Combat exposure and mental health: A comparison of soldiers deployed to Iraq and Afghanistan

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Abstract

To measure the impact of combat on mental health, education, and crime after homecoming, we exploit the randomness of combat exposure among all Danish soldiers deployed on concurrent missions in Iraq and Afghanistan in 2006 and 2007. We use unique data from confidential mission reports to measure individual combat exposure for the deployed soldiers, and explore between-mission and within-mission differences. We also compare soldiers born between 1975 and 1987 with a control group of men born in the same years who are fit for military service but not deployed on an international military mission. Compared to their controls, deployed soldiers show a lower prevalence of mental health problems. While combat exposure has no effect on soldiers' outcomes, we find that soldiers' pre-mission background characteristics are important factors in

explaining their post-deployment use of mental health services and their prevalence of criminal behavior.

Keywords: Military deployment; Combat exposure; Mental health; Homecoming.

JEL Classification: H56; I12; I21.

Highlights:

- Register data for combat exposure and mental health are used in a long follow-up
- Combat exposure is unrelated to soldiers' pre-mission characteristics
- Soldiers have lower prevalence of mental health problems than non-deployed controls
- Combat exposure has no effect on soldiers' outcomes
- Pre-mission use of mental health services is important in explaining post-mission use

1. Introduction

From the end of the war in the Balkans in the late 1990s to the end of the deployment of the International Security Assistance Force in Afghanistan (ISAF) in 2021, millions of military personnel and soldiers were deployed on international missions to conflict areas throughout the world. These soldiers are at risk of developing mental disorders or experiencing difficulties at homecoming (Wilk et al., 2010; Seal et al., 2011, Lyk-Jensen and Pedersen, 2019). Comparing the post-deployment outcomes of these soldiers is difficult because many societal changes may also affect these outcomes. For example, Culp et al. (2013) state that wars not only differ by type of equipment, means of waging war, type of war (e.g., invasion, diffuse, or fault line war), and the recruitment process, but also in terms of the society into which the veterans must be reintegrated.

Comparing the impact of war in different temporal contexts has also been complicated by the implementation of improved health surveillance. Both the 1991 Gulf War and the 2003 invasion of Iraq resulted in different impacts on soldiers' mental health, despite the similarities of these wars in terms of brevity and number of casualties among the coalition forces (Horn et al., 2006). Other studies have analyzed the impact of deployment to Iraq and Afghanistan for US and UK soldiers and they find differences between missions. For example, Hoge et al. (2006) show a one-in-five prevalence of mental health problems for soldiers returning from Iraq and a one-in-ten prevalence for those returning from Afghanistan.

In general, most previous research on mental health among soldiers returning from the Global War on Terrorism (GWOT) includes either self-reported assessments of mental health or short-term

follow-ups (e.g., Hoge et al., 2006; 2008)[1], with very few studies considering other impacts such as education (e.g., Sabia and Skimmyhorn, 2018) or crime (e.g., Anderson and Rees, 2015). Although some studies exploit natural experiments to investigate the effect of combat on mental health (e.g., Cesur et al., 2013; Watts and Wright, 2021), they also rely on self-reported assessments of both mental health and combat exposure for relatively small samples. These studies can therefore be subject to recall bias or justification bias (see e.g., Black et al., 2017), and self-reported assessment of combat exposure may be affected by a respondent's concurrent PTSD symptoms (Koenen et al., 2007; Wilson et al., 2008). No studies to date have included register-based information on mental health and other life outcomes combined with individual measurements of combat exposure from military records for extended follow-up periods.

In this paper, we focus on concurrent Danish missions deployed to Afghanistan (International Security Assistance Force Regional Commando South, ISAF RC(S) missions 1 to 3) and Iraq (Iraq missions 7 to 9) between 2006 and 2007. In this study we had research access to confidential mission reports detailing individual soldier combat exposure and we combine these data with the Danish administrative registers These registers link family members and provide information on both mental health and a large range of socio-demographics for long pre-deployment and post-deployment periods. Denmark is both a NATO member and it suffered the highest deaths per capita

[1] To study the persistence of the effect, Thomas et al. (2010) followed up on US soldiers three and 12 months after returning from combat duty in Iraq. Their study investigated the comorbidity of alcohol abuse or aggressive behavior with the prevalence of PTSD and depression. Their findings showed higher comorbidity with alcohol abuse and aggression and persistent or increased prevalence rates at 12 months than at three months, emphasizing the importance of post-deployment care.

in the ISAF mission in Afghanistan[2]. Denmark deployed about 9,000 soldiers to Afghanistan and Iraq in 2003-2012. Moreover, with no financial barriers to health care access, Denmark is a valuable case study, as both soldiers and civilians have free access to general practitioners (GPs), specialists, and hospitals, and prescription drugs are subsidized.

To disentangle the impact of the type of mission from changes in the institutional context in particular, and in society in general, we study soldiers deployed during the same period to different GWOT peace-enforcing missions. By exploiting a natural experiment, in which combat exposure is as good as randomly distributed among the soldiers, we study the impact of combat exposure on their later life outcomes in general and their post-deployment mental health outcomes in particular.

As investigating the relationship between deployment, combat exposure, and mental health is also complicated by positive selection into the military, whereby selected individuals have to satisfy both physical and psychological criteria, we construct a control group of men of similar age and fit for military service but not deployed on an international military mission. In this way, we can compare education, crime levels, and the utilization of the mental health services (MHS) among both soldiers and civilians, and explore the resilience of the deployed soldiers.

Our results confirm that, conditional on the specific mission, unit type and year of birth of the soldiers, combat exposure is as good as randomly distributed among the deployed soldiers. Moreover, we find that soldiers' pre-mission background characteristics are important factors in explaining their post-deployment use of MHS and the incidence of their being charged with or

[2] "Denmark lost the most troops in Afghanistan," February 15, 2009, *Politiken* (in Danish). Retrieved 1 March 2022. https://politiken.dk/udland/art4788077/Danmark-mister-flest-soldater-i-Afghanistan.

convicted of a crime. However, we find no effect of combat exposure on the use of MHS or other later-life outcomes. Moreover, compared to their controls, deployed soldiers show a lower prevalence of mental health problems.

We make four important contributions to the literature on the effects of combat service in the GWOT. First, we have access to unique data about soldiers' individual combat exposure, thereby avoiding possible recall bias or justification bias. Second, because combat exposure is unrelated to the soldiers' characteristics and therefore as good as randomly distributed among the soldiers, we can obtain credible causal estimates about the effects of combat exposure. Third, we can compare the effects of combat exposure for concurrent missions, allowing us to disentangle the impact of the mission from changes in the institutional context. Fourth, given the Danish registers, we can retrieve both pre-mission and post-mission information and follow these soldiers and their controls for several years after homecoming. We can compare their outcomes in terms of use of the MHS, purchase of mental health medicine (MHM), suicide attempts, and death (during and after mission). We can also examine education and crime outcomes after homecoming as other possible indicators of the soldiers' well-being.

The paper proceeds as follows. Section 2 explains the institutional setting and access to health care in Denmark. Section 3 describes the data we use, and Section 4 presents our empirical approach. Section 5 gives the results, and Section 6 concludes.

2 Background

2.1 The Danish military system in the 2000s

The Danish military system is characterized by two pillars: limited conscription and deployable professionals (Heurlin, 2006). Figure 1 illustrates the general recruitment principles for the period studied. All young men are called to an Armed Forces Day (AFD) when they turn 18; at the AFD, their fitness for service is evaluated.[3] Those deemed fit for service (FFS) can either volunteer or be conscripted, based on random selection (lottery conscription). The recruits then undergo basic Army training (*Hærens Basisuddannelse*, HBU) for four months. After completing HBU, they can apply for Army Reaction Forces Training (*Hærens Reaktionsstyrke Uddannelse*, HRU), which lasts eight months. During HBU, military personnel evaluate the volunteers or conscripts who want to continue to HRU, to determine whether they react as expected in specific situations and whether they are in good physical condition (informal screening). The intensity and extent of the screening differs according to the different groups of personnel (e.g., officers, sergeants or privates). Whereas HRU prepares soldiers for deployment to international military missions as privates, future officers usually bypass HRU by going straight to a military college. Before being deployed on an international mission (which last six months on average), soldiers will have had at least 12 months of military training.

Deployed soldiers come either from HRU or are professional soldiers from the Army Standing Reaction Force (*Haerens Staaende ReaktionsStyrke*, SRS). While HRU personnel are volunteers with short-term contracts, SRS soldiers are professional soldiers with longer-term contracts. Importantly, only personnel who volunteer for deployment can be deployed. Moreover, regardless of their

[3] For more details about the selection process, see, e.g., Lyk-Jensen (2018).

training and contract with the Danish Armed Forces, all soldiers deployed on a mission must participate in mission-oriented training before departure.

[FIGURE 1 ABOUT HERE]

2.2 The missions

The wars in Iraq and Afghanistan were both characterized as "diffuse wars," meaning a war without fronts, where the enemy is often hidden among civilians and the threats are diffuse. Moreover, these wars also entailed “asymmetric warfare”, with enemies of inferior strength employing remotely detonated improvised explosive devices (IEDs), roadside bombs, and mines against allied forces (Buffaloe, 2006; Wallace, 2009). Another characteristic of such wars is the nature of injuries, with lower mortality rates, as soldiers today can survive serious injuries (Cohen et al., 2010).

Danish participation in the wars in Afghanistan and Iraq

Denmark’s participation in the war in Afghanistan began in 2002, and her participation in Iraq commenced in 2003. In 2006-2007, this paper’s period of interest, the first missions to Helmand Province in Afghanistan began for ISAF RC(S) missions 1 to 3 (see event timeline for the ISAF missions in Appendix Table A.1). The last missions to Iraq, missions 7 to 9, began in the same period (see event timeline for Iraq in Appendix Table A.2).

During 2006-2007, Denmark increased its military presence in and financial contribution to the war in Afghanistan. In Iraq, Denmark contributed to international efforts to train and equip the new Iraqi security forces. From 2006, the Danish contingent in Iraq gradually decreased as the Danish

presence in Afghanistan increased, and in 2007, the Danish force in Iraq was sent home.[4] The missions in Afghanistan involved mostly professional soldiers (on long-term contracts), while missions in Iraq mostly involved some of the first HRU soldiers. As these six missions to Iraq and Afghanistan were concurrent, they constitute an excellent comparison.

2.3 The Danish health care system

While the Danish Armed Forces operate a Military Health System, it is not an alternative parallel to the civilian health system (National Health Service, NHS). The Military Health System mainly ensures that soldiers are fit for deployment and provides medical support during deployment, whereas access to hospital treatment is only possible through the NHS.[5] Soldiers are treated in the same hospitals as civilians and have access to the same general practitioners (GPs) and specialists.[6] In

[4] The Danish forces in Iraq: Personal Protection Detachment, Baghdad (2003-2010), NATO Training Mission, Baghdad (2005-2007); Basra Province (2003-2007). Denmark deployed soldiers to the Operation Iraqi Freedom.

