

# King's Centre for Military Health Research: *A fifteen year report*

**What has been achieved by fifteen years of research into the health of the UK Armed Forces?**



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Mortar platoon deploys forward in Afghanistan

# Summary



## INTRODUCTION

### SECTION 1

#### The health consequences of the 1991 Gulf War

##### Epidemiology

- ▶ Definite increase in ill health in UK Gulf veterans
- ▶ But no unique “Gulf War Syndrome”
- ▶ Picture similar to USA, Canada, Australia and Denmark
- ▶ No increase in cancer
- ▶ No increase in mortality other than suicide and/or accidents
- ▶ All three Services equally affected
- ▶ No influence of role/task/duty in theatre
- ▶ Symptoms more common in lower ranks
- ▶ Symptoms not an artefact of how questions were asked

##### Causes

- ▶ No evidence of damage to peripheral nervous system
- ▶ Organophosphate pesticides or nerve agents not cause
- ▶ Subjective rather than objective neuropsychological problems suggest that frank “brain damage” also unlikely
- ▶ Psychiatric disorders such as PTSD doubled, but overall rates not sufficient to explain all ill health
- ▶ Any possible cause must be a widespread exposure
- ▶ Plausible candidates for the increase in symptoms therefore include medical counter measures, stress/fear of chemical weapons, media/social influences

##### Medical counter measures

- ▶ Statistical link between particular pattern of medical counter measures used by UK Armed Forces and ill health (1991 Gulf only, not Iraq)
- ▶ Interaction between biological vaccines, multiple vaccines and stress in theatre

- ▶ Some immunological changes identified in sick Gulf veterans, but unable to confirm this was due to vaccines
- ▶ Link between vaccines and symptoms may not be immunological
- ▶ Anxiety secondary to genuine threat of chemical weapons remains a possible factor
- ▶ Since the Gulf War and our studies, UK Armed Forces vaccination policy has been changed on a precautionary basis

##### Outcome

- ▶ Gulf health effect has persisted over time

### SECTION 2

#### Historical approaches to veterans' health

- ▶ Medically unexplained symptoms have arisen after many previous conflicts involving the UK Armed Forces
- ▶ There has been a gradual shift in the pattern of symptoms and the explanations offered since the Victorian period
- ▶ Psychological reactions to trauma are likewise not static, and have changed since the First World War
- ▶ The perception of the psychiatric consequences of being a prisoner of war has shifted over the last century– from seeing them as protected against disorder to being particularly vulnerable
- ▶ The psychological effects of chemical weapons during the First World War had long term adverse effects on health and wellbeing
- ▶ Mild traumatic brain injury has much in common with both shell shock and post-concussion syndrome.
- ▶ A historically informed MSc in “War and Psychiatry”, is now offered by KCL and approved by MOD for members of the Armed Forces

## **SECTION 3**

### **The wars in Iraq and Afghanistan: 2003-2009**

#### **“Iraq War Syndrome”**

- ▶ No “Iraq War Syndrome”
- ▶ Makes it unlikely that factors common to both conflicts, such as depleted uranium (DU), anthrax vaccine, pesticides, NAPS tablets, or general stress, were a main cause of the “Gulf War Syndrome” problems

#### **Mental health outcomes (Regulars)**

- ▶ No increase in psychiatric problems in Regular Forces who have deployed to either Iraq or Afghanistan compared to rest of Armed Forces
- ▶ Rates stable from war fighting to counter insurgency, and with increased Op Tempo in Afghanistan
- ▶ No increase in rates during deployment
- ▶ Increase in alcohol problems in combat troops after deployment (2006), extended to all deployed personnel (2009)
- ▶ No substantial increase in mental health problems when personnel return home, unlike US data
- ▶ Self reported violent behaviour is prevalent among Regular personnel on homecoming from deployment and is associated with exposure to combat trauma as well as premilitary antisocial behaviour.

#### **Mental health outcomes (Reservists)**

- ▶ Doubling of PTSD in UK Reserve Forces, although overall rate remains low.
- ▶ Explanations unlikely to be due to events in theatre
- ▶ More likely are family issues before deployment, support to families during deployment, and experiences of home coming
- ▶ Early problems with Reservists being accepted by Regulars when deployed appear to have resolved

#### **“Overstretch”**

- ▶ No relationship between tour length and mental health, provided Harmony Guidelines adhered to
- ▶ Increase in PTSD and alcohol problems when guidelines exceeded, especially if tour length extended during deployment
- ▶ No relationship yet found between number of deployments and mental health

#### **US/UK differences**

- ▶ The overall rate of psychiatric problems is lower for the UK than for the US Armed Forces, including those deployed
- ▶ Differences in prevalences of mental health outcomes reduced as differences in rates of combat exposure also reduced
- ▶ Correlation between increased number of deployments and worse mental health only found in US not UK Forces

- ▶ In addition to initial differences in combat exposure, US forces were younger, had less previous deployment experience, were more likely to be Reservists, and had longer deployments
- ▶ Substantial increase in mental disorders over time once personnel had returned home only observed in US and not UK data sets
- ▶ Other important differences could be examined by sharing of data between the US and UK

## **SECTION 4**

### **Medical Countermeasures and Op TELIC**

- ▶ No medium/long term side effects detected from anthrax vaccine
- ▶ No medium/long term side effects detected from multiple vaccines
- ▶ Recall bias may have explained previous findings on multiple vaccines
- ▶ Side effects are related to perception of consent
- ▶ Developing special consent procedures for anthrax vaccine has not increased confidence
- ▶ Acceptance of biological vaccines has decreased as the perception of the threat decreased

## **SECTION 5**

### **How is psychological trauma best managed in the Armed Forces?**

- ▶ Current stress briefing/education is patchy, often forgotten, and of relatively unproven benefit
- ▶ Single session psychological debriefing does not reduce psychological problems after trauma
- ▶ A new system of peer support and risk assessment (TRIM) is better suited to military culture, and is popular.
- ▶ TRIM has not been shown to reduce subsequent PTSD, but may be part of longer term cultural change
- ▶ Third Location Decompression is of unproven benefit, but is also popular.
- ▶ BATTLEMIND is a US developed approach to post deployment stress management that avoids suggesting that symptoms/behaviours are pathological
- ▶ BATTLEMIND improved mental health in the US trial but not the UK trial

## **SECTION 6**

### **Outcomes and barriers to care**

- ▶ Only a minority of those with mental health problems in service have sought medical help

- ▶ Non medical sources of support such as padres are more popular than medical sources
- ▶ Stigma remains a powerful barrier to accessing help in the UK Armed Forces, the military of other countries and society at large
- ▶ Outcomes of those treated by the Field Mental Health Teams in theatre are good, suggesting that “Forward Psychiatry” remains relevant
- ▶ Outcomes of those seen in secondary mental care in the UK are not as good, especially for those who have been in the Services for a short time

## **SECTION 7**

### **Screening**

- ▶ Mental health screening before deployment does not predict deployment ill health, and might have adverse consequences for some individuals and the Armed Forces
- ▶ Mental health screening after deployment is undertaken in other countries, but is not yet supported by evidence of benefit
- ▶ Possible disadvantages include numbers of false positives, natural history and low prevalence of PTSD and continuing stigma/barriers to care
- ▶ The issue is now being addressed by a UK randomised controlled trial of post deployment screening

## **SECTION 8**

### **Peacekeeping and its consequences**

- ▶ Peacekeeping creates as many psychological problems as war fighting
- ▶ Whilst war fighting includes exposure to the classic “horrors of war”, peacekeeping stressors are characterised by high threat ambiguity and helplessness

## **SECTION 9**

### **Alcohol and risk taking behaviours**

- ▶ Background levels of reported alcohol misuse in the UK Armed Forces are higher than in general population
- ▶ This difference is particularly striking amongst young women
- ▶ Levels of binge drinking also increased
- ▶ By 2009, we are starting to see an impact of deployment on alcohol misuse (among Regulars)
- ▶ Increase in risk driving is also related to deployment
- ▶ Smoking is becoming less common

## **SECTION 10**

### **Contemporary approaches to the transition to civilian life and the health of ex-Service personnel**

- ▶ UK uses a very broad definition of a veteran – one day of employment in the Armed Forces
- ▶ Using the Adult Psychiatric Morbidity Survey we estimate that in 2007 the number of veterans in England was 3,770,000.
- ▶ The same dataset suggests that service in the Armed Forces is not associated with overall increases in psychiatric disorders
- ▶ Most people who leave the Armed Forces do well and get jobs quickly
- ▶ Service leavers with poor mental health in service are more likely to leave and less likely to get jobs after leaving
- ▶ Poor outcomes are clustered in early Service leavers, and found to be multiple (debt, antisocial behaviour, substance misuse, mental health problems, unemployment, marital difficulties and unstable housing)
- ▶ Those with psychiatric problems have difficulties accessing appropriate NHS services, and rarely obtain the best psychological treatments. This is not unique to the Armed Forces
- ▶ The main barriers to care remain stigma and reluctance to access services, but this is also not unique to Armed Forces,
- ▶ For the minority most at risk of poor social outcomes, interventions need to be broad based, and given before or as soon after separation as possible

## **SECTION 11**

### **Other issues**

- ▶ mTBI is a new label for concussion
- ▶ The symptoms that follow a presumed mTBI/concussion are not specific, although double vision seems to be an exception
- ▶ There is an overlap between mTBI and PTSD
- ▶ mTBI seems to be commoner in US than in UK combat personnel
- ▶ Medical downgrading for long term physical illness hides a burden of psychological problems
- ▶ Watching TV programmes containing personally relevant and powerful scenes does not worsen mental health
- ▶ Partners have different views about the impact of deployment on family life and functioning
- ▶ Informal networks of social support (“military family”) remain strong
- ▶ Imbalance in both formal and informal support between Regulars and Reserves
- ▶ No overall impact of deployment on marital breakdown
- ▶ No evidence of clinically significant exposure to DU in UK military personnel deployed to Iraq

## **SECTION 12**

### **Academic Centre for Defence Mental Health (ACDMH)**

- ▶ ACDMH is a synergistic link between MOD and academia
- ▶ It is an in-house mental health research capability that complements the work of KCMHR
- ▶ ACDMH is able to carry out some “in vivo” studies which would be impossible for non-military academics

## **SECTION 13**

### **What impact has KCMHR had on policy?**

- ▶ Identified the Gulf War illness problem, leading to changes in health surveillance, health communication and record keeping
- ▶ Showed that pesticides, DU and the anthrax vaccine were not to blame – thus allowing them to remain available for use within the operational environment as required
- ▶ New vaccination policy utilized during Op Telic on a precautionary basis
- ▶ Emphasised importance of adhering to deployment Harmony Guidelines
- ▶ Mental health care after demobilisation extended to Reservists
- ▶ Facilitated resource to be spent on improving community mental health services rather than pre deployment mental health screening
- ▶ Provided evidence to be cautious in the introduction of screening for mental illness
- ▶ Created awareness that alcohol misuse is common in the UK Armed Forces and should be tackled
- ▶ Supported the overarching review of operational stress management and implementing the lessons of the PTSD Class Action.
- ▶ Showed increased risk of accidents in personnel post deployment
- ▶ Facilitated release of MOD data to support medical audit and research
- ▶ Facilitated the introduction of TRiM into Armed Forces policy
- ▶ Allowed MOD to monitor the reaction of troops to emerging policy initiatives such as decompression
- ▶ Supported the establishment of the Joint Stress Management Training Centre in order to ensure MOD provides evidence based mental health training
- ▶ Had a direct impact on the psychological support of deployed troops and their families through the use of in-theatre mental health surveys

## **SECTION 14**

### **Where are we going? Work in progress**

- ▶ Maintaining the existing cohort
- ▶ Using routinely collected sources alongside cohort
- ▶ Offending and violent behaviour after deployment
- ▶ Children of military fathers
- ▶ Randomised controlled trial of post deployment screening
- ▶ How does society view those who are serving or have served?
- ▶ What is the overall effect of military service on health – balancing the positives and negatives
- ▶ Data sharing with US colleagues

## **SECTION 15**

### **Conclusions**

#### **APPENDIX 1**

#### **Gulf War Illnesses Research Unit and KCMHR staff 1996-2010**

#### **APPENDIX 2**

#### **Acknowledgements**

#### **APPENDIX 3**

#### **KCMHR Advisory Board**

#### **APPENDIX 4**

#### **Grants**

#### **APPENDIX 5**

#### **Publications**



# Introduction



**IN THE MID 1990s** there was an upsurge of government and public interest in the health of UK service personnel, or more specifically UK Service veterans. There were various reasons for this. First, the 50 year commemorations of D Day and of the end of the Second World War focussed attention on a generation coming to the end of their lives. Second, increasing recognition of the psychological costs of trauma in general extended to the ex-Services population, such as those of the Falklands War. This was reflected in the large class action brought in 2001 by many veterans claiming that the MOD had failed to address the issue of post traumatic stress disorder (PTSD).<sup>1</sup> But perhaps the most important factor was the increasing concerns and controversy surrounding the health of those who had taken part in the 1991 Gulf War, many of whom came to be labelled by the media as suffering from "Gulf War Syndrome".

Starting in 1996 we began to study the health and well being of UK Gulf War veterans. We also looked at those who had been involved in peace keeping operations in the Former Republic of Yugoslavia, and then at the health and social problems of ex-Service populations in general. At the same time, we carried out historical studies on the health of veterans going back to the Crimean War.

Based on lessons learnt from the saga of Gulf War Syndrome, in 2003 we were asked by the UK MOD to start a new large scale study into the physical and psychological health of those who were going to take part in the invasion of Iraq. This study has since expanded as the war continued, and as UK Forces began to be deployed in increasing numbers to Afghanistan. We reported our findings in 2006. Earlier this year (2010) we completed a follow up of the same group, including not only those still serving, but those who had now left the military and returned to civilian life. These studies have been wide ranging, and have brought together researchers from a wide variety of disciplines, including anthropology, biochemistry, dermatology, epidemiology, genetics, history, immunology, neurology, nursing, psychology, psychiatry, public health, statistics and sociology.

We began as the Gulf War Illnesses Research Unit, founded in 1996. As our work expanded, this was reflected in a change of name to the King's Centre for Military Health Research (KCMHR), launched in 2004. KCMHR is a collaboration between three parts of King's College London (KCL) – the Institute of Psychiatry (IoP), the Department of War Studies, and the Medical School. Finally we also launched the new Academic Centre for Defence Mental Health (ACDMH), a direct collaboration between the university and the MOD, involving both academics and serving military medical personnel seconded to the unit.

Our work is independent of the Ministry of Defence, although of course we work in close collaboration with them in deciding what are the key topics that need to be addressed, and then over the numerous complex practical and logistical difficulties that doing this kind of research entails. But the primary means of communication of our results is in the scientific literature; KCL is an academic institution, and publication in the peer reviewed scientific literature remains the way in which science is, and should be, reported. During the 15 years of our existence, we have published all our findings in this way. We should also add, for the benefit of any sceptical readers, that at no time have MOD attempted to prevent us from publishing any of our results. Instead MOD have recognised the importance of genuinely independent studies in assisting them to formulate policy. The only restriction on how we operate was a stipulation from the beginning that we do not involve Special Forces (SF) in our work for reasons of security.

However, the scientific literature is not easily accessible to the general public. And even when people do access the literature, it is not always written in an easily digestible or lay friendly style. For that reason we first provided an overview of our work in 2006. But even in the short space of time since then, much more has happened. The UK involvement in Iraq is now over for the most part, but continues in Afghanistan, where casualties continue to mount. There have been increasing



public concerns about the medium and long term health of our military personnel and their families, especially those who have now left the Armed Forces. We feel it is timely to update our previous report, summarising what we know so far about the impact of recent operations on the physical, psychological and social health and well being of the Armed Forces. Once again, we make no apologies for concentrating on the work of our Centre. We will refer to research from other institutions where directly relevant, but emphasise that our intention is to provide an overview of our contribution.

Finally, a personal note. We have been fortunate over the life of the unit to have worked with a remarkably able, talented and also collegiate group of colleagues, both within and outside the unit. In Appendix 2 we list all of those who have worked in the unit or continue to do so – their names are also scattered liberally around our reference lists. We also go on to pay tribute to our collaborators in the UK and around the world, both within and outside the Armed Forces. These have been so many and so numerous that we suspect that even that long list is not comprehensive – our apologies to those we have inadvertently left out. But throughout the now 15 year history of the unit, there has been one person who has been at the heart of almost everything we have done. Lisa Hull joined us in 1996, and for the last decade has been the person who has kept the show on the road. Without her hard work, devotion and management skills, very little of what follows would ever have happened.

**Professor Simon Wessely**  
**Professor Christopher Dandeker**  
*September 2010*

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## Reference

- 1 McGeorge et al. The MOD PTSD Class Action - A Psychiatric Perspective. *Occupational Health Review* 2006; 122: 21-8.

# Section 1

## The health consequences of the 1991 Gulf War



**THE 1991 GULF WAR** was a military and medical success. Traditionally, fighting in hostile environments such as the desert has been associated with disease and death from causes not related to enemy action such as heat stroke, dehydration and infectious disease. Yet none of this happened during the Gulf campaign, partly due to the improvements in medical care and force health protection.

Few will now remember the medical achievements of the campaign, and instead most people when asked about the Gulf War and health, will answer “ah yes, that’s where Gulf War Syndrome began”.

It was shortly after the cessation of hostilities that reports started to emerge from the United States of clusters of unusual illnesses occurring amongst Gulf War veterans. Claims were made that previously fit veterans had developed unusual diseases, illnesses and symptoms. Reports also emerged of children with birth defects being born to Gulf War veterans. All of these were grouped under the popular term “Gulf War Syndrome”.

### THE SITUATION IN THE UNITED KINGDOM (UK)

The same sequence of events happened in the UK as in the US, even though we don’t know if they happened at the same time. One of the reasons why we will never know exactly when problems started is because there was no systematic monitoring of the health of the Armed Forces on either side of the Atlantic after 1991. We know that newspaper reports started to accumulate about health problems in UK Service personnel towards the end of 1992, and gathered pace after that. By 1994, the Ministry of Defence (MOD) had established the Medical Assessment Programme (MAP) to assess individual veterans, confirming that increasing numbers of Gulf veterans were seeking help.

But what was missing was fundamental information on the rates of illness in Gulf veterans. 53,000 UK personnel served in the Gulf, and with the passage of time it was inevitable that some would develop serious illnesses, and

even die prematurely. But unless one knows the rate of illness, and is able to compare with the rate of illness in an appropriate comparison group, it is impossible to draw any conclusions from the fact that some Gulf veterans presented with health complaints on both sides of the Atlantic. That would not be the case if there was something exceptional about the illnesses affecting veterans, but the kind of complaints being brought to doctors were not in themselves unusual or novel.

So the answer was to look at a large, randomly chosen, representative sample of UK Gulf veterans. Large so that relatively small changes in health could be detected, and randomly chosen so that the results could be generalised to the rest of those who served in the Gulf. Simply studying small groups of veterans who had been identified by doctors as having cancer, or neurological conditions, would tell us little, since Armed Forces personnel are no more immune from these problems than anyone else. But by surveying a large random sample we are able to draw conclusions that can be extended to all those who served in the Gulf.

Our next question was the choice of a comparison group, since one must compare like with like. There was no point in comparing Gulf veterans with civilians, since the Armed Forces differ from civilians in numerous ways, but most importantly on health. People with poor health are largely prevented from joining the Armed Forces, which means that Service personnel are healthier than the rest of the population.

We decided to compare the Gulf veterans with two groups. First, UK Service personnel who had deployed to Bosnia in 1992 on peace enforcement duties (Op GRAPPLE). This was a particularly dangerous and unpleasant deployment. We felt that those who had deployed to Bosnia were directly comparable to those who had deployed to the Gulf in terms of fitness, training and so on. We also compared both groups to Service personnel who had been in the UK Armed Forces in 1991 but had not served in either the Gulf or Bosnia, whom we labelled the “Era” group.

Research needs money. Back in 1995 the UK government was not convinced of the need for the study we proposed, so we applied to the US government for funding, under an open peer reviewed call for proposals. This was successful, so our first set of studies was funded by the US Department of Defense.

The study took three years to complete – largely due to the problems of finding people, many of whom had left the Armed Forces since the Gulf War. The military had undergone a significant “down sizing” immediately after the end of the Gulf War as a result of the White Paper “Options for Change”.

Finally over 8,000 male and female serving and ex-serving personnel agreed to give us information about their health and well being via a mailed questionnaire.

## MAIN RESULTS: 1991 GULF WAR

Figure 1 gives the key results.<sup>2</sup> Each point on the figure represents a single symptom – common symptoms such as fatigue or headache are on the left, uncommon symptoms are on the right. Looking first at the Bosnia and Era men, indicated by the dots, it is clear that both groups can and do develop symptoms. Because there is no difference between the two groups, there is no evidence that veterans of the Bosnia mission have any worse health than the rest of the Armed Forces.

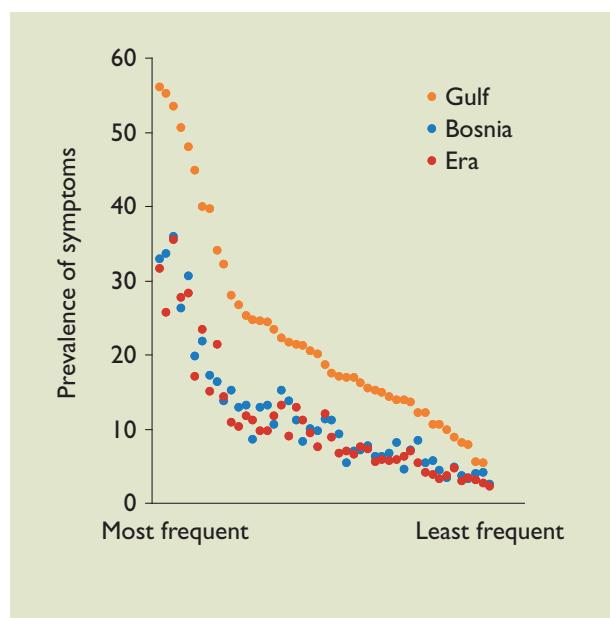


Figure 1: Symptoms are increased in UK Gulf veterans compared to Bosnia and Era veterans (Unwin et al 1999)

But there is a clear difference between these two groups and those who served in the Gulf. The Gulf veterans are more likely to report each of the 50 symptoms we asked about. They also report them at greater intensity. This graph gives the results for the men, but it was just the same for women.<sup>3</sup> So given that this is a random sample, and given that it is unlikely that there were

important differences between, for example, the Bosnia and Gulf veterans before they were deployed to either conflict, this is conclusive evidence that something had affected the health of the UK Gulf veterans.

## IS THERE A GULF WAR SYNDROME?

No one is sure where the phrase “Gulf War Syndrome” came from. Perhaps it is a pity that it ever did, since the term itself has caused confusion from the start. A syndrome is a new group of signs and/or symptoms, not previously seen in medicine. AIDS was such a new syndrome. But the problem that affected Gulf War veterans was not a new syndrome – the symptoms they complain of were not new to medicine. Likewise the pattern of symptoms between the three groups is not that different. The problem is that Gulf veterans report more symptoms than expected, and at greater intensity. Figure 1 shows that the shapes of the three lines representing Gulf, Bosnia and Era military personnel are the same, but the line representing the Gulf deployed personnel is higher. The types and pattern of symptoms remain the same, so a symptom that is common in the comparison groups is common in the Gulf group, whilst unusual symptoms in the comparison groups are unusual in the Gulf group as well. But the Gulf veterans have more of each and every one of the symptoms. We subsequently published several statistical studies confirming that there is no unique syndrome associated with Gulf deployment,<sup>4,5</sup> which have been replicated by numerous other studies across the world, but you can draw the same conclusion by simply looking at figure 1.

So statistically speaking we are not dealing with a “Gulf War Syndrome”. The correct term should be “Gulf War Illness”, or even better “Gulf War Illnesses”. But whilst this is technically correct, there are dangers in even writing that “Gulf War Syndrome” is a misnomer, since it can be all too easily be interpreted as saying there is no such thing, or worse, that nothing untoward happened to any Gulf War veteran, which is not the case. Furthermore, “Gulf War illnesses”, or the “Gulf War health effect” just doesn’t sound the same. For better or worse, “Gulf War Syndrome” is going to remain the popular term.

## CANCER AND MORTALITY

Yet despite this clear evidence of poorer health amongst Gulf veterans, this has not been accompanied by any increase in “hard” outcomes, such as death, cancer or physical disease. Of course some Gulf veterans have died since the end of the conflict, but the important question is whether or not that would have been the case if they had not served in the Gulf War. And the answer is yes. The mortality rate of both US and UK Gulf veterans is monitored on a regular basis, and we know that right up

to 2009 it has not increased compared to non Gulf veterans, with the exception of suicide and accidental death.<sup>6</sup> Likewise, the cancer rate of UK veterans is no higher than expected.<sup>7</sup>

## SUMMARY

- ▶ Demonstrated increase in ill health in UK Gulf veterans
- ▶ No unique “Gulf War Syndrome”
- ▶ Picture similar to USA, Canada, Australia and Denmark
- ▶ No increase in cancer
- ▶ No increase in mortality other than suicide (US) and/or accidents (US/UK)

## SUMMARY

- ▶ All three Services equally affected
- ▶ No influence of role/task/duty in theatre
- ▶ Symptoms associated with rank
- ▶ Any possible cause must be a widespread exposure
- ▶ Possible candidates include medical counter measures, stress/fear of chemical weapons, media/social influences

## WHO WAS AT RISK?

The main risk factor for ill-health experienced after serving in the Gulf was the fact that the troops went to the Gulf, as opposed to Bosnia, Northern Ireland or elsewhere. But what else differentiated those who had problems from those who did not?

The answers were unexpected and informative. First, it did not matter which branch of the Armed Forces you served with, nor what your job or task was. Thus the Royal Navy was just as affected as the Army or RAF. Likewise, it did not matter whether people were in the combat “teeth” arms, combat support or combat services support –those at the ‘sharp end’ were no more or less at risk than those involved in logistics, intelligence, medical support and so on. Reserves also had the same risk as Regulars, as did women compared to men.<sup>8</sup>

All of this gives some clues. For example, exposure to depleted uranium (DU) munitions is often cited as the cause of ill health in Gulf personnel. But exposure is largely restricted to those in Armoured Brigades (tanks and mechanised infantry) and also REME who deal with combat damaged military vehicles, yet this was not a risk factor for illness. In order for any single risk factor to be a plausible candidate for what has been observed in all the studies of Gulf health, a large number of people would have to have been exposed to that factor. So what the epidemiology suggests is that we need to look for risk factors that could potentially affect large numbers of personnel, in all three Services, and who served at either at the front or the rear. This narrows the possibilities.

