UK Armed Forces - Psychological Health and Deployment

Greenberg Neil*

Fear Nicola T

Jones Norman

Wessely Simon

(on behalf of the King's College London Military Health Research Team)
Academic Centre for Defence Mental Health
Weston Education Centre
London SE5 9RJ

*sososanta@aol.com

ABSTRACT

Background: *Concerns have been raised about the psychological effect of continued combat exposure and of repeated deployments. We examined the consequences of deployment to Iraq and Afghanistan on the mental health of UK Armed Forces from 2003 to 2010 and the effect of multiple deployments.*

Methods: *We assessed the prevalence of probable mental disorders in four samples of participants. (1) an post deployment initial study (2003–05) (2) a further post deployment study (including a follow up of the initial sample) (2007-2009) (3) a sample of troops deployed to Iraq (2009) and (4) a sample of troops deployed to Afghanistan (2010). Samples 1 and 2 were randomly chosen samples to ensure that they were wholly representative of the UK Armed Forces. All participants completed a questionnaire about their deployment experiences and health outcomes.*

Main Findings: *Sample sizes ranged from 611 to 9990 and response rates ranged from 56% to 99%. The prevalence of probable post-traumatic stress disorder in the most recent post deployment sample was 4·0% (95% CI 3·5–4·5; n=376), 19·7% (18·7–20·6; n=1908) for symptoms of common mental disorders, and 13·0% (12·2–13·8; n=1323) for alcohol misuse. After post deployment, regulars who had been to Iraq or Afghanistan reported significantly higher levels of alcohol misuse (odds ratio 1·22, 95% CI 1·02–1·46) and reservists reported significantly higher levels of probable post-traumatic stress disorder (2·83, 1·23–6·51). Regular personnel in combat roles were more likely than were those in support roles to report probable post-traumatic stress disorder (1·87, 1·26–2·78). There was no association with number of deployments for any outcome. There was some evidence for a small increase in the reporting of probable post-traumatic stress disorder with time since return from deployment in regulars (1·13, 1·03–1·24). Data from the in-theatre surveys were not dissimilar to the post deployment findings. The in theatre data showed that the prevalence of probable PTSD was higher in forward locations whilst the common mental disorders were more common in major bases.*

Interpretation: *Even in deployed samples, symptoms of common mental disorders were considerably more common that those suggestive of PTSD. At post deployment alcohol misuse is also far more frequently reported than PTSD. Overall, these findings show that in spite of UK Armed Forces personnel being engaged on high threat duties in Iraq and Afghanistan since 2002, the prevalence of probable post-traumatic stress disorder remains low indicating the considerable resilience of UK military personnel.*

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
APR 2011	**N/A**	**-**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
UK Armed Forces - Psychological Health and Deployment	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Academic Centre for Defence Mental Health Weston Education Centre London SE5 9RJ**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release, distribution unlimited

13. SUPPLEMENTARY NOTES
See also ADA578905. Mental Health and Well-Being across the Military Spectrum (Bien-être et santé mentale dans le milieu militaire). RTO-MP-HFM-205

14. ABSTRACT
Background: Concerns have been raised about the psychological effect of continued combat exposure and of repeated deployments. We examined the consequences of deployment to Iraq and Afghanistan on the mental health of UK Armed Forces from 2003 to 2010 and the effect of multiple deployments. Methods: We assessed the prevalence of probable mental disorders in four samples of participants. (1) an post deployment initial study (200305) (2) a further post deployment study (including a follow up of the initial sample) (2007-2009) (3) a sample of troops deployed to Iraq (2009) and (4) a sample of troops deployed to Afghanistan (2010). Samples 1 and 2 were randomly chosen samples to ensure that they were wholly representative of the UK Armed Forces. All participants completed a questionnaire about their deployment experiences and health outcomes.

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**SAR**	**10**	

These findings show the importance of continued health surveillance of UK military personnel in order to ensure high risk groups are monitored and spurious press and health media claims are firmly rebutted.