[5] During the mission, the Danish military used small group processes to give soldiers the opportunity to talk about critical events (defusing). Debriefing with a psychologist is also common after violent operations and always in connection with a death on a mission. While returning soldiers are examined by the Military Health System, only wounded soldiers are given a follow-up examination. One goal of the health check for returning soldiers is to discover whether the soldiers have work-related injuries that may make them eligible for financial compensation. Soldiers also answer a non-anonymous questionnaire to detect those at risk of developing mental health problems. Different support programs also exist for the soldiers and their families (for further details, see chapter 5 in Lyk-Jensen and Pedersen, 2019).

[6] In contrast to many other NATO countries, many Danish soldiers have short-term contracts and leave the military after one or two deployments. The Military Health Service offers free psychological help from military or private psychologists, even after the soldier has left the military system. However, the program was not in widespread use at the time the missions under study were deployed. Military psychologists cannot prescribe medicine, nor can they refer soldiers to psychiatric hospitals.

2006-2007, when the missions under analysis took place, Danish soldiers did not have special health insurance, nor was the NHS focused on, or particularly aware of, soldiers' mental health issues.[7] Soldiers can be formally recorded as having a psychiatric diagnosis, either as acute emergency cases or through contacts with hospitals (either through admissions or as day patients) following referrals from GPs, specialists, or military doctors. Prescription drugs are common and heavily subsidized in Denmark. Moreover, all people living in Denmark have free access to a GP. Using the Danish health registers, we can avoid any possible underestimation of mental health problems due to self-reporting, recall bias, fear of damage to career prospects, or other barriers to health care access that might occur in other institutional contexts. The main limitation of register data is that we can only observe those registered with a diagnosis.

3 Data

We have access to administrative records from the Danish Ministry of Defence on the full population of deployed soldiers and recruitment tests (ability and physical tests) for both the deployed soldiers and the non-deployed soldiers. Our information on soldiers includes the number of missions; the place, date, and type of mission; the soldiers' former rank; and, for more than 45% of the soldiers (the younger ones, those born after 1975), their recruitment tests.

Furthermore, we have access to individual combat exposure records for about 2,000 deployed soldiers taking part in six peace-enforcing missions in Afghanistan and Iraq in 2006-2007. We

[7] The Danish participation in international military missions and the changes in type of mission (from peace-keeping to peace-enforcing) occurred rapidly. The Danish veterans' policy on the consequences of deployment on soldiers' mental health was first implemented in October 2010.

measure the level of combat exposure from special events (SEs) collected from military archives. These SEs include both combat events and non-combat events. In this paper we focus on combat events. These include ambush, improvised explosive devices (IED), and indirect fire attack. Each event is characterized by a date, a place, and the units or the persons directly exposed to it.[8]

Thanks to the unique Danish civil registration number for each individual in Denmark, military records are linked to other Statistics Denmark administrative registers that contain information on family composition and demographic characteristics such as education, crime, and mental health.

To measure the utilization of MHS among soldiers, , we use objective measurements of mental health from the Danish Psychiatric Central Research Register (Munk-Jørgensen et al., 1997), as also done in Lyk-Jensen and Pedersen (2019) and Lyk-Jensen et al. (2016). This administrative register (Munk-Jørgensen et al., 1997) also contains information about the type of diagnoses. In addition, we use the Danish National Health Service Register (Schmidt et al., 2015), which provides information on health-insurance-subsidized treatment from psychiatrists and psychologists (see also Olivarius et al., 2011, and Sahl et al., 2011).

To examine individuals' purchase of mental health medication (MHM) [9] as another indicator of psychological problems, we use data from the Danish National Prescription Registry (*Lægemiddeldatabasen*), which classifies prescription medicine according to the Anatomical Therapeutic Chemical Classification (ATC) system. It contains data on purchase of prescription drugs

[8] See Appendix B for more details about data collection and the construction of the individual combat exposure.
[9] We use the following five groups of mental health medicine with their ATC codes in parentheses: antipsychotics (N05A), anxiolytics (N05B), hypnotics and sedatives (N05C), antidepressants (N06A), and psychostimulants (N06B).

in Denmark from 1995 (see Wallach et al., 2011). We also investigate the purchase of opioids (N02A).

Moreover, we examine suicide attempts and early death after homecoming. In Denmark, a suicide attempt can be identified from the National Patient Register (LPR) and the Psychiatric Central Research Register. We find suicide attempts in these two registers either by using the International Classification for Diseases (ICD)-10 codes X60-X84 or by finding that the reason for contacting the hospital is coded as a suicide attempt or self-harm.[10]

The data on criminal charges and convictions comes from the Central Crime Register, which collects all data on criminal court proceedings.

For each year and period we consider in the analysis, we look at whether the person has received a psychiatric diagnosis, has purchased MHM, has been registered with a suicide attempt or has been charged with or convicted of a crime.

3.1 Descriptive statistics of the samples

In this section, we (a) compare soldiers deployed on Iraq missions with soldiers deployed on Afghanistan missions and (b) compare the subsample of the soldiers deployed on Iraq missions and the soldiers deployed on Afghanistan missions and born between 1975 and 1987 with a control group of men born in the same years and deemed fit for service at the AFD.

[10] See Lynge et al. (2011) for a description of the LPR register, which also includes somatic disease. As the episodes of suicide attempts are under-reported in the registers (Nordentoft, 2007), we follow the definition of suicide attempts as reported in Gasse, et al., (2018), Table 1.

The population of deployed soldiers before the first mission in 2006-2007

While our original population consists of 2,176 soldiers, in the analyses we focus only on the 2,091 male soldiers deployed to ISAF RC(S) 1-3 or IRAQ 7-9 during 2006-2007.[11] In some of the analyses, we will exclude those who died during the mission, 12 persons in all, and use a sample of 2,079 individuals.

[TABLE 1 ABOUT HERE]

Table 1 shows the distribution of soldiers by sex for the missions to Iraq and Afghanistan.

[TABLE 2 ABOUT HERE]

Table 2 further splits the six missions (3 to Afghanistan and 3 to Iraq) by deployment experience (first-timers vs. previously deployed). The table clearly shows that the first missions to ISAF RC(S) consisted of professionals and previously deployed soldiers, while the last missions to Iraq consisted primarily of first-timers. First-timers to both missions are more likely to be HRU soldiers. For the selected ISAF missions, the average share of previously deployed soldiers is 65%, while for the selected Iraq missions it is 37%.

[TABLE 3 ABOUT HERE]

Comparisons of the sociodemographic and military characteristics of the soldiers before their mission in Table 3 show that the soldiers have very similar sociodemographic profiles. The main differences are driven by the soldiers' experience, as represented by variables such as age or education and reflected in the first missions to ISAF RC(S) consisting of more experienced and older

[11] We excluded the 85 women because they represent too small a number for us to make valid inferences in our analyses. For comparison, of the US military personnel serving in the GWOT in Iraq and Afghanistan, 89% were men and 11% women (DOD, 2007).

soldiers. In contrast, the last missions to Iraq principally consisted of HRU soldiers, who were younger, with many of them first-timers. Table 3 also shows that the missions to Iraq had more soldiers from combat units than missions to Afghanistan. [12]

[TABLE 4 ABOUT HERE]

In Table 4, we focus on the sociodemographic profiles and family background of the soldiers deployed on the two missions. [13] Soldiers deployed on Iraq missions had a relatively higher Armed Forces Qualification Test (AFQT) score[14] and birth weight, and on average grew up in a family with a higher household income than those deployed to the ISAF missions. Because of data availability (since 1980 for most of the background variables and since 1994 for the AFD variables), and because soldiers from the ISAF missions are older, we have more cases with missing information about AFQT and birth weight for soldiers from the ISAF missions (missing for 48% in the ISAF missions vs. 29% in the Iraq missions).

[12] According to the US Institute of Medicine (2013), about 15% of the US soldiers deployed to Iraq and Afghanistan were younger than 25, 59% were married, 49% had dependent children, and more than 60% had an education level of high school or less. On average the US soldiers were deployed on 1.72 missions. Of those US soldiers deployed, 57% were deployed only once and 43% more than once. The average deployment length for all branches and components was 7.7 months.

[13] For comparison, of the US military personnel serving in the GWOT in Iraq and Afghanistan, over 40% of active-component officers were over 35 years old, compared to 15% of active-component enlisted personnel; 55% were married, and 43% had children (two on average) (DOD, 2007).

[14] The Danish AFQT has been used since 1957. The score is the number of correct answers out of the 78 items. See Teasdale (2009) for more details.

Descriptive statistics: Soldiers deployed and FFS men born 1975-1987

Finally, we compare the younger soldiers with non-deployed controls born in the same year, deemed fit for service (FFS) at the AFD, and with no missing information for the AFQT. In other words, for each soldier, we randomly select five non-deployed FFS born in the same year to ensure no differences in the average age for the two groups. Because of data availability, we select the birth cohort 1975-1987, aged 19-31 in 2006. In Table 5, we compare soldiers from both missions with their controls.[15]

[TABLE 5 ABOUT HERE]

Table 5 shows that the soldiers from these missions, born 1975-1987, have similar AFQT scores and height as their control group. We find significant differences in the type of family (number of half-siblings and mother married when the soldier was 15 years old). The soldiers in general come from families with slightly lower household income and are marginally more likely to have been placed in out-of-home care or to have been subject to preventive social measures in their childhood. Column (4) in Table 5 shows the characteristics of all FFS men born between 1975 and 1987, a total of 189,651 individuals who have never been deployed.

[15] We obtain similar results, as in Table 4, i.e. soldiers born 1976-1987 and deployed on ISAF and Iraq missions have the same differences in profile as in the full sample. In other words, soldiers deployed to Iraq are younger, with higher family household income, higher birth weight, and higher AFQT.

3.2 The outcomes of interest

This subsection presents the outcomes of interest. We divide these outcomes into five thematic areas: family, education, mental health, employment, and crime. Table 6 shows the outcomes of interest measured two to 10 years after deployment for all soldiers deployed to the selected ISAF and Iraq missions, while Tables 7 and 8 compare the soldiers born between 1975 and1987 with their controls for the following periods: 2006-2008; 2006-2011 and 2006-2016.

[TABLE 6 ABOUT HERE]

Table 6 also contains variables indicating the soldiers' mental health status. We show whether the soldier has had at least one contact with a hospital or a psychologist, and whether the soldier has purchased MHM or opioids (dummies variables). Ten years after the missions, soldiers are often single again (29%); they have more education than at the beginning of the missions (37%), with an average of 13.6 years of schooling (33% have a college degree); and 45% are still in the Army, while only 2% are unemployed. Ten years after the missions, slightly more than 20% have mental health issues, 5% have other health problems, and 21% have purchased opioids.