At the same time, we also showed that the health of the Armed Forces is influenced by many of the same factors that influence the health of everyone else. Most studies confirm that socio economic status is strongly related to health – physical and psychological health are worse for those at the lower end of the social scale than those at the upper end. The Armed Forces are little different, irrespective of serving in the Gulf, the higher the rank, the better the general health and well being.

## WHAT DO WE KNOW ABOUT THE NATURE OF ILL HEALTH AFTER THE 1991 GULF WAR?

So far we had shown that many UK Gulf veterans feel worse as a result of having served in the 1991 conflict, that they experience more symptoms, and that they feel their health has been affected. However, there is no evidence of any change in what doctors called “hard” outcomes such as cancer or death. So what is the nature of this ill health?

## PHYSICAL HEALTH

The large population based epidemiological studies have shown that, apart from suicide and accidental death, there is no increase in death from any particular physical illnesses in those who served in the Gulf War. We also know that cancer rates are not higher. And most studies have failed to show any excess of other well known physical diseases.

There are exceptions. For example, in our study we found an excess of hypertension in ill Gulf veterans compared to well Gulf veterans. They were also more likely to be overweight, and had higher levels of a particular enzyme (gamma GT) which is associated with alcohol intake, but is also a marker for obesity.<sup>9</sup> It is possible that all of these reflect the influence of problems such as fatigue and lack of exercise, which may be part of a vicious circle of ill health, fatigue, lack of exercise, and hence increased weight, more fatigue and even less exercise.

We also showed that there was an excess of a particular skin disease, seborrheic dermatitis,<sup>10</sup> which whilst not particularly serious itself, is intriguing because of its associations with immune dysfunction (see later).

Finally, an American study reported that Gulf veterans were more likely to be suffering from motor neuron disease (MND), a rare neurological condition.<sup>11</sup> However, this finding is controversial, since as MND is a terrible disease that is usually and fairly rapidly fatal, one would expect this to be reflected in higher death rates, which have not been found. Our neurological studies, to be discussed below, have also not found any evidence of disease in the peripheral nervous system. Whether or not

the American data is correct, MND is still a very rare condition in Gulf veterans, and cannot account for the large health effects that have been found.

## NEUROLOGY

Another possible cause of illness was exposure to organophosphate (OP) pesticides. Like most chemicals these are useful when given in the right place and right doses, and highly dangerous if taken in overdose. During the Gulf campaign these were used to reduce the threat of insect born diseases. But did they also cause damage to health?

The best way to look for evidence of OP toxicity is by detailed studies of the nervous system. So we asked a sample of those identified in the main study as having poor health and symptoms that might indicate neurological damage to come to King's for two days of intensive neurological testing. We also asked a random group of well Gulf veterans who had also filled in the questionnaire to come to King's for the same tests. It was remarkable how many agreed to this, given that there was nothing wrong with them, but they were keen to help those less fortunate than themselves.

We examined virtually every aspect of their nervous system, using a variety of electrophysiological tools that record the activity and integrity of the nerves and muscles. In particular, we used a technique called single fibre electromyography (SFEMG), which can record activity of individual neurons. This is a sensitive test for neuropathy (nerve damage).

The results were largely normal. Although the ill veterans reported symptoms that might indicate damage to the peripheral nervous system, this could not be confirmed on the sophisticated tests.<sup>12</sup> The SFEMG results made it unlikely that poisoning by organophosphate pesticides (OP) or any other OP agents had occurred. Overall, there was no evidence of any damage to the peripheral nerves, neuromuscular junction or muscles. These results were subsequently confirmed by a much larger American study.<sup>13</sup>

We also looked at how the muscles worked in sick and well Gulf veterans. We found that sick veterans were able to do physical exercise, but it required more effort than for the well controls.<sup>14</sup> During exercise sick Gulf veterans muscles produced more sodium lactate, which indicates that the mitochondria in the muscle cells are not working as efficiently as they should. There are several possible explanations for this. Subtle damage to the mitochondria from a variety of toxins is one possibility, although one might then expect other signs of muscle damage, which were not found. Alternatively, this could be the response of the muscles to unfitness, particularly in people who have previously been extremely fit, as is the case with many Service personnel, in which case the changes we detected would be the consequence, not the cause, of symptoms.

## NEUROPSYCHOLOGICAL STUDIES

In the preceding section we looked at the integrity of the peripheral nervous system. But what about the central nervous system (CNS)? There are many ways of studying the CNS, but one of the most sensitive is to use standardised tests of neuropsychological functions, such as memory, attention, co ordination, sequencing and concentration.

Using the same design as before, we compared sick and well Gulf veterans, using a battery of neuropsychological tests. The sick veterans reported far more symptoms indicating difficulties in memory or concentration but when these functions were tested the results were surprisingly normal.<sup>15</sup> Although sick veterans felt that their thinking, concentration and memory were impaired, this was not reflected in the test results. There is thus a difference between subjective complaints and objective tests. This is not unique to Gulf veterans, with similar findings being reported in civilians with chronic fatigue syndrome (CFS). Another finding, which overlaps with CFS, was the strong correlation between measures of psychological distress (such as depression or PTSD), and the subjective reports of poor memory, concentration and difficulties in thinking.

Only on one particular test, called the Purdue Pegboard, a test of motor skills, were sick Gulf veterans impaired, suggesting an impairment of motor dexterity, which might indicate some subtle neurotoxic damage.

So the conclusion of this and other studies was that there is little evidence of major neuropsychological impairment in Gulf veterans, and hence little evidence to suggest serious brain damage.<sup>16</sup> It is important to remember that whilst complaints such as poor memory and concentration can reflect direct damage to the nervous system, as might happen after exposure to neurotoxic chemicals, the same symptoms can also be associated with psychological distress such as depression or PTSD.

## PSYCHOLOGICAL STUDIES

War is stressful. It always has been, and most likely always will be. But did this contribute to the Gulf War Syndrome story? We showed that rates of every symptom were increased in Gulf War veterans, so it was inevitable that many of those in our studies fulfilled criteria for conditions such as depression, anxiety and PTSD, just as they also fulfilled criteria for CFS, chemical sensitivity and irritable bowel syndrome. But when we interviewed these people, using standardised interviews that are the "gold standard" for making diagnoses, many did not have formal psychiatric disorders. We found that although the rate of true psychiatric disorders had doubled in Gulf veterans, the actual level was not particularly high. So whilst people

were twice as likely to report PTSD if they went to the Gulf (a figure confirmed by many other studies),<sup>17</sup> most Gulf veterans, even those with increased levels of physical symptoms, did not have mental health disorders.<sup>18</sup> Psychiatric disorders per se could not account for all Gulf War ill health.

But that does not mean that psychological factors played no role in their health problems? Classic psychiatric disorders such as PTSD are not the only outcome of prolonged stress or fear. Virtually any stressful situation may result in an increase in physical symptoms. In particular, there was a real threat posed by chemical weapons before the Gulf campaign, which are as much, if not more, weapons of psychological as physical warfare. During the campaign there were several thousand documented chemical alarm alerts, and many veterans would have experienced several such alerts in the course of a single day. Subsequently the consensus of opinion is that all were false positives (not true detections), and Iraq did not use its chemical arsenal – but at the time each one had to be assumed to be genuine. One doesn't need much imagination to accept just how stressful that must have been. We know from our study and many others that those who latterly believed that they had been exposed to chemical weapons (a belief much more common in USA than UK personnel) were considerably more likely to report symptoms. So it is possible that a part of the ill health experienced after the Gulf campaign was triggered by anxiety caused by chemical weapons.

### SUMMARY

- ▶ No evidence of damage to peripheral nervous system
- ▶ Organophosphate pesticides or nerve agents not the cause
- ▶ Subjective rather than objective neuropsychological problems, suggest that frank “brain damage” also unlikely
- ▶ Psychiatric disorders such as PTSD doubled, but overall rates not sufficient to explain all ill health
- ▶ Cannot exclude role of anxiety caused by genuine threat of chemical weapons

### IS THE REPORTING OF ILL HEALTH BY GULF VETERANS RELATED TO HOW YOU ASK THE QUESTION?

One problem that we and every other research group encountered is that Gulf War veterans cannot help but be aware of the controversy that developed on both sides of the Atlantic about these issues. A few sceptical commentators suggested that veterans who have been to the Gulf have been sensitised by the

media furore to answer questionnaires in a particular way, even perhaps encouraged by the hope of compensation. In our studies, people knew they were being contacted because they were Gulf veterans, and the accompanying information about the study, not to mention the kind of questions everyone asks, makes that clear. Like everyone else, we found it easier to get responses from Gulf veterans than from personnel involved in other campaigns, because the opposite happens to the latter –no matter how diplomatically worded, they knew that they were not the main interest.

In 2002 we did a large study that was nothing to do with the Gulf, but concerned health screening in the Armed Forces. No mention was made of Gulf service, and there was nothing in the questionnaire to remind anyone about the events of 1991 and subsequently. However, the symptoms that we recorded were similar to those that we had used in our Gulf studies. Only later did we determine who had served in the Gulf by checking the data base.

Once we compared those who we knew had served in the Gulf against those who had not, the excess of symptoms remained. This was a particularly rigorous test, since everyone in the study was still serving and were a healthy sub group of Gulf veterans; yet the differences remained. We concluded that an overt response bias was unlikely to explain the Gulf health effect.<sup>19</sup>

### WHAT HAS HAPPENED TO UK GULF VETERANS OVER TIME?

At some time between 1991 and 1996, when we started data collection, we can be sure that the health of many Gulf veterans worsened. But what has happened to them since? We followed up most of the same people about four years later.

The differences between the Gulf cohort and the two comparison groups (Bosnia and Era) remained, and there had been only slight improvements in symptoms such as fatigue or psychological distress. Perhaps predictably those who had more symptoms when first assessed did worse, as did those who were older, and those who had experienced depression or anxiety. Those who believed that they had Gulf War Syndrome also did less well, even taking into account the fact that they had worse health.<sup>20,21</sup>

### SUMMARY

- ▶ Gulf health effect not an artefact of how the questions are asked
- ▶ Gulf health effect has persisted over time

## THE PICTURE ELSEWHERE

Does the work on UK Gulf veterans, and more specifically the contribution from King's College London, fit in with work carried out elsewhere? The answer is yes. Soon after we started our work, our colleagues at the University of Manchester began a similar study. Likewise, colleagues at the London School of Hygiene and Tropical Medicine launched a study of the reproductive health of Gulf War veterans, which also looked at general health. Both studies confirmed the same general health effect that we found, whilst failing to report a unique Gulf War Syndrome.<sup>22, 23, 24, 25</sup>

The picture was the same in the USA, where numerous studies came to the same conclusions, and likewise Australia, Canada and Denmark. On the other hand, one centre, based in Dallas under the leadership of Professor Robert Haley, produced a series of studies whose conclusions are at variance not just with our own, but with the conclusions of the other large scale studies. On the basis of what are mainly small studies drawn from a single reserve construction battalion, Professor Haley continues to argue that Gulf veterans have been affected by the long term side effects of exposure to very low levels of the nerve gas Sarin. He has stated that this was a consequence of an unnoticed attack by the Iraqi forces early in the ground campaign. However, military and intelligence sources do not support this view, and the scientific community has not been convinced by this argument.

## PROTECTION AGAINST CHEMICAL AND BIOLOGICAL WARFARE

Back in 1991, there was no denying that Saddam possessed both chemical and biological weapons. He had used them in the Iran-Iraq war, as well as against the Kurdish people. So there was no option but to try and protect UK Service personnel against these threats. Various measures were taken, collectively known as Medical Counter Measures (MCMs).



UK soldiers wearing NBC suits during the Gulf War

To counter the threat from biological warfare the main line of defence is vaccination. Before any overseas deployment, vaccinations are routinely given to protect against diseases such as cholera or typhoid. However, before the Gulf War they were also all offered vaccination against plague and anthrax, both of which are potentially lethal biological weapons. The anthrax vaccine was also given with pertussis vaccine, the whooping cough vaccine. Pertussis is not a biological weapon, but the vaccine was given as an "adjuvant", in order to enhance the development of immunity against the anthrax agent. The Canadians did something similar, but the Americans chose to use a different anthrax vaccine and also immunise their personnel against Botulinum.

As health complaints started to emerge after the war, attention was focussed on the programme of vaccination used. Could that have been responsible for ill health?

## EPIDEMIOLOGICAL EVIDENCE

It was known that vaccination uptake had varied – in some Units coverage had been near 100%, but in others, particularly where the Commanding Officer had expressed some scepticism, it was far less. So could we find a link between receiving the vaccines and later symptoms?

It proved a hard task, largely because of the difficulties in finding any accurate records. In general, we had to rely on medical records kept by the Service personnel themselves, which were only available for about one third of people. With that information we failed to find any convincing links between the individual vaccines and ill health. There was a small relationship between anthrax/pertussis and symptoms, but not sufficient to account for much ill health. Individual vaccines seemed not to be the answer.

But many people had told us that they had received what they considered to be a lot of vaccines in a brief period of time, and that this had "overloaded" their system. There were in total seven biological warfare vaccines, and 13 "normal" vaccinations so a person could have received up to 20, although most received nothing like that. Most experts do not think that vaccination can "overload" the immune system, but what we did find was a statistical link between the number of vaccines that people received and health. The more they had received, the more likely they were to have symptoms.<sup>26</sup>

But even that was not enough, because it is not unusual for Service personnel to receive a lot of vaccines in a short space of time – the same had happened before the Bosnia deployment as well. But there we found no link between numbers of vaccines and symptoms. There was something special about the Gulf.

So single vaccines alone are not associated with subsequent symptoms, but multiple vaccines, including

the anthrax/pertussis combination, seemed to be linked. Our colleagues in Manchester and Australia later reported the same link.

## IMMUNOLOGICAL EVIDENCE

What might be the reasons for these associations? Two scientists, Rook and Zumla, at University College Hospital put forward a theory that the specific circumstances of the UK vaccination programme (the use of anthrax/pertussis combination, the multiple vaccines and the high stress setting) would cause a shift in the balance of the immune system towards production of a particular class of cytokines, the chemicals that regulate the immune system.<sup>27</sup> This is known as a "Th 2" shift, and reflects the pattern found in some allergic diseases and that we have already reported in CFS, a condition with substantial overlaps to Gulf related illness.<sup>28</sup> And whilst we do not claim that our epidemiological evidence was conclusive, it lent support to the Rook/Zumla hypothesis.

However using the latest immunological techniques, we were unable to confirm the Rook/Zumla hypothesis.<sup>29</sup> This involved studies of immunological function in sick Gulf veterans themselves, as well as lab studies of how the immune system reacts to anthrax and plague vaccine.<sup>30, 31</sup>

So what were we left with? Yes, we found a link between multiple vaccination and ill health, but did not confirm that this operates via the immune system. In the meantime, although MOD did not accept any link between vaccinations and ill health, they decided on the basis of precaution to drop the pertussis vaccine, spacing out the remaining vaccines, and give personnel more information and choice than before.

Had it not been for the 2003 invasion of Iraq, in which it was decided to once again use medical counter measures, it is probable that we would still know little more about this subject than we did ten years ago. In Section 4 we will consider what new information was gained from the second large scale effort to protect personnel against biological warfare.

## EVIDENCE FROM ELSEWHERE

In this report we are concentrating on the health of UK Forces, and the contributions made to research by KCMHR. However, a word is necessary on the picture elsewhere. One of the most striking findings after the 1991 Gulf War was that reports of similar symptoms first surfaced in the USA, then the UK and Canada, and finally both Denmark and Australia. Studies of all these countries have found a very similar picture of ill health. But the patterns of health protection differed between the five countries. For example, the US did not offer pertussis vaccine, but its military had similar health

problems to ours. In the Royal Canadian Navy some ships took pyridostigmine "anti nerve gas" tablets (Nerve Agent Pre-Treatment Set (NAPS) tablets), another did not, but all had similar rates of illness. And most telling of all, Danish Gulf War veterans had remarkably similar elevated rates of ill health as elsewhere, yet the Danes deployed to the Gulf region only after the end of the war, and did not take any medical counter measures such as vaccinations or anti nerve gas pills.<sup>32</sup>

## REFLECTIONS ON GULF WAR ILLNESS

This is not the first time that veterans of a foreign war have voiced health concerns. In 1945, Australian veterans of the campaign against the Japanese in Papua New Guinea believed that malarial prophylaxis had caused both problems with infertility and an increased rate of congenital handicap in their offspring. However, it was the Vietnam War, and more specifically the legacy of Agent Orange, that triggered a major political crisis on a scale that equalled or even surpassed that associated with Gulf War illness.

## History does repeat itself



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There are parallels between the experiences of Gulf War veterans and those of Vietnam veterans. The perceived legacy of government misinformation or even betrayal concerning Agent Orange was used to claim similar cover ups and conspiracies, as was the Cold War legacy of experiments carried out on Service personnel, often without consent. Governments on either side of the Atlantic have made misinformed statements on Gulf issues – the US government misjudging the Khamisayah incident (a presumed accidental release of nerve agents after the end of the conflict) whilst the UK government made an inadvertently inaccurate statement to Parliament about the use of organophosphate pesticides. Both episodes fuelled further suspicion and occasional paranoia, neither of which has helped the situation of Gulf veterans.

We conclude that it is difficult to see how further direct research on Gulf veterans will provide much more in the way of relevant information concerning what happened in 1991. Likewise, after 20 years we don't expect to learn much more about the direct causes of ill health.<sup>33</sup> Much relevant information wasn't collected, and is not going to be found now. However, researching other populations may shed some light, and animal studies will continue to provide controlled data in a way that human studies cannot.

But does that mean that we should abandon research into Gulf veterans? Not at all. There is still a need to try and understand the causes of disability and disadvantage in Gulf veterans. We have suggested looking at Gulf War illness in a similar fashion to the way we think about illnesses such as CFS, irritable bowel syndrome and other unexplained syndromes, and to think more about why veterans are either staying ill or not getting better, putting to one side the vexed question of what started the problem in the first place.<sup>34</sup>

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Australian infantry protect themselves against gas attack at Ypres in 1917. Chemical and biological weapons remain significant threats and much of the evidence gathered from the First World War has a contemporary relevance.

# Section 2

## Historical approaches to veteran's health



### HAVE THERE BEEN PREVIOUS "GULF WAR SYNDROMES"?

Scholars in the United States found historical medical reports and publications, some dating back to the American Civil War, which described illnesses that seemed to have similarities with so called Gulf War Syndrome,<sup>35</sup> although different names were given to these conditions, such as soldier's heart, effort syndrome, neurocirculatory asthenia or shell shock. We investigated the medical records of random samples of UK service personnel who had been awarded war pensions for these conditions and systematically recorded symptoms. The records dated from Victorian colonial wars, the Boer War, the First and Second World Wars, and finally Korea. We then added the symptoms of 400 Gulf War veterans who had been investigated at the Medical Assessment Programme (MAP) at St Thomas' Hospital and tried to see if statistical tests could find differences between the various groups.<sup>36</sup>

We found that all these wars had been linked to unusual syndromes involving physical symptoms, and for which doctors were generally unable to come up with a clear cut reason. But the clusters of symptoms were not identical. Over the last hundred years the pattern of these syndromes had subtly changed. In the Victorian period and during the Boer War, soldiers complained more of general fatigue, rheumatic pains and weakness, and, to a lesser extent, symptoms such as shortness of breath, rapid heart rate, headaches and dizziness. In the two World Wars it was these symptoms, such as chest pain, breathlessness, dizziness and fatigue that were most prominent, and with headaches and anxiety starting to appear as well. But by the end of the century, the picture had changed again, and now fatigue, headache, depression and anxiety were the main complaints.

So, many wars have been associated with their own post-conflict syndrome, but the pattern of symptoms had shifted. We have witnessed the rise of neuropsychiatric symptoms such as depression and anxiety, which were unusual at the end of the 19th century. At the same time,

symptoms such as "flashbacks", in which a person suddenly and unpleasantly experiences an earlier traumatic event as if it is happening all over again – as when a Vietnam veteran becomes disturbed by the sound of a helicopter many years after the end of the conflict – seemed almost absent from the war pension records of the First World War, but relatively common in those from the 1991 Gulf War.<sup>37</sup> It has been argued that post-traumatic stress disorder (PTSD) is a timeless disorder, which has always existed in all cultures, but was recognised formally only in 1980 when it was included in the classification system produced by the American Psychiatric Association. We suggest that PTSD may not be a universal phenomenon, and that responses to traumatic events are influenced by culture and historical context.

So our reactions to stress, trauma and war are not static, but have changed. The names we use to describe these experiences have also changed, along with the explanations given by both soldiers and doctors. A hundred years ago chest pain, as exemplified by the condition known as "Soldier's Heart" was blamed on the equipment straps pressing on a soldier's chest. During the First World War, so called "effort syndrome" was attributed to physical exertion or alternatively infections, such as trench fever. It was unusual until the modern era for psychological explanations to be given by either soldiers or doctors, but on the other hand some of the toxic explanations favoured by Gulf War veterans had no historical equivalent.

### OTHER HISTORICAL RESEARCH

Further research has been conducted into the relationship between physical and psychiatric casualties sustained on the battlefield<sup>38</sup> and into war pensions and the extent to which their award is related to changing models of psychological understanding.<sup>39</sup> We brought this research together in a textbook,<sup>40</sup> which in part was written as a guide to the MSc in War and Psychiatry jointly run by the IoP and Department of War Studies, and which is

approved by the MOD for members of the Armed Forces.

More recent research initiatives include a study of the impact of the Vietnam War on the practice of military psychiatry and the conceptualization of trauma,<sup>41</sup> an investigation of a First World War ‘PIE’ unit to identify those most likely to breakdown in battle and to test whether the opportunity to kill served as a protector against psychological disorders.<sup>42,43</sup> These studies were followed by an investigation of a forward psychiatric hospital operating during the most intense fighting after the D-Day landings. This showed that those at greatest risk of being killed and wounded were also most likely to suffer from psychological breakdown.<sup>44</sup>

Gas was one of the most feared weapons of the First World War and gave rise to emotional responses out of all proportion to its ability to kill or wound and to this day chemical and biological weapons exercise powerful psychological effects. To understand this process better, we examined a sample of First World War servicemen who had been given a war pension for the effects of gas but did not display any clear evidence of respiratory damage.<sup>45</sup> Findings show that most veterans tended to present enduring respiratory disorders, but a significant group also suffered with psychological problems such as persistent anxiety, repeated fears, sleep difficulties, dizziness and tremor. This group of veterans were further convinced that the effects of chemical weapons were irreversible, potent and debilitating.<sup>46</sup> Yet these convictions stood in contrast to their recorded health. The sample, for example, was a particularly long-lived group with a mean age of 82. Moreover, it appears that the conviction of having been gassed, whether accurate or not, has long-term deleterious effects on a person’s perceptions of their own health and well-being.

A more recent study has included the relationship

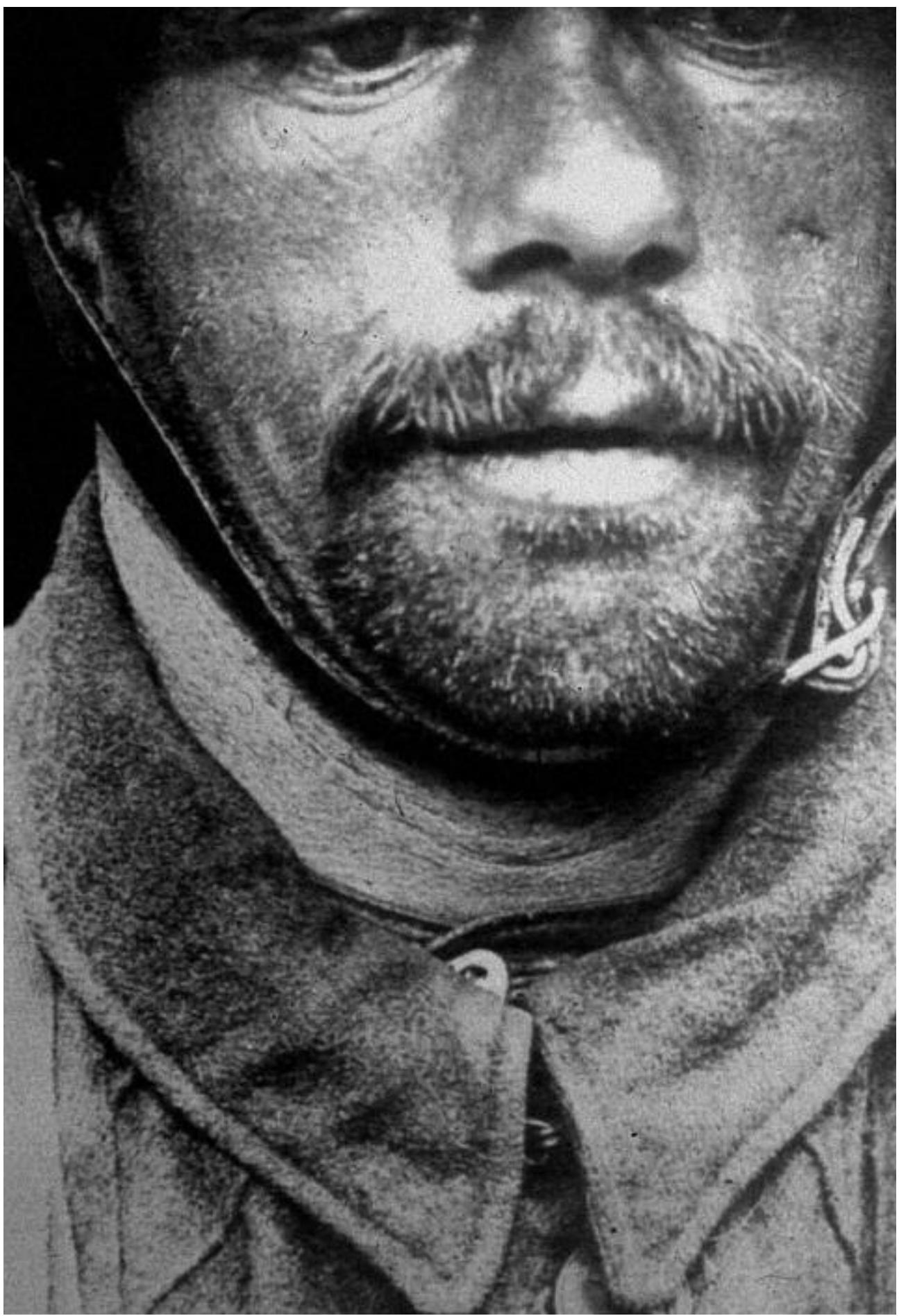
between mild Traumatic Brain Injury, post-concussion syndrome, identified in the Second World War, and shell shock<sup>47</sup> (see section 12 for more details). The psychological effects of being a prisoner-of-war have also been explored to understand how the widespread belief post-1918 that imprisonment protected against psychiatric disorder became almost completely reversed by the time of the Vietnam War.<sup>48</sup>

## SUMMARY

- ▶ Medically unexplained symptoms have arisen after many previous conflicts involving the UK Armed Forces
- ▶ There has been a gradual shift in symptoms since the Victorian period
- ▶ Psychological reactions to trauma are likewise not static, and have changed since the First World War
- ▶ There has been a dramatic shift over the century in the perception of the psychiatric consequences of being a prisoner of war – from seeing them as protected against disorder to being particularly vulnerable
- ▶ The psychological effects of chemical weapons during the First World War had long term adverse effects on health and wellbeing
- ▶ Mild traumatic brain injury has much in common with both shell shock and post-concussion syndrome
- ▶ A historically informed MSc in “War and Psychiatry” is now offered by KCL and approved by MOD for members of the Armed Forces

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Shellshock, 1917

# Section 3

## THE WARS IN IRAQ AND AFGHANISTAN



**TEN YEARS AGO ONE** criticism that could be laid at the door of the MOD was the delay in carrying out systematic research into the health of Gulf War veterans. Our study, the first of its kind, did not start until five years after the end of the conflict, with the first results not being available until 1999. That delay probably means that there will always be gaps in our knowledge about Gulf related illness.