1.0 BACKGROUND

Since the start of the 2003 Iraq War, over 130,000 UK Armed Forces personnel have deployed to Iraq, with approximately 60,000 UK Service personnel having deployed to Afghanistan since 2001. In 2009, the Iraq operation ended for the majority of UK troops but the UK commitment to Afghanistan continued and indeed is on-going. The UK commitment to these conflicts has cost the country financially and also in terms of UK lives lost. In 2009 over £4.5 billion was spent on both campaigns and between the start of 2001 and February 2010, 263 UK Service personnel died in Afghanistan and 170 in Iraq since March 2003 (Fear, Jones et al. 2010). On Feb 14 2011 the number of UK Service personnel who have died in Afghanistan stood at 357. The number of deaths in Afghanistan now exceeds the number of UK military deaths during the Falklands War in 1982.

Within the UK there has been considerable speculation about the mental health status of Service personnel who have deployed to Iraq and Afghanistan since 2003. In this paper we briefly report on four studies which have examined the psychological wellbeing of troops who have served in both theatres. The paper aims to explore what the real effects, upon personnel's mental health, has been of serving in either theatre and to draw conclusions about the psychological resilience of UK military personnel.

2 STUDY 1

Because of concerns about the potential psychological effects of deploying troops to Iraq as part of the 2003 invasion force, the UK Ministry of Defence funded a planned cohort study in which a research team from King's College London were asked to compare mental and physical health outcomes in two groups: individuals who had deployed on Operation TELIC 1 (the codename given to UK Armed Forces deployments to Iraq beginning in 2003), and individuals who were in the military at that time, but who were not deployed on Operation TELIC 1. The initial phase of deployment where major combat duties took place was designated TELIC 1 and took place from Jan 18, 2003, to June 28, 2003. Subsequent deployments, each lasting about 6 months, were been designated TELIC 2, 3, and so on. The study was initially designed to compare the health of those deployed on Operation TELIC 1 with non-deployed service personnel; however by the time the survey begun (in 2004) personnel who had deployed on subsequent TELIC deployments could be identified in the control group. In order to ensure we could make proper comparisons between those who had served in Iraq and those who had not, personnel from the comparison group who had served in later Operation TELICs were reassigned to the deployed to Iraq group (Hotopf 2006).

2.1 Study 1 Methods

Participants were identified by the UK Ministry of Defence and a list of all personnel, excluding Special Forces and high security personnel, who had deployed on Operation TELIC 1 between Jan 18 and April 28, 2003, was generated. A similar list of all UK service personnel serving in the armed forces on March 31, 2003, but not in the TELIC 1 group was generated as the comparison group, which we refer to as Era. A random stratified sample was selected from the TELIC and Era populations. Sampling was done by assigning each individual to a stratum with a random number, sorting them into ascending order, and selecting the first x individuals where x was the sample size for the stratum. The stratification variables

were service (Royal Navy including Royal Marines, Army, Royal Air Force [RAF]) and enlistment type (regular or reserve). The number of Era personnel sampled in each stratum was calculated from the proportions of personnel in each TELIC stratum. More individuals were sampled into the Era cohort, to take into account the 10% of regular military personnel who are medically downgraded (which indicates that an individual may not be fit to deploy) at any one time. The extra individuals were also sampled to allow for the likelihood that some of the personnel in the Era cohort would have been deployed to subsequent TELIC operations. Because particular concerns had been raised about the effect of deployment on reservists, who constituted a numerically small proportion of those deployed, we oversampled this group by a ratio of 2:1.

In total some 7695 TELIC 1 personnel and 10 003 Era personnel were sampled. We were regularly updated on deaths among potential participants by DASA, in order to avoid sending questionnaires and causing distress to families. 23 participants died before they could be sent questionnaires. We subsequently found that 176 individuals were ineligible for other reasons; 135 reservists were nondeployable, and address data were not supplied for 41 other people. The final number of individuals we actively followed up was 17 499. The study received approval from the Ministry of Defence (Navy) personnel research ethics committee and the King's College Hospital local research ethics committee.