[TABLE 7 ABOUT HERE]

In Table 7, we compare soldiers with their FFS controls of the same age for specific periods after 2006. Soldiers have a higher mortality rate than their controls, are more likely to have become separated (from their partner) since 2006 (but also more likely to be in a couple if they were not in a couple in 2006), and have fewer children on average. Soldiers are less likely to be unemployed, charged with committing crimes, or have mental health problems than their not-deployed controls. However, soldiers are more likely to have purchased opioids ten years after deployment. These opioid purchases could be because of chronic pain due to combat-related and non-combat-related

injuries during service and not necessarily represent an abuse of opioids, as investigated by Cesur et al. (2019) for U.S. soldiers.[16]

As to education measured as years of schooling and compared with their controls, the soldiers have on average one year less of schooling, measured 10 years after deployment. One possible explanation for this is that the length of deployment delays soldiers' education plans. Moreover, despite a similar AFQT, soldiers are less likely to enroll in higher education (e.g. college) than their controls.

[TABLE 8 ABOUT HERE]

Table 8 compares some selected outcomes measured before deployment (i.e. before 2006) and after 2006 for soldiers born between 1975 and 1987 and their controls.

Table 8 shows that before their missions, soldiers have fewer mental health diagnoses, lower purchase of MHM or opioids, and fewer contacts with psychologists. Soldiers also have lower rates for being charged with crimes. However, they show a similar prevalence for selected diagnoses (e.g. accidents, alcohol and drug abuse), and suicide attempts.

[16] Cesur et al. (2019) use the National Longitudinal Study of Adolescent and Adult Health (Add Health). Their analysis includes 482 male respondents from Add Health who reported active-duty military service and were deployed overseas during the period of the Iraq and Afghanistan wars. To establish opioid abuse, they use responses to the following survey item: "[Have] you ever taken pain killers that were not prescribed for you, taken [them] in larger amounts than prescribed, more often than prescribed, for longer periods than prescribed, or that you took only for the feeling or experience they caused? Although the question cannot provide the exact timing relative to deployments, they use the longitudinal nature of the data to identify illicit substance use prior to enlistment.

Furthermore, the lower criminality rate after 2006 is likely to be the result of further military screening before deployment, because young men sentenced to 30 days or more in prison are not allowed to serve, for example.[17]

After deployment, soldiers' purchase of opioids increases compared to their controls, while soldiers have similar or lower rates than their controls for mental health problems as measured by diagnoses, contacts with psychologists, or purchase of MHM, and identical rates for suicide attempts. In contrast, O'Gorman reports that, since the war in Afghanistan began, more US military service personnel have lost their lives by suicide than in combat operations.[18]

3.3 Combat exposure and balance test

In this section, we check whether we can identify any noteworthy differences in soldiers' characteristics before exposure to combat. In the analyses that follow, we use a measure of combat intensity (standardized measure of the total number of combat events for all the soldiers' missions, with mean equal to zero and standard deviation equal to one) at the individual level and dummy variables for wounded and repatriated soldiers.

[TABLE 9 ABOUT HERE]

[17] Article 4 of the Danish Law of Military Service states that if a risk of disciplinary problems or impairment of service exists, an individual who has been sentenced to 30 or more days in prison is likely to be excluded from military service.

[18] O'Gorman, K., 2012, August. Army Reports Record High Suicides in July. Iraq and Afghanistan Veterans of America, available at https://www.huffpost.com/entry/army-suicides-veterans_b_1797199.

Table 9 shows that, at unit level, the ISAF missions have higher combat exposure than the Iraq missions (5.25 combat events per unit vs. 2.81). For Iraq, the number of special events (SEs) for Danish military units is 92, with 60 combat events, while the number of SEs for ISAF missions is 61, with 55 combat events.

Summarizing the combat exposure at mission level, Figure 2 shows higher combat intensity for the ISAF missions at aggregate level.

[FIGURE 2 ABOUT HERE]

We now check whether combat exposure is related to soldiers' pre-mission characteristics. For those assigning soldiers to daily missions, it is very difficult to forecast the risk of the soldiers being involved in an exchange of shots or a rocket attack, or the intensity of this exposure. Because of the unpredictability of the diffuse war, we can assume that combat exposure in the form of ambush, IED, or an exchange of shots is as good as randomly distributed within and between units, and therefore we expect combat exposure to be unrelated to the soldiers' characteristics. Moreover, soldiers are not on duty every day, and both daily missions and leave schedules are constantly rotated among the troops. All these factors make the risk of exposure to intense combat—resulting in soldiers being KIA, wounded, or repatriated—exogenous. We test whether combat intensity is independent of the soldiers' background characteristics by regressing the standardized measure of combat intensity (mean equal to zero and standard deviation equal to one) on the soldiers' characteristics measured before deployment or at deployment.

In Table 10, we examine the relationship between combat intensity and individual and family characteristics when controlling for dummies for year of birth, specific mission and types of unit. Table 10 confirms that combat intensity is as good as random. The F-stat p-value in Table 10 is larger

than 0.20, showing that neither the soldiers' characteristics nor their background can explain combat intensity.[19]

[TABLE 10 ABOUT HERE]

4 Empirical Strategy

As previously mentioned, our key explanatory variable, $Combat\ intensity$, is an individual measure of combat intensity for the soldier *i*. We have aggregated all events related to combat and standardized the accumulated number of combat events for these soldiers.[20]

We can also control for whether the soldier was wounded or repatriated. In the analysis, we exclude those who were KIA or died during deployment.[21]

As shown in Table 10, we use the fact that combat intensity is as good as randomly distributed when estimating equation (1):

$$Y_i = \delta_0 + Y_{i-before} + \delta_1 Combat\ intensity_i + \delta_2 M_i + \delta_3 X_i + \varepsilon_i \text{ , (1)}$$

with Y_i as an indicator for post-deployment outcomes, such as education, being charged with committing a crime, or the use of MHS by individual *i* after deployment.

[19] Combat exposure is also balanced on pre-mission characteristics when we use combat as a dummy variable 1/0 (not shown).

[20] We use the combat intensity for all the missions in which these soldiers were involved. The results are unchanged if we only include the six selected missions.

[21] Six persons for the selected missions and six persons in the later missions, twelve persons in all.

The variable $Y_{i-before}$ controls for the incidence of the outcome of interest, e.g. use of MHS, before the first mission of interest.

The vector M_i denotes individual military variables measured at the first mission of interest for rank, type of unit, previous experience (first-timer, previously deployed), and dummies for each mission.

The vector X_i denotes socio-demographic variables at pre-deployment, such as age, education, and family background.

Given that first-timers could be assigned to a mission in either Iraq or Afghanistan, we can compare the impact of higher combat exposure during deployment on experienced mission soldiers with the lower exposure for less experienced mission soldiers.

To see whether the share of experienced soldiers is important for the studied outcomes, we construct a variable *Percentage of experienced soldiers*, which remains constant within the specific mission and is computed as the ratio of previously deployed soldiers to the total number of deployed soldiers.

6 Results

This section presents our results for the six concurrent peace-enforcing missions. In the regression analyses, we exclude the twelve soldiers who died during the missions.[22]

[22] Since the missions in 2006-2007, 28 soldiers have died (last update 2020) after deployment, including the six who were killed in action (KIA) in subsequent missions. The main cause of death for the non-KIA soldiers was natural (as opposed to accident or suicide), and the average age at death was about 40 years.

6.2 Combat intensity and post-deployment mental health

We start by investigating the impact of combat intensity on our main outcome, i.e. soldiers' mental health. As suggested by the literature about self-reported combat exposure (e.g. Cesur et al, 2013), we would expect that combat intensity has a negative impact on soldiers' mental health and we presuppose a positive coefficient for the variable combat intensity

[TABLE 11 ABOUT HERE]

To investigate the effect of combat intensity on the use of MHS (i.e., diagnoses, contacts with hospitals, purchase of MHM, contacts with psychologists), we need to follow soldiers during a sufficiently long period after their last mission (up to six years). Indeed, Møller et al. (2020) show that more than four years after deployment can elapse before the veterans begin to use MHS.

Hougsnæs et al. (2017) report a low prevalence of mental health problems for Norwegian soldiers four years after deployment (5.1%). They also report that this prevalence is lower than that for the male population in Oslo in general. This finding is likely hiding a "healthy warrior effect" due to the process of diagnosing psychiatric disorders early during the initial months of training, thereby sorting out psychologically unfit personnel (Larson et al., 2008). However, Hougsnæs et al. (2017) report that, compared to the Danish soldiers, Norwegian soldiers had fewer and briefer deployments and were less exposed to combat.

In contrast to Hougsnæs et al. (2017), our measure of mental health is based on administrative records and includes purchase of MHM. Nevertheless, when comparing deployed soldiers with FFS men (see Tables 8 and 9), we also find a higher prevalence of mental problems among the control group.

Table 11 shows that combat intensity has no significant impact on purchase of MHM measured six years or more after a soldier's last deployment. As expected, the coefficients are positive, but small and not statistically significant. The main drivers explaining purchase of MHM are low level of education, previous mental health problems, and previous criminal charges.

We also find that previous deployment has no effect (the variable for first-timers is not significant). We also split the sample into first-timers and previously deployed soldiers (not shown). The main difference between the two separate regressions is that the type of unit in which the soldier is deployed matters for the first-timers. First-timer soldiers deployed in staff units[23] are more likely to purchase MHM after deployment. The separate regression for first-timers also shows that (a) combat intensity is insignificant and does not explain the purchase of MHM and (b) soldiers with pre-mission college and high school education are less likely to purchase MHM afterwards.

Soldiers' background (being placed in out-of-home care during childhood or having been registered with a charge of criminal behavior or psychiatric contact before the mission) increases the post-deployment purchase of MHM. We obtained similar results for the sub-sample of the previously deployed soldiers, although in this case the type of unit does not explain the post-deployment purchase of MHM. However, we find that, surprisingly, combat unit soldiers purchase less MHM than staff personnel, at a 10% significance level (see column 2 in Table 11), possibly reflecting differences in screening or training.

[23] Staff unit includes officers and civilian staff who serve the commander of a division or other large military unit in their command and control through planning, analysis, and information gathering. Their functions include relaying, coordinating, and supervising the execution of the plans and orders. They are organized into functional groups, e.g. administration, logistics, operations, intelligence, training.

In Table 12, the dependent variable includes the use of mental health services: diagnosis and contact with hospitals or other health professionals and MHM purchase. The results are close to those presented in Table 11, and show that a soldier's pre-mission background characteristics (family background, pre-mission crime, and use of MHS) are the most important factors in explaining their post-deployment outcomes (in this case, their post-deployment use of MHS).[24] As in Table 11, combat intensity does not explain the use of MHS. Moreover, we find a significantly lower use of MHS among soldiers who served in combat units.

[TABLE 12 ABOUT HERE]

These results stand in contrast to those of Cesur et al. (2013), who found that those who experienced deployment to combat zones had a higher risk of PTSD than those deployed to non-combat zones. In our setting, all soldiers are deployed to the same combat zone and we compare those exposed to combat to those not exposed to combat. So one possible explanation could be that we have a more objective measure of combat (not affected by PTSD symptoms) and a better control group, as all the soldiers are deployed to the same combat zone and we exploit the fact that combat intensity is unrelated to the soldiers' background and is therefore as good as random conditional on the soldier's type of unit and rank. Moreover, as we use administrative register data for both combat exposure and mental health measures, our data are not subject to either recall bias or justification bias (see e.g., Black et al., 2017), nor are they biased by the respondent's concurrent PTSD symptoms, as the severity of these symptoms could inflate the dose-response relationship between combat exposure and PTSD (Koenen et al., 2007; Wilson et al., 2008)

[24] Lyk-Jensen et al., (2016) also show that pre-deployment psychiatric diagnosis was a risk factor for post-deployment diagnoses.