So one of the many lessons learned in the aftermath of the Gulf conflict was the need to have improved health surveillance and/or research in place after another major deployment, especially if it was in similar territory, against the same opponent, and, as it seemed at the time, requiring similar protective measures against chemical or biological warfare.



Royal Marines prepare for action during the invasion of Iraq

We were asked to carry out such a study soon after the end of the initial operation, Op TELIC 1 (the 2003 Iraq War). Figure 2 outlines what we did. It was not dissimilar to the general strategy of the previous Gulf War programme, but with some differences. First, we

decided to compare those who had taken part in the invasion of Iraq with the rest of the Armed Forces, and not with two comparison groups as before, to make things easier. Second, we decided not to over sample women, as we had done before, but this time to study extra numbers of Reservists, to be able to detect smaller changes in their health outcomes.

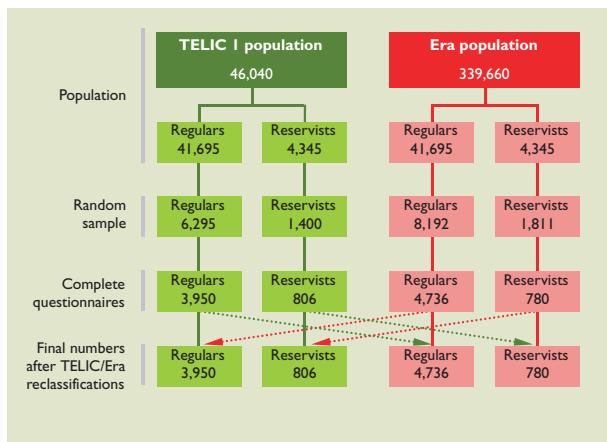


Figure 2 - Study outline<sup>49</sup>

As before, the sample was large, and was randomly chosen. The results can therefore be generalised either to all of those who originally took part in the invasion of Iraq, or, if we include the comparison group, to the whole of the Armed Forces as constituted in 2003. We attempted to contact over 17,000 military personnel for the study, which involved visiting over 50 military bases in the UK and Germany, and sending out countless postal questionnaires. Eventually over 10,000 military personnel completed the questionnaire - a response rate of 60%. The main reason for non-response was that either we could not find the person, despite considerable efforts, or they were too busy to complete the questionnaire. Importantly, there was no evidence that non-responders differed from responders on any of the key outcomes that we studied.<sup>50</sup>

The main study started in 2004, and the first set of results was published in 2006.<sup>51</sup> We will now look at those results before we describe later work.

## WAS THERE AN IRAQ WAR SYNDROME?

It is no secret that one of the principal reasons why the “TELIC” study was launched was because of fears of a repeat of the Gulf War Syndrome episode, which had adversely affected the health of a proportion of UK veterans, as well as causing harm to the general reputation of the Armed Forces, who, whether rightly or wrongly, were seen by many people to have failed in some of their “duty of care” to personnel.

And there were many reasons to suspect that history might indeed repeat itself. First, we had already shown that syndromes similar to the Gulf War Syndrome had been seen after many previous conflicts (see above), and hence there was reason to believe that the next conflict would cause a similar problem. Second, the causes of the Gulf War Syndrome saga itself remained controversial. Third, although changes had been made in the measures to be used to protect the Armed Forces against the threat of chemical and biological weapons, it was still intended to offer both the anthrax vaccine and pyridostigmine prophylaxis. Finally, the war was to be fought against the same enemy on much the same terrain.

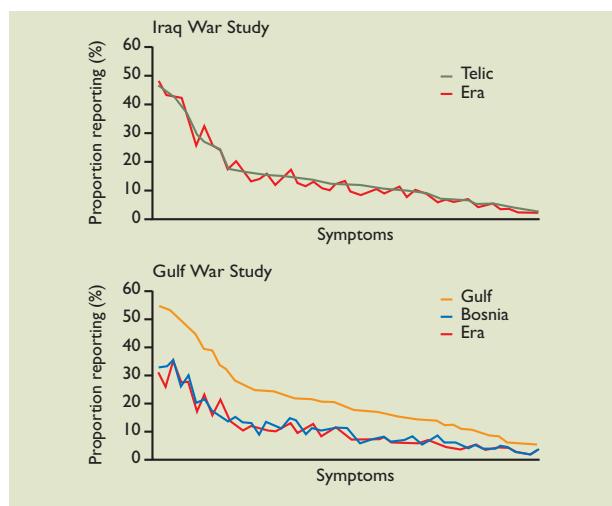


Figure 3 - Gulf War (1991) versus Iraq War (2003)

However, what we found was not what we expected<sup>51</sup>. Figure 3 shows first of all the results from the first Gulf War study, and then the same comparisons, but this time for the Iraq study. Remember that we were asking exactly the same questions, in exactly the same way. It is clear that this time there has been no repetition of the substantial increase that we saw in symptoms after the first Gulf War. But what we did find, as one can see in Figure 3, is a general increase in the background level of symptoms from the Gulf study to the Iraq study, suggesting a general decrease in the threshold for reporting symptoms that is not connected to deployment.<sup>52</sup>

## SUMMARY

- ▶ No “Iraq War Syndrome” to date
- ▶ Makes it unlikely that factors common to the 1991 Gulf War and the 2003 invasion of Iraq, such as DU, anthrax vaccine, pesticides, NAPS tablets, or general stress, were a main cause of the “Gulf War Syndrome” problem

## MENTAL HEALTH CONSEQUENCES

Even by 2006 there were considerable concerns expressed about the mental health impact of the war in Iraq on UK Service personnel, and it was already clear that some were already coming back with psychological problems such as PTSD. But just how large was the problem? (see table below).

The answer is not as large as some might have predicted. Table 1 gives the technical results, as it is important for people to see both the absolute values and the odds ratios. Odds ratios are a measure of how much more common problems are in one group compared to another

Looking at the absolute values first, about 20% of those coming back from Iraq show some symptoms of what are called common mental health problems. These mean symptoms such as stress, poor sleep, unhappiness, worry and anxiety. It does not mean that 20% of the Armed Forces have mental disorders, although some of those in this category will have clinically significant

**Table 1:** Distribution of main outcomes by original cohort

	Era	Telic 1	Unadjusted OR	Adjusted OR
Common mental disorder (GHQ-12)	1,071 (20%)	953 (20%)	1.02 (0.92-1.12)	1.03 (0.92-1.15)
PTSD (PCL-C)	193 (4%)	201 (4%)	1.18 (0.96-1.45)	1.20 (0.95-1.50)
Multiple physical symptoms	546 (10%)	575 (12%)	1.22 (1.08-1.39)	1.33 (1.15-1.54)
Case on AUDIT	1,159 (22%)	1,183 (26%)	1.28 (1.17-1.41)	1.10 (0.99-1.22)
Fair or poor general health	673 (12%)	537 (11%)	0.89 (0.79-1.01)	1.00 (0.86-1.15)

depression or anxiety. The figure is also slightly lower than the levels of common mental health problems reported with in the general population – these symptoms are thus common. Furthermore, not all of those scoring positively on a questionnaire will have a psychiatric disorder following a standardised interview but a proportion will. Even so, for any member of the Armed Forces to have depression or PTSD is undesirable – over 50% of those with PTSD have serious limitations in their social and working lives.

But what is the overall impact of serving in Iraq? The answer to that question comes by looking at the odds ratio (Table 1) – in this case comparing those who deployed to Iraq to those who did not. If the odds ratio is one, then there is no difference. The results are clear – in 2006 there was still no increase in psychiatric disorders in TELIC Regular personnel compared to the rest of the UK Armed Forces.

It is important to emphasise that our results did not mean that no one had been affected. The data show that some have. Those who have experienced combat, for example, report more PTSD symptoms than those who have not. But what it does reflect is that many of our Servicemen and women who deployed to Iraq were already experienced when it comes to deployments, and that 70% of our comparison group had also already seen active service.

What we also find is that the experience of deployment, even to Iraq, is not solely negative. In the interviews that we did before we started the main study, many personnel reported positive experiences associated with the deployment. In our main Iraq study, two thirds of those contacted reported that going on Op TELIC made it more likely that they would continue their career in the Armed Forces.

## WHO GETS PROBLEMS?

In the preceding section we showed that there was no overall increase in mental health problems as a result of serving in Iraq, at least compared to other deployments. But as we were at pains to point out, some people have developed problems. What do we know about the risk factors for this?

First, it is clear that there are factors about any deployment that increase the chances of developing subsequent mental health problems. So it is not a surprise that people were more likely to have subsequent problems if they spent time in forward areas, in combat, were exposed to enemy fire or spent time seeing or handling the dead and wounded.<sup>53,54</sup>

Also important, but more related to general mental health and well being than PTSD, were chain of command issues such as supply of information, comradeship, mismatch of trained ability and deployed role, confidence and trust in the leadership, perceived usefulness of post-deployment briefs and support by

the military (and the media) both for troops in theatre and their families at home<sup>54</sup>. This distinction between factors causing PTSD and those affecting general mental health became even clearer in our latest study which collected data out in Afghanistan in 2010. We found that PTSD was more prevalent in the Forward Operating Bases and hostile areas, but general mental health was worse in the large safer, bases - Bastion and Kandahar.

There are also personal factors but still relevant to the mission, such as negative expectations about the perceived length and danger of the mission; low confidence in the adequacy of training and kit; and, general lack of pride in the deployment. Finally, as noted by others, those with previous symptoms of poor mental health are much more likely to develop PTSD or general psychological distress.

In recent times, with our contemporary focus on traumatic events, there has been a tendency to overlook issues such as morale, leadership and group cohesion, as well as individual backgrounds, but none of this would have come as a surprise to a previous generation of military psychiatrists.<sup>55</sup>

## RESERVISTS

So far we have been talking about the outcomes for Regular Forces, or “active duty” personnel as the Americans call them. But what about our Reserve Forces, largely the Territorial Army (TA), but also the Army Regular Reserve, the Royal Navy and Royal Marine Reserves and the Royal Auxiliary Air Force? Here the picture was more problematic.

Unlike the Regulars, we found from the start an increase in mental health problems in Reservists who had served in Iraq. They were twice as likely to have symptoms suggestive of common mental health problems (depression, stress, anxiety and so on) than fellow Reservists who had not been to Iraq, and six times as likely to have symptoms suggestive of PTSD. However, whilst this is a substantial increase in risk, it was still the case that the actual rate was relatively low, at 6%, and was lower than the comparable rate for US forces.

Why were the reserves more affected than the Regulars? We don't think it is because the Reserve Forces had a more dangerous time in Iraq. Once the initial invasion was complete (i.e. after the end of TELIC 1) reserves and Regulars have been used in similar ways. Whilst at the start of the Iraq deployment many Reservists did report being underutilised and unaccepted, we showed that within a few years this had changed, and that by 2006 TA personnel were generally reporting being satisfied with their work as a Reservist and felt integrated with Regular colleagues.<sup>56</sup>

So the answer may lie in differences before the Reservists deploy, and after they come home. When Regulars return from a tour of duty, by and large they

continue to spend time with the same people they have served with, and have ample opportunity to talk about experiences, reminisce and wind down either with people who have shared the same experience, or with others who at least know what it is all about, and value it. By contrast, brief demobilisation and a period of post tour leave, Reservists return to a civilian environment, away from their military colleagues. Family, friends and employers may have little understanding of the Reservists' experience, and Reservists may be subject to more open criticism of the war in Iraq.<sup>56,57</sup>

Furthermore, when we did the study, as soon as they took off the uniform, Reservists no longer had access to military medical services. Any health problems they developed would have been the responsibility of the NHS. The number of NHS doctors who have personal experience of the military is now extremely small, and many either lack knowledge, or perhaps interest, in the problems that people may encounter after deployment. It is unlikely that this difference in medical care was the reason for the higher prevalences of mental health problems in Reservists, but it may have made it more difficult for Reservists to engage with appropriate services when they did have problems. When our results were published, MOD addressed this gap with an announcement that Reservists would now be entitled to access to military mental health care for two years after deployment, even when they have returned to civilian life. In Section 6 we will discuss how successful this proved to be.

Better news was that unlike Regulars, Reservists did not show an increase in risky driving behaviour after Iraq. Returning to an exclusively civilian environment and culture may also have some protective benefits as well.

## SUMMARY

### Mental health outcomes (Regulars)

- ▶ No increase in psychiatric problems in Regular Forces who have deployed to either Iraq or Afghanistan compared to rest of Armed Forces
- ▶ Rates stable from war fighting to counter insurgency, and with increased Op Tempo in Afghanistan
- ▶ No increase in rates during deployment
- ▶ Increase in alcohol problems in combat troops after deployment (2006), extended to all deployed personnel (2009)
- ▶ No substantial increase in mental health problems when personnel return home, unlike US data
- ▶ Self reported violent behaviour is prevalent among Regular personnel on homecoming from deployment and is associated with exposure to combat trauma as well as pre-military antisocial behaviour

### Mental health outcomes (Reservists)

- ▶ Increase in PTSD in UK Reserve Forces after deployment, although overall rate remains low
- ▶ Explanations unlikely to be due to events in theatre
- ▶ More likely are family issues before deployment, support to families during deployment, and experiences of home coming
- ▶ Early problems with Reservists being accepted by Regulars when deployed appear to have resolved

## OVERSTRETCH

By 2006, the UK Armed Forces were deploying simultaneously to two major operations, Iraq and Afghanistan. Numerous voices, from the Chief of the General Staff downwards, expressed concerns that the Armed Forces were being pushed too hard, with possible detrimental effects on mental health and morale of both Service personnel and their families. The UK Armed Forces have long established "Harmony Guidelines" which determine how often personnel should be deploying within certain time frames. For example, the threshold for the Army is that an individual should deploy for no more than 13 months in a period of 3 years.

We therefore collected information on the actual frequency and duration of deployment over a three year period, allowing us to assess the effect of cumulative deployment on mental health of UK personnel. When the Harmony Guidelines were adhered to, which was most of the time, there was no relationship between length of time deployed and mental health. However, when personnel had deployed for 13 months or more during that period, then there was an increase in the risk of PTSD, psychological distress and severe alcohol problems, even taking into account the extra risk of combat exposure. The most difficult situation, which fortunately happened rarely, was where the actual length of deployment exceeded the expected – which we took to mean when tour length was extended after the start of a tour. Overall we concluded that the Harmony Guidelines remain relevant and that it is important to manage expectations.<sup>58</sup>

## SUMMARY: "Overstretch"

- ▶ No relationship between tour length and mental health, provided Harmony Guidelines adhered to
- ▶ Increase in PTSD and alcohol problems when guidelines exceeded, especially if tour length extended during deployment
- ▶ No relationship yet found between number of deployments and mental health

## HOW DOES THIS COMPARE WITH THE UNITED STATES?

These results are different from the results of similar American studies. The rates of PTSD initially reported by the US Forces on returning from Iraq were higher than those we found.<sup>59</sup> And because this time we were using the same measure of PTSD as the US researchers, we can be confident that these are true differences.

There are many reasons for this. There is no doubt that during the first years of the Iraq War US Forces were doing more fighting and taking more casualties than the UK Forces. And as we have shown, the level of physical casualties remains a good guide to the level of psychiatric casualties. In both US and UK forces, increased combat exposure increases the risk of mental health problems, and the US studies were initially focussed on the high exposure group. The importance of combat exposure was also highlighted by the sad reality that operations in Iraq continued, and the security situation in the South deteriorated, while the UK also started its major deployment into Helmand Province in Afghanistan, with a further tragic impact on our own casualty rates. So it was perhaps not surprising that as we followed up a particular subgroup of our cohort, by which time the differences in combat exposure between the two militaries had started to diminish, so did the differences in prevalence of mental health problems.<sup>60</sup>

But whilst exposure to combat is associated with PTSD, it is not the only determinant. For example at the start of the war in 2003, UK personnel were significantly older than US personnel, and had more previous deployment experience. A greater proportion of the US forces are made up of Reservists – approximately one third compared to about 10% for the UK. Given that Reservists, whether British or American, are more vulnerable to the psychological ill effects of deployment than Regulars, this too will contribute to some of the observed differences.

Perhaps the biggest issue is tour length. UK Service personnel spend less time on deployment, either in Iraq or Afghanistan – the average tour of duty is six months for the UK but one year, sometimes longer, for the US. Given the results discussed in the previous section, this is also likely to contribute to some of the US/UK differences that we have observed.

## DO THINGS GET WORSE WHEN PERSONNEL RETURN HOME?

There is one final, perplexing difference between what we are observing in the UK Armed Forces and what is being reported from the US. Many people who come back from operations can be expected to have some emotional reactions to what they have experienced. These are common, normal and usually brief and should not be confused with psychiatric disorders such as

PTSD. These do not require treatment, unless one calls the support of friends, family, chain of command and so on as ‘treatment’, which we do not. Mostly these will go away as people readjust back to ‘normal life’. In a relatively small number of cases these reactions will develop into formal psychiatric disorders, which may require treatment. Usually, these will be apparent within a few weeks or months of return from deployment, although it often takes months or years before personnel are either themselves willing, or alternatively persuaded by family or employers, to actually present for help. This delayed presentation is common, but should not be confused with a genuine delay in the onset of mental disorder, as in delayed onset PTSD, which is relatively uncommon.

None of the above is controversial, and forms the basis of our standard public mental health approach to those who have experienced traumatic events, for example the victims of the 2005 July bombs on the London transport system.

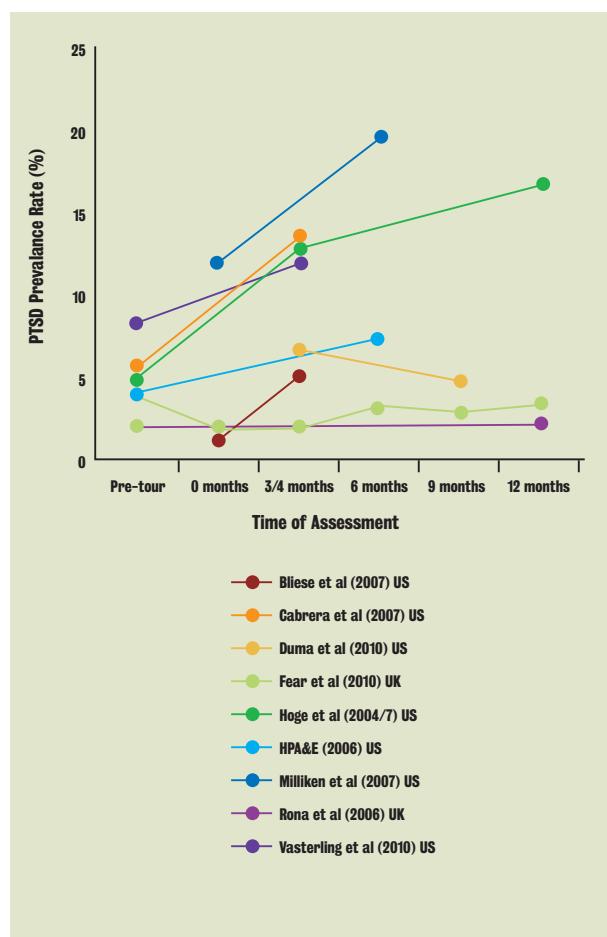


Figure 4 - From Sundin et al<sup>63</sup>

But something different is being reported from the US. A series of studies are documenting a steady increase in the rates of psychiatric disorder (including PTSD) once personnel return from deployment. This is particularly striking in Reservists. The increase in rates is not trivial, and influential think tanks, such as the

Rand Corporation,<sup>61</sup> predict a final cost to the economy that may run into billions of dollars.

The US data become even more difficult to understand when compared to our data – the blue dotted line in Figure 4, which is expanded in figure 6, page 27 (next section). As is clear, we are seeing at best a small increase in probable PTSD prevalence rates over time, which is not on the same scale as that observed in many US studies. There is no obvious reason for these differences – if for example this represents delayed onset PTSD, then why is that not happening to our personnel, who have been fighting the same enemy, facing the same risks, and in the last few years experiencing similar rates of casualties?

We don't know the answer. We do wonder about differences in the ways in which health care is delivered. In the UK, there is universal health care (via the NHS), and, at least in theory, it should make no differences to access to care whether or not someone sustained an injury in the military – it might affect that person's war pension, but not their right to treatment. But that is not true in the US, where having a service related disability may make a considerable difference to your entitlement to later health care. For many years, one only received automatic health care for two years after leaving the service, although this has just been extended to five years. After that entitlement depends on having a service related disability.

Understanding the differences between the rates of mental health problems in US and UK Forces is a complex process. There is no denying that differences exist. For example, we cannot easily explain the repeated finding that, overall, there is no increase in PTSD in Regular forces simply as a result of deployment to either theatre of war, when this is clearly visible in the US data. Likewise, numerous US studies clearly show an increase in the rates of disorder after homecoming, often an order of magnitude greater than in our data. Nor can we explain the association in US data between the number of previous deployments and mental health in theatre (as assessed by the excellent US in theatre studies ("MHAT") series of studies) and the absence of such an effect in our data. The issue is also clouded because not all US studies agree.<sup>63</sup>

Gaining a better understanding of these issues is difficult when proceeding independently. For example, it is difficult for either a US or a UK group to properly study the impact of variations in tour length, simply because in general there is not much variation. One way forward is via data sharing. We are therefore delighted that the US and UK have now signed a data sharing agreement at the level of our respective Secretary of States for Defence, and that we are now working closely with our US colleagues at both the Walter Reed Institute for Army Research and the Millennium Cohort Study team in San Diego on taking this forward.

## SUMMARY: US/UK differences

- ▶ The overall rate of psychiatric problems is lower for the UK than for the US Armed Forces, including those deployed
- ▶ Differences in prevalences of mental health outcomes reduced as differences in rates of combat exposure also reduced
- ▶ Correlation between increased number of deployments and worse mental health only found in US not UK Forces to date
- ▶ In addition to initial differences in combat exposure, US forces were younger, had less previous deployment experience, were more likely to be Reservists, and had longer deployments
- ▶ Substantial increase in mental disorders over time once personnel had returned home only observed in US and not UK data sets
- ▶ Other important differences could be examined by sharing of data between the US and UK

## THE SITUATION IN 2009

Our first study was based on TELIC 1 the original invasion of Iraq, under the assumption that this would not be dissimilar to the invasion of Kuwait – a short, high intensity but limited conflict. As everyone knows, things have not turned out as expected. In Iraq traditional war fighting soon gave away to counter insurgency and peace enforcement duties. These produce their own pressures and problems, such as the threat from Improvised Explosive Devices (IEDs). Based on the Vietnam experience, many commentators were predicting that it would be these duties that would lead to greater psychological problems for Service personnel.

And that was without also taking into account that by 2006 the UK Armed Forces were increasingly engaged in a second war in Afghanistan. And this war combines both counter insurgency and infantry fighting. At the time of writing (2010), British service personnel continue to die or be seriously wounded in Helmand Province.

There was, therefore, a clear imperative to monitor any health impact of these increased and unforeseen pressures. So in 2006, the MOD asked us to start a new study of the mental and physical health of the UK Armed Forces. We completed this study at the end of 2009.