The survey took the form of a 28-page questionnaire booklet, which included the information that participation in the survey was entirely voluntary, and that the researchers were independent of the Ministry Of Defence (MOD). Researchers visited bases and sent out up to three mailings of surveys in order to maximize response. The survey included questions about the nature of the deployment and health outcomes, which included symptoms of post-traumatic stress disorder, common mental disorders, general wellbeing, alcohol consumption, physical symptoms, and fatigue. The specific outcome scales used were the Post Traumatic Stress Disorder Checklist PCL-C (civilian version)(Weathers, Litz et al. 1994) and the General Health Questionnaire GHQ (12 item version)(Goldberg and Williams 1988). Alcohol misuse was measured using the AUDIT questionnaire (Fear, Iversen et al. 2007). PTSD caseness was set at 50 or more on the PCL-C, common mental health disorder caseness was 4 or more on the GHQ and alcohol misuse was found to be present if personnel scored 16 or more on the AUDIT. 53 types of physical symptoms and symptoms of fatigue were also enquired about (Hotopf 2006).

2.2 Study 1 Results

The participation rate was 62·3% (n=4722) in the deployed sample, and 56·3% (n=5550) in the non-deployed sample. Differences in health outcomes between groups were slight. There was a modest increase in the number of individuals with multiple physical symptoms (odds ratio 1·33; 95% CI 1·15–1·54). No other differences between groups were noted. The effect of deployment was different for reservists compared with regulars. In regulars, only presence of multiple physical symptoms was weakly associated with deployment (1·32; 1·14–1·53), whereas for reservists deployment was associated with common mental disorders (2·47, 1·35–4·52) and fatigue (1·78; 1·09–2·91). There was no evidence that later deployments, which were associated with escalating insurgency and UK casualties, were associated with poorer mental health outcomes.

2.3 Study 1 Implications

For regular personnel in the UK armed forces, at the time of study 1 (published in 2006) deployment to the Iraq war had not, so far, been associated with significantly worse health outcomes, apart from a modest effect on multiple physical symptoms. There was, however, evidence of a clinically and statistically significant effect on health in reservists.

3. STUDY 2

In study 1 we showed that deployment to Iraq in 2003 (during the "war fighting" phase) was not associated with mental disorders among regular Service personnel but this was not the case for reservists.[5] These results were in contrast to the data from the US where considerably higher proportions of personnel returning from deployment were identified as suffering from mental disorders, particularly post-deployment PTSD (Hoge, Terhakopian et al. 2007; Milliken, Auchterlonie et al. 2007). Furthermore, contrary to expectation, US PTSD rates had been observed to increase with time since return from deployment (Milliken, Auchterlonie et al. 2007). Finally, we had also published research which showed that deployments totalling more than 12 months within a 3-year period are associated with mental disorders (Rona, Fear et al. 2007). Operations in Afghanistan (codenamed HERRICK) and Iraq (codenamed TELIC) had continued longer than initially anticipated and when study 2 was conducted there was still no clear date for UK personnel to leave Afghanistan.

3.1 Study 2 Methods

Study 2 was a re-assessment of the mental health of those who participated in phase 1 of our cohort study (Study 1) which was set up to examine the impact of deployment to Iraq in 2003.[5] However, in Study 2 we included two additional groups of UK Service personnel in order to represent the, then, current military structure (those who joined the military since 2003) and current operational deployments (those deployed to Afghanistan, between April 2006 and April 2007). We aimed to: examine the legacy of the deployment to Iraq on the health of those who served there; the impact of multiple deployments of UK personnel to both Iraq and Afghanistan; and, assess whether or not these effects increase or decrease with time since return from deployment. Study 2 was the first research to specifically examine the mental health of those deployed to both Iraq and Afghanistan from the UK perspective and the surveys were conducted between November 2007 and 30th September 2009. A slightly modified version of the original (Study 1) questionnaire was used and the main outcome measures were the same.

3.1 Study 2 Results

The participation rate was 56% (n=9990) and included regulars, reservists and those who had left the military. The prevalence of symptoms of PTSD was 4.0%, 19.7% for symptoms of common mental disorders and 13.0% for alcohol misuse. There was an effect of deployment to Iraq or Afghanistan among regular personnel for alcohol misuse (odds ratio (OR): 1.23; 95% confidence interval (CI): 1.03-1.47) and among reservists for symptoms of PTSD (OR: 2.84; 95% CI: 1.24-6.52). Regular service personnel in combat roles were more likely than those in support roles to report symptoms of PTSD (6.9% vs. 3.6% respectively). No association with deployment phase or number of deployments was observed for any of the outcomes. There was limited evidence for an association between increased reporting of PTSD symptoms and time since return from deployment.