6.3 Combat intensity and education after homecoming

In this subsection, we use the randomness of our combat measure to investigate whether soldiers obtain a higher level of education after their last missions. We construct our dependent variable as a dummy indicating whether the level of education or the years of schooling increase for a period of up to six years after their last mission.

[TABLE 13 ABOUT HERE]

Table 13 shows that six years after their last deployment, the soldiers have obtained a higher level of education than prior to their deployment. However, when we compare this outcome with the control group born between 1975 and 1987, we find that the soldiers end with fewer years of schooling or less college (see Table 8). The post-deployment higher level of education is explained by the age at mission start, the pre-deployment level of education, and the family background (parent education). However, we find no significant impact of pre-measures for mental health or crime. Moreover, combat intensity has no impact on explaining post-deployment level of education.

Sabia and Skimmyhorn (2018) reported negative effects on education among homecoming veterans leaving the military, particularly for those exposed to casualties within their own units. For example, they found that these veterans had a lower probability of obtaining a bachelor's degree after homecoming. In contrast, our results show that combat exposure has no effect on soldiers' education after homecoming.

6.4 Combat intensity and post-deployment crime

We now explore the possible effect of combat intensity on post-deployment crime. As the dependent variable, we use preliminary charges for criminal behavior, including violent, property, sexual, and other types of crime, but excluding traffic offenses.

[TABLE 14 ABOUT HERE]

Table 14 shows that the coefficient of *combat intensity* is positive and small, but not statistically significant. We find that combat intensity has no impact on crime measured at any year after the soldiers' deployment. Age at deployment, family background, and previous criminal convictions are the main drivers for post-deployment crime. We also find that pre-measures for mental health and crime, along with family background and education, are the most significant contributors to explaining criminal activity after homecoming. Military personnel (sergeants, officers and privates) compared to other personnel (e.g., civilians, priests) are more likely to commit crime after their deployment. Furthermore, we find that having a high percentage of experienced soldiers in a unit during deployment decreases crime at the 10% significance level. We have previously shown that soldiers born between 1975 and 1987, who are among the youngest at deployment, are less likely to commit post-deployment crime than their controls (see Table 8).[25] We obtain similar results when we restrict the regression to two years after the deployment or use convictions instead of charges.

Our results are in line with Anderson and Rees (2015), who concluded that soldiers returning from combat did not represent a threat to public safety. They studied US units repeatedly deployed during the Iraq War, and exploited the exogenous changes in troop levels to measure the impact on violent crime in the area to which the soldiers return.

6.5 Deployment, combat exposure, and other outcomes

In this section, we analyze the association between deployment and our outcomes for the population of deployed soldiers born between 1976 and 1987 and their controls. Using this sample,

[25] An incapacitation effect for the soldiers while deployed cannot be excluded (see e.g. Rohlfs, 2010).

we conduct equation (1) with deployment instead of combat intensity as our key explanatory variable.[26] As deployment is not random, we can only study associations.

Table 15 shows our results for the following outcomes: MHM, MHS, more education, and crime measured for the period 2006-2016, i.e. about ten years after the start of the missions.

The results confirm our simple descriptive statistics in Section 3.1 when we compare the deployed soldiers with their controls, and show that deployment is associated with a lower increase in education level for the deployed soldiers and especially a lower level of criminality measured with a dummy for criminal charges. Table 15 also shows that being registered with crime or use of MHS before 2006 has a negative impact on all outcomes, with more use of MHS and MHM, more criminality and less education. Moreover, AFQT scores are associated with lower levels of MHS use, MHM purchase, criminality, and higher achieved level of education.

7 Conclusion

Based on data from administrative registers covering several years after the soldiers' deployment, this paper compares several outcomes after homecoming for Danish soldiers from concurrent missions to Iraq and Afghanistan in 2006 and 2007. We use mission-related combat exposure during the GWOT because it is unrelated to soldiers' pre-mission characteristics and therefore as good as randomly distributed among the deployed soldiers. For soldiers born between 1975 and 1987, we construct a control group of men who were fit for military service and born in the same years but who have not been on an international military mission.

[26] Appendix Table A.3 shows the results for a combination of combat exposure and deployment and the results are very similar.

The main strength of the paper is that we conduct our comparisons in an identical institutional context, with high-quality data for long pre-deployment and post-deployment periods. We also have access to unique data indicating the degree of combat exposure. Our data are not subject to recall bias or justification bias (see e.g. Black et al., 2017) or affected by the respondent's concurrent PTSD symptoms (Koenen et al., 2007; Wilson et al., 2008). Moreover, even though our findings are specific to these missions and time, they should nonetheless help disentangle the effects of the context from the combat exposure.

While we find significant differences in the profile of soldiers before their missions, we find no significant differences after homecoming between the two different destinations (Iraq and Afghanistan) in the same period. Our measure of combat intensity has no significant impact on the use of MHS, criminal behavior, or education after homecoming. Instead, the main results are that we find significant correlations for pre-mission use of the MHS and previous criminal behavior when we include these pre-mission factors as explanatory variables. Furthermore, having spent part of their childhood in out-of-home care (likely indicating lower social support) has a significant impact on the soldiers' use of MHS and criminal behavior after homecoming. Finally, education after homecoming is significantly related to both family background and age.

From a policy perspective, both in relation to future composition of teams for military deployment, and in relation to healthcare surveillance of deployed soldiers, our findings show that the percentage of experienced soldiers may also have an impact on soldiers' later-life outcomes by possibly decreasing the incidence of crime, and soldiers from non-combat units may be more at risk of using MHS after homecoming. Further research should focus on the composition of the team and on health care surveillance of all deployed soldiers, regardless of their type of unit.

Declaration of competing interest

The authors declare that they have no conflict of interest.

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TABLES

Table 1 SAMPLE CONSTRUCTION

	All	IRAQ 7-9	ISAF1-3
Female	85	57	28
Male	2,091	1,207	884
All soldiers from the staff list (with valid personal number)	2,176	1,264	912

Note: 19 (male) soldiers have been deployed to both missions in the period. Figures show the first mission.

Table 2 SHARE OF FIRST-TIMERS AND PREVIOUSLY DEPLOYED BY MISSION. NUMBERS, AND PERCENT

	First-timers		Previously deployed		Total	
	Number	Percent	Number	Percent	Number	Percent
Iraq 7	264	56	210	44	474	100
Iraq 8	256	68	123	32	379	100
Iraq 9	235	66	119	34	354	100
Iraq 7-9	*755*	*63*	*452*	*37*	*1207*	*100*
ISAF RC(S) 1	74	27	202	73	276	100
ISAF RC(S) 2	119	41	173	59	292	100
ISAF RC(S) 3	119	38	197	62	316	100
ISAF RC(S) 1-3	*312*	*35*	*572*	*65*	*884*	*100*
Total	1,067	51	1,024	49	2,091	100

TABLE 3 SUMMARY STATISTICS – DESCRIPTIVES OF THE SOLDIERS DEPLOYED IN 2006-2007 TO IRAQ MISSIONS 7-9 AND ISAF MISSIONS RC(S) 1-3 MEASURED BEFORE THE FIRST MISSION IN 2006-2007

	(1) Iraq 7-9		(2) ISAF 1-3		(1)-(2) Mean	
	Mean	ST. Dev.	Mean	ST. Dev.	diff.	p-value
Single	0.712	0.453	0.604	0.489	0.108***	0.000
With college education	0.136	0.343	0.154	0.361	-0.018	0.251
With high school (HS) education	0.482	0.500	0.481	0.500	0.001	0.949
Aged 19-23	0.456	0.498	0.208	0.406	0.248***	0.000
Aged 37 and above	0.203	0.402	0.290	0.454	-0.087***	0.000
In job	0.902	0.297	0.954	0.210	-0.051***	0.000
Studying before the mission	0.076	0.267	0.028	0.166	0.048***	0.000
Father's education lower than HS	0.277	0.448	0.303	0.460	-0.026	0.189
Mother's education lower than HS	0.418	0.493	0.468	0.499	-0.051*	0.021
Staff	0.067	0.250	0.098	0.298	-0.031*	0.011
Support	0.510	0.500	0.611	0.488	-0.101***	0.000
Combat	0.423	0.494	0.288	0.453	0.135***	0.000
First-timer	0.626	0.484	0.353	0.478	0.273***	0.000
Private group	0.635	0.482	0.614	0.487	0.021	0.323
Sergeant group	0.229	0.421	0.241	0.428	-0.012	0.543
Officer group	0.121	0.326	0.130	0.337	-0.011	0.535
Individuals	1,207		884		2,091	

Note: Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

TABLE 4 SUMMARY STATISTICS – SOCIOECONOMIC BACKGROUND FOR THE SOLDIERS DEPLOYED IN 2006-2007. IRAQ MISSION 7-9 AND ISAF MISSION RC(S) 1-3.

	(1)		(2)		(1)-(2)	
	Iraq 7-9		ISAF 1-3			
	Mean	SD	Mean	SD	Mean Diff.	p-value
No. of brothers	0.692	0.709	0.739	0.716	-0.046	0.161
No. of sisters	0.722	0.689	0.696	0.710	0.026	0.429
No. of half-siblings	0.497	0.924	0.565	0.958	-0.068	0.120
Mother married	0.719	0.450	0.701	0.458	0.018	0.393
Living in urban area	0.303	0.460	0.292	0.455	0.011	0.574
Living in rural area	0.149	0.356	0.143	0.350	0.007	0.673
Household income at age 17 (1,000 USD)	27.113	10.101	24.980	12.158	2.134***	0.000
Household income at age 17 (1,000 USD)-missing	0.065	0.247	0.100	0.300	-0.034**	0.006
Birth weight missing	0.231	0.422	0.302	0.456	-0.071***	0.000
Birth weight lowest quartile	0.191	0.394	0.250	0.433	-0.059**	0.002
Birth weight top quartile	0.210	0.407	0.140	0.347	0.069***	0.000
Out-of-home care	0.044	0.205	0.053	0.224	-0.009	0.334
Preventives social measures	0.030	0.170	0.032	0.0175	-0.002	0.809
Height cm measured at AFD	180.589	6.478	180.262	6.701	0.327	0.363
AFQT (BPP) measured at AFD	44.89	7.649	43.991	7.605	0.899*	0.030
No information about AFQT/height	0.292	0.455	0.367	0.482	-0.075***	0.000
Individuals	1,207		884		2,091	

Notes: All the variables in the table are measured before deployment in 2006. Means and standard deviations (SD). The population covers all deployed to Iraq and Afghanistan in 2006-2007 (missions Iraq 7-9 and ISAF RC(S) 1-3). The ISAF column describes soldiers deployed to ISAF RC(S) 1-3. The column "IRAQ" describes soldiers deployed to Iraq 7-9. Brothers, sisters, and half-siblings are counted, top-coded at 2, 2, and 3. Urban (rural) indicates living in a municipality with the highest (lowest) third population density. Disposable income at 17 is equivalized according to the formula (sum of income in the household plus transfers minus taxes)/(1*first_adult+0.7*second_adult+0.5*number_of_children) and deflated to 2018 prices by the CPI and converted to '000 USD at exchange rate 1DKK=0.147USD. AFQT score (no. of solved items out of the 78) and height are observed on the AFD. Birth weight is measured by the midwife. Missing birth weight is due to births outside Denmark. Mother's and father's schooling are observed on 1 January of the year the son turns age 17, and may be missing if parents have no qualifications obtained in Denmark, if the parents are unregistered, or if the soldiers were born before 1963. AFD data are collected at age 18-20.