The core of the new study was to include as many of those who had taken part in the study that we originally launched in 2003 as we could find. By this time, not only had many of those who had originally been in our "non-Iraq" control group, now deployed to either Iraq or

Afghanistan, others had now been back to either theatre, sometimes more than once. In addition, we recruited some new personnel for the study, to represent those who had joined the military since the start of the study, and were thus eligible to deploy, and finally an additional sample to cover the unexpected increased commitment to Afghanistan. It was indeed a rather complex design, but reflecting the unanticipated changes on the ground since the start of the study in 2003. But, after a great deal of effort, the consequence was that we were able to assess the impact of the continuing hostilities on the overall mental health of the Armed Forces<sup>62</sup>.

reporting of alcohol misuse. We were disappointed, however, to note that as before, Reservists remained at higher risk of post deployment PTSD, despite a series of changes in policies regarding how they were deployed which had increased morale/satisfaction. To our surprise, we found that there was no relationship between mental health and number of deployments – which is in direct contrast to what is being reported in the US. Is this a further consequence of the differences in tour length? We don't know. And again, as before, those in combat roles were reporting more PTSD and other mental health problems than those in other roles. These results are perhaps surprising, given the

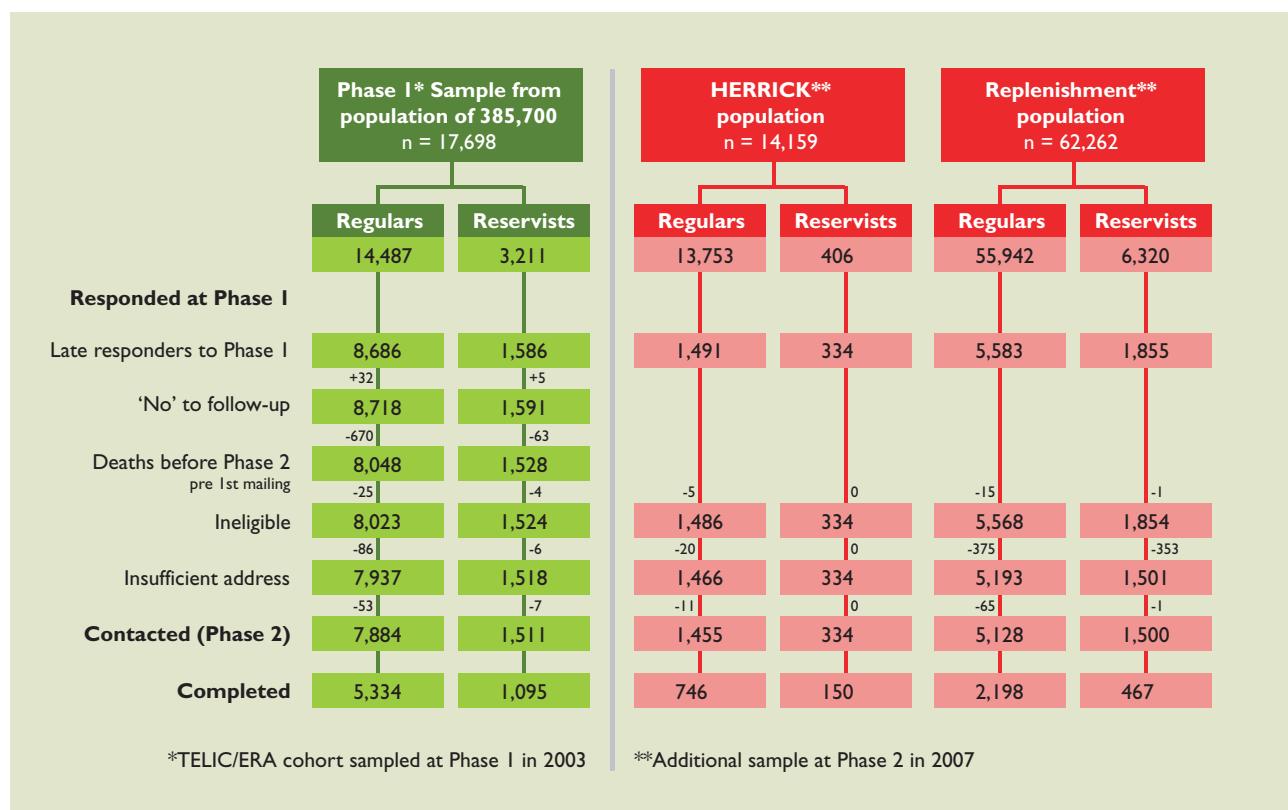


Figure 5

We made three predictions. First, that we expected that the increased Op TEMPO since 2006 would result in an increase in the rate of mental health problems. Second, that the more people deployed the more likely they would be to have mental health problems. And finally, that as in the US, we would see an increase in the reporting of mental health problems as time since returning from theatre increased, which was being repeatedly predicted in the media.

We were wrong. Overall, the figures were similar to those that we had reported in 2006. As before, there was no overall impact of deployment to either Iraq or Afghanistan on the mental health of our Regular Forces. Once again, alcohol misuse, and not PTSD, was the main problem (but common mental disorders had a slightly higher prevalence than alcohol misuse), and we now saw a significant impact of deployment on the

difficulties our Armed Forces have faced both in the latter part of the Iraq deployment and of course in Helmand Province, and suggest that despite everything, the general health and morale of the Armed Forces in theatre remains robust.

But what about after the troops come home? Are we indeed due to face the same increase in problems reported from the USA? Is there really a "tidal wave" or "bow wave" approaching, as some have been saying?

## TIME BOMBS AND BOW WAVES?

Everyone is worried that we are already facing an increasing number of ex-Service personnel with mental health problems. The answer is yes and no.

As we described in the previous section, what is not



British servicemen operating in CBRN equipment

happening, so far, is a large rise in the rate of mental health problems in those who have served in Iraq or Afghanistan (see Figure 6) – unlike what is happening in the US. But it is true that the absolute number of military personnel who have served in either conflict and now require support or treatment is increasing, and will continue to do so. This is simply because the total numbers who have deployed to either theatre and eventually decide they need help will inevitably increase or because of an increase in the general awareness of the importance of mental health problems. This finding should not be taken as evidence that the situation is getting worse, but it does mean that military mental health services, service charities, and the UK national health system should anticipate a steady increase in the number of serving and ex-service personnel needing support.

## IN THEATRE

So far we have been talking about our data from our main study, covering the period 2003 to 2009. But we have also carried out different studies, on different samples, as well as looking in more detail at subgroups within the main study. For example, in 2009, towards the end of the main TELIC operational effort, we deployed a small team to collect data in Iraq.<sup>64</sup> We were able to survey some 600 military personnel in Iraq both within the main base areas and in more

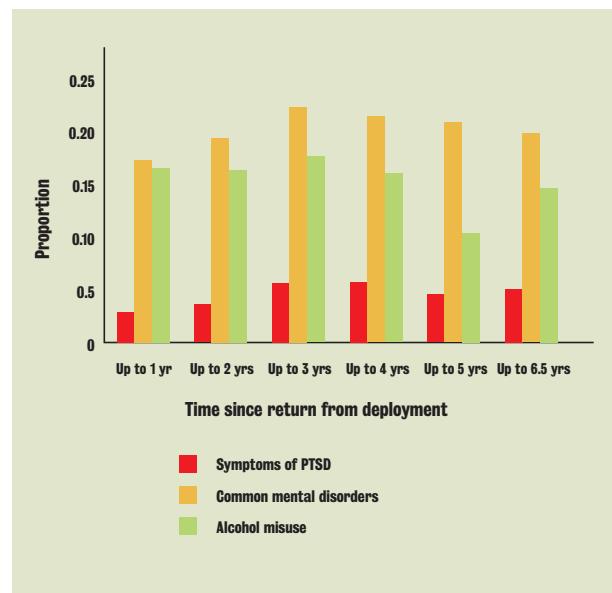


Figure 6 - Rates of mental/alcohol disorders in UK personnel over time since deployment<sup>62</sup>

austere locations. The results of the OMHNE (Operational Mental Health Needs Evaluation) showed that on a ‘mature’ deployment Service personnel’s mental health was similar to that back in garrison. The research also demonstrated the powerful protective effects of good cohesion and good leadership; well led and close knit units had substantially better mental health even if they had been exposed to high threat situations. The results also indicated that, as in garrison,



Personnel complete an operational mental health survey whilst deployed in Iraq

stigma acted as a powerful deterrent to asking for help so that even though about 10% of the deployed force were interested in some additional support at the time they were surveyed, the majority of these were fearful of asking for it because of the potential career and reputational effects they perceived if they had done so. We carried out a second OMHNE study in Afghanistan in early 2010, with similar results.

Both OMHNEs have also shown that family and relationship issues at home, including perceptions of how well families are supported by the military whilst personnel are deployed, continue to impact in theatre whether or not personnel are engaged on combat duties. Much like the US MHAT studies, our OMHNE surveys continue to have a substantial impact on how MOD attend to the mental health needs of personnel on deployment.

## ONGOING WORK

One of the strengths of a large scale follow up study is that not only does it give you a second look at what is going on and how things have developed over time, it also allows you to start looking not just at statistical associations, but because the data are prospective, to look at predictors and what causes what. With support from MOD, MRC, ESRC and the Royal British Legion we are now looking at issues such as what predicts mental health within and post service; early service leavers; the impact of deployment on well being; marriage and family life; women in the Armed Forces, how social networks and support change when one leaves the Armed Forces; the outcome of medical illnesses ; the links between deployment, crime and violence; the impact of cohesion and leadership; and many other issues.

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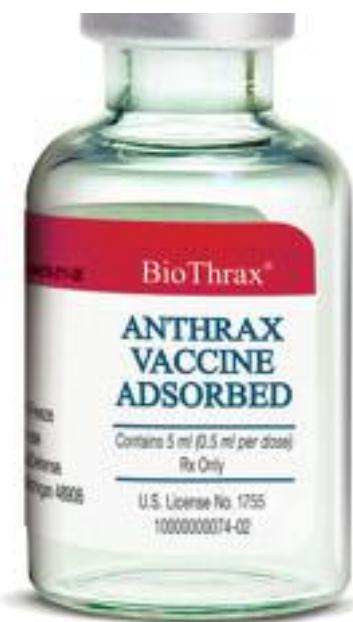
# Section 4

## Medical counter measures and Op TELIC



**AFTER THE PROBLEMS WITH** Gulf War illness, and influenced by some of the work discussed in Section 1, MOD decided to alter its methods of protection against biological warfare on a precautionary basis before the war in Iraq. One of our tasks was to see how effective these changes had been.

First of all, and despite the Weapons of Mass Destructions (WMD) saga, uptake of the anthrax vaccination was high at the start of the conflict (72%). 79% of the Army accepted the vaccine, with slightly lower proportions of the Royal Navy and RAF (59% and 58% respectively). We found that, before they deployed, nearly all thought that they were somewhat or very likely to be exposed to chemical or biological agents.



We have already shown that after Iraq there has been no repeat of the Gulf War Syndrome saga, at least not yet. Likewise, so far we have not found any link between receiving anthrax vaccination (now given without pertussis vaccine) and ill health. There was no risk of

longer term symptoms in those who received the vaccine.<sup>65</sup> Nor did we find a link this time between multiple vaccines and ill health, except when we relied solely on self report of the number of vaccines, raising the possibility that our and others previous findings of such an association after the Gulf War may after all have been a subtle recall bias.<sup>66</sup> But that does not mean there were no side effects - the medical intervention that is both successful and entirely free of side effects probably does not exist.

What we found was that the rate of side effects was related to how people perceived the vaccine, and in particular whether or not they felt that they had been under pressure to accept the vaccine. We do not know whether or not people really were pressurised – but people who felt that they had been under pressure from the Chain of Command to accept the vaccine were more likely to report side effects.

### IMPROVING CHOICE AND CONFIDENCE

One consequence of the experiences of the Gulf War was to move towards a policy of explicit informed consent around the anthrax vaccination. Before the Iraq War, Service personnel were again offered anthrax vaccination, but this time were required to watch an information video, read a glossy brochure, and then sign a consent form.

But did these new measures improve confidence or uptake? Not necessarily. We found that over 20% of Service personnel continued to be worried about the effectiveness and safety of the vaccine. For at least some people, the “special arrangements” made for the anthrax vaccination programme, as opposed to all the other vaccines that people are offered, had backfired, since they reported that “there must be something really wrong with the anthrax vaccine, otherwise they wouldn’t go to all this trouble”, or as someone else put it - “If it is really as safe as the other vaccines, how come we only



A dismounted patrol in Afghanistan

have to watch a video and sign a consent form for this one alone?”<sup>67</sup>

What this suggests is that in future the information given and/or consents obtained should be the same for all vaccinations, and no “special cases” made for any single one.

Finally, improving choice and consent does not inevitably mean that more people will accept the intervention. Acceptance of the anthrax vaccine has declined dramatically since the start of the Iraq War. This relates largely to the fact that personnel no longer believed that there is a realistic threat from biological weapons.<sup>68</sup>

## SUMMARY

- ▶ No medium/long term side effects detected from anthrax vaccine
- ▶ No medium/long term side effects detected from multiple vaccines
- ▶ Recall bias may have explained previous findings on multiple vaccines
- ▶ Side effects are related to perception of consent
- ▶ Developing special consent procedures for anthrax vaccine has not increased confidence
- ▶ Acceptance of biological vaccines has decreased as the perception of the threat decreased

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# Section 5

## How is psychological trauma managed in the armed forces?



**TRADITIONAL MILITARY THINKING, DATING** back to the conclusions of the “Shell Shock” Commission of 1922, is that the best protection against psychological breakdown in conflict lies in training, morale, leadership and so on. And to be fair, nothing since then has altered that conclusion; the psychological welfare of troops is still a chain of command responsibility – not a medical one. But no matter how well trained, and how well led, it is incontrovertible that military personnel do get exposed to stressful and traumatic situations, sometimes on a scale that lies beyond any comparable civilian experience. And ever since the First World War, it has been recognised that some will develop acute psychological distress as a result.

We have been interested in the way in which the Armed Forces have managed stress, and its various manifestations, over the last century. For the military, the basic approach to breakdown in battle has not changed much since 1917, and is known as “forward psychiatry”. That means treating distressed Service personnel as quickly as possible, as close to the front line as possible, and doing everything to persuade him that his is a normal physiological response to the stress of battle, and that after a few days of rest, sleep, clean clothes and hot food, he will be able to resume his military duties. It was concluded as far back as 1916 that giving a medical label, such as shell shock, was a mistake and ever since then terminology such as combat fatigue, combat stress reaction or more recently operational stress reaction, emphasises that this is both a normal and transient reaction.

Largely because the opposite - giving personnel who have suffered a breakdown in battle a medical/ psychiatric label, removing them from their comrades, and sending them far to the rear - is known to be associated with a poor long term outcome, the principles of forward psychiatry are widely accepted. There are data that show that, for example, Israeli soldiers treated according to the principles of forward psychiatry do better than those evacuated to the rear,<sup>69</sup> something we later found as well.<sup>70</sup> However, because there is an overwhelming tendency for commanders to retain those soldiers who are either more

valued within in the unit and/or less severely stressed, and to send back those who are either seen as poor soldiers and/or more sick, then it is impossible to know if forward psychiatry really does work, and indeed whether or not it is serving the interests of the individual or the military.<sup>71</sup>

For most of the last century, there was little difference between how civilian and military psychiatrists approached the problem of trauma.<sup>55</sup> However, with the introduction of PTSD in the psychiatric diagnostic systems in 1980 this has now changed. Civilian mental health professionals now generally emphasise the importance of disclosure, talking about trauma and expressing emotional distress, whilst the military continue to emphasise values such as stoicism, resilience and reserve. One consequence has been the rise of trauma counselling, including the intervention known as psychological or critical incident stress debriefing. Over the last two decades, it has been common for normal people exposed to psychological trauma to be immediately encouraged to ‘ventilate’ their emotions, and at the same time receive counselling and/or “psycho education” about trauma reactions, and what symptoms they may expect in the coming days and weeks. The arrival of “trained counsellors” has become as much part of the disaster scene as the emergency services themselves.

Although the military have long accepted the importance of operational debriefing after critical incidents, this has been to establish the facts about what happened, and seeing if lessons can be learned. Such debriefing is not intended for emotional ventilation. But by the 1980s the climate had changed, and the UK military also started to espouse psychological debriefing.

But does it work? The only way to answer this is via a randomised controlled trial, in which people are assigned by chance to either receiving immediate debriefing, or not. And when these started to be performed, and then linked in a statistical meta analysis the summary of all the trials was surprising.<sup>72</sup> In a Cochrane review, not only does individual single session psychological debriefing not work,

it in fact seems to make some people worse, especially those who are the most visibly distressed. In consequence, the UK Armed Forces formally abandoned psychological debriefing in the year 2000.

Psychological debriefing seemed intuitively attractive, so why did it not work? Perhaps it happened too quickly, when people were not ready. Also, not everyone wants to talk about their emotions, and not everyone (indeed not many) are going to develop persistent symptoms. Perhaps debriefing gets in the way of doing what comes naturally, which is talking to someone, and at a time and a place of your choosing – people like your family, friends, colleagues, GP or padre, but not a mental health professional who you have never met before. When we asked military personnel returning from a stressful peacekeeping mission what they would like in terms of psychological support, the answers were many and varied, but what was clear was that talking to a mental health professional was low on the list.<sup>73</sup> Likewise, in the immediate aftermath of the 2005 London bombs, we found that whereas nearly all ordinary Londoners had felt the need to talk to family and friends about what had happened, less than 1% wished to speak to a counsellor or mental health professional.<sup>74</sup>

Psychological debriefing does not prevent or even reduce psychological distress after trauma. Most people can and indeed do get better using their own social resources, and do not need the help of professionals. But does that mean that we should do nothing?

No. We are confident that we have treatments such as antidepressants or cognitive behaviour therapy to help the minority (and as our studies show in the military it is a small minority) that go on to develop recognised psychiatric disorders such as depression or PTSD. But what, if anything, can we do to help the majority? Is there anything we can do in the way of prevention after people have been exposed to severe trauma?

The answer is that we know less than we think. Stress education or stress briefings are one popular approach. However, our data suggest that these are often given in a piecemeal fashion, and that many of those who have attended such briefings later deny ever receiving such an intervention. Hard data on effectiveness are also lacking, although there is some evidence which



What Trim is not: Sigmund Freud and his couch

suggested that psycho-educational briefings carried out after deployments had a modest benefit.<sup>75</sup>

One attractive approach has been pioneered within the Royal Marines, and is known as Trauma Risk Management (TRIM).<sup>76</sup> The key difference between TRIM and traditional debriefing is that TRIM is not carried out by mental health professionals such as counsellors or psychiatrists. Instead TRIM is practiced by serving military personnel themselves, after a short training period. It aims to identify those in need of treatment, but not to treat them. Thus it stays firmly within military culture, and is carried out within the unit itself, without any intervention by outsiders. It is not directed towards emotional expression or catharsis, but towards assessing who might be at risk of developing later problems and ensuring that the unit provides practical support and peer social support for those who need it.

TRIM fits better within military culture than psychological debriefing, and has proven popular. But just because something looks good, and is popular, does not guarantee that it is effective. The only way of deciding if an intervention does more good than harm is via a randomised controlled trial, which we have now concluded within the Royal Navy.<sup>77</sup>

The trial (which as far as we know was the first randomised controlled trial of a mental health intervention within the UK Armed Forces) did not show that TRIM reduced traumatic stress, but nor did it do any harm either. There were several reasons for this – first and foremost, TRIM is about making it easier for people to talk about traumatic stress related problems, not preventing them. Second, during the period of the trial there were few traumatic incidents within the Royal Navy, which was good for them, but not good for testing out TRIM. Finally, a series of studies confirmed that TRIM is popular within the UK Armed Forces, so much so that it is now being rolled out across all three Services.

So TRIM cannot and does not claim to prevent stress or psychiatric disorder. Military life can and often is stressful. And when people are exposed to severe stress, many will develop brief symptoms, and some, hopefully only a few, will develop psychiatric problems. The only way to prevent that is not to put people in harm's way.



What Trim is: Major Richard Dorney, Grenadier Guards, who is trained in trauma risk management

TRiM will not prevent such distress –claims that any intervention can prevent distress after trauma are probably far-fetched. But what TRiM aims to do is change culture, and in particular to make it more acceptable for military personnel to admit to psychological distress when they experience it, and to present for treatment when they need it. So, perhaps in the longer term, TRiM might still be part of the slow process of cultural change making it easier for people to acknowledge distress and seek help. The problem is not stress, which is unavoidable, but stigma, which is the subject of the next section.

Another intervention which is proving popular with some (but not all) of the UK Armed Forces over the last five years is Third Location Decompression or TLD. TLD refers to the process of ensuring that troops who fight together begin to unwind together. For UK troops this happens over a day and half in Cyprus; troops ending their tours in Afghanistan, and formerly in Iraq, stop off in Cyprus and are provided with a relaxing itinerary which includes time on the beach, a Barbeque, a comedy/entertainment show and usually access to alcohol. Whilst TLD is the start of the winding down process it is not a mental health treatment nor can it prevent subsequent mental health disorders. Psycho-educational briefing about homecoming and risky driving form only a small part of the TLD process. We do not know if decompression is effective, but we do know that in spite of less than half of troops wanting to attend TLD before they arrive, about 90% report that they find it helpful afterwards.<sup>78</sup>

Whilst the evidence about psycho-education is generally equivocal about whether it is effective or not, US military researchers have reported that troops who had experienced high levels of combat and received a briefing procedure called BATTLEMIND reported significantly less distress than those troops who had received a standard post deployment brief.<sup>79</sup> Whilst it might have seemed like good practice to use the BATTLEMIND brief with UK troops, we were cautious for a number of reasons. US troops appear to suffer from higher levels of psychological ill health as a result of deployment than are found in the UK so the US effect might not be present for UK troops. The BATTLEMIND brief aims to work by trying to explain to troops that the skills they used to maintain operational effectiveness deployed may need to be adapted for them to achieve a successful ‘transition’ home. Whilst many of the challenges faced by troops of any nation who return home are similar, some are not. We therefore decided to anglicise the brief and carry out a RCT to assess whether it might help UK troops. The trial was concluded in 2010, and the main result was that we found no effect of UK BATTLEMIND on mental health status although there was a mild reduction in those getting the BATTLEMIND brief in terms of their likelihood of binge drinking – which given the UK Armed Forces propensity to consume alcohol (see section 9) is not inconsequential. Despite the lack

of a clear positive result, the concept of framing post deployment symptoms and behaviours as being adaptive rather than indicating illness remains attractive and is understood by commanders.

## SUMMARY

- ▶ Current stress briefing/education is patchy, often forgotten, and of relatively unproven benefit
- ▶ Single session psychological debriefing does not reduce psychological problems after trauma
- ▶ A new system of peer support and risk assessment (TRiM) is better suited to military culture, and is popular.
- ▶ TRIM has not been shown to reduce subsequent PTSD, but might be part of longer term cultural change
- ▶ Third Location Decompression is of unproven benefit, but is popular.
- ▶ BATTLEMIND is a US developed approach to post deployment stress management that avoids suggesting that symptoms/behaviours are pathological
- ▶ BATTLEMIND improved mental health in the US trial but not in the UK trial

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# Section 6

## OUTCOMES AND BARRIERS TO CARE



**IN SECTION 3 WE REVIEWED** how many of those in the Armed Forces suffer from mental health problems, and outlined some of the complex issues involved in understanding who and why. But what happens to these people? What treatments do they receive, how do they fare, and what do we know about those who don't get any treatment?

To address these questions, we looked at a subset of those we had identified with mental health problems as part of the main study. There is a limit to what can be discovered via a questionnaire, so now we made direct contact with the personnel, using a telephone-based structured diagnostic interview and a series of questions about services used and treatments received.<sup>80</sup>

Most of those we interviewed were aware that they had a mental health problem (although that was less true for alcohol misuse). But even though they knew they had problems, only a quarter of those with common mental disorders and still serving in the military were receiving any form of medical professional help. Instead, non-medical sources of help such as chaplains/padres were more widely used. Most of those who were receiving professional help were being seen by general practitioners (79%) and the most common treatment was medication or counselling/psychotherapy. Few Service personnel were receiving cognitive-behavioural therapy (CBT).

Overall, the situation was little changed over the five years since we conducted a similar study, but one that looked largely at ex-Service personnel, many of whom had served in the 1991 Gulf War, which will be discussed in the section of this report dealing with Service leavers (Section 10). It would, however, be premature to lay the blame for this state of affairs at the door of the Armed Forces, or to suggest that military culture uniquely stigmatises mental disorders or makes it difficult for those with such problems to come forward for help. These results are comparable with those reported by others in the general population. Mental illness is stigmatised across society, and difficulty in

admitting a need for help is not restricted to the UK or any other Armed Force.<sup>81</sup>

So why don't people seek help? The reasons are not surprising. When we spoke to the Service personnel, the most common barriers to care were those relating to the self-stigma associated with consulting for a mental health problem. In addition, participants reported practical barriers in consulting such as scheduling an appointment and having time off work for treatment. And it did not get easier once people had left the Armed Forces, further evidence that this is a general not specific problem. Veterans reported additional barriers to care of not knowing where to find help and a concern that their employer would blame them for their problems. Of particular concern, those with mental health problems, such as PTSD, reported significantly more barriers to care than those who did not have a diagnosis of a mental disorder.<sup>82</sup>

So only a minority who seek help whilst they are still in service. What do we know about their outcomes?

### DEPLOYMENT MENTAL HEALTH SUPPORT AND WORK OUTCOMES

When deployed on operations, military personnel who develop mental health conditions which cannot be managed in their unit by primary care assets can be referred for assessment by deployed Field Mental Health Teams (FMHTs). We examined the short term outcomes (return to the operational unit) and long term outcomes (work adjustment) in over 800 soldiers. The FMHTs returned three quarters of those treated for mental health problems to their operational units and a substantial number went on to serve for periods of over two years with many completing their elective term of military service.<sup>70</sup> This supports the principles known as 'Forward Psychiatry', first developed during World War 1 (see sections 2 & 5), in which personnel are managed as

close to their place of work as possible, as quickly as possible, and with the expectation of a speedy recovery. In contrast, being evacuated out of the operational environment was associated with lower levels of retention in service which was compounded by being in service for a short time.

## SECONDARY MENTAL HEALTH CARE

Approximately 300 military personnel with mental health problems require admission to hospital each year. However, little is known about the long term impact upon military work in this group. We therefore examined the occupational outcomes in 384 British Army soldiers by linking hospital admission records to military work outcomes held in a personnel administration database.<sup>83</sup> Three quarters of those admitted were discharged from the Army before completing their elected term of military service and three quarters of service discharges occurred in the first year following hospitalisation. Those with increased risk of premature discharge could be categorised as ‘vulnerable service leavers’ in that they were more likely to be male, have a shorter service term, served in a combat role, and have received community mental health based treatment prior to admission. The outcome was not influenced greatly by the duration of stay in hospital.

Since we concluded that study, there is now a new NHS consortium providing secondary mental health care for service personnel. We will continue to monitor the outcomes of the new contract.

## POST DEPLOYMENT MENTAL HEALTH TREATMENT FOR THE RESERVE FORCES

In section 3 we reported that Reserve Forces personnel continue to be at greater risk of developing mental health problems following operational deployment. When we first reported this in 2006, the Ministry of Defence put in place the Reserves Mental Health Programme (RMHP) as a pilot project for the assessment and treatment of current and former members of the reserve who had mental health concerns related to overseas combat deployments since 2003. We examined the clinical and occupational outcomes in two groups of Reservists; those receiving treatment for an operationally attributable mental health problem and those who required simple reassurance for their concerns.<sup>84</sup> We found a significant improvement in mental health between initial assessment and follow up for the treated group and mental health became similar to that of the reassurance only group. Furthermore, three quarters of those with a continuing TA commitment had returned to full occupational fitness after their contact with the RMHP.