3.3 Study 2 Implications

More than six years after operations had begun in Iraq and more than three years since operations had begun, in earnest, in Afghanistan we found that the UK Armed Forces personnel who had deployed to either or both theatres of operations had remained highly resilient. Overall, symptoms of common mental disorders and alcohol misuse were the most frequently reported mental disorders among UK Service personnel and, in contrast to reports relating to US forces, the prevalence of symptoms of PTSD was low.

We did, however, find an effect of deployment to Iraq or Afghanistan among regular personnel for alcohol misuse and for symptoms of PTSD among reservists. Whilst we found a gradual increase in PTSD symptoms over the years since returning from deployment it was of a substantially lower magnitude than the effect reported in US troops and appeared to have reached a plateau some 4 to 5 years after returning home; however given that the effect was only a small one, further research would be needed to ascertain how long this effect might last.

4 STUDY 3

Studies 1 and 2 examined the psychological health of UK military personnel who had returned from serving in either Iraq or Afghanistan. The aim of study 3 was to examine the mental health status of troops whilst they were deployed. The Operational Mental Health Needs Evaluation in Iraq (OMHNE-I) – was carried out in Iraq (during TELIC 13) between 26 Jan and 27 Feb 2009(Mulligan, Jones et al.).

4.1 Study 3 Methods

The OMHNE-I team consisted of two military personnel who spent about six weeks visiting the main operational areas in Iraq where UK troops were serving. The OMHNE questionnaire included two main outcome measures; the General Health Questionnaire (GHQ) and Post Traumatic Stress Disorder Checklist (PCL). Visits were carried out by asking the location commander to assemble all available personnel in one central location in order to receive a brief from the survey team prior to the surveys being distributed; the brief was supplemented by printed information sheets and was clear in telling participants that none of their answers would be fed by to their units in any way that would make it possible to identify individuals. Surveys were scanned into a Remark database using a TWAIN scanner. The Remark software had been used to produce the questionnaire. This allowed the software to 'read' the filled in boxes on the questionnaire and convert them to numerical information which was stored in the database. Although the scanning software was highly accurate it was necessary to 'clean' the scanned data where respondent's answers were unclear. The cleaning process consisted of the OMHNE team manually entering data into the Remark database by examining scanned images of the questionnaire stored within the Remark software. Once the Remark database was complete, and cleaned, the data was transferred into a Statistical Package for Social Sciences (SPSS) version 15 database; this was possible by direct export from the Remark package. A variety of analyses were undertaken according to the nature of the analysis. Chi-Squared (χ^2) analysis was used for categorical data, T tests were used to compare means of normally distributed data, Mann-Witney U tests were used to compare means of non-parametric data and logistic regression analysis was used to determine how variables interacted with one another in relation to outcomes of interest.

4.2 Study 3 Results

Of 611 participants, 20.5% scored above the cut-off on the, GHQ–12 and 3.4% scored as having probable PTSD. Higher risk of psychological distress was associated with younger, age, female gender, weaker unit cohesion, poorer perceived leadership and non-receipt of a pre-deployment stress brief. Perceived threat to life, poorer perceived leadership and non-receipt of a stress brief were risk factors for symptoms of PTSD. Better self-rated overall health was associated with being a commissioned officer, stronger unit cohesion and having taken a period of rest and recuperation. Personnel who reported sick for any reason during deployment were more likely to report psychological symptoms. Around 11% reported currently being interested in receiving help for a psychological problem.

4.3 Study 3 Implications

In an established operational theatre the prevalence of common psychopathology was similar to rates found in nondeployed military samples. This study also provided evidence that, at least whilst deployed, there remains scope for further improving the in-theatre resilience of troops to deal with operational stressors including raising awareness of the link between reporting sick and mental health and ensuring implementation of current policy to deliver pre-deployment stress briefs.

5 STUDY 4

Whilst Study 3 examined troops deployed to Iraq towards the end of the UK involvement in Iraq, at the time of that deployment the Iraq theatre of operations, whilst far from safe, was relatively mature. However, operations in Afghanistan were continuing and the death toll of UK military personnel deployed there was increasing. Study 4 was therefore an Operational Mental Health Needs Evaluation in Afghanistan (OMHNE-A) which aimed to assess the impact of cohesion, morale and leadership upon post-traumatic stress disorder (PTSD) symptoms and common mental disorders amongst UK Armed Forces personnel deployed to Afghanistan.