TABLE 5 SUMMARY STATISTICS – DESCRIPTIVES OF THE SOLDIERS DEPLOYED IN 2006-2007 TO IRAQ MISSIONS 7-9 AND ISAF MISSIONS RC(S) 1-3 AND BORN 1975-1987, WITH CONTROLS

	(1)		(2)		(1)-(2)		(4)	
	Soldiers born 1975-1987		5 randomly selected Controls born 1975-1987				All controls born 1975-1987	
	Mean	SD	Mean	SD	Mean Diff.	p-value	Mean	SD
Year of birth	1982.1	3.196	1982.1	3.195	0	(1.00)	1980.0	3.669
No. of brothers	0.705	0.714	0.738	0.714	-0.033	(0.118)	0.721	0.707
No. of sisters	0.708	0.690	0.684	0.680	0.024	(0.239)	0.686	0.684
No. of half-siblings	0.563	0.956	0.453	0.888	0.111***	(0.000)	0.432	0.867
Mother married	0.705	0.456	0.733	0.443	-0.028*	(0.037)	0.738	0.440
Living in urban area	0.336	0.473	0.294	0.456	0.042**	(0.002)	0.288	0.453
Living in rural area	0.149	0.356	0.184	0.387	-0.035***	(0.001)	0.182	0.386
Household income at age 17 (1,000 USD)	27.314	9.794	28.679	14.225	-1.365***	(0.000)	28.368	13.666
Birthweight missing	0.040	0.196	0.050	0.218	-0.009	(0.097)	0.046	0.210
Birth weight lowest quartile	0.249	0.433	0.224	0.417	0.026*	(0.043)	0.275	0.447
Birth weight top quartile	0.248	0.432	0.251	0.434	-0.003	(0.830)	0.233	0.423
Out-of-home care	0.051	0.220	0.038	0.192	0.013*	(0.049)	0.686	0.464
Preventives social measures	0.044	0.206	0.032	0.177	0.012*	(0.042)	0.512	0.500
AFQT (BPP) measured at AFD	44.534	7.625	44.508	8.080	0.027	(0.907)	44.708	8.144
Height cm measured at AFD	180.495	6.585	180.371	6.503	0.124	(0.520)	180.361	6.548
Individuals	1,397		6,985		8,382		189,651	

Notes: All the variables in the table are measured before deployment in 2006. Mean and standard deviations (SD). Column (1) describes soldiers deployed to ISAF RC(S) 1-3 or Iraq 7-9 born 1975-1987 with no missing AFQT. Brothers, sisters, and half-siblings are counted, top-coded at 2, 2, and 3. Urban (rural) indicates living in a municipality with the highest (lowest) third population density. Disposable income at 17 is equivalized according to the formula (sum of income in the household plus transfers minus taxes)/(1*first_adult+0.7*second_adult+0.5*number_of_children) and deflated to 2018 prices by the CPI and converted to '000 USD at exchange rate 1DKK=0.147USD. AFQT score (no. of solved items out of the 78) and height are observed on the AFD. Birth weight is measured by the midwife. Missing birth weight is due to births outside Denmark. Mother's and father's schooling are observed on 1 January of the year the son turns age 17, and may be missing if parents if parents have no qualifications obtained in Denmark, if the parents are unregistered, or if the soldiers were born before 1963. AFD data are collected at age 18-20. Significance levels * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

TABLE 6 DESCRIPTIVES OF THE OUTCOME OF INTEREST AT 2, 5, OR 10 YEARS after the selected missions (PERCENT)

	Years after deployment		
	2	5	10
Dead	0.3%	0.5%	1.0%
Newly separated (non-separated at the mission and later separated)	2%	3%	8%
Newly single (non-single or separated at the mission and later single or separated)	53%	39%	29%
New couple (not in couple at the mission and later in couple)	4%	12%	23%
More education	10%	19%	37%
Years of schooling	12.95	13.08	13.61
Standard deviation in parentheses	(2.47)	(2.8)	(3.24)
With college education	16%	20%	33%
Still in the army	65%	59%	45%
Unemployed	1%	2%	2%
Crime (charges, not convictions)	4%	5%	8%
Contact with NHS, drugs prescription (mental health)	7%	13%	22%
Mental health medicine excluding opioid N02A	6%	11%	18%
Opioids (N02A)	5%	11%	21%
Alcohol or drug abuse diagnosis from LPR	0.6%	0.5%	0.9%
Non-psychiatric diagnosis from LPR (somatic)	1.6%	2.6%	4.7%

Note: The sample includes 2,085 male soldiers. We have excluded the six soldiers who died during these missions. However, six more soldiers died in subsequent missions and are included among the dead. They all died within two years after the selected missions. Twenty-three were wounded in action (10 of whom were repatriated because of their injury). In all, 44 of these soldiers were repatriated, six of them for psychological problems. As a measure of mental health, we use whether the soldier were registered with at least one contact with hospitals or with psychologists or registered for at least a purchase of MHM. As a measure of criminality, we use whether the person has been charged with a crime. As a measure of education, we use the number of extra years since last measurement. MHM includes the Anatomical Therapeutic Chemical code (ATC) N06 A: antidepressants; N05B: anxiolytics; N05C: hypnotics and sedatives. Opioids are the drug ATC code N02A.

TABLE 7 COMPARING THE OUTCOMES VARIABLES FOR THE SUB-SAMPLE OF SOLDIERS DEPLOYED TO ISAF RC(S) 1-3 OR IRAQ 7-9 AND BORN 1975-1987 WITH A CONTROL OF FIVE RANDOMLY SELECTED MEN FIT-FOR-SERVICE AND BORN IN THE SAME YEARS. SPECIFIC YEARS AFTER 2006.

	2006-2008		*2006-2011*		*2006-2016*	
	Soldiers	Controls	Soldiers	Controls	Soldiers	Controls
Dead excluding those who died during the mission*	0.3%	0.1%	0.4%	0.2%	0.6%	0.5%
Dead including KIA	0.7%	0.1%	0.8%	0.2%	1.1%	0.5%
Children per person	0.10	0.18	0.28	0.39	0.78	0.84
Newly separated (non-separated in 2006 and later separated)	0.4%	0.2%	1.6%	1.0%	5.4%	3.7%
Newly single (non-single or separated in 2006 and later single or separated)	67.6%	59.0%	47.5%	44.0%	30.0%	30.1%
New couple (not in couple in 2006 and later in couple)	1.7%	1.2%	10.4%	5.9%	24.5%	18.1%
More education	2.4%	24.0%	13.2%	44.6%	39,7%	54.2%
Average years of schooling	12.48	13.13	12.61	13.74	13.28	14.16
(SD)	2.38	2.85	2.77	3.26	3.51	3
Type of education—with college	8.0%	17.6%	13.3%	31.5%	30.6%	42.5%
Unemployed	0.4%	2.3%	1.9%	6.2%	2.0%	5.4%
Crime (charges)	4.6%	7.9%	6.8%	10.5%	8.9%	13.3%
Contact with NHS, prescription drugs (mental health)	7.0%	9.6%	13.0%	15.9%	23.0%	24.1%
Mental health medicine excluding N02A	5.0%	7.9%	10%	12.9%	17.8%	19.0%
Suicide attempts	1.4%	1.5%	1.6%	2.0%	2.0%	2.3%
Opioids	4.9%	4.8%	9.9%	9.1%	19.1%	16.5%
Alcohol or drug abuse diagnoses from LPR	0.4%	1.1%	0.5%	1.4%	0.9%	1.8%
Non-psychiatric diagnosis from LPR (somatic)	1.6%	2.5%	2.6%	3.8%	5.2%	5.8%

Notes: We follow the population of 1,397 soldiers and 6,985 controls from 1995 through 2016. As a measure of mental health, we use contact with hospitals and psychologists, and prescriptions for MHM (dummy variable reflecting at least one registration in the period). As a measure for criminality, we use whether the person has been charged with a crime. As a measure of education, we use the number of extra years since last measurement. * In subsequent missions, six soldiers from our sample were also KIA, while 23 were wounded and 64 repatriated.

TABLE 8 COMPARING THE OUTCOMES VARIABLES FOR THE SUB-SAMPLE OF SOLDIERS DEPLOYED TO ISAF RC(S) 1-3 OR IRAQ 7-9 AND BORN 1975-1987 WITH A CONTROL OF FIVE RANDOMLY SELECTED MEN FIT-FOR-SERVICE AND BORN IN THE SAME YEARS. BEFORE AND AFTER 2006.

	Before 2006			After 2006		
	Soldiers	Controls	All	Soldiers	Controls	All
Purchase Opioids (N02A)	3.3%	4.7%	4.5%	22.9%	18.8%	19.5%
Diagnoses, psychologists, medicine	6.6%	9.5%	9.0%	25.6%	26.3%	26.2%
Mental health medicine excluding N02A	4%	6.3%	5.9%	20.0%	20.9%	20.7%
Contact with psychologist	1%	1.8%	1.8%	7.0%	10.3%	9.8%
Crime (charged)	17%	17.9%	17.7%	10.3%	14.2%	13.5%
Crime(convicted)	11.5%	13.7%	13.4%	6.7%	10.2%	9.6%
Prison sentences	0.4%	1.8%	1.6%	0.7%	2.1%	1.9%
Charges of violent behavior	3%	5.3%	5.0%	3.7%	5.1%	4.9%
Selected diagnoses: accident, alcohol abuse, drug abuse, maltreatment of others.	1.1%	1.0%	1.0%	3.2%	5.6%	5.2%
Suicide attempts	1.1%	1.1%	1.1%	2.1%	2.4%	2.4%
Alcohol or drug abuse diagnoses in LPR	0.2%	0.5%	0.4%	1.1%	2.1%	1.9%
Non-psychiatric diagnoses (somatic) from LPR	4.9%	5.1%	5.0%	5.3%	6.4%	6.2%

Note: We follow the population of 1,397soldiers and 6,985 controls from 1995 through 2016. We selected certain diagnoses from the Danish Patient National Register (LPR). Accidents: V01-X59; Assault X85-Y09; Maltreatment syndromes T74; Alcohol abuse and dependence F10.1, F10.2 and F10.3; Drug abuse and dependence: F11.1; F11.2 and F13.1, F13.2 and F14.2. All variables are dummies indicating whether the individuals are registered at least once in the studied period for the given outcome.