## SUMMARY

- ▶ Only a minority of those with mental health problems in service have sought medical help
- ▶ Non medical sources of support such as padres are more popular than medical personnel
- ▶ Stigma remains a powerful barrier in the UK Armed Forces, the military of other countries and society at large
- ▶ There is no evidence to suggest that the situation is worse in the Armed Forces than elsewhere
- ▶ Outcomes of those treated in theatre by the Field Mental Health Teams are good, suggesting that “Forward Psychiatry” remains relevant
- ▶ Outcomes of those seen in secondary mental care in the UK are not as good, especially for those who have been in the Services for a short time

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# Section 7

## MENTAL HEALTH SCREENING



**AFTER THE FIRST WORLD WAR** those in authority tried to understand why there had been the epidemic of psychiatric breakdowns during the war, particularly after 1916. Although they accepted that the sheer strain of the trenches could cause breakdown in nearly everyone, they felt that these conditions should be relatively short lived. And when they weren't, then the problem was not the war, but the person. Chronic breakdown was blamed more on people's pre service background and vulnerabilities.<sup>85</sup> And if this was the case, then in theory those vulnerabilities should be spotted before deployment. And that makes sense – if one could predict those who are going to suffer breakdown before they go into harm's way, then that person is spared the distress of psychiatric disorder, the military are spared having to deal with personnel who can no longer carry out their military duties, and the Treasury is spared having to pay their war pensions afterwards.

It sounds splendid in theory, but the problem is that so far it just hasn't worked in practice. The Americans tried it in the Second World War, and it was a disaster.<sup>86</sup> By 1944, when General George C Marshall called a halt to the programme, nearly two million men had been removed from military service because they were thought likely to break down. Many were then re-enlisted, and the majority made satisfactory soldiers. There were many reasons for this, but the main one was that the methods of prediction were not accurate enough, and for every person whose breakdown was correctly predicted, half a dozen were wrongly labelled. Not only did that deprive the military of manpower, which is why General Marshall stopped the programme, it also meant that many people went through their lives believing that they were psychologically vulnerable, and were exposed to the stigma of being labelled unfit for military service for psychiatric reasons.

But what goes around, comes around, and the belief that screening for psychological vulnerability should be possible never goes away. So we looked at it again in the context of the Iraq deployment. First, we investigated how any mental health screening might work in practice. The answer was not very well.

Many Service personnel were not keen on the system, probably because of reasons of stigma and also the frequent perception (again, whether rightly or wrongly we cannot say) that the system was not confidential. A considerable number made it clear that they would not give honest answers if our screening study had been "for real", and if we had been in uniform, and not independent researchers. Second, questionnaire based methods are not very accurate, and the medical officers were displeased at having to see a number of people who had been incorrectly identified (the problem of false positives). Many personnel were reasonably happy with military medical services when it came to knees, backs and so on, but preferred to get mental health care from outside the Armed Forces.<sup>87,88,89</sup>

Those studies had been carried out just before the preparations started for the invasion of Iraq. That meant that we now had mental health data on nearly three thousand personnel, about a third of whom then deployed to Iraq. We then attempted to follow all of them up on their return, and managed to get good data from 70% of them. Now we could repeat the Second World War studies. We knew, but no one else did, who was "vulnerable" on the basis of their answers to questionnaires- exactly the people who would have been identified by a real screening programme. And we also knew what had happened to their health as a result of Iraq. The results were clear. Mental health screening before Iraq would not have prevented very much illness after Iraq, and the majority of those who would have been identified by such a programme did not develop problems<sup>50</sup>.

What about screening after deployment? The UK does not routinely do this, unlike several other countries such as the US and Australia. So far no programme has been shown to reduce mental health problems after trauma, either in the military or civilian sectors. We have outlined the reasons for this, and argued that until there is good evidence to support the effectiveness of screening, it is better to spend limited resources on improving access to,

and acceptability of, military health services.<sup>90</sup>

But that does not mean that screening cannot work; only that it has not been proven to be effective. If evidence emerges to support screening, to the same standards that apply within the NHS for example, then clearly policy too should change. And it has to be accepted that the pressure from the public, politicians, the media and Service personnel to launch a programme of mental health screening continues to increase for perfectly understandable reasons.

The appropriate response to this is not to simply launch a programme. If that were to happen, then we would never learn if it had proven effective or not. Nor would we ever be able to grasp the side effects and adverse consequences (and as the head of the NHS Screening Programme famously said, “all screening programmes do harm, some can do good as well”).<sup>91</sup>

Instead we believe that the best way forward is to carry out a proper randomised controlled trial of screening, something that has not been done in any military to date. We are pleased that we now have

funding from the US Department of Defence to do this, and will be starting work soon.

## SUMMARY

- ▶ Mental health screening prior to deployment has not been shown to reduce post deployment ill health, and would have adverse consequences for some individuals and the Armed Forces
- ▶ Mental health screening after deployment is practiced in other countries, but is not yet supported by evidence of benefit
- ▶ Possible disadvantages include numbers of false positives, natural history and low prevalence of PTSD and continuing stigma/barriers to care
- ▶ The issue is now being addressed by a UK randomised controlled trial of post deployment screening

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HMS Northumberland, a type 23 frigate, taking part in a NATO exercise

# Section 8

## PEACEKEEPING



**UNTIL THE CONFLICTS IN IRAQ** and Afghanistan, most modern armies have spent less time fighting wars, and more on peace keeping and peace enforcement duties, and this trend seems likely to continue. Particularly since the end of the Cold War, peacekeeping is less about maintaining the boundaries between two previously warring states, and more of a complex mixture of both forceful and peaceful instruments and techniques, taking place in environments that are less benign than is normally the case in cases of classic peacekeeping. Peace operations of this kind have been referred to as 'strategic peacekeeping'.<sup>92</sup> By contrast,



UK peacekeepers in Sierra Leone

classic peacekeeping is based on maintaining ceasefire agreements which have already been made by the conflicting parties. Classic peacekeeping was the norm in the Cold War era, although there were important

exceptions such as the violent UN peacekeeping operations in the Congo during the period 1960-64. In addition to the more active use of force (Bosnia during the 1990s for example), these multifaceted and more strategic peace operations have sought to deliver ambitious security and development objectives. Consequently, Armed Forces have become engaged in a range of 'complex cultural encounters'<sup>93</sup> with other national armed forces, NGOs, media organisations, contractors, other foreign and host government departments as well as the local populations. This trend increasingly applies across the spectrum of classic, strategic and other kinds of peace and stabilisation operations, extending to counter-insurgency and counter-terror operations in Iraq and Afghanistan.

One consequence of these changes is that peacekeeping missions generate their own particular pressures and problems.<sup>94</sup> It has been suggested that because soldiers are trained and prepared for traditional war fighting, the unfamiliar role of the peacekeeper - caught between two sides, never sure who is the enemy, unclear of his or her role and often burdened with complex rules of engagement - is more stressful for the modern soldier than traditional conflicts such as the 1991 Gulf War or the 2003 invasion of Iraq.

Our investigations into the psychological effects of UK peacekeeping missions have shown that PTSD is as common after peacekeeping missions as it is after more traditional war fighting.<sup>95,96</sup> We have also confirmed that the most common stressors are those that are associated with ambiguity and complex decision making such as unofficial negotiating at checkpoints or operating under restrictive rules of engagement; exposure to either being associated with poor mental health. However, it is not all bad news as we also found that many peacekeepers believed they had helped the local population and, unsurprisingly, doing so was good for their mental health. Others found it beneficial in unexpected ways, and we used a line written by one respondent to one of our



A Forward Operating Base in Afghanistan

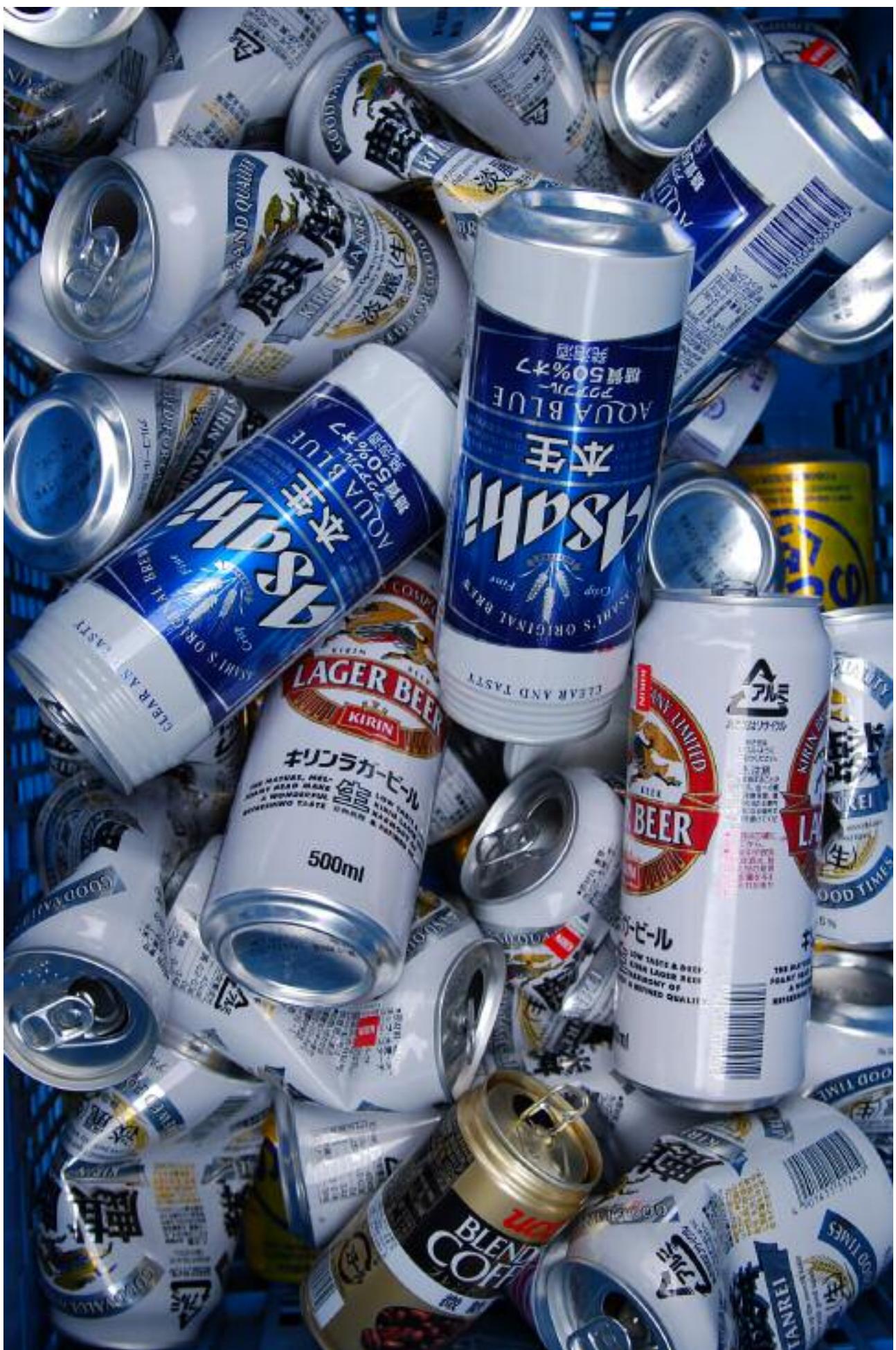
studies as the title of a paper – “serving in Bosnia made me appreciate living in Bristol”<sup>97</sup> We believe it is incorrect to view peacekeeping as simply a “watered down” war, since undertaking such duties can have a substantial impact on military personnel.

## SUMMARY

- ▶ Peacekeeping creates as many psychological problems as war fighting
- ▶ Whilst war fighting includes exposure to the classic “horrors of war”, peacekeeping stressors are characterised by high threat ambiguity and helplessness

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# Section 9

## ALCOHOL AND RISK TAKING BEHAVIOURS



**FROM THE DAYS OF RUM** rations to drinking in the mess, alcohol has long been part of military life. Alcohol use and misuse is often part of time honoured military rituals and traditions, and can play an important part in socialisation, bonding and group cohesion, as it is with other professions, such as the police or even medicine.

But the Armed Forces are not impervious to the harmful effects of alcohol. Whilst alcohol use and its consequences have been studied extensively in the general population, there is a surprising lack of research into its use by the UK military population.

We included a well known measure of alcohol use, the World Health Organization's (WHO) Alcohol Use Disorders Identification Test (AUDIT) in our main Iraq study. This allowed us to look at the general patterns of alcohol use and abuse across the Services, as well as the specific impact of the Iraq deployment, and to make comparisons with the general population of the UK.

Looking across the Armed Forces in the younger age groups (those under 35), alcohol misuse in both men and women was twice that of the UK population of the same age and gender. Within the Armed Forces, people were more likely to drink if they were male, in the Navy or Army, single, of junior rank, and had a parent with a drink or drug problem.

Drinking did decrease with increasing age, until, by about 35 years of age, the levels were similar to the UK general population. The pattern of drinking also differs in the younger age groups— the military population are more than twice as likely to indulge in binge drinking as the general population.<sup>98</sup> Because most of the heavy drinking is concentrated in the early years, alcohol related problems such as dependence are less common, although if the pattern of heavy drinking were to continue in any particular individual or group at the same level, then this would definitely change.

What role does deployment and/or operational stress play in this? When we looked in 2006 in the main study we found no significant impact of deployment to Iraq on drinking, once one took account of the fact that that

deployed personnel tend to be younger and thus drink more anyway,<sup>99</sup> although in a smaller study also representative of the Armed Forces we did find an increase in drinking due to deployment.<sup>100</sup>

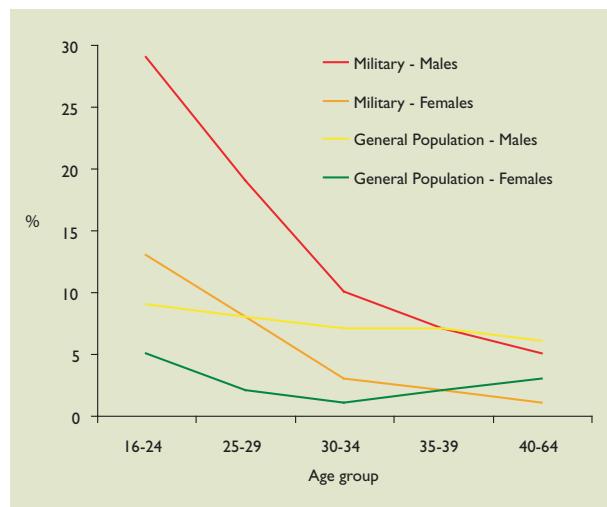


Figure 7: Prevalence of high risk drinking (AUDIT score >16)

By 2009 things had become clearer. Whilst we continued to report no overall effect of deployment on the mental health of Regulars (see Section 3), there was now no doubt this did not apply to alcohol, and we now found an approximately 20% increase in drinking once personnel had returned home. In other words, and despite deployments being “dry”, personnel were reinstating drinking at a significantly higher level than before they deployed<sup>102</sup>. However, this effect did start to reduce over time.

### RISK TAKING

It has been noted before that after any major deployment, such as Vietnam or the 1991 Gulf War, there is an unexplained increase in accidental death. Whilst this is not a major increase, it is still of concern. Many have also



observed that when people come back from major operations they often continue to exist on an “adrenalin rush” for some time, and talking to individuals it is clear that some miss the “buzz” of a real deployment.

On operations people take risks, and it will never be otherwise. But do some people continue to take risks even when they return? We therefore asked about various behaviours that were associated with risk taking, such as driving too fast, driving without wearing a seat belt, and driving under the influence of alcohol.

Whereas we had not found an impact of Iraq on standard mental health measures, we did find an impact on these behaviours. There was a definite increase in reporting risky driving behaviours, for example, in those who had been to Iraq.<sup>101</sup> It was particularly marked in the Army.

We think there are two reasons for this. First, it may reflect part of a general tendency for sensation seeking after the emotional intensity of deployment. Second, whilst on deployment personnel do sometimes drive fast and without a seat belt. It is possible that this style of driving then becomes a habit.

Since the publication of these results, there has been an investment of resource into trying to reduce the rate of accidents after deployment, such as a short film called “Grim Reaper” which highlights the issue, but in a manner in keeping with military black humour. We will be seeing if this has had an impact.

## SMOKING

Whilst alcohol consumption continues to rise in the UK Armed Forces, and also in society, on the other hand, the prevalence of smoking has fallen. Between 2003 and

2007 for example, smoking fell by 5% in the UK Armed Forces, from 30% to 25%. Once again this emphasises the continuities between society in general and the Armed Forces.<sup>100,102</sup>

## SUMMARY

- ▶ Background levels of reported alcohol misuse in the UK Armed Forces are higher than in general population
- ▶ This difference is particularly striking amongst young women
- ▶ Levels of binge drinking also increased
- ▶ By 2009, we are starting to see an impact of deployment on alcohol misuse (among Regulars)
- ▶ Increase in risk driving is also related to deployment
- ▶ Smoking is becoming less common

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# Section 10

## CONTEMPORARY STUDIES ON THE TRANSITION TO CIVILIAN LIFE AND THE HEALTH OF EX SERVICE PERSONNEL



**DESPITE THE PUBLIC RECOGNITION** and regular celebrations of the UK's distinguished military history and the well known role of ex-Service charities such as the Soldiers, Sailors, Airmen and Families Association (SSAFA) and the Royal British Legion (RBL) in looking after ex-Service personnel, we know surprisingly little about the health and well being, views, expectations and needs of UK veterans.<sup>103,104</sup> Indeed, there is even doubt about just how many ex-Service personnel there are – we recently used data from the 2007 Adult Psychiatric Morbidity Study, a population based, random sample based in England, in which we persuaded the organisers (NatCen) to add a couple of questions about military service. We were then able to estimate a figure of 3,770,000 ex-Service personnel alive and living in the community in England in 2007, close to the previous estimate made by the Royal British Legion.<sup>105</sup>

Some may be surprised by this figure, but remember that this includes many going back to the Second World War and National Service. The UK also uses a broad definition of who is a veteran (anyone who has received a day's pay in the services). Not all other countries use this definition, some of which require people to have either completed training, or been deployed. We had previously discussed why the UK has developed this inclusive definition and what that meant for the allocation of resources and the role of veteran's charities.<sup>106</sup> Finally the word veteran has different meanings in different countries – so to avoid confusion we have used the term ex-service throughout to refer to those who have left the military, who may or may not be veterans of a particular conflict.

### LEAVING THE ARMED FORCES

Not everyone who joined the Armed Forces serves their expected term. Some leave early, for many reasons. Such early Service leavers represent a significant drain in manpower as well as a loss of trained personnel. So improving retention is an important priority.

Asking people who have left the Services about their reasons for doing so, as we have done, is one strategy. But only in a prospective study can one see how various factors measured during service predict premature separation from the Armed Forces. We are now starting to look at this in more detail, but it is already clear that mental health measures taken during service are powerful predictors of premature separation, results which are similar to US data. We are now looking at the different ways of exiting the military, their associations and subsequent outcomes, as well as linking to resettlement records.

### WHAT HAPPENS TO PEOPLE AFTER THEY LEAVE THE ARMED FORCES?

We looked first at what had happened to about 4,000 people who had left the UK Armed Forces at some time between 1991 and 2001. The good news was that most had done well. Nearly 90% had for example got a job.<sup>107</sup> Perhaps surprisingly, having served in the Gulf War increased one's chance of getting a job – providing one remained well. The reason is probably what is known as the "healthy worker" effect – and also the impact of a campaign medal on employers.

But not everyone does well. First, there are those who leave prematurely. We found that leaving early is not random, and that early Service leavers have worse mental health in service than those who stay. Furthermore, one of the best predictors of whether or not leavers get jobs is mental health. So poor mental health in service gives a double disadvantage – you are more likely to leave, and less likely to get a job after you leave.

We wanted to know more about this particularly vulnerable group – either those who had mental health problems in service, or those who couldn't get jobs after leaving. We therefore made direct contact with nearly 500 of these vulnerable leavers<sup>108</sup> – note that these were entirely different from those who were mentioned in Section 6 where we looked at barriers to care in a large

group of those who had served mainly in the Iraq War, but where the majority were still in the Armed Forces.

When interviewed, nearly half had a psychiatric diagnosis. The commonest diagnosis was not PTSD, but depression, together with alcohol problems. Of those who had psychiatric disorders, half were seeking help. The remainder either did not want help, or felt that they could deal with their problems on their own. The most common source of help was the general practitioner. Many were receiving medication, chiefly antidepressants, but very few had received any psychological treatment, such as cognitive behavioural therapy (CBT), which we know to be effective, and is recommended in the recent NICE guidelines. About a quarter were in contact with the Service charities such as the Royal British Legion or Combat Stress.

In that study we looked at a sub set of ex-Service personnel who had served in the 1991 Gulf War, but in the next study we deliberately focussed on a group whom we believed to be at greatest risk of poor outcomes – those who were, at the time, at the Military Corrective Training Centre (MCTC) (informally referred to as “the military prison”) and who would be leaving the military at the end of their sentence. This is an atypical group, but still worthy of study.<sup>109</sup>

Pre-discharge, three quarters of those leaving MCTC had risk factors that made them vulnerable to poor outcomes such as debt, relationship instability and lack of permanent housing. Many had unrealistic and oversimplified expectations of the resettlement process and lacked an understanding of the avenues through which to find suitable help. So fear of the unknown, lack of understanding and lack of skills to access available support services acted as barriers to getting help.

Six months post-discharge, over half had indeed not done well, as might have been predicted from the factors identified at MCTC. Half were in debt and half did not have proper housing. 10% had experienced homelessness. Just over half had a mental health problem, the commonest being alcohol dependence. Looking back, participants reported that they now recognised the need for targeted advice and guidance at the point of transition so that immediate assistance could be given to tackling the multitude of resettlement difficulties they faced.

## NATIONAL ADULT PSYCHIATRIC MORBIDITY SURVEY

A problem that faces all research in the area of military health is comparing those who have served in the military with their general population counterparts, and to do so in a way that does not introduce bias. As already described, the 2007 Adult Psychiatric Morbidity Survey (APMS), in which 7461 randomly chosen adults living in the community in England were interviewed about their lives and mental health, added a couple of questions about military service. This had two advantages. First, it used face-to-face interviews, not self-completed

questionnaires. Second, the main focus of the survey had nothing to do with military health. Overall, the results did not suggest that military service lead to disadvantage. No association was found between any mental health outcome, including PTSD, and military service, with the exception of violent behaviour in males, and suicidal ideation in females. Early service leavers drank more, and were more likely to have self harmed than longer serving veterans. There was no difference in treatment seeking behaviour between veterans and non veterans.<sup>110,111</sup>

## HOMELESSNESS AND SOCIAL EXCLUSION

Some ex-Service personnel end up homeless on the streets of London and elsewhere, and it is often said that up to 25% of London’s homeless, for example, have a military background. Finding out exactly how many homeless people are ex-service personnel, and what role Service life plays in those who become subsequently homeless, is not easy. 25% seems to be an exaggeration, less than 10% being a more likely estimate.<sup>112</sup> Subsequent work by the University of York suggests a figure of 6%.

## SUMMARY

- ▶ The UK uses a very broad definition of a veteran – one day of employment in the Armed Forces
- ▶ Using the Adult Psychiatric Morbidity Survey we estimate that in 2007 the number of veterans in England was 3,770,000
- ▶ The same dataset suggests that service in the Armed Forces is not associated with overall increase in psychiatric disorders
- ▶ Most people who leave the Armed Forces do well and get jobs quickly
- ▶ Service leavers with poor mental health in service are more likely to leave and less likely to get jobs after leaving
- ▶ Poor outcomes are clustered in early Service leavers, and to be multiple (debt, antisocial behaviour, substance misuse, mental health problems, unemployment, marital difficulties and unstable housing)
- ▶ Those with psychiatric problems have difficulties accessing appropriate NHS services, and rarely obtain the best psychological treatments. This is not unique to the Armed Forces
- ▶ The main barriers to care remain stigma and reluctance to access services, but this is also not unique to Armed Forces
- ▶ For the minority most at risk of poor social outcomes, interventions need to be broad based, and given before or as soon after separation as possible

## THE RISKS VERSUS BENEFITS OF MILITARY LIFE

Our research on veterans' health has shown that, although most people leave the Armed Forces and do well, some do not. But just how much did being in the military contribute to these outcomes? Some people are already disadvantaged before they join the Services, particularly in the Army, which has for many years recruited from areas of social deprivation. We have shown that UK ex-Service personnel report more childhood adversity than non-Service populations<sup>111</sup>. Likewise, not all mental health problems arising during service, even after deployments, are related to the deployment itself. We also already know that pre-deployment adversity considerably increases the risk of developing PTSD after exposure to trauma.<sup>113</sup> So, even if we can be sure that there are veterans who cannot find jobs, who get into trouble with the law and so on, we cannot be sure what are the relative contributions of Service and pre Service life.

We have taken several approaches to these issues. First, taken over the life span, does simply being in the Armed Forces have a detrimental effect on one's health and social outcomes? We partially addressed this question by using the 2007 Adult Psychiatric Morbidity Survey, already mentioned above.

Second, given that we know that some people do have poor outcomes after their military service, can we quantify the contributions of pre-Service and in Service life to those outcomes? How much were these outcomes influenced by issues that were already present before recruitment, how much by what happened to a person during their service, and how much is a result of the cumulative effect of pre- and post-enlistment issues?

These questions are particularly relevant when we consider the currently contentious issue of offending by those who have served in the military. At the time of writing, there is a great deal of concern over the apparently large numbers of veterans serving prison sentences, and a general feeling that this is in some way a reflection of their experiences during military service. However, good data are lacking in this area. The best data were recently published by Defence Analytical Services and Advice (DASA), which concluded that 3% of the prison population had served in the UK Armed Forces. But even this is not particularly helpful. Those in prison represent only a small proportion of those who offend. Second, just how much does Service life contribute to this, given that the Armed Forces in general and the Army in particular, actively recruit from those already at risk of subsequent offending behaviours? It is possible that aspects of military life actively improve the social trajectories of Service personnel from what they might have been if they had not been recruited. Indeed, it might be argued that what is remarkable is not how many veterans are in prison, but how few. We don't know.

To answer this we have recently obtained permission to link our main cohort study, the Iraq/Afghanistan cohort

described in Section 3, with the Police National Computer, which contains detailed information on all aspects of convictions and incarceration. This study, funded by the Medical Research Council, will enable us to produce an accurate picture of post-Service offending, but perhaps more importantly to quantify the relative contributions to post-Service offending of pre recruitment social disadvantage; events during military service (including deployment); mental health; and substance misuse.

All of the above work is part of our wider goal of understanding the balance of risks and benefits of military service, taking into account that many "risky" people join the Services; that Service life provides tangible benefits in terms of skills, structure, connectedness to others and self esteem; but also exposes people to very particular risks and traumas.

## SUMMARY

- ▶ We are now looking at rates of offending and incarceration in the current generation of ex service personnel.
- ▶ This will include the relative contribution of pre service vulnerabilities and events in service including deployment.
- ▶ The overall strategy is to weigh up the risks and benefits of service life.

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# Section 11

## OTHER ISSUES – DEPLETED URANIUM (DU), MILD TRAUMATIC BRAIN INJURY (mTBI), DOWNGRADING, MEDIA, FAMILIES



**DEPLETED URANIUM (DU) MUNITIONS** have proved controversial, and have been blamed by some for Gulf War Syndrome. Putting to one side the lethal effects of DU when used as a weapon (its primary purpose), what are the side effects of its use? Despite the word “uranium”, DU is not in fact an important radioactive hazard. Instead its toxic properties are similar to those of lead because it is a “heavy” metal. A team in the US continue to carry out intensive surveillance of soldiers who received DU fragments in their bodies as a result of so called “friendly fire” or “blue on blue” incidents. Those affected continue to excrete DU 15 years later. There are also subtle changes in renal function and also some evidence of increased chromosome mutation in those most heavily exposed.<sup>114</sup> But importantly there is no evidence of any health problems.



“Cleaning up” a destroyed Iraqi tank is another potential source of DU contamination

What is the UK situation? We have not studied any veterans from the first Gulf War who received DU shrapnel fragments. All we have been able to show is that a small proportion of Gulf veterans have requested screening for DU, but most of those did not come from those at risk of DU contamination.<sup>115</sup> Surprisingly some of the veterans who believed that they had breathed in DU dust did not want to be screened, which suggests

that there may be multiple factors, including denial, influencing who wants to be screened for DU.

After the conclusion of the 2003 invasion of Iraq, we were able to launch a direct study looking for evidence of DU exposure, concentrating particularly on those most at risk, which were those in the armoured brigades and those involved after the end of active war fighting in cleaning up knocked out Iraqi tanks. DU is excreted by the kidneys, but we found no traces of DU in 341 at-risk Army and Royal Marines personnel who had taken part in the invasion of Iraq.<sup>116</sup>

### SUMMARY

- ▶ No evidence of clinically significant exposure to DU in UK personnel deployed to Iraq

### MILD TRAUMATIC BRAIN INJURY (mTBI)

Mild traumatic brain injury (mTBI) is now claimed to be one of the signature injuries of the Iraq and Afghanistan conflicts. But what is it, and is it quite so closely associated with the current conflicts? When shell shock was first postulated during World War 1, it was assumed to be the product of a head injury. However, subsequent clinical studies suggested that this view was too simplistic, and explanations soon oscillated between the strictly organic and the psychological as well as the behavioural. Despite a vigorous debate, physicians failed to identify anything to support such clear cut distinctions between the organic and the psychological. There was a similar debate during World War 2 about post concussional syndrome, and with similar conclusions. It was agreed that there were dangers in labelling anything as a unique “signature” injury and that disorders that cross any divide between physical and psychological require a nuanced view of their interpretation<sup>47</sup>.

So to the current situation. When we started our main study in 2003, mTBI was not an issue, and it was only later that it became labelled as the “signature injury” of the war. However, we were able to look at the symptoms that made up the post concussional syndrome. We found that these were indeed associated with self report of blast injury, which is what was being predicted. But the same symptoms were also associated with exposures that had nothing to do with blast injury, such as exposure to depleted uranium munitions, or to problems at home during deployment. And finally they were strongly associated with PTSD, which had already been reported by the Walter Reed team. So it seemed that post concussion symptoms were not a specific consequence of blast injury.<sup>117</sup>

By 2006, when we designed our follow up study, mTBI had become a concern, and so we now asked questions on whether or not people had experienced a head injury which qualified as an mTBI – in other words an episode of concussion. Not surprisingly, some had. Overall 4% of those surveyed reported such an episode, although in only 0.7% was there actual loss of consciousness. These figures increased in those in combat roles (9%), as one would expect. However, as in the previous paper, not all of the symptoms were specifically associated with the injury, although there was a surprisingly strong association with double vision.<sup>118</sup>

Another intriguing finding was that the rates we were describing were substantially lower than those being reported from US studies, where the prevalence ranged from 12 to 23%. This difference is too large to be explained simply by the fact that the US have longer tours of duty, and suggests that we need to consider more than exposure to blast injury in understanding the mTBI phenomenon. Words convey many meanings, and it is possible that the words traumatic, brain and injury (even though prefixed with “mild”) can themselves have a more negative impact than the more vernacular “concussion”. It has already been shown that after a concussion people who believe that their symptoms have lasting and deleterious effects are at higher risk of experiencing longer term disorder.<sup>119</sup>

## SUMMARY

- ▶ mTBI is a new label for concussion
- ▶ The symptoms that follow a presumed mTBI/concussion are not specific, although double vision seems to be an exception
- ▶ There is an overlap between mTBI and PTSD
- ▶ mTBI seems to be commoner in US combat personnel than in UK

## MEDIA - DO TELEVISION PROGRAMMES CAUSE DISTRESS TO UK VETERANS?

It is often said that when soldiers have been traumatised by their war experiences, seeing visual reminders of combat and conflict has a negative effect on their mental health, leading to general distress, flashbacks and the like. However, most of these reports come from the particular experiences of US Vietnam veterans.

In November 1999, the BBC showed a powerful TV drama called “Warriors”, which was a dramatic reconstruction of the experiences of a group of British peacekeepers who were deployed on “Op Grapple” at the start of the Bosnian war. It won several awards. One of the themes of the drama was the adverse psychological impact of peacekeeping duties on the mental health of several of the key characters.

By coincidence, we had studied a large group of genuine UK veterans of the same operation before the programme was shown. As we were about to follow this group up, we added a few questions on the impact of the programme.

Half of our large sample, all of whom had served in Bosnia, saw the programme, and nearly all agreed it was accurate and moving. But in contrast to the received wisdom, those who before the programme had psychological distress did not avoid the programme because of its traumatic memories – if anything they were more likely to have watched. Furthermore, there was no evidence that the programme caused further psychological distress in any of the soldiers who watched it. In this group, watching dramatic reconstructions of traumatic events did not cause any psychological problems, even in those who were affected by the events in question.<sup>120</sup>

On the other hand, in subsequent work as part of our Iraq studies we went on to show that Service personnel are concerned about how media coverage of the conflict affected not themselves but their families.<sup>121</sup>

## MEDICAL DOWNGRADING

Medical downgrading (being unfit for operational deployment) is another area of hidden psychological morbidity. Those who are medically downgraded make up 7 to 10% of the total strength of the Armed Forces. Being downgraded was associated with a doubling of the risk of having psychological problems, and this was particularly marked in those with chronic physical illness.<sup>122</sup> This is in keeping with the general population literature, which consistently reports the hidden psychological burden of chronic physical illness. Given that we also know that psychological disorder is a major factor determining prognosis, functional impairment and treatment outcome, this is an area where the military need to explore the role of psychological treatments.

## FAMILIES

Everyone acknowledges the importance of families to the health and well being of serving personnel, but surprisingly little is known about how families cope with the stressors of deployment. To investigate this further we carried out some in depth interviews with service personnel and their partners before, during and after deployment to Iraq (Op TELIC 5).

The first thing this showed was that there was a difference in the way in which the deployed person and their partner viewed the stressors of separation and deployment. Put simply, those in Iraq tended to over estimate the impact on their partners who had to remain at home, and to under estimate their resilience. Partners back home were often prepared to put up with rather more than the person out on deployment thought. There was acknowledgement of the tensions that military life brought on what is often called “work life balance”, but in the opinion of these personnel, this was off set by the additional financial security they received.

We also looked at what support was available for spouses during the separation of deployment. For partners of Regular personnel, there was a variety of both informal and formal networks of support. Informal support being the so called “military family” and its networks, with formal support being the support from padres, voluntary organisations and welfare departments. In general, people preferred to use informal networks, but the formal



A RAMC soldier reunited with his family

networks were also valued as a “safety net” or “insurance” in case things went seriously wrong. The concept of the “military family” remains alive and well.<sup>123</sup>

We also examined the issue of family difficulties in the OMHNE study, evidenced by intention to split from one’s partner or after such a split had indeed occurred, whilst personnel were deployed. Once again we found that where personnel viewed their family as being well supported they had less mental health problems than when this was not

the case. This suggests that the mental health of Armed Forces personnel whilst deployed is, at least in part, related to the strength of their family relationships.

Finally, we looked at the impact of deployment on close personal relationships, using our main study data. Overall deployment per se was not associated with an increased rate of breakdown in relationships, compared to those who did not deploy. In those who however did experience negative relationship changes after deployment, what happened on deployment, such as traumatic events, played a small part, but the biggest influence came from existing problems in the relationship, and also mental health/substance abuse issues.

## SUMMARY

- ▶ Partners have different views about the impact of deployment on family life and functioning
- ▶ Informal networks of social support (“military family”) remain strong
- ▶ There is an imbalance in both formal and informal support between Regulars and Reserves
- ▶ Whilst deployed family issues may be “dragged” into theatre and impact on mental health
- ▶ No overall impact of deployment on marital breakdown

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# Section 12

## ACADEMIC CENTRE FOR DEFENCE MENTAL HEALTH (ACDMH)



**THE ACADEMIC CENTRE FOR DEFENCE** Mental Health (ACDMH) was established in 2004 in order to provide MOD with an ‘in-house’ mental health research capability. In 2009, with the appointment of the first Defence Professor of Mental Health, the unit is now co-directed by two mental health academics – one military and the other civilian. The unit itself consists of both uniformed and civilian personnel and works very closely with KCMHR with which it is co-located. However, the formal command chain for ACDMH lies within MOD rather than within King’s College London, unlike KCMHR

ACDMH personnel have a number of key tasks. First and foremost is to facilitate and carry out mental health research in order to support the needs of the Ministry of Defence. ACDMH achieve this by working closely with other research departments, most importantly, but not exclusively, KCMHR, and by working with military Departments of Community Mental Health (DCMH) which provide mental health care for service personnel in the UK and Germany. ACDMH also works with other military mental health teams (e.g. Gibraltar, Cyprus and Afghanistan) to provide research advice where assistance is requested. The ACDMH team also organise the academic day of the annual Tri-Service Defence Mental Health Conference. This is the annual forum for all Defence Mental Health Services personnel.

Team members also maintain international links with other military mental health researchers from Anglophone coalition countries including being part of TTCP (the technical cooperation panel) and NATO groups who are working on mental health related projects of interest to MOD. Again, this complements the other cross-national strands that are being developed in KCMHR.

ACDMH also monitors the emergent mental health research that is relevant to the UK Armed Forces and produces an annual review of the literature for the head of the UK Armed Forces medical staffs (the Surgeon General). This ensures that MOD continues to deliver evidence based care to its personnel. ACDMH also

carries out research projects which require a significant understanding of military personnel and processes such as surveying the mental health of deployed personnel. The Operational Mental Health Needs Evaluation studies carried out in Iraq (2009) and Afghanistan (2010) have had significant influence on MOD policies relating the mental health of deployed personnel. ACDMH has also surveyed troops who are undergoing decompression and has carried out randomised controlled trials of psychological support processes which aim to support the mental health of service personnel (see section 5).

ACDMH also contributes to monitoring some of the MOD’s healthcare outcomes including looking at what happens to personnel who are referred to the operational Field Mental Health Teams whilst deployed, who are admitted to the MOD’s mental health inpatient facility or who have been treated through accessing the Reserves Mental Health Programme.

Lastly, ACDMH also provides a considerable amount of educational activity aiming to improve the understanding of a wide variety of MOD personnel (including senior officers and ministers) about military mental health. ACDMH staff also teach on the War and Psychiatry MSc and assist with medical student teaching at King’s College London.

### SUMMARY

- ▶ ACDMH is a synergistic link between MOD and academia
- ▶ It is an in-house mental health research capability that complements the work of KCMHR
- ▶ ACDMH is able to carry out some “*in vivo*” studies which would be impossible for non-military academics

# Section 13

## WHAT IMPACT HAS KCMHR HAD ON POLICY?



**AS EXPLAINED IN THE INTRODUCTION**, KCMHR exists to not only produce scientific peer reviewed publications but also, when and where appropriate, to illuminate the context of policy on military health and well-being. In a number of areas, our research has led to changes in the direction of policy. Key highlights include the following:

- ▶ Shown the existence and extent of the Gulf War Illness problem
- ▶ Showed that pesticides, DU and anthrax vaccination was not to blame – thus allowing them to remain available for use within the operational environment as required
- ▶ Identified a possible link between rate of vaccination and the possible use of the anthrax/pertussis combination. This led to a major policy change in the pattern and schedule of vaccinations prior to the Iraq War. Subsequent work confirmed the medium/long term safety of the anthrax vaccine.
- ▶ Provided evidence to improve future vaccination uptake and confidence, identifying that information given and/or consents obtained should be the same for all vaccinations and no “special cases” made for any single one such as anthrax.
- ▶ Demonstrated that pre deployment psychological screening was not a solution for post deployment mental health problems
- ▶ Identified the many problems that remain before post deployment mental health screening could be implemented. Currently starting the first ever randomised controlled trial of post deployment screening, which will provide crucial information on the effectiveness and cost effectiveness of screening.
- ▶ Identified an increase in mental health problems in Reservists after Iraq, which directly led to the Reserves Mental Health Programme, the extension of mental health support to Reservists after demobilisation
- ▶ Was able to give strong reassurance that there had been no repeat of the “Gulf War Syndrome” episode
- ▶ Provided robust evidence that permitted MOD to alter data protection policies to permit important data collection/research to continue.
- ▶ Showed that psychological symptoms are common among personnel medically downgraded for physical disorders
- ▶ Showed increased risk of accidents in personnel post deployment
- ▶ Added to the evidence that single session psychological debriefing does not reduce post traumatic stress
- ▶ Has been actively involved in the development of peer based trauma risk management and support (“TRIM”). Carried out the first ever RCT of TRIM in the Royal Navy. Paved the way for the current roll out of TRIM across the three Services.
- ▶ Provided a series of studies confirming that post traumatic stress disorder (PTSD) is not the most prevalent mental health problem in the Armed Forces, and that both depression and alcohol misuse are commoner. Helped raised awareness of the importance of alcohol misuse at all levels.
- ▶ Showed that mental health in theatre (both Iraq and Afghanistan) remained robust.
- ▶ Highlighted the importance of adherence to the Harmony Guidelines governing tour length in preventing mental health problems. Drew particular attention to the importance of not altering tour length during an operational tour.

# Section 14

## WHERE ARE WE GOING? WORK IN PROGRESS



**PREVIOUS SECTIONS HAVE DESCRIBED** much of our ongoing research. For example, we are just starting an MRC funded programme of work on offending and criminality in ex-Service personnel, addressing the critical question of what are the relative contributions of, on the one hand, pre-Service issues and, on the other, what happens to people during their military service (Section 10). Another critical study that will be starting shortly will be the first ever randomised controlled trial of post deployment screening (see section 7).

We are also aware that the subject of military families has received less attention than it merits. With this in mind, in 2010 we started a large-scale epidemiological study to systematically examine mental health outcomes for children across the ages ranges 3-16 years. Data will be collected from fathers, mothers, children themselves (11+) and their teachers and care-givers. The study compares outcomes for children of fathers with PTSD with those of fathers who return without a combat related psychiatric injury. The study, funded by the US Department of Defense, will run over three years and involves more than 600 military fathers, their spouses/partners and children.

The next question is whether or not it is desirable to continue to follow up the main cohort that we started in 2003, and which has proven to be an invaluable source of data on the impact of the wars in Iraq and Afghanistan on UK military personnel. As we described in Section 3, we now have data to the end of 2009, by which time most of the cohort had served in either or both theatres of war. Many had already left the Armed Forces, and as outlined in Section 10, we are now analysing various aspects of the transition from the military to civilian life. At the time of writing no decisions have been made as to whether or not we should continue to follow up this cohort, given that the UK deployment to Iraq has officially ended (although of course operations in Afghanistan continue). It is possible that new developments in electronic patient records within the Defence Medical Services and the NHS might make the

daunting task of obtaining further data on medium/longer term outcomes easier in the future, but it would be a brave person who would make a confident prediction that this will be the case, at least in the short term. Furthermore, a system based on routinely collected data will never be satisfactory for monitoring mental health.

Another area of interest is the wider issue of how society views those in the Armed Forces both during and after their military service. As many have noted, there seems to be an increasing divide between support for current military interventions (which has been declining) and support for the Armed Forces (which appears to be increasing). We are starting to analyse our data on how this impacts on well being and morale. At the same time we have successfully bid for funding from ESRC to incorporate a module on current public attitudes to the Services into the influential British Social Attitudes Survey.

## THE INTERNATIONAL PERSPECTIVE

Research on the health and well being of Service and ex-Service personnel has become more internationalised, reflecting the increased international collaboration amongst a variety of countries in military operations around the world (and not just in Iraq and Afghanistan) over the past two decades. Analysis of findings and their implications for scientific theory as well as policy involves comparing what we have found in the UK case with other countries, most notably the US, which is the UK's closest military ally and one that invests very significant resources in the support of Service personnel and the scientific research on which that support depends. Issues such as the potential value of screening – pre- and/or post deployment or on leaving the Armed Forces, the consequences of deployments for PTSD, alcohol use, retention, family strains, as well as the value of long term follow up of personnel after they have made the transition



An RAF Chinook helicopter deploys countermeasures

to civilian life, to mention just some of the important ones – continue to generate debate and discussion amongst policy makers and the scientific community. In this more internationalised research environment it is a positive sign that such debate can also lead to cross-fertilisation of research as for example in our ongoing research collaboration with US colleagues in San Diego and the Walter Reed Institute. The US DOD funding of our UK based study of military families focusing on mental health outcomes for children across the ages ranges 3-16 years is a good example of this process of cross-fertilization, as is their support of our randomised controlled trial of post deployment screening, work that could no longer been done in the US.

As our work continues, the research and policy debate will extend beyond the Anglo-American context to include other countries, such as Australia, Germany, France, Canada and the Netherlands that have deployed military personnel abroad. We need to extend our scientific and policy discussions accordingly.

## SUMMARY

- ▶ Maintaining the existing cohort
- ▶ Using routinely collected sources alongside cohort
- ▶ Offending and violent behaviour after deployment
- ▶ Children of military fathers
- ▶ Psychological outcomes of physical injury
- ▶ Randomised controlled trial of post deployment screening
- ▶ How does society view those who are serving or have served?
- ▶ What is the overall effect of military service on health – balancing the positives and negatives
- ▶ Developing resource for sharing data with US colleagues

# Section 15

## CONCLUSIONS



**AT THE TIME OF WRITING** (2010), it remains the case that the mental health of the UK Armed Forces has by and large survived both the war in Iraq (Op TELIC) and the continuing war in Afghanistan (Op HERRICK). By that we mean that there is no evidence to support a significant decline in morale or well being, nor of a significant increase in mental health problems such as, but not restricted to, post traumatic stress disorder. Nevertheless, our research has highlighted certain problems that continue to need to be addressed. First, alcohol misuse remains, and whilst the primary determinants of this are not related to deployments, for the first time we have documented that deployment to either Iraq or Afghanistan has resulted in still higher levels of alcohol misuse. Second, whilst these two major deployments have yet to be associated with a particular adverse impact on the overall mental health of those who served there (compared with all other contemporaneous campaigns or deployments), it is the case that there has been an increase in mental health problems in certain sub-groups – namely those in combat roles and those in the reserve forces.

What about the future? We are mindful of Tony Blair's possibly apocryphal comment to the effect that "I don't make predictions, I never have and I never will". Nevertheless, we will try. First, many of those who have developed psychiatric injury as a result of their service in Iraq or Afghanistan will remain hidden to either the military or the NHS. This is not because they have yet to develop problems, but because they admit to their not yet taken the decision to come forward for help. Second, many of that group will probably already have left the Services and returned to civilian life. This is because those most vulnerable to post Service problems are those who leave the Armed Forces early, most often within the first four years. In Section 10 we pointed out that early Service leavers are at greater risk of a wide range of social adversity – such as debt, alcohol and drug misuse, unemployment, homelessness, deliberate self harm and so on. This in turn poses a policy dilemma –at present the longer you serve,

the greater the support and assistance you receive in terms of resettlement. Yet those who are most in need are most often to be found in the ranks of early Service leavers. Hence those who receive the most are those who perhaps deserve or who have earned the most, but paradoxically may not need the most. Third, whilst it is true that the military health services, the NHS and the Service charities can expect, and indeed are already experiencing, an increased demand for their services in those who have returned from Iraq or Afghanistan, this reflects the fact that personnel are continuing to deploy, hence the absolute numbers who served in either theatre will likewise continue to rise, and/or personnel are presenting earlier than in the past. It does not mean that the true rate of disorders is increasing, and nor does it indicate any incipient failure of morale.

Finally, the Armed Forces have made important strides in recognising not just the physical, but also the mental, costs of conflict. Numerous initiatives, described particularly in Section 5, ranging from pre- and post-deployment briefing, decompression, Battlemind, TRIM and others, have been put into place or are being tested. It is too early to determine precisely what impact these will have. But notwithstanding Tony Blair, we make two predictions. First, none of these will eliminate the stigma of mental disorder, which remains the single greatest barrier impeding those who need help from seeking it. This is a problem wider than the Armed Forces, and indeed in Section 6 we outlined some of our studies in which found no evidence that barriers to care and reluctance to seek treatment is any worse in serving and ex-serving military personnel than in the general population. Second, it is naive and utopian to believe that the risk of psychiatric injury can ever be banished from the profession of arms. Most people accept that the idea that a military operation, be it Operation TELIC, HERRICK or whatever might follow, could ever be free of physical casualties is something devoutly to be wished for, but unlikely to be achieved. So it is also with psychiatric casualties.

In the meantime, we hope we have assisted in showing that the military has little to be afraid of in acknowledging the reality of psychiatric casualties. Accepting this more sympathetically, as they are doing, poses no dangers to them, provided it is managed within the context of military culture (the goal of initiatives such as TRIM or Battlemind), and provided they also do not heed those voices who claim that stress can be

avoided or prevented, as opposed to managed. It is nonsense to believe that stress can ever be eliminated from a military organisation, and it is probably undesirable. The military deliberately stretch and test people because war is a stressful business – it always has been and it always will be. It is best to come prepared. We would like to think that some of the work outlined in this report has played a small part in such preparations.



RAF personnel prepare a meal from rations

## APPENDIX 1

### GULF WAR ILLNESS UNIT, King's Centre for Military Health Research and Academic Centre For Defence Mental Health Staff - 1996-2010

- ▶ Helen Alvarez
- ▶ Cate Birtles
- ▶ Duncan Bland
- ▶ Josh Buckman
- ▶ Tess Browne
- ▶ Howard Burdett
- ▶ Susie Burdett
- ▶ Trudie Chalder
- ▶ Bola Coker
- ▶ Christopher Dandeker
- ▶ Anthony David
- ▶ Kimberlie Dean
- ▶ Clare Dyson
- ▶ Mark Earnshaw
- ▶ Brian Everitt
- ▶ Lydia Farrin
- ▶ Nicola Fear
- ▶ Claire French
- ▶ Neil Greenberg
- ▶ Jamie Hacker Hughes
- ▶ Sam Harvey
- ▶ Stephani Hatch
- ▶ Liz Higgins
- ▶ Richard Hooper
- ▶ Oded Horn
- ▶ Matthew Hotopf
- ▶ Lisa Hull
- ▶ Khalida Ismail
- ▶ Amy Iversen
- ▶ Edgar Jones
- ▶ Margaret Jones
- ▶ Norman Jones
- ▶ Vicky Kelly
- ▶ Kate Kent
- ▶ Susie Kilshaw
- ▶ Vicki Langston
- ▶ Katie Lye
- ▶ Louise Machell
- ▶ Dee MacManus
- ▶ Kathleen Mulligan
- ▶ Dominic Murphy
- ▶ Maria O'Hagan
- ▶ Vasilis Nikalaou
- ▶ Ian Palmer
- ▶ Mark Peakman
- ▶ Stephanie Pisarski
- ▶ Julie Pridden
- ▶ Steven Reid
- ▶ Randalle Roberts
- ▶ Roberto Rona
- ▶ Michael Rose
- ▶ John Ross
- ▶ James Rubin
- ▶ Rachel Seddon
- ▶ Mohammed Sharief
- ▶ Anna Skowera
- ▶ Jo Sundin
- ▶ Rosemary Tate
- ▶ Sam Thomas
- ▶ Catherine Unwin
- ▶ Lauren Van Staden
- ▶ Simon Wessely
- ▶ Jennifer Wilson
- ▶ Charlotte Woodhead
- ▶ Ed White
- ▶ Til Wykes

## APPENDIX 2

### ACKNOWLEDGEMENTS

#### COLLABORATORS

- ▶ Prof David Alexander
- ▶ Prof Jonathan Bisson
- ▶ Col Phil Bolton
- ▶ Maj Caroline Caldicott
- ▶ Prof David Coggan
- ▶ Dr Simon Cohen
- ▶ Prof Brad Doebling
- ▶ Col Dougie Gamble
- ▶ Brig John Graham
- ▶ Dr Craig Hyams
- ▶ Dr Noreen Maconochie
- ▶ Prof Theresa Marteau
- ▶ Lt Col Peter McAllister
- ▶ Gp Capt Frank McManus
- ▶ Dr Leigh Neal
- ▶ Prof Pat Doyle
- ▶ Dr Susan Klein
- ▶ Prof Gary MacFarlane
- ▶ Gp Capt Geoff Reid
- ▶ Surgeon Capt John Sharpley
- ▶ Dr Tyler Smith
- ▶ Prof John Weinman
- ▶ Dr Robin Woolvern
  
- ▶ Army Benevolent Fund
- ▶ Army Families Federation
- ▶ Dr Anne Braidwood and colleagues at DWP
- ▶ AFPAA
- ▶ Kate Harrison and her colleagues Lisa Baird, Nick Blatchley, Jason

- ▶ Bradbury, Issy Bray, Alison Byers, Craig Corbet, Kate Harrison, Alison Richards, Sandra White at DASA
- ▶ BFPO Mill Hill
- ▶ Commander Toby Elliot, Wing Commander David Hill, Dr Walter Busitill and colleagues at Combat Stress
- ▶ Megan Challis, Dave Rutter, Claire Phillips, Suzanne Paylor and colleagues at the Department of Health.
- ▶ Defence Medical Services Directorate, now the Surgeon General's Department
- ▶ ESAG
- ▶ Single Service Medical Directorates
- ▶ Capt Debs Skennerton and colleagues at 4th Armd Brigade
- ▶ Col Brian Eadon, Major Roger Morton and colleagues at Army Land HQ
- ▶ Sally McManus and colleagues at the National Centre for Social Research
- ▶ Oswald Stoll Foundation
- ▶ SSAFA
- ▶ Staff at MCTC
- ▶ Ms Sue Freeth, Ms Lisa Bainbridge and colleagues at the Royal British Legion
- ▶ Veterans Agency

- ▶ Daniel Applegate, Chris Baker, Clare Caldin, Peter Davies, Jeff Garrett, Dr Paul Howarth, Jonathan Iremonger, Piers Jones, Malcolm Lingwood, Lee Mansfield, Elizabeth Merritt, Angela Page, Christine Paxton, Jim Plato, Dr Brigid Rodgers, John Royle, Tim Taylor, John Tesh, Mike Tonnison, Stephen Trout, Rosie Wane and colleagues at the Veterans Policy Unit
- ▶ War Widow's Association

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## APPENDIX 3

### KCMHR ADVISORY BOARD

- ▶ General the Lord Guthrie (Chair)
- ▶ Admiral Peter Wilkinson (DCDS Pers)
- ▶ Ms Sue Freeth (representing the Royal British Legion)
- ▶ Prof Christopher Brewin (University College London)
- ▶ Prof Pat Doyle (London School of Hygiene and Tropical Medicine)
- ▶ Prof Sir Lawrence Freedman (King's College London)
- ▶ Prof Anthony Forster (University of Durham)
- ▶ Colonel Jerry Tuck (representing Defence Medical Services)

## APPENDIX 4

### GRANTS

#### **US Department of Defense**

- ▶ Clinical and epidemiological studies into Persian Gulf War Illness
- ▶ The role of Th1/Th2 cytokine balance in Gulf War related illness
- ▶ War syndromes from 1900 to the present: symptom patterns and long term outcomes
- ▶ A comparison of self referred and epidemiologically defined Gulf war veterans
- ▶ Mechanisms and consequences of vaccine effects on TH 1/TH2 balance in UK Gulf War Veterans.
- ▶ Development of a common data base for shared analysis between US and UK studies
- ▶ The Welfare of Children of Military Fathers
- ▶ A randomized controlled trial to assess and improve the effectiveness of post-deployment screening for mental illness

#### **UK Ministry of Defence**

- ▶ Neurophysiological studies of Gulf related illnesses
- ▶ Treatment of Post traumatic Stress Disorder: A Historical Analysis
- ▶ Defence Health Surveillance Systems.
- ▶ Improving cross departmental support and Services to Veterans
- ▶ Monitoring the physical and psychological health of veterans of the recent deployment to Iraq
- ▶ Establishing a Centre for Defence Psychiatry
- ▶ Post discharge Mentoring for vulnerable early service leavers.
- ▶ Operation TELIC: Investigation of Possible Health Effects Post Conflict
- ▶ Maintaining and exploiting the King's Military Cohort
- ▶ Randomised Controlled Trial of "Battlemind"

#### **UK Medical Research Council (MRC)**

- ▶ Specimen collection and storage, Gulf related illness
- ▶ Gulf War Illness Programme, King's College London., Proposal for Third and Final Stage of Gulf related research
- ▶ Doctoral training grant: Occupational Risk Factors of PTSD in Military Personnel.
- ▶ MRC Clinical Training Fellowship: The impact of deployment on aggression and criminality among UK military troops.
- ▶ PhD Studentship: The mental health and well-being of women in the UK Armed Forces

#### **UK MRC/ESRC (Economic and Social Research Council)**

- ▶ PhD Studentship: The health and social well being of UK military veterans

#### **Defence Science and Technology Laboratory (DSTL)**

- ▶ Defence Medical Services Health Surveillance Study
- ▶ Development and Evaluation of a Military Health Screening Programme

#### **Leverhulme Trust**

- ▶ Gulf War Syndrome in the UK: A qualitative study of veterans' accounts

#### **Office of the Deputy Prime Minister (ODPM)**

- ▶ Feasibility study into ex-Service homeless.

#### **Economic and Social Research Council (ESRC)**

- ▶ The Family and Military as Greedy Institutions: Negotiating a Work-Life Balance
- ▶ Are the Armed Forces understood and supported by the public? British Social Attitudes towards the military and contemporary conflict.

#### **Economic and Social Research Council/ MOD**

- ▶ Psychological Effects of Chemical Weapons: the impact of World War One on UK servicemen

#### **Joseph Rowntree Trust**

- ▶ The British Army: sensible drinking in the work place

#### **Royal Navy**

- ▶ A cluster randomised trial of trauma management in the Royal Navy

#### **Royal British Legion**

- ▶ Ph D studentship: Social Impact of Deployment

## APPENDIX 5

### PUBLICATIONS

#### 1991 GULF WAR

Unwin C, Blatchley N, Coker W, Ferry S, Ismail K, Hotopf M, Palmer I, David A, Wessely S. The health of United Kingdom Servicemen who served in the Persian Gulf War. Lancet 1999;353: 169-178

*First study to show that service in the 1991 Gulf War had affected the subjective health of part of the UK Armed Forces.*

Ismail K, Everitt B, Blatchley N, Hull L, Unwin C, David A, Wessely S. Is there a Gulf war syndrome? Lancet 1999; 353: 179-182

*There is a health problem, but no single syndrome*

Hotopf M, David A, Hull L, Ismail K, Unwin C, Wessely S. The role of vaccinations as risk factors for ill-health in veterans of the Gulf War: cross sectional study. BMJ 2000;320:1363-1367

*Reported a link between the very particular vaccination programme used to protect the Armed Forces against biological warfare and subsequent ill health. Led to important policy changes in UK forces health protection*

Ismail K, Blatchley N, Hotopf M, Hull L, Palmer I, Unwin C, David A, Wessely S. Occupational risk factors for ill health in UK Gulf war veterans. J Epi Comm Health 2000; 54:834-838

*Outlined main risk factors for ill health – showed could not be DU for example*

Reid S, Hotopf M, Hull L, Ismail K, Unwin C, David A, Wessely S. Chronic fatigue syndrome and multiple chemical sensitivity in UK Gulf war veterans. Am J Epidemiology 2001;153:604-609  
*Increase in several multi symptom conditions*

Chalder T, Hull L, Unwin C, David A, Hotopf M, Wessely S. Prevalence of Gulf war veterans who think they have Gulf War Syndrome. Br Med J 2001: 323;473-476

*Social networks play a role*

Wessely S et al. Ten Years On: What Do We Know About the Gulf War Syndrome? Clinical Medicine (JRCP) 2001; 1: 28-37

Ismail K. A review of the evidence for a 'Gulf War Syndrome'. Occup Environ Med 2001;58:754-9

Ismail K. New challenges facing ill health in Gulf war veterans. Occup Environ Med 2001;58:389-90.

Reid S, Hull K, Unwin C, Hotopf M, David A, Wessely S. Reported chemical sensitivities in a health survey of UK military personnel. Occupational & Environmental Health 2002: 59: 196-198

David A, Farrin L, Hull L, Unwin C, Wessely S, Wykes T, Cognitive functioning and disturbances of mood in UK veterans of the Persian Gulf War: a comparative study. Psych Med 2002; 32: 1357-1370

*Found no evidence of brain damage*

Skowera A, Stewart E, Davis E, Cleare A, Hossain G, Unwin C, Hull L, Ismail K, Wessely S, Peakman M. Antinuclear antibodies (ANA) in gulf war related illness and chronic fatigue syndrome (CFS) patients. Clin Exp Immunology 2002;129:354-358  
*Failed to replicate an earlier claim from USA*

Hotopf, M, Hull L, Unwin, C. David, A. Hyams K, Wessely, S. Self-Reported Health of Persian Gulf War Veterans: A Comparison of Help-Seeking and Randomly Ascertained Cases. Mil Med 2002: 167:747-752

Unwin C, Hull L, Hotopf M, Ismail K, David A, Wessely S. Women in the Gulf: Lack of a Gender Difference in Long Term Health Effects in UK Armed Forces. Mil Med 2002: 167: 406-413

*No gender differences - women affected much the same as men*

Wessely S, Chalder T, David A, Hotopf M, Ismail L, Jones E, Palmer I, Reid S, Unwin C. Ten Years On: What Do We Know About Gulf War Syndrome? In: Toxic Turmoil: Psychological and Societal Consequences of Ecological Disasters (ed Havenaar. Cwikel, Bromet), Plenum 2002: 101-128

Everitt B, Ismail K, David A, Wessely S. Searching for a Gulf War Syndrome Using Cluster Analysis. Psych Med 2002: 32 1371-1378

*Different analysis to confirm no unique syndrome*

Ismail K, Kent K, Brugha T, Hotopf M, Hull L, Seed P, Palmer I, Reid S, Unwin C, David A, Wessely S. . The mental health of UK Gulf war veterans: phase 2 of a two-phase cohort study. BMJ 2002: 325: 576-579.

*Doubling of psychiatric disorder; but PTSD not main issue. Alcohol and depression more important*

Wessely, S. The Gulf War and its aftermath. Horizons in Medicine 2002: 13: 229-246.

Sharief M et al. Neurophysiological evaluation of neuromuscular symptoms in UK Gulf War veterans. A controlled study. Neurology 2002: 59: 1518-1525

*No evidence for peripheral neurological damage – and therefore organophosphate pesticides unlike to be playing a role in ill health.*

Higgins E, Ismail K, Kant K, Harman K, Mellerio J, du Vivier A, Wessely S. Skin disease in Gulf War Veterans. Quart J Med 2002: 95: 671-676

Farrin L et al. Effects of Depressed Mood on Objective and Subjective Measures of Attention. J Neuropsychiatry Clin Neurosci 2003;15 98-104

Hull L, Farrin L, Unwin C, Everitt B, Wykes T, David A. Anger, psychopathology and cognitive inhibition: A study of UK servicemen. Personality and Individual Differences 2003: 35: 1211-1226

Greenberg N, Iversen A, Hull L, Unwin C, DeStrange M, Wessely S. Vaccination records in Gulf War veterans. *J Occup Environ Med* 2003; 45: 219

*Ended the “prepped but not deployed” issue – only one valid record was found*

Wessely S, Unwin C, Hotopf M, Hull L, Ismail K, Nicolaou V, David A. Is recall of military hazards stable over time? Evidence from the Gulf War. *Br J Psych* 2003; 183:314-322

*No it isn’t. Self report of exposure to some military hazards unreliable over time*

Hotopf M, Mackness I, Nikolaou V, Collier D, David A, Durrington P, Hull L, Ismail K, Peakman M, Unwin C, Wessely S, Mackness B. Paraoxonase in Persian Gulf War veterans. *J Occup Environ Med* 2003; 45:668-675.

*Failed to replicate claim that sick Gulf veterans have a particular variant of the enzyme that deals with organophosphates, but did show that the levels of this enzyme in the blood were lower in Gulf veterans than controls*

Hotopf, M. David, A. Hull, L. Nikolaou, V. Unwin, C. Wessely, S. Gulf War illness - better, worse or just the same? A cohort study *Br. Med J.* 2003;327:1370.

*Just the same – not getting worse, not getting better*

Hotopf M, David A, Hull L, Nikolaou V, Unwin C, Wessely S. Risk factors for continued illness among gulf war veterans: a cohort study. *Psych Med* 2004; 34: 1-8

*Emphasised that social/psychological factors were important in prognosis*

Macfarlane G, Biggs A, Maconochie N, Hotopf M, Lunt M. Incidence of cancer among UK Gulf War Veterans: cohort study. *BMJ* 2004; 327: 1373-1375.

*No increase in cancer*

Wessely S, Hotopf M. Something Old, Something New, Something Borrowed, Something Blue: The Story of “Gulf War Syndrome”. In: Medical and Psychiatric Comorbidity over the Course of Life. Ed Eaton W. APPI, Washington. 2005:213-251

*One more review*

Wessely S. The Long Aftermath of the 1991 Gulf War. *Annals Int Med* 2004; 141: 155-156

*Editorial on treatment*

Hotopf, M Treating Gulf War Veterans’ illnesses: are more focussed studies needed? *JAMA* 2003; 289: 1436-1437

Rose, M et al. Evaluation of Neuromuscular Symptoms in UK Gulf War Veterans. A Controlled Study. *Neurology* 2004; 63: 1681-1687

*Ill gulf veterans found physical exercise more demanding than controls. Found evidence that the mitochondria in muscle cells were working less efficiently, but unable to say if this was cause or effect.*

Nisenbaum R, Wessely S, Unwin C, Hull L, Ismail K, Reeves W. Dichotomous factor analysis of symptoms reported by UK and US veterans of the Gulf War. *Population Health Metrics* 2004; 2: 8

Hotopf M, Wessely S. Can epidemiology clear the fog of war? Lessons from the first Gulf War. *Int J Epidemiology* 2005; 34: 791-800

*Review of the problems in carrying out this kind of research after deployment*

Marfarlane G, Hotopf M, Maconochie N, Blatchley N, Richards A, Lunt M. Long-term mortality amongst Gulf War Veterans: is there a relationship with experiences during deployment and subsequent morbidity? *Int J Epidemiology* 2005; 34:1403-1408.

*No there isn’t.*

Wessely S, Hotopf M. Gulf War Syndrome. In: Chemical Warfare Agents: Toxicology and Treatment (ed Maynard, Marrs, Sidell). London, John Wiley

*Another contribution to deforestation*

Murphy D, Hooper R, French C, Jones M, Rona R, Wessely S. Is increased reporting of symptomatic ill health in Gulf War veterans related to how one asks the question? *J Psychosom Res* 2006; 61: 181-186

*No it isn’t – important confirmation that the Gulf Health effect is not an artefact of knowing you went to the Gulf*

Wessely S (editor). Gulf War Illness. *Philosophical Transactions of the Royal Society*, 2006.

*A single volume account of the Gulf health issue; international authors, multi disciplinary, in the world’s oldest scientific journal*

Wessely S, Freedman L. Reflections on Gulf Illness. *Philosophical Transactions of the Royal Society* 2006; 361: 721-730

*A brief summing up of what we know, and what we don’t know*

Iversen A, Chalder T, Wessely S. “Gulf War Syndrome”: Lessons from Medically Unexplained Symptoms. *Clinical Psychology Review* 2007; 27: 842-854

*A review paper proposing that we need now to look at Gulf War illness in a similar fashion to the way we think about illnesses such as chronic fatigue syndrome, irritable bowel syndrome and other unexplained syndromes to think more about why veterans are either staying ill or not getting better, and put to one side the vexed question of what started the problem in the first place.*

Stimpson N, Hull L, Unwin C, Lewis G, David A, Wessely S. Prevalence of reported pain, widespread pain and pain symmetry in veterans of the Gulf War. The use of pain manikins in Gulf Health research. *Mil Med* 2006; 171, 1181-1186

Iversen A, Morriss R, Greenberg N, Wessely S. Bridging the Gulf: “Gulf War Syndrome”: What we know and what we don’t. *Advances in Clinical Neurosciences and Rehabilitation* 2007; 7; 6-7

Peakman M, Skowera A, Hotopf M. Immunological dysfunction, vaccination and Gulf War Illness. Philosophical Transactions of the Royal Society 2006; 361: 681-687.

Cohn S, Dyson C, Wessely S. Early accounts of Gulf War illness and the construction of narratives in UK service personnel. Social Science and Medicine 2008; 67: 1641-1649

*An anthropological perspective using free text accounts given by study respondents to our first Gulf study, showing how uncertainty, rumours and information gaps played a role in how veterans started to make sense of their symptoms*

Ismail K, Sherwood R, Kent K, Hull L, Seed P, David A, Wessely S. Chronic fatigue syndrome and related disorders in UK veterans of the 1991 Gulf War: results from a two phase cohort study. Psych Med 2008; 38: 953-951

Greenberg N, Wessely S. "Gulf War Syndrome": an emerging threat or a part of history? Emerging Health Threats 2008; 1:e10. doi: 10.3134/ehtj.08.010

## THE WARS IN IRAQ AND AFGHANISTAN

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*Not the best title, but showed that in elite forces (16 AA Bde) Op TELIC I was associated with an improvement in mental health*

French C, Dandeker C, van Staden L, Wessely S. Deployment of British Army Reserves on Op TELIC 5: Expectations, experiences and impact on retention. Unpublished Research Report. MOD, 2006.

*Reservists and Regulars differ less on what they experience on deployment and more on how they are treated when they come home*

French, C. Dandeker, C. UK military families and the deployments to Iraq: Preliminary findings from a pre-, during-, and post-deployment study of the British Army. Paper presented at the 2005 Inter-University Seminar on Armed Forces and Society. Chicago, October 2005

*Wives are more resilient than their service partners think they are when facing the stresses of separation due to deployment*

Campion BH, Hacker Hughes JG, Devon M, Fear N. Psychological morbidity during the 2002 deployment to Afghanistan. JRAMC 2006; 152:91-3.

Jones M, Rona R, Hooper R, Wessely S. The burden of psychological illness in the UK Armed Forces. Occup Environ Med 2006; 56: 322-328

*First epidemiological paper on background levels of psychological illness in the UK Armed Forces, which formed the basis for later comparisons of the impact of the War in Iraq.*

French, C. Dandeker, C. Birtles, C & Wessely, S. Deployment experiences of British Army wives before, during and after deployment: Satisfaction with military life and use of support networks. NATO HFM-134 Symposium, Brussels April 2006, *Service wives tend to use informal networks for support when their partners are deployed rather than formal military agencies, although they appreciate the formal sources of support for their 'insurance' value.*

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. The health of UK military personnel who deployed to the 2003 Iraq War. Lancet 2006; 367: 1731-1741

*Key paper showing that between 2003 and 2006 there was no increase in psychiatric problems in Regular personnel who had served in Iraq from the initial invasion to the shift to counter insurgency. This contrasted with the US experience. However, there was a significant increase in psychiatric disorders in Reservists associated with service in Iraq.*

Horn O, Hull L, Jones M, Murphy D, Browne T, Fear N, Hotopf M, Rona R, Wessely S. Is there an "Iraq War Syndrome"? Comparison of the health of UK service personnel after the Gulf and Iraq wars. Lancet 2006; 367: 1742-1746

*History has not repeated itself. Raises interesting questions about why not.*

Hotopf M, Wessely S. Neuropsychological changes following military service in Iraq: case proven, but what is the significance? JAMA 2006; 296: 574-575

Browne T, Hull L, Horn O, Jones M, Murphy D, Fear N, Greenberg N, French C, Rona R, Wessely S, Hotopf M. Explanations for the increase in mental health problems in UK Reserve Forces who have served in Iraq. Br J Psychiatry 2007; 190: 484-489, *Showed how problems at home and problems adjusting to homecoming played an important role in the increase in PTSD symptoms that we found as a result of deployment in UK Reservists.*

Bland D, Rona R, Coggan D, Anderson J, Greenberg N, Hull L, Wessely S. Urinary isotopic analysis in the UK Armed Forces: No evidence of depleted uranium absorption in combat and other exposed personnel in Iraq. Occup Environ Med 2007; 64: 834-838

Rona R, Fear N, Hull L, Greenberg N, Earnshaw M, Hotopf M, Wessely S. The mental health consequences of "overstretch" in the UK Armed Forces. BMJ 2007; 335: 603-607

*No link between number or length of deployments and mental health, provided the "Harmony Guidelines" are observed. If they are not, and in particular if tour length is unexpectedly increased, then there are increases in both PTSD and alcohol.*

Sharpley J, Fear N, Greenberg N, Hacker Hughes J, Jones M, Wessely S. Pre-Operational Stress Briefing: Does it have any effect? A comparison of Royal Naval and Royal Marine personnel receiving a pre-operational stress briefing before the invasion of Iraq with a group of personnel who did not. Occupational Medicine 2008; 58: 30-34.

Iversen A et al. Risk Factors for Post traumatic stress disorder in United Kingdom Armed Forces. Psych Med 2008; 38: 511-522 *As expected PTSD was associated with traumatic events in theatre, most particularly believing one's life was in danger. But it was also associated with early adversity, such as poor school record and childhood adversity.. Low morale and poor social support within the unit also played a role.*

Jones N, Greenberg N, Fear N, Earnshaw M, McAllister P, Reid G, Wessely S. The operational mental health consequences of deployment to Iraq for UK Forces. JRAMC 2008; 154; 101-105  
Jones M, Fear N, Greenberg N, Jones N, Hull L, Hotopf M, Wessely S, Rona R. Do medical personnel deployed to Iraq have worse mental health than other personnel? Eur J Public Health 2008; 18; 422-427 *Unfortunately yes they do, although this had improved by 2009*

Wilson J, Jones M, Hull L, Hotopf M, Wessely S, Rona R. Does prior psychological health influence recall of military experiences? A prospective study. *J Traumatic Stress* 2008; 21: 385-393

*Is that more vulnerable people simply recall more traumatic exposures? A little, but not sufficient to suggest that predeployment psychological status would be useful for correcting for recall bias.*

Fear N, Iversen A, Chatterjee A, Hull L, Rona R, Hotopf M, Wessely S. Risky driving behaviours among Regular UK Armed Forces personnel. *Am J Prev Med* 2008; 35: 230-236

Rona R, Jones M, Iversen A, Hull L, Greenberg N, Hotopf M, Wessely S. The impact of post traumatic stress disorder on impairment in the UK military at the time of the Iraq war. *J Psychiatric Research* 2009; 43: 649-655

*Social and work impairment is a serious problem for those with PTSD and even for those who only have partial PTSD.*

Iversen A, van Staden L, Birtles C, Hacker Hughes J, Browne T, Langston V, Hull L, Hall J, Greenberg N, Rona R, Hotopf M, Wessely S, Fear N. The prevalence of common mental disorders and PTSD in the UK Military using data from a clinical interview-based study. *BMC Psychiatry* 2009;9:68

*Common things are common. Depression and alcohol misuse, not PTSD, remain the most common disorders in still serving and veterans alike.*

Sundin J, Fear N, Hull L, Jones N, Dandeker C, Hotopf M, Wessely S, Rona RJ. Rewarding and unrewarding aspects of deployment to Iraq and its association with psychological health in UK military personnel. *Int Arch Occup Environ Health* 2010; 6: 653-663

*Sundin J, Fear N, Iversen A, Rona R, Wessely S. PTSD after Iraq: conflicting rates, conflicting claims. Psych Med 2010; 40: 367-382.*

Fear N et al What are the consequences of deployment to Iraq and Afghanistan on the mental health of the UK Armed Forces? A cohort study. *Lancet* 2010; 375: 1783- 1797.

*Main results of the follow up study. Overall mental health of Armed Forces remains robust. No overall increase in PTSD following deployment to either Iraq or Afghanistan in Regulars, but increases in combat troops and Reservists. Situation stable from 2003 to 2009. Impact of deployment on alcohol misuse. No impact of number of deployments. Only a very small increase in PTSD over time since return – ie no “tidal wave”.*

Mulligan K, Jones N, Woodhead C, Davies M, Wessely S, Greenberg N. Mental Health of UK Military Personnel while on Deployment in Iraq: the Operational Mental Health Needs Evaluation (OMHNE). *Br J Psych*, in press

*First ever UK assessment of the mental health of a large group of service personnel in a theatre of war. Showed surprisingly few differences in the prevalence of mental health disorders before, during and after*

## MEDICAL COUNTER MEASURES

Hotopf M, David A, Hull L, Ismail K, Unwin C, Wessely S. The role of vaccinations as risk factors for ill-health in veterans of the Gulf War: cross sectional study. *BMJ* 2000;320:1363-1367

*Reported a link between the very particular vaccination programme used to protect the Armed Forces against biological warfare and subsequent ill health. Led to important policy changes in UK forces health protection*

Skowera A et al. Cellular Immune activation in Gulf War veterans. *J Clin Immunology* 2004; 24: 60-73

*Found persistence immunological changes in Gulf vets*

Skowera A, de Jong E, Schuitemaker J, Wessely S, Griffiths G, Kapsenberg M, Peakman M. Impairment of dendritic cell maturation and effector function by vaccines used for protection against anthrax and plague. *J Immunology* 2005; 175: 7235-7243. *How anthrax /plague combination works*

Allen J, Skowera A, Rubin J, Hotopf M, Wessely S, Peakman M. Long-lasting T cell responses to biological warfare vaccines in human vaccinees. *Clin Infect Dis* 2006; 43:1-7

*Anthrax immunity can be detected 10 years after vaccination, but failed to confirm the Th 1/ Th 2 hypothesis of Gulf war illness*

Peakman M, Skowera A, Hotopf M. Immunological dysfunction, vaccination and Gulf War Illness. *Philosophical Transactions of the Royal Society* 2006; 361: 681-687.

Murphy D, Dandeker C, Horn O, Hotopf M, Hull L, Jones M, Marteau T, Rona R, Wessely S. UK Armed Forces response to an informed consent policy for anthrax vaccination: A paradoxical effect? *Vaccine* 2006; 24: 3109-3114

*Changing to informed consent for anthrax vaccine in Armed Forces has caused confusion and not increased confidence*

Murphy D, Hull L, Horn O, Jones M, Browne T, Marteau T, Rona R, Hotopf M, Wessely S. Anthrax vaccination in a military population before the war in Iraq: acceptance, side effects and choice. *Vaccine* 2007; 25; 7641-7648

Murphy D, Hotopf M, Marteau T, Wessely S. Multiple vaccinations, health and recall bias in UK Armed Forces deployed to Iraq. *BMJ* 2008; 337: a220

*Using data from the Iraq deployment, showed no link between multiple vaccines and ill health, except when using self report. Suggested that our previous findings of such a link after the Gulf War may despite all efforts still have been influenced by recall bias.*

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*Because they no longer believe there is a realistic threat.*

Stuart J, Ursano R, Fullerton C, Wessely S. Belief in exposure to chemical and biological agents in Persian Gulf War soldiers. *J Nerv Mental Diseases* 2008; 196: 122-127

*Shows how those who believe that they were exposed to CBW agents as a result of their Gulf service are substantially more likely to have long term symptomatic ill health. Given that the evidence of any exposure is far from compelling, shows both the dangers of recall bias and also the influence of illness beliefs on health.*

## CBW AND TERRORISM ARTICLES

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*Account of early episode of mass hysteria triggered by fear of terrorism*

Wessely S, Hyams K, Bartholomew R. The Psychological Effects of Biological and Chemical Warfare. *BMJ* 2001; 323: 878-879.

Bartholomew R, Wessely S. The protean nature of mass sociogenic illness: From possessed nuns to chemical and biological terrorism fears. Br J Psychiatry 2002; 180: 300-306  
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Durodie W, Wessely S. Resilience or panic: the public's response to a terrorist attack. Lancet 2002; 360: 1901-1902

*Editorial on how risk communication can influence public reaction to terrorism*

Hyams K, Murphy F, Wessely S. Combating terrorism: recommendations for dealing with the long term consequences of a chemical, biological attack. J Health Politics, Policy & Law 2002; 27: 273-291

*Short term effects will be well managed, long term problems will be difficult*

Jones E, Woolven, R, Durodié B, Wessely S. Civilian Morale during World War Two: responses to air-raids re-examined, Social History of Medicine 2004; 17: 463-79.

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Wessely S. When being upset is not a mental health problem. Psychiatry 2004; 67: 153-157

*Why it is important to distinguish between normal symptoms of distress and psychiatric disorder*

Richie E, Friedman M, Watson P, Ursano R, Wessely S, Flynn B. Mass violence and early mental health intervention: a proposed application of best practice guidelines to chemical, biological and radiological attacks. Mil Med 2004; 169: 575-579

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Wessely S. Don't Panic!: Short and Long Term Psychological Reactions to the New Terrorism: The Role of Information and the Authorities. J Mental Health 2005; 14: 1-6

*Developing themes of civilian resilience and communication*

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Shephard B, Rubin J, Wardman J, Wessely S. Terrorism and dispelling the myth of a panic prone public. J Public Health Policy 2006; 27:219-245

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Rubin J, Brewin C, Greenberg N, Simpson J, Wessely S. Psychological and behavioural reactions to the bombings in London on 7 July 2005: cross sectional survey of a representative sample of Londoners. BMJ 2005; 311: 606-610

*Demonstrated emotional and behavioural reactions in ordinary Londoners ten days after July 7th attacks*

Rogers B, Amlot R, Rubin G, Wessely S, Krieger K. Mediating the social and psychological impact of terrorist attacks: the role of risk perception and risk communication. Int Rev Psychiatry 2007; 19: 279-288

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Rubin G et al. Public information needs after the poisoning of Alexander Litvinenko with polonium-210 in London: Cross sectional telephone survey and qualitative analysis. BMJ 2007; 335: 1143-1146.

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*It is not acceptable for many reasons, and will not work until those are sorted*

French C, Rona RJ, Jones M, Wessely S. Screening for physical and psychological illness in the British Armed Forces: II Barriers to screening - learning from the opinions of Service personnel. *J Medical Screening* 2004; 11: 153-157

*Problems include stigma, confidence and confidentiality*

Rona RJ, Hooper R, Jones M, French C, Wessely S. Screening for physical and psychological illness in the British Armed Forces: III The value of a questionnaire to assist a Medical Officer to decide who needs help. *J Medical Screening* 2004 ; 11: 158-161  
*Psychological tests not helpful for mental health screening in the context of the UK military*

Greenberg N, Iversen A, Unwin C, Wessely S. Screening for depleted uranium in members of the UK Armed Forces: Who wants it and why? *J Epi Comm Health* 2004: 58:558-561

*Those who want screening are not those who have been exposed to DU, but instead are more likely to be psychologically distressed*

Rona R, Hyams C, Wessely S. Screening for psychological illness in military personnel. *JAMA* 2005: 293: 1257-1260

*Response to US programme setting out reasons why UK has not followed suit*

Gilbody S, Sheldon T, Wessely S. Depression, a suitable case for screening? *BMJ* 2006;332:1027-1030.

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*Using before/after data we show that mental health screening would not have prevented mental health problems after Iraq*

## VETERANS ARTICLES

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*Analyses what veterans need and how gaps in what is provided by government might be filled*

Dandeker C, Thomas S, Dolan M, Chapman F, Ross J. Feasibility study on the extent, causes, impact and costs of rough sleeping and homelessness amongst ex service personnel in a sample of Local Authorities in England. Unpublished Research Report, MOD 2004

*Shows the difficulties involved in gauging the extent of homelessness amongst ex service personnel and reviews what we know about this subject.*

Iversen A, Nicolaou V, Unwin C, Greenberg N, Dandeker C, Ross, J, Wessely S. What happens to UK veterans when they leave the Armed Forces? *Eur J Public Health* 2005: 15:175-184  
*Most get jobs and do well, a few don't*

Iversen A et al. "Goodbye and Good Luck"; the Mental Health Needs and Treatment Experiences of British Ex Service Personnel. *Br J Psychiatry* 2005: 186: 480-486

*Many of those with continuing mental health problems do not access the best treatments once they have left the Armed Forces. Began what would become a continuing theme of our work – that PTSD is not the only, or the commonest, mental health problem affecting veterans.*

Dandeker C, Iversen A, Ross J, Wessely S. What is a Veteran? *Armed Forces & Society* 2006: 32: 161-77.

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van Staden L, Fear N, Iversen A, French C, Dandeker C, Wessely S. Transition back into civilian life: A study of personnel leaving the UK Armed Forces via "military prison". *Mil Med* 2007: 172: 925-930

Murphy D, Iversen A, Greenberg N. The Mental Health of Veterans. *J Royal Army Medical Corps* 2008: 154: 135-138

Iversen A, Greenberg N. Mental health of Regular and Reserve veterans. *Advances in Psychiatric Treatment* 2009: 15: 100-106

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*Using this population based study, to which we had added a couple of questions on military service, we estimated that the total number of ex service personnel in England in 2007 was 3,770,000, close to the previous estimate made by the Royal British Legion*

Woodhead C et al. Mental health and service use amongst post-National Service veterans: results from the 2007 Adult Psychiatric Morbidity Survey of England. *Psych Med*, in press

*First study to use a population base to compare veterans and non veterans, and in which mental health was ascertained independently of knowledge of service status. No association was found between any mental health outcome, including PTSD, and military service, with the exception of violent behaviour. Females who had served had more suicidal ideation. Early service leavers drank more, and were more likely to have self harmed than longer serving veterans. There was no difference in treatment seeking behaviour between veterans and non veterans*

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## PEACEKEEPING ARTICLES

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*Analyses the differences between classic and more forceful kinds of peacekeeping in the post Cold War era and the factors that contribute to their success and failure*

Dandeker C, Gow J. Strategic Peacekeeping and Military Culture. In E Schmidl, (Ed) *Peace Operations Between War and Peace*, Frank Cass, 2000, 58-79.

*Discusses the extent to which military culture has to change to accommodate the demands of strategic peacekeeping and how those demands may vary by nation*

Dandeker C, Gow J. 'Strategic Peacekeeping: Military Culture and the Defining Moment', in D. S. Gordon and F. H. Toase (Eds.) Aspects of Peacekeeping, 2001, 181-198.

Boone, Callaghan J, Dandeker C. Warriors in Peacekeeping: An Overview of Themes and Issues. In Callaghan, Schönborn (Editors) Warriors in Peacekeeping: Points of tension in complex cultural encounters. A comparative study based on experiences in Bosnia: George C. Marshall European Center for Security Studies  
*One of the first studies of how different national contributors to a complex peacekeeping operations experienced the events and dealt with the challenges, including managing relations with local populations*

Hotopf, M. David, A. Hull, L. Ismail I. Palmer, I. Unwin, C. Wessely, S. The health effects of peace-keeping in the UK Armed Forces: Bosnia 1992-1996. Predictors of psychological symptoms. Psych Med 2003; 33: 1-8  
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Hotopf, M. David, A. Hull, L. Ismail, I. Unwin, C. Wessely, S. The health effects of peace-keeping in the UK armed forces: Bosnia 1992-1996.. Mil Med 2003: 168: 408-413

Greenberg N, Thomas S, Iversen A, Unwin C, Hull L, Wessely S. Do military peacekeepers want to talk about their experiences?. J Mental Health 2003: 6: 565-573  
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Jones E, Wessely S. Psychiatric battle casualties: an intra- and inter-war comparison. Br J Psych 2001: 178: 242-247  
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Jones E, Wessely S. The origins of British military psychiatry before the First World War. War and Society 2001: 19: 91-108

Jones E, Hodgins-Vermaas R, McCartney H, Everitt B, Beech C, Poynter D, Palmer I, Hyams K, Wessely S. Post-combat syndromes from the Boer War to the Gulf: a cluster analysis of their nature and attribution. Br Med J 2002: 324: 321-324.  
*Used war pension records to show that Gulf War Syndrome is not as new as we think it is*

Jones E, Palmer I, Wessely S. War Pensions (1900-1945): changing models of psychological understanding. Br J Psychiatry 2002: 180: 374-379.  
*Show how the awarding of war pensions is socially influenced*

Jones E, Wessely S. Forward Psychiatry in the Military: Its Origins and Effectiveness. J Traumatic Stress 2003:16:411-419  
*Discusses the origins of the standard way in which most Armed Forces treat acute psychiatric casualties, whilst concluding that we will probably never know if this is effective or not*

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*Paper that suggests that PTSD is not a "hard wired" response, but more culturally determined*

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*Shell shock, effort syndrome etc not associated with increased mortality, much like gulf war illness*

Jones E. Aubrey Lewis, Edward Mapother and the Maudsley, in K. Angel, E. Jones and M. Neve, European Psychiatry on the Eve of War: Aubrey Lewis, the Maudsley Hospital and the Rockefeller Foundation in the 1930s, Medical History 2003: Suppl 22: 3-38.

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*Paper used in PTSD case to show that UK military could not be blamed for failing to learn the lessons of Vietnam, because no one knew what they were*

Jones E, Wessely S. Hearts, Guts and Minds: Somatisation in the Military from 1900. J Psychosomatic Research 2004: 56: 425-429

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#### *Broad review of unexplained syndromes in the military*

Jones E, Wessely S. From Shellshock to PTSD: Military Psychiatry from 1900 to the Gulf War. Hove: Psychology Press, 2005.

#### *Historical account of the development of military psychiatry*

Wessely S. War Stories. *Br J Psychiatry* 2005: 186: 473-475

*Importance of understanding recall bias – memory is a human function, and soldiers can sometimes forget things that happened to them, or remember things that didn't*

Wessely S. Twentieth century theories on combat motivation and breakdown. *J Contemp Hist* 2006: 41: 268-286

*A historical paper outlining how the military and the psychiatrists used to think in a similar fashion about why men fight, and why they cease to fight, but since the coming of PTSD these views have diverged*

Jones, E. 'LMF': the use of psychiatric stigma in the Royal Air Force during the Second World War, *J Military History* 2006: 70: 439-458.

Jones E. The Psychology of Killing: The Combat Experience of British Soldiers during the First World War, *J Contemporary History* 2006: 41: 229-246

Jones E, Greenberg N. Royal Naval Psychiatry: organisation, methods and outcomes 1900-1945, *Mariner's Mirror* 2006: 92: 190-203.

Jones E. Historical approaches to post-combat disorders, *Philosophical Transactions of the Royal Society* 2006: 361: 533-542.

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*Harry Farr was one of those executed for military offences during the First World War. This paper looks at why things happened the way they did, and raises questions about the dangers of rewriting history through our modern sensibilities*

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*One of those "haven't we been here before?" papers. And we have*

Jones E, Thomas A, Ironside S. Shell shock: an outcome study of a first World War "PIE" unit. *Psych Med* 2007: 37; 215-223

Jones E, Palmer I, Wessely S. Enduring beliefs about the effects of gassing in war: qualitative study. *BMJ* 2007: 335: 1313-1315

Jones E, Wessely S. Post traumatic stress disorder: a paradigm shift in the conceptualization of psychiatric disorder. *J Anxiety Disorders* 2007: 21: 164-175

*What did we think about trauma and psychiatry before we had PTSD?*

Jones, E. The Art of Medicine, Doctors at War, *Lancet* 2008: 371: 1658-59.

Jones E, Everitt B, Ironside S, Palmer I, Wessely S. Psychological effects of chemical weapons: a follow up study of First World War veterans. *Psych Med* 2008: 38: 1419-1426

Jones E, Wessely S. British Prisoners-of-War: from resilience to psychological vulnerability, reality or perception. *Twentieth Century British History* 2010: 21: 163-183

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Jones E, Ironside S. Battle Exhaustion: an outcome study of a Second World War forward psychiatric unit. *Historical Journal*,2010: 53: 109-28

Jones E. 'The Gut War': Functional Somatic Disorders in the UK during the Second World War, *History of the Human Sciences*, in press.

## ALCOHOL AND SMOKING ARTICLES

Iversen A, Drinkwater A, Fear N, Greenberg N, Barker C, Hotopf M, Hull L, Wessely S. Factors associated with heavy consumption in the UK Armed Forces: Data from a health survey of Gulf, Bosnia and Era veterans. *Mil Med* 2007: 172: 925-930.

Fear N, Iversen A, Meltzer H, Workman L, Hull L, Greenberg N, Earnshaw M, Rona R, Hotopf M, Wessely S. Do the UK Armed Forces drink more than the general population? Patterns of drinking in the military and comparisons with the general population? *Addictions* 2007: 102: 1749-1759

*The answer to the question is yes they do, and the differences between the military and the general population are most marked in young women. This is partly explained by selection – the Services recruit young people, some of whom already are prone to heavier drinking. However, other factors also play a part, such as culture, price and availability.*

Browne T, et al. Experiences in Iraq: how do they effect alcohol consumption among male UK military personnel? *Occup Environ Med* 2008: 65: 628-633

Hooper R, Rona R, Jones M, Fear N, Hull L, Wessely S. Cigarette and alcohol use in the UK Armed Forces, and their association with combat exposure; a prospective study. *Addictive Behaviors* 2008: 33: 1067-1071

*Alcohol consumption and binge drinking has increase over time. The increase of consumption is greater in those who have been deployed, but the increase was strongest in those most recently deployed. Smoking is declining.*

Henderson A, Langston V, Greenberg N. Alcohol misuse in the Royal Navy. *Occup Med* 2009: 59: 25-31

Fear N, Horn O, Hull L, Murphy D, Jones M, Browne T, Hotopf M, Wessely S, Rona R. Smoking in the UK Armed Forces: Changes over a seven year period. *Prev Med* 2010: 50:282-4.

*Going down*

Rona R, Jones M, Fear N, Hull L, Hotopf M, Wessely S. Alcohol misuse and functional impairment in the UK Armed Forces. Drug and Alcohol Dependence 2010; 108, 37-42

*Social and work impairment is acknowledged by those with alcohol dependence, alcohol induced harm or severe alcohol misuse. Those with lower scores of alcohol misuse, but still excessive drinking do not acknowledge impairment.*

## PRE AND POST DEPLOYMENT PSYCHOLOGICAL SUPPORT (TRAUMA RISK MANAGEMENT (TRIM), DECOMPRESSION, BRIEFINGS ETC)

Jones, N., Roberts, P., & Greenberg, N. Peer-group risk assessment: a post-traumatic management strategy for hierarchical organizations. Occup Med 2003; 53, 469-47.

*Described the establishment of the TRIM system – started in the Royal Marines but has since been taken on across defence*

Greenberg, N., Cawkill, P., Sharpley, J. How to TRIM away at post traumatic stress reactions: traumatic risk management--now and the future. J R Nav Med Serv 2005; 91, 26-31.

Gould M, Greenberg N, Hetherton J. Stigma and the military: evaluation of a PTSD Psychoeducational Program. J Traumatic Stress 2007; 20:1-11

*A non randomised comparison group study suggesting that TRIM improved personnel's attitudes towards handling stress reactions both immediately after the course and a month later – no changes seen in control group*

Greenberg N, Langston V, Gould M. Culture – what is its effect on stress in the military? Mil Medicine 2007; 172: 931-935

Henderson A, Greenberg N, Langston V, Iversen A. Peer responses to perceived stress in the Royal Navy. Occup Med 2007; 57: 424-427

Greenberg, N; Langston, V; Jones, N. Trauma risk management (TRIM) in the UK Armed Forces. JRAMC 2008; 154; 123-126

Hacker Hughes J, Earnshaw M, Greenberg N, Eldridge R, Fear N, French C, Deahl M, Wessely S. The use of psychological decompression in military operational environments. Mil Medicine 2008; 173: 534-538

*Why decompression might be useful, why it is popular, and why there is scant evidence to suggest that it actually is beneficial*

Wessely S, Bryant R, Greenberg N, Earnshaw M, Sharpley J, Hacker Hughes J. Does psycho education help prevent post traumatic distress? Psychiatry 2008; 71: 287- 302

Greenberg, N, Dow, C, Bland, D. Psychological Risk Assessment following the terrorist attacks in New York in 2001. J Mental Health 2009; 18:218-223

Langston V, Greenberg N, Jones M, Fear N, Wessely S. An evaluation of stress education in the Royal Navy. Occup Med 2009; 59:20-24

*Although stress education is now almost impossible to avoid, most military personnel do not recall ever have received any. Those who did remember and also found it helpful reported better mental health – no differences were found if briefings were perceived as being unhelpful*

Mulligan K, Fear N, Jones N, Wessely S , Greenberg N. Psycho-educational interventions designed to prevent deployment-related psychological ill-health in Armed Forces personnel: a review. Psych Med, 2010, doi:10.1017/S003329171000125X

Greenberg N, Langston V, Everitt B, Iversen A, Fear N, Jones N, Wessely S. A cluster randomised controlled trial to determine the efficacy of TRIM (Trauma Risk Management) in a military population. J Traumatic Stress 2010; 23: 430-436

*Results of the cluster randomised controlled trial. No differences in primary outcomes between the ships that did or not receive TRIM, but overall there were very few traumatic incidents anyway during the year in question*

Frappell-Cooke, W, Gulina, M; Green, K, Hacker Hughes, J, Greenberg, N. Does the use of Trauma Risk Management (TRIM) influence Post-Trauma Reactions of United Kingdom Armed Forces personnel after deployment. Occup Med, in press.

*Small study which showed that TRIM use may have beneficial effects through mobilising social support whilst personnel were deployed on operations*

Jones, N., Greenberg, N. Burdett, H. & Wessely, S The Subjective Utility of Early Psychosocial Interventions Following Combat Deployment. Occup Med, in press.

## METHODOLOGY/DATA PROTECTION AND MILITARY HEALTH RESEARCH

Iversen A, Liddell K, Fear N, Hotopf M, Wessely S. Consent, Confidentiality and the Data Protection Act: Epidemiological Research and hard-to-engage Cohorts BMJ 2006; 332: 165-169  
*Uses data from our Gulf and Iraq studies to show that the main obstacle to using personal medical information in key research is faulty understanding of the Data Protection Act, and not as is often claimed the law itself*

Wood A, White I, Hotopf M. Using number of failed contacts attempts to adjust for non ignorable non response. J Royal Statistical Society 2006; 169: 525-542.

Tate R, Jones M, Fear N, Hull L, Rona R, Wessely S, Hotopf M, How many mailouts? Could attempts to increase the response rate in the Iraq war cohort study be counter productive? BMC Medical Research Methodology 2007, 7:51

Seddon R, Jones N, Wessely S, Greenberg N, Fear N. Does anonymity increase the likelihood of participants reporting mental health symptoms? Sub

*Just a little. And if you collect anonymous data, you can't then follow people up.*

## MEDIA

Greenberg N, Thomas S, Murphy D., Dandeker C. Occupational stress and job satisfaction in media personnel assigned to the Iraq War (2003): A qualitative study. Journalism Practice 2007; 1: 356-371.

Pinder R, Murphy D, Hatch S, Iversen A, Dandeker C, Wessely S. A Mixed Methods Analysis of the Perceptions of the Media by Members of the British Forces during the Iraq War. Armed Forces & Society 2009; 36: 131-152

Greenberg N, Gould M, Langston V, Brayne M. Journalists' and media professionals' attitudes to PTSD and help-seeking: A descriptive study. *J Mental Health* 2009; 18: 543 – 548.

Hull L, Asanga F, David A, Hotopf M, Nikolaou V, Unwin C, Wessely S. "Warriors": Lack of effect of powerful TV drama on the mental health of UK Armed Forces who participated in peacekeeping operations in Bosnia. *Sub*

*Title speaks for itself – contradicts what many might believe*

## MILD TRAUMATIC BRAIN INJURY (mTBI)

Jones E, Fear N, Wessely S. Shell Shock and Mild Traumatic Brain Injury: A Historical Review *Am J Psychiatry* 2007; 164,1641-1645

*A historical paper outlining the early history of "shell shock" during the First World War, emphasising shifting perspectives, beginning with the belief this was a form of head injury, before more psychological and/or social paradigms took over. One hopes the reader will notice the analogies with the current debate over mTBI*

Fear N, Jones E, Groom M, Greenberg N, Hull L, Hodges T, Wessely S. Symptoms of post concussional syndrome are non specifically related to mild traumatic brain injury in UK Armed Forces personnel on return from deployment in Iraq. An analysis of self reported data. *Psych Med* 2009; 39: 1379-87

*The symptoms of mTBI (or post concussional syndrome as the UK prefers to call it) are linked with self reported exposure to blast injuries, as one would predict, but also with several other traumas/exposures that have nothing to do with concussion*

Rona R et al. Mild Traumatic Brain Injury (mTBI) in the UK military personnel returning from Afghanistan and Iraq. *Sub* *mTBI is commoner in US than UK forces, even fighting though same enemy, facing same risks and threats*

## OTHERS

Hooper R, Rona R, French C, Jones M, Wessely S. Unmet expectations in primary care and the agreement between doctor and patient: a questionnaire study *Health Expectations* 2005; 8: 26-33

*Patients (all of them in the Armed Forces) and doctors have different views on what actions the doctor took during a consultation, and these conflicting perspectives may or may not fulfil patient's expectations*

French, C. Dandeker, C. Birtles, C. & Wessely, S. The family and military as 'Greedy Institutions': Negotiating a work-life balance in the British Armed Forces. A report prepared for the ESRC, November 2005.

*Analyses tensions between work and family life in the military setting*

Wessely S. Risk, psychiatry and the military. *Br J Psychiatry* 2005; 186: 459-466

*Reflections on risk and the Armed Forces*

French, C. Dandeker, C. Birtles, C. & Wessely, S. The family and military as 'Greedy Institutions': Negotiating a work-life balance in the British Armed Forces. A report prepared for the ESRC, November 2005.

Rona R, Hooper R, French C, Jones M, Wessely S. The meaning of self perception of health in the UK Armed Forces. *Br J Health Psychology* 2006; 11: 703-715

*Points out that the Armed Forces often score highly on questionnaire self reports of ill health, but this does not mean that their health is impaired*

Rona R, Hooper R, Greenberg N, Jones M, Wessely S. Medical downgrading, self-perception of health and psychological symptoms in the British Armed Forces. *Occup Environ Med* 2006; 63: 250-254

*Those who are downgraded for longer periods of time with physical problems often have psychological distress as well*

McGeorge T, Hacker Hughes H, Wessely S. The MOD PTSD Class Action – A Psychiatric Perspective. *Occupational Health Review* 2006; 122:21-28

*Summary of the large class action brought unsuccessfully by veterans against MOD in 2003. What is the duty of care re stress/PTSD? What must MOD do in future? What does it not need to do?*

Dandeker, C 'Surveillance and Military Transformation: Organizational Trends in Twenty First Century Armed Services' in K Haggerty and R V Ericson, *The New Politics of Surveillance and Visibility*, University of Toronto Press, 2006, 225-249.

Dandeker C. The End of War? The Strategic Context of International Missions in the Twenty First Century' in, Magnus Christiansson, (Ed) *Eight Essays in War Studies*, Act Politica, Military Academy Karlberg, Stockholm, 2007.

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Greenberg N, Browne T, Langston V, McAllister P. Operational mental health: a user's guide for medical staff. *J R Nav Med Serv*. 2007;93:5-11.

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Rona R, Fear N, Hull L, Wessely S. Women in novel occupational roles: mental health trends in the UK Armed Forces. *Int J Epidemiology* 2007; 36: 319-327

*Women have higher prevalence rates of mental illness than men with the exception of alcohol misuse. However, the effects of deployment are similar for both sexes.*

Wilson M, McAllister P, Hacker Hughes J, Fear N. Do military uniform and rank impact on the therapeutic relationship between military mental health clients and clinicians? *JRAMC* 2007; 153:170-1

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Croft A, Ollerton J, Fear N. Hepatitis B infection following deployment to Angola. *J Royal Naval Medical Service* 2008; 94:108-111.

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*Overall the Armed Forces have a lower suicide rate than the general population, the exception being young men in the Army*

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*Generally poor, especially in those with short employment histories and/or substance misuse problems*

Dandeker C. 'Recruiting the All-Volunteer Force: Continuity and Change in the British Army, 1963-2008', in Cohen (ed) Israel's Armed Forces in Comparative Perspective: The New Citizen Armies, Routledge, 2009.

Fear et al. Job strain, rank and mental health in the UK Armed Forces. *Int J Occup Env Health* 2009; 15:291-298

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Mason D, Dandeker C. Evolving UK Policy on Diversity in the Armed Services: Multiculturalism and its Discontents. *Commonwealth & Comparative Politics*: 2009; 47: 393-410.

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*A small "healthy warrior" effect was demonstrated*

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*Complaints by Reservists that they were under utilised and under appreciated by their Regular colleagues in 2003 had substantially improved by 2006. By 2006 the main negative influence on retention of Reservists was a perception of poor welfare support for families during deployment.*

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*Not between USA, UK, Canada and Australia*

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Greene T, Greenberg N, Buckman J, Dandeker C. Does communication with families help or hinder service members' mental health and occupational effectiveness on deployment? *Mil Med*. In press

*Review paper looking at the delicate balance between too little communication (bad for morale) and too much (additional stressors)*

Greene T, Greenberg N, Buckman J, Dandeker C. The Impact of Culture Clash on Deployed Troops. *Mil Med*. in press

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*There is a general increase in symptom reporting across the Armed Forces over a 7 year period, which is independent of deployment*

Iversen A et al. Help seeking and receipt of treatment in United Kingdom Service Personnel. *Br J Psychiatry* 2010; 197:149-155  
*Padres are more popular than psychiatrists. Informal sources of help are first port of call for service personnel with mental health problems and only the minority are seen in specialist services*

Jones, N. Fear, N., Greenberg, N. & Wessely, S. Long Term Occupational Outcomes in Soldiers Who Become Mental Health Casualties When Deployed on Operations. *Psychiatry*, in press  
*Confirms that most of those treated in theatre by the Field Mental Health Teams do well, but less so if they are evacuated back to UK*

Langston V, Greenberg N, Fear N, Iversen AC, French C, Wessely S. Stigma and mental health in the Royal Navy: A mixed methods paper. *J Mental Health*. 2010;19:8-16.

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van Staden L, Iversen A, Fear N, Hall J, Wessely S. "50 ways to trace your veteran": increasing response rates can be cheap and effective.

## Submitted for Publication

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Jones, N., Wink, P., Brown, A.B., Berreclot, D., Abson, E., Doyle, J., Fear, N.T., Wessely, S., and Greenberg, N. A clinical follow up study of reserve forces personnel treated for mental health problems following demobilisation.

MacManus D, Dean K, Iversen A, