD, ranging from 18.5 to 65% [27–29] compared to less than 1% in the current study. However, these studies have assessed selected, treatment-seeking samples and/or focused on Prisoner's of War (POWs), so estimates are likely to be higher than the general population of World

War II and Korean War veterans. However, even when studies of Korean and World War II veterans have used non treatment-seeking samples, differences in PTSD rates are large.

When veterans have been identified from samples not selected on the basis of their military record, such as in the current study, the differences between veterans and non-veterans are reduced. For example, Bramsen and Van der Ploeg [30] estimated PTSD rates of 7.1% in a community sample of Dutch World War II era military veterans, compared to 1.5% among civilians of the same age unexposed to combat. Spiro et al. [24] report PTSD rates of less than 1%, similar to those found here, for World War II veterans in a community sample, although rates were higher (3.5%) for those exposed to moderate to heavy combat and no non-veteran group was examined. The most comparable study in terms of respondent selection found no differences in 6-month or lifetime prevalence of overall mental disorder between World War II or Korean War veterans and non-veteran groups of the same age, but they did not measure symptoms of PTSD [4].

The low rates of mental illness found here may also reflect the age of the sample, since research has found a significant improvement in common mental disorder

morbidity among men of retirement age and older (65+ years) than men in younger age groups [31].

### Strengths and limitations

These data come from a nationally representative sample of community-dwelling adults in England and selection into the study was independent of health or veteran status thus reducing bias.

There are limitations to the study. Despite being a large community survey, the numbers of national service veterans and male non-veterans aged over 65 years is small, so differences that may exist between veterans and non-veterans could have been missed due to limited power. The sample included community-dwelling respondents only, thus omitting those veterans requiring care in residential homes, hospitalised, in prison, or homeless. From the 2001 census data [32], an estimated 0.9 and 3.9% of the male English population in the 65–74 and 75+ age groups, respectively live in communal establishments. These institutionalised veterans may be experiencing worse mental or physical health as a result of their service. In addition, no information about pre-service mental health status, service type, service arm, deployment history, combat exposure or military role was available from the survey. Thus, the veteran group may have been a heterogeneous sample in terms of military experience, which may explain the low proportion of trauma in this group. In prior studies of veterans, these factors have been identified as being associated with an elevated risk of developing PTSD and other disorders [5, 6].

The significant finding related to the category of ‘any mental disorder’ should be treated with caution as it is not necessarily clinically relevant. Furthermore, symptoms of neurotic disorder were assessed using the past week as a reference period thus may not be fully reflective of participants’ symptom experiences.

In conclusion, community-dwelling national service veterans are not at greater risk of current adverse mental, physical or behavioural health than population controls.

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and a Trustee of Combat Stress, a UK charity that provides services and support for veterans with mental health problems.

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