TABLE 9 NUMBER OF COMBAT EVENTS FOR ISAF 1-3 AND IRAQ 7-9 BY UNIT TYPE

	Combat Events at the unit level, By type of unit			
	All units	Staff units	Support units	Combat units
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
ISAF RC(S) 1	4.033 (4.776)	0.522 (0.511)	2.548 (3.987)	8.770 (3.898)
ISAF RC(S) 2	3.682 (3.616)	0.310 (0.471)	2.194 (3.027)	7.452 (1.557)
ISAF RC(S) 3	6.899 (8.912)	0.629 (0.910)	7.452 (1.557)	19.11 (3.452)
ISAF RC(S) 1-3	*4.941* *(6.473)*	*0.494* *(0.697)*	*2.407* *(4.310)*	*11.86* *(6.120)*
Iraq 7	1.443 (2.990)	0.0370 (0.192)	0.291 (1.401)	2.771 (3.315)
Iraq 8	1.868 (2.507)	0.571 (1.168)	0.648 (0.962)	3.559 (2.713)
Iraq 9	5.633 (2.286)	3.808 (0.849)	3.994 (0.921)	7.765 (1.960)
Iraq 7-9	*2.742* *(3.105)*	*1.432* *(1.857)*	*1.485* *(1.978)*	*4.462* *(3.522)*

Notes: Means and standard deviations (SD) in parentheses. Combat events include indirect fire (IDF), troop in contact (TIC), friendly fire (FF), improvised explosive device, (IED), shots, and collateral damage. We have a total of 61 special events, 55 of which are combat events for the missions in Afghanistan and 92 special events in the missions in Iraq, 60 of which are combat events. Other events included in the reported special event are e.g., accidents or non-battle injuries.

TABLE 10 RANDOMIZATION BALANCE CHECK FOR COMBAT INTENSITY FROM THE SELECTED MISSIONS

	(1)	(2)	(3)
Single at mission start	0.022	0.022	0.020
	(0.043)	(0.043)	(0.043)
With college education at mission start	0.046	0.046	0.064
	(0.064)	(0.064)	(0.090)
With high school (HS) education at mission start	-0.072	-0.072	-0.070
	(0.037)	(0.038)	(0.039)
Father's education lower than HS	-0.019	-0.022	-0.022
	(0.038)	(0.038)	(0.038)
Mother's education lower than HS	0.028	0.027	0.027
	(0.035)	(0.035)	(0.035)
Out-of-home care	-0.120	-0.123	-0.125
	(0.077)	(0.077)	(0.077)
Being employed one year before mission start		-0.097	-0.096
		(0.094)	(0.095)
Under education one year before mission start		-0.165	-0.163
		(0.104)	(0.105)
Officer group			-0.026
			(0.126)
Sergeant group			0.001
			(0.136)
Privates group			0.006
			(0.133)
F-Statistic	1.445	1.450	1.232
F-Stat p-value	0.194	0.171	0.260
Partial-R2	0.006	0.008	0.009
Observations	2,091	2,091	2,091

Notes: Robust standard errors in parentheses.* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. The dependent variable is the total standardized combat intensity measure for all the missions. The combat exposure is measured at the individual level. These regressions also control for soldier's year of birth, type of unit, and missions. The background variables are measured at the first mission since 2003.

TABLE 11 OLS REGRESSION, DEPENDENT VARIABLE MENTAL HEALTH MEDICINE (PURCHASE) ANY YEARS AFTER DEPLOYMENT 1/0

	(1) Reg0	(2) Reg1	(3) Reg2
Combat intensity (standardized)	0.004	0.005	0.009
	(0.012)	(0.013)	(0.013)
ISAF mission (ref. Iraq mission)	-0.030	-0.015	-0.003
	(0.585)	(0.588)	(0.526)
First-timer (ref. Previously deployed)	0.022	0.022	0.005
	(0.032)	(0.032)	(0.031)
First-timer Iraq =1 (ref.= 0)	-0.020	-0.045	-0.028
	(0.039)	(0.040)	(0.039)
Percentage of experienced soldiers	-0.100	-0.269	-0.170
	(2.001)	(2.010)	(1.769)
Support unit (ref. staff unit)		-0.060	-0.051
		(0.037)	(0.037)
Combat unit (ref. staff unit)		-0.084*	-0.076
		(0.042)	(0.042)
Officer group (ref. other personnel)		-0.142	-0.137
		(0.083)	(0.081)
Sergeant group (ref. other personnel)		-0.063	-0.026
		(0.083)	(0.082)
Private group (ref. other personnel)		0.021	0.023
		(0.082)	(0.078)
Aged 19-23 at mission start (ref. 24-36 years)			-0.029
			(0.026)
Aged 37 and older at mission start (ref. 24-36 years)			-0.048
			(0.025)
With college education at mission start (ref. lower than HS)			0.001
			(0.041)
With HS education at mission start (ref. lower than HS)			-0.082***
			(0.021)
Single at mission start (ref. married or cohabiting)			-0.016
			(0.022)
Father's education lower than HS (ref. higher than HS)			0.035
			(0.020)
Mother's education lower than HS (ref. higher than HS)			-0.022

			(0.018)
Out-of-home care =1 (ref.= 0)			0.085
			(0.050)
Pre-mission MH (medicine and contact) (ref. no pre-mission MH)			0.239***
			(0.039)
Pre-mission crime (charges only) (ref. no pre-mission crime)			0.097***
			(0.027)
Mean of the dependent variable	0.212	0.212	0.212
Std. deviation of the dependent variable	(0.409)	(0.409)	(0.409)
R-squared	0.020	0.035	0.704
Observations	2,079	2,079	2,079

Note: Standard errors in parentheses.* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Percentage of experienced soldiers is computed as the ratio of previously deployed divided by the number of soldiers for each of the six selected missions. HS refers to high school education. We have excluded soldiers KIA. All regressions control for the soldier's specific missions, e.g., ISAF1, Iraq 7. All excluded categories are reported in parentheses in the first column.

Table 12 OLS REGRESSION, DEPENDENT VARIABLE USE OF MENTAL SERVICE (DIAGNOSES, CONTACT, MEDICINE) ANY YEARS AFTER DEPLOYMENT 1/0

	(1)	(2)	(3)	(4)
Combat intensity (standardized)	0.011	0.010	0.013	0.016
	(0.012)	(0.014)	(0.013)	(0.013)
ISAF mission (ref. Iraq mission)	-0.232	-0.179	-0.204	-0.273
	(0.602)	(0.597)	(0.541)	(0.497)
First-timer (ref. Previously deployed)	0.031	0.032	0.011	0.008
	(0.034)	(0.033)	(0.033)	(0.033)
First-timer Iraq =1 (ref.= 0)	-0.021	-0.0471	-0.035	-0.036
	(0.042)	(0.042)	(0.042)	(0.042)
Percentage of experienced soldiers	0.882	0.569	0.772	1.027
	(2.054)	(2.041)	(1.816)	(1.643)
Support Unit (ref. staff unit)		-0.103*	-0.098*	-0.095*
		(0.040)	(0.040)	(0.040)
Combat Unit (ref. staff unit)		-0.111*	-0.111*	-0.115*
		(0.045)	(0.046)	(0.046)
Officer group (ref. other personnel)		-0.134	-0.139	-0.134
		(0.086)	(0.083)	(0.082)
Sergeant group (ref. other personnel)		-0.037	-0.011	-0.005
		(0.086)	(0.084)	(0.082)
Private group (ref. other personnel)		0.043	0.032	0.034
		(0.085)	(0.084)	(0.082)
Aged 19-23 at mission start (ref. 24-36 years)			-0.029	-0.026
			(0.028)	(0.027)
Aged 37 and older at mission start (ref. 24-36 years)			-0.070*	-0.069*
			(0.027)	(0.027)
With college education at mission start (ref. lower than HS)			-0.008	-0.001
			(0.045)	(0.045)
With high school (HS) education at mission start (ref. lower than HS)			-0.088***	-0.086***
			(0.022)	(0.022)
Single at mission start (ref. married or cohabiting)			-0.016	-0.013
			(0.024)	(0.024)
Father's education lower than HS (ref. higher than HS)			0.025	0.024
			(0.022)	(0.021)

Mother's education lower than HS (ref. higher than HS)			-0.015	-0.013
			(0.020)	(0.020)
Out-of-home care =1 (ref.= 0)			0.047	0.042
			(0.045)	(0.045)
Pre-mission MH (medicine and contacts) (ref. no pre-mission MH)			0.230***	0.222***
			(0.034)	(0.034)
Pre-mission crime (charges only) (ref. no pre-mission crime)			0.086**	0.085**
			(0.028)	(0.028)
Wounded in action during the missions=1 (ref.=0)				0.057
				(0.087)
Repatriated before the end of the mission =1 (ref.=0)				0.137***
				(0.043)
Mean of dep var.	0.260	0.260	0.260	0.260
Std. dev of dep var.	0.439	0.439	0.439	0.439
R-squared	0.020	0.035	0.077	0.083
Observations	2,079	2,079	2,079	2,079

Note: Robust standard errors in parentheses.* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Percentage of experienced soldiers is computed as the ratio of previously deployed divided by the number of soldiers for each of the six selected missions. We have excluded soldiers KIA from the regressions. HS refers to high school education. We have excluded soldiers KIA. All regressions control for the soldier's specific missions, e.g., ISAF1, Iraq 7. All excluded categories are reported in parentheses in the first column.