5.1 Study 4 Methods

The OMHNE-A research team deployed to Afghanistan between 23rd Jan and 26th Feb 2010 which was during operation HERRICK 11. The research protocol was very much in keeping with that described for the OMHNE-I study (Study 3). UK Armed Forces personnel completed a self-report survey about many aspects of their current deployment, including perceived levels of cohesion, morale, leadership, frequency of combat exposure and also their ongoing mental health status during their deployment to Afghanistan. Outcomes were symptoms of common mental disorder and symptoms of (PTSD).

5.2 Study 4 Results

The study team surveyed 1431 personnel which represented about 15% of the deployed force. Combat exposure was associated with both PTSD symptoms and symptoms of common mental disorder. Of the 1431 participants 17.1% reported caseness levels of common mental disorder and 2.7% were classified as probable PTSD cases. High unit cohesion, high morale and perceived good leadership were all associated with lower levels of common mental disorder and PTSD.

5.3 Study 4 Implications

The burden of psychological ill health was very much in keeping with that found in Iraq and within troops in their home bases. The resilience of UK troops to the high levels of combat exposure were, at least in part, due to high perceived levels of unit cohesion, morale and good leadership which appeared to act as buffers against the development of mental health problems associated with increased frequency of combat exposure amongst UK Armed Forces personnel deployed to Afghanistan.

6 CONCLUSIONS

This paper presents four studies which have examined the psychological health of the United Kingdom Armed Forces since the beginning of military operations in Iraq in 2003. The results of the studies, which have examined troops before, during and after deployment to both Iraq and Afghanistan, show a picture of remarkable resilience in that the psychological health of troops has remained remarkably consistent despite the high intensity operations carried out by the UK military in both theatres of operations. As shown in Figure 1. data obtained from the various studies carried out by King's College London show that the rates of probable PTSD vary between just below 3% to just below 6%.

Interestingly the lowest reported rates of PTSD are within deployed troops suggesting that whilst troops are carrying out their primary role in a highly hazardous environment. Whilst this result might, in part, be artefactual as it the survey teams in Afghanistan were not able to visit every location in theatre and therefore it is possible that troops with high levels of psychological ill health could have been disproportionately unlikely to be in the study sample, the low rates found could also be a result of the high levels of unit cohesion and good leadership which the both of the deployed studies reported. Unit cohesion and leadership have been repeatedly shown to be protective to troop's mental health.

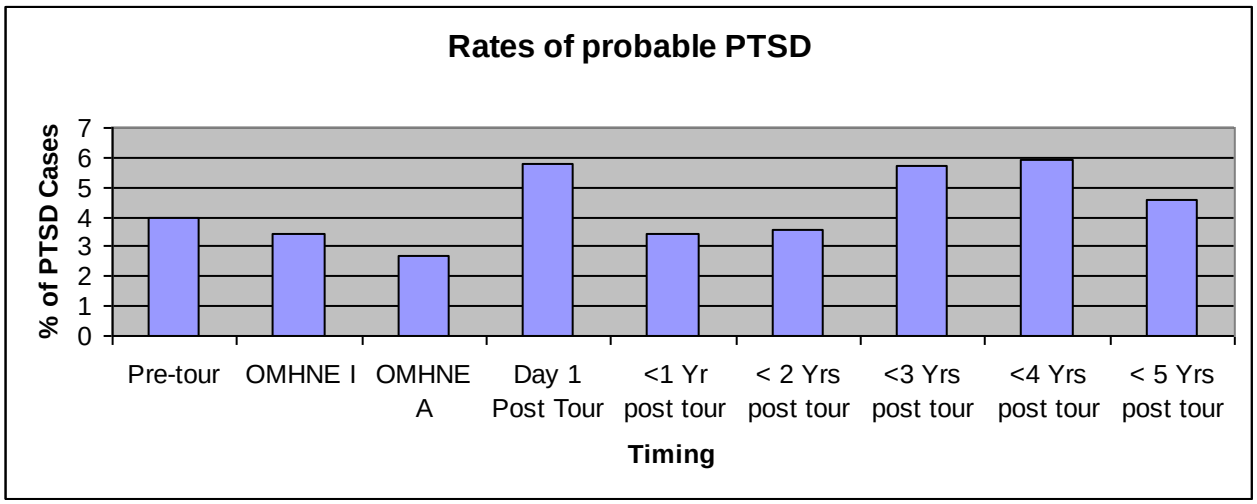
Apart from Unit Cohesion and Leadership, the presented data provides other clues as to the possible origin of the UK Armed Forces' psychological resilience. Unlike US troops, UK personnel ordinarily deploy for no more than one year in three and deployment length is usually for six months as opposed to many of the US forces who deploy for up to a year at a time and spend more total time away than UK troops. Also, UK forces have a staged return home from deployment, usually stopping over for 24-36 hours in Cyprus where the process of "unwinding" can begin. The UK post operational stress management process also includes the provision of a number of psychological briefings which both have been found, when given correctly, to be useful in both US and UK studies.

Other, less well researched, factors such as provision of family support, the provision of communications with families whilst deployed and the quality and availability of mental health services are also likely to affect the UK Armed Forces ability to deal with the stressors they encounter on deployment. Stigma, whilst shown through research to be an issue for UK troops, has also similarly been shown to affect other nation's troops. Whilst more research on this topic is likely to be helpful, it is unlikely that especially low levels of stigma could explain the particular resilience of UK troops demonstrated in this paper.

In conclusion, this paper is an amalgamation of research based upon a longitudinal high quality cohort study of troops in their home bases, some of which have deployed to high threat locations, and in-situ troops in such locations. The results show that UK military forces have remained remarkably resilient in spite of facing a considerable burden of operational stressors and whilst some potential contributors to this finding are discussed there is still a need for more research to investigate this matter further. In particular, it would be helpful if further studies could examine the reasons for the differences in prevalence of psychological ill health between the various coalition nations in order to identify whether factors such as tour length or post deployment management (including potentially the use of mental health screening which the UK Armed Forces currently does not use) might be important factors for force resilience.

Figure 1.

Rates of Probable PTSD in UK Armed Forces In Relation to Deployment



References:

[1] Fear, N. T., A. Iversen, et al. (2007). "Patterns of drinking in the UK Armed Forces." Addiction **102**(11): 1749-1759.

[2] Fear, N. T., M. Jones, et al. (2010). "What are the consequences of deployment to Iraq and Afghanistan on the mental health of the UK armed forces: a cohort study." Lancet: doi:10.1016/S0140-6736(10)60672-1.

[3] Goldberg, D. and P. Williams (1988). A User's Guide to the General Health Questionnaire. Windsor, NFER-Nelson.

[4] Hoge, C., A. Terhakopian, et al. (2007). "Association of Posttraumatic Stress Disorder with Somatic Symptoms, Health Care Visits, and Absenteeism Among Iraq war Veterans." American Journal of Psychiatry **164**: 150-153.

[5] Hotopf, M., Hull, L., Fear, N., Browne ,T,. Horn, O., Iversen, A., Jones, M., Murphy, D., Bland, D., Earnshaw, M., Greenberg, N., Hacker-Hughes, J., Tate, R., Dandeker, C., Rona, R., Wessely, S. (2006). "The health of UK military personnel who deployed to the 2003 Iraq War: a cohort study." Lancet **367**: 1731-1741.

[6] Milliken, C., J. Auchterlonie, et al. (2007). "Longitudinal assessment of mental health problems among active and reserve component soldiers returning from the Iraq war." Journal of the American Medical Association **298**: 2141-2148.

[7] Mulligan, K., N. Jones, et al. "Mental health of UK military personnel while on deployment in Iraq." Br J Psychiatry **197**: 405-10.

[8] Rona, R. J., N. T. Fear, et al. (2007). "Mental health consequences of overstretch in the UK armed forces: first phase of a cohort study.[see comment]." BMJ.335(7620):603.

[9] Weathers, F., B. Litz, et al. (1994). The PTSD checklist - civilian version (PCL-C). Boston, National Center for PTSD.