TABLE 13: OLS REGRESSION WITH MORE EDUCATION 6 YEARS AFTER THE LATEST MISSION 1/0 AS THE DEPENDENT VARIABLE

	(1)	(2)	(3)
Combat intensity (standardized)	0.013	0.002	-0.002
	(0.011)	(0.012)	(0.011)
ISAF mission (ref. Iraq mission)	-0.390	-0.411	-0.738*
	(0.286)	(0.351)	(0.323)
First-timer (ref. previously deployed)	0.056	0.054	-0.017
	(0.032)	(0.032)	(0.032)
First-timer Iraq (ref. Non Iraq FT)	0.166***	0.172***	0.115**
	(0.041)	(0.041)	(0.041)
Percentage experienced soldiers	1.442	1.653	2.632*
	(0.940)	(1.200)	(1.078)
Support Unit (ref. staff unit)		0.105**	0.062
		(0.040)	(0.038)
Combat Unit (ref. staff unit)		0.156***	0.062
		(0.044)	(0.046)
Officer group (ref. other personnel)		0.244**	0.205*
		(0.081)	(0.085)
Sergeant group (ref. other personnel)		-0.022	-0.147
		(0.078)	(0.084)
Private group (ref. others)		0.011	-0.184*
		(0.077)	(0.085)
Aged 19-23 at mission start (ref. 24-36 years)			0.085**
			(0.027)
Aged 37 and older at mission start (ref. 24-36 years)			-0.175***
			(0.025)
With college education at mission start (ref. lower than HS)			-0.162***
			(0.041)
With high school (HS) education at mission start (ref. lower than HS)			-0.079***
			(0.023)
Single at mission start (ref. married or cohabiting)			0.056*
			(0.024)
Father's education lower than HS (ref. higher than HS)			-0.047*
			(0.022)
Mother's education lower than HS (ref. higher than HS)			-0.023
			(0.020)

Out-of-home care =1 (ref.= 0)			-0.007
			(0.046)
Pre-mission MH (medicine and contacts) (ref. no pre-mission MH)			-0.061
			(0.032)
Pre-mission crime (charges) (1/0) (ref. no pre-mission crime)			-0.010
			(0.026)
Mean of the dependent variable	0.307	0.307	0.307
Std. deviation of the dependent variable	(0.462)	(0.462)	(0.462)
R-squared	0.077	0.103	0.1575
Observations	2,079	2,079	2,079

Note: Robust standard errors in parentheses.* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Percentage of experienced soldiers is computed as the ratio of previously deployed divided by the number of soldiers for each of the six selected missions. HS refers to high school education. We have excluded soldiers KIA. We obtain similar results if we use convictions instead of charges for the pre-crime measurement. All regressions control for the soldier's specific missions, e.g., ISAF1, Iraq 7. All excluded categories are reported in parentheses in the first column.

TABLE 14 OLS REGRESSIONS, DEPENDENT VARIABLE: CRIME CHARGES ANY YEARS AFTER THE MISSION 1/0

	(1)	(2)	(3)
Combat intensity (standardized)	0.012	0.004	0.004
	(0.008)	(0.009)	(0.008)
ISAF mission (ref. Iraq mission)	0.606	0.677	0.675
	(0.456)	(0.441)	(0.381)
First-timer (ref. previously deployed)	0.010	0.010	-0.009
	(0.021)	(0.021)	(0.022)
First-timer Iraq =1 (ref.= 0)	0.022	-0.003	-0.005
	(0.027)	(0.027)	(0.027)
Percentage of experienced soldiers	-2.379	-2.684	-2.595*
	(1.667)	(1.610)	(1.385)
Support unit (ref. staff unit)		0.001	0.008
		(0.021)	(0.021)
Combat unit (ref. staff unit)		0.017	0.021
		(0.0248)	(0.025)
Officer group (ref. other personnel)		0.049**	0.047*
		(0.018)	(0.021)
Sergeant group (ref. other personnel)		0.045**	0.069**
		(0.0174)	(0.023)
Private group (ref. other personnel)		0.118***	0.105***
		(0.0174)	(0.024)
Aged 19-23 at mission start (ref. 24-36 years)			0.048*
			(0.020)
Aged 37 and older at mission start (ref. 24-36 years)			-0.009
			(0.016)
With college education at mission start (ref. lower than HS)			0.034
			(0.030)
With HS education at mission start (ref. lower than HS)			-0.035*
			(0.015)
Single at mission start (ref. married or cohabiting)			0.014
			(0.015)
Father's education lower than HS (ref. higher than HS)			0.011
			(0.014)

Mother's education lower than HS (ref. higher than HS)			-0.001
			(0.013)
Out-of-home care =1 (ref.= 0)			0.082*
			(0.041)
Pre-mission MH (medicine and contacts) (ref. no pre-mission MH)			0.060**
			(0.028)
Pre-mission crime (charges only) (ref. no pre-mission crime)			0.118***
			(0.022)
Mean of the dependent variable	0.094	0.094	0.094
Std. dev. of the dependent variable	(0.292)	(0.292)	(0.292)
R-squared	0.025	0.040	0.084
Observations	2,079	2,079	2,079

Note: Robust standard errors in parentheses.* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Percentage of experienced soldiers is computed as the ratio of previously deployed divided by the number of soldiers for each of the six selected missions. HS refers to high school education. We have excluded soldiers KIA. We obtain similar results if we use convictions instead of charges for the pre-crime measurement. All regressions control for the soldier's specific missions, e.g., ISAF1, Iraq 7. All excluded categories are reported in parentheses in the first column.

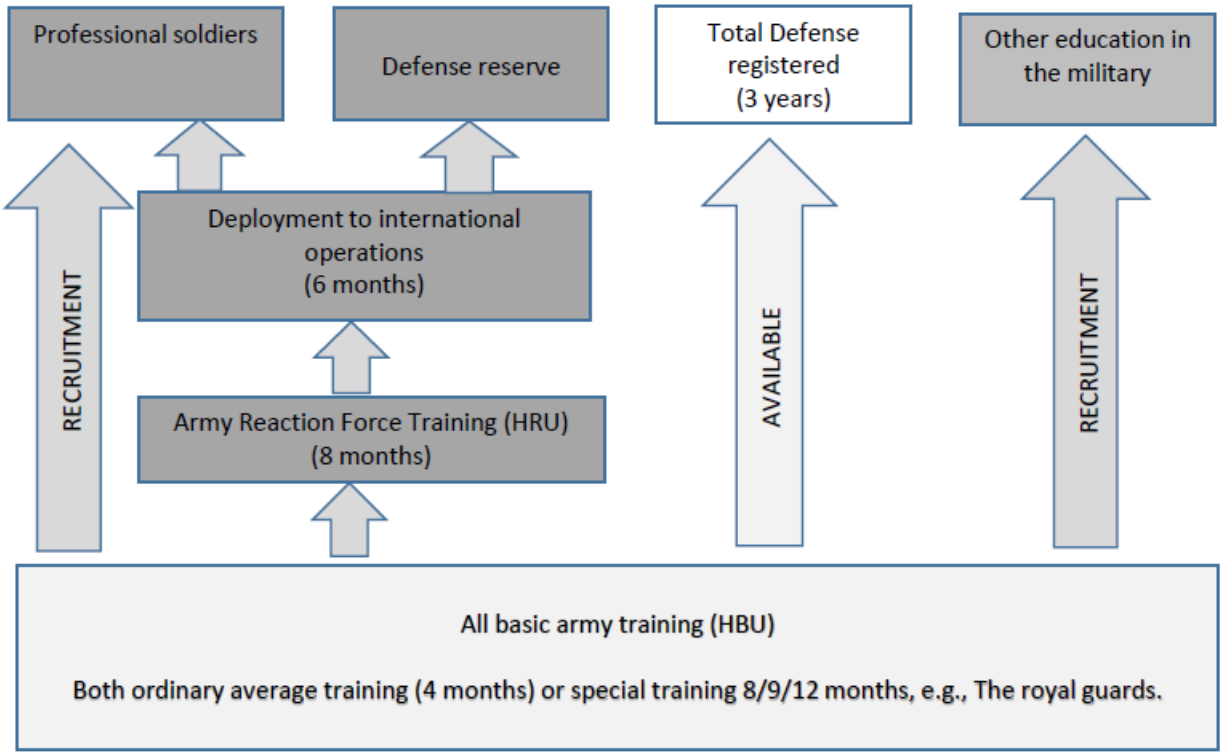
TABLE 15 OLS REGRESSIONS, DEPENDENT VARIABLE: MHM, MHS, MORE EDUCATION, CRIME CHARGES 10 YEARS AFTER 2006 (1/0).

	(1) MHM+10	(2) MHS+10	(3) More Educ+10	(4) Crime+10
Deployed (ref. controls)	0.006	0.007	-0.048**	-0.044***
	(0.013)	(0.011)	(0.015)	(0.009)
Pre-registration MH (medicine and contacts)=1 (ref.=0)	0.329***	0.301***	-0.042*	0.055***
	(0.019)	(0.019)	(0.017)	(0.015)
Pre-registration crime (charges) =1 (ref.=0)	0.097***	0.100***	-0.112***	0.217***
	(0.014)	(0.013)	(0.013)	(0.013)
With college education (ref. education lower than HS)	-0.085***	-0.083***	-0.171***	-0.079***
	(0.019)	(0.017)	(0.020)	(0.013)
With High school education (ref. education lower than HS)	-0.059***	-0.057***	-0.123***	-0.071***
	(0.012)	(0.011)	(0.012)	(0.010)
Father with college education (ref. lower than HS)	0.006	-0.007	0.077***	-0.021*
	(0.013)	(0.012)	(0.014)	(0.010)
Father with High school education (ref. lower than HS)	-0.017	-0.014	0.034**	-0.016
	(0.011)	(0.010)	(0.011)	(0.009)
Mother with High school education (ref. lower than HS)	-0.013	-0.012	0.022*	-0.004
	(0.011)	(0.010)	(0.011)	(0.008)
Mother with college education (ref. lower than HS)	-0.016	-0.015	0.059***	-0.013
	(0.013)	(0.012)	(0.014)	(0.010)
Being employed before mission start/in 2006 =1 (ref=0)	-0.120***	-0.138***	0.005	-0.137***
	(0.021)	(0.021)	(0.022)	(0.019)
Under education before mission start/in 2006 =1 (ref=0)	-0.103***	-0.119***	0.355***	-0.156***
	(0.023)	(0.022)	(0.023)	(0.020)
Single in 2006 (ref. married or cohabitating)	0.023*	0.016	-0.002	0.029***
	(0.011)	(0.010)	(0.012)	(0.008)
AFQT score (number of correct items out of 78 items)	-0.003***	-0.003***	0.006***	-0.002***
	(0.001)	(0.001)	(0.001)	(0.000)
Height (cm)	-0.000	-0.000	0.002**	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Out-of-home care=1 (ref.=0)	0.093***	0.090***	-0.070**	0.145***
	(0.027)	(0.026)	(0.025)	(0.025)
Mean of dep. var	0.239	0.188	0.518	0.126
Std dev of dep. var	0.426	0.391	0.500	0.332
R-squared	0.103	0.115	0.269	0.163
Observations	8,382	8,382	8,382	8,382

Note: The sample includes the population of 1,397 soldiers and 6,985 controls born in 1975-1987. Pre-measurement for MHS and MHM are for the period 1995-2005. The regression also control for the year of birth of the individual. Robust standard errors in parentheses.* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. HS stands for high school. All excluded categories are reported in parentheses in the first column.

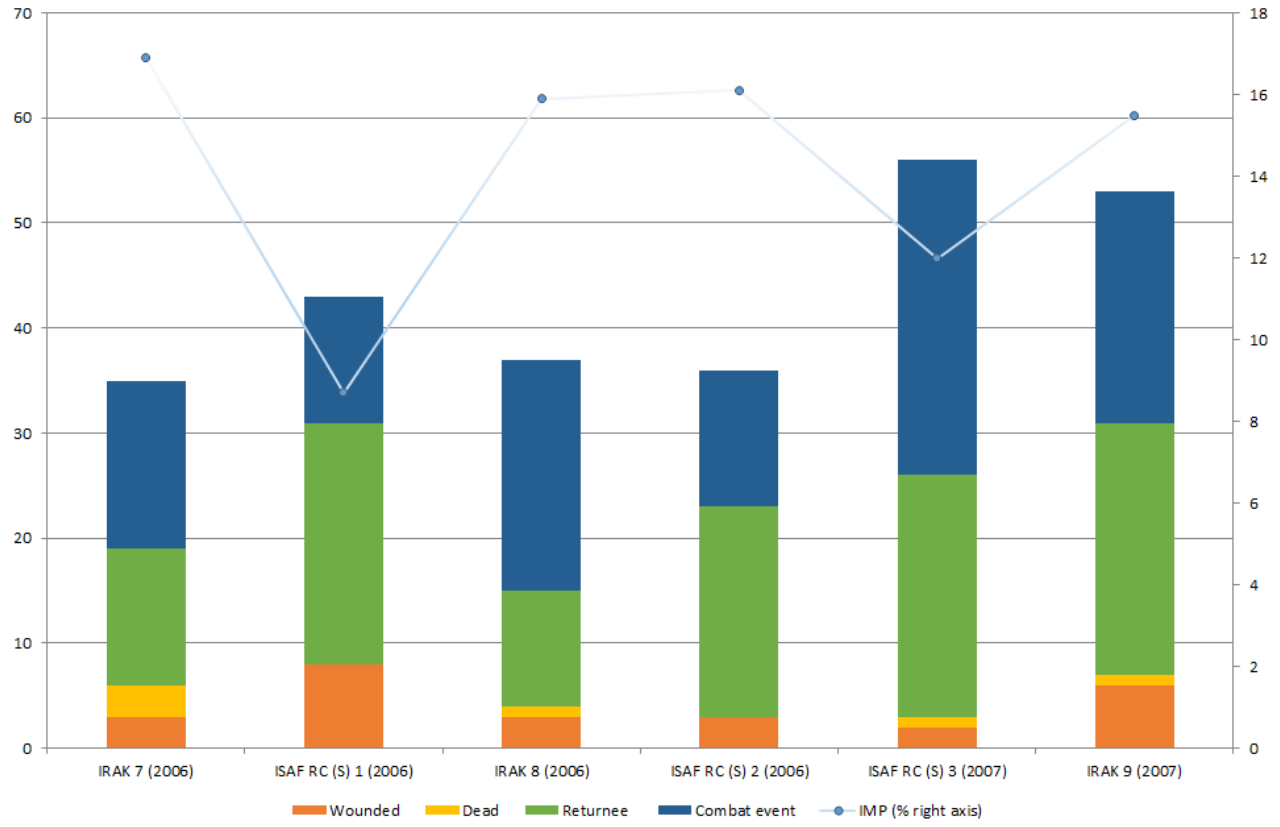
FIGURES

FIGURE 1 RECRUITMENT DIAGRAM



Source: The Danish Defence

FIGURE 2 WOUNDED, DEAD, RETURNEES BY MISSION



Note: The Institute for Military Psychology (IMP). Dots correspond to the percentage of soldiers classified as at risk for developing psychological problems according to the PRIM data for the Army psychologists (survey-based and self-reported). We compare the exposure within the nine Iraq missions and the twelve ISAF missions for which we have the data. ISAF RC(S) 1-3 belong to the lowest total exposure for all ISAF missions, while Iraq 7-9 belong to the highest exposure for the nine missions to Iraq. Missions are ordered chronologically.

Source: Data from the Danish Defence.

APPENDIX TABLES

TABLE A.1-EVENTS TIME LINE FOR AFGHANISTAN

September 11, 2001	Terror attack in NY and Washington.
October 2001	U.S. invades Afghanistan.
December 2001	Bonn Conference. Establishment of the ATA (Afghan Transitional Authority) and Danish decision to participate in the international military operation.
January 2002	The first Danish soldiers arrive in Afghanistan.
March 2002	First Danish soldier KIA (In total 43 died, 40 KIA).
June 2002	The Loya Jirga (Grand Assembly of Afghanistan) choose Hamid Karzai as interim head of state.
June 2004	Loya Jirga adopt a new constitution.
Oct-Nov. 2004	Hamid Karzai win the first president election in Afghanistan.
September 2005	Parliament election in Afghanistan.
January, 2006	Parliamentary resolution on expanding the Danish contribution to the ISAF in Afghanistan.
Spring-Summer 2006	Danish troops move into Helmand Province in Afghanistan.
October 2006	NATO takes over control of the whole Afghanistan.
2007	Denmark strengthened its contribution to Afghanistan, both in terms of development assistance and military contribution. In relative terms, Denmark is now among the largest military contributors and the second largest financial donor (USD 53 million in 2007) to Afghanistan. Parliamentary resolution B161 on strengthening the Danish contribution to ISAF, adopted June 1, 2007.
December 2008	Parliamentary resolution B24 on strengthening the Danish contribution to ISAF. The decision entails an adjustment from about 665 persons to about 750.
Note: We focus on the period 2006-2007. Source: Dalgaard-Nielsen (2008) and Danish Foreign Policy Yearbook 2008.	

TABLE A.2 TABLE 1-EVENT TIME LINE FOR IRAQ MISSION

March 2003	U.S. invades Iraq.
May 2003	Denmark (DK) sends troops to Iraq.
August 2003	Attack of the United Nation's head quarter in Baghdad: 22 killed.
August 2003	First Danish soldier KIA in Iraq (in total, 4 KIA for the whole period).
December 2003	Saddam Hussein is captured.
June 2004	U.S. hands over power to Iraqi transitional government.
January 2005	Election of the transitional parliament in Iraq.
April 27, 2005	Danish Foreign Minister Per Stig Moeller announced that Denmark would keep its troop in Iraq for at least eight months after the expiration of their current mandate at the beginning of June.
December 2005	Government and parliament election in Iraq.
February 2006	Attack on a mosque in Samarra in Iraq, one of the Shia Islam' s holiest sites.
Jan.9, 2007	Danish Prime Minister Anders Fogh Rasmussen reportedly told President Bush that he hoped Denmark would be able to reduce the number of Danish troops (from 470) in Iraq during 2007.
August 2007	DK withdraws its main force from Iraq, leaving 25 support personnel and four helicopters to work with British forces until the end of 2007.
December 2007	British forces hand over control of Basra to the Iraqis.
Note: We focus on the period 2006-2007. Source: Sharp and Blanchard (2007) and Dalgaard-Nielsen (2008).	

TABLE A.3 OLS REGRESSIONS, DEPENDENT VARIABLE: MHM, MHS, MORE EDUCATION, CRIME CHARGES 10 YEARS AFTER 2006 (1/0).

	(1) MHM+10	(2) MHS+10	(3) More Educ+10	(4) Crime+10
Deployed (ref. controls)	-0.002	0.005	-0.066**	-0.043**
	(0.021)	(0.019)	(0.024)	(0.014)
deployed_combat (ref. deployed no combat)	0.012	0.003	0.025	-0.000
	(0.024)	(0.022)	(0.028)	(0.016)
Pre-mission MH (medicine and contacts))=1 (ref.=0)	0.329***	0.301***	-0.042*	0.055***
	(0.019)	(0.019)	(0.017)	(0.015)
Pre-mission crime (charges)) =1 (ref.=0)	0.097***	0.100***	-0.112***	0.217***
	(0.014)	(0.013)	(0.013)	(0.013)
With college education (ref. education lower than HS)	-0.085***	-0.083***	-0.172***	-0.079***
	(0.019)	(0.017)	(0.020)	(0.013)
With High school education (ref. education lower than HS)	-0.059***	-0.057***	-0.123***	-0.071***
	(0.012)	(0.011)	(0.012)	(0.010)
Father with college education (ref. lower than HS)	0.006	-0.007	0.077***	-0.021*
	(0.013)	(0.012)	(0.014)	(0.010)
Father with High school education (ref. lower than HS)	-0.017	-0.014	0.034**	-0.016
	(0.011)	(0.010)	(0.011)	(0.009)
Mother with High school education (ref. lower than HS)	-0.013	-0.012	0.022*	-0.004
	(0.011)	(0.010)	(0.011)	(0.008)
Mother with college education (ref. lower than HS)	-0.017	-0.015	0.058***	-0.013
	(0.013)	(0.012)	(0.014)	(0.010)
Being employed one year start/in 2006 =1 (ref=0)	-0.120***	-0.138***	0.005	-0.137***
	(0.021)	(0.021)	(0.022)	(0.019)
Under education one year before start/in 2006 =1 (ref=0)	-0.103***	-0.119***	0.356***	-0.156***
	(0.023)	(0.022)	(0.023)	(0.020)
Single at mission start (ref. married or cohabitating)	0.023*	0.016	-0.002	0.029***
	(0.011)	(0.010)	(0.012)	(0.008)
AFQT score (number of correct items out of 78 items)	-0.003***	-0.003***	0.006***	-0.002***
	(0.001)	(0.001)	(0.001)	(0.000)
Height (cm)	-0.000	-0.000	0.002**	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Out-of-home care	0.093***	0.090***	-0.070**	0.145***
	(0.027)	(0.026)	(0.025)	(0.025)
Mean of dep var	0.239	0.188	0.518	0.126
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R-squared	0.103	0.115	0.269	0.163
Observations	8382	8382	8382	8382

Note: The sample includes the population of 1,397 soldiers and 6,985 controls born in 1975-1987. Pre-measurement for MHS and MHM are for the period 1995-2005. The regression also control for the year of birth of the individual. Robust standard errors in parentheses. The variable deployment_combat indicates whether the deployed soldiers was exposed to combat during the deployment and is zero for non-exposed deployed and controls. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. HS stands for high school. All excluded categories are reported in parentheses in the first column.

Appendix B Combat exposure data collection and construction

We were granted research access to the two military archives of the Danish Defence (the old historical military archives and the new archive CAPTIA from August 2008 onwards) to collect special events (SEs) from confidential mission reports detailing individual soldier combat exposure. During their mission, officers have to report these SEs, i.e., combat events, but also sickness and other events related to their staff that are "special". The reports are sent to the Danish Defence headquarters and follow a standard layout where it is possible to identify the date, the place, the type of event and which units or persons are involved. The reports also include a battle damage assessment when relevant.

To retrieve this information from the two archive databases, we used the following keywords: "Special & ISAF/Iraq"; "Special & Afghanistan/Iraq"; "Special & dates of missions". Special events for mission ISAF 6 can be found in both archives as the system changed in August 2008.

These SE reports can be exported to an Excel file and information about type of event, unit names, persons involved, and dates were automatically retrieved from these Excel files.

For each soldier wounded, killed, repatriated, or injured (non-battle injury such as small accidents or sickness), the Danish Ministry of Defence also provided information about their units and the dates of the event. Moreover, we also had access to the full staff list for each unit of each of the 21 missions with the soldier's start and end date of deployments, the dates for leave (soldiers generally have a two-week leave during their deployment), the date of their repatriations or injuries, and dates of secondment to a new unit during deployment.

In our data, a soldier is affected by an SE or a combat event if this event occurs while he or she is on a mission and this event is related to the soldier-specific unit. We have about 1,500 special events for the 21 missions.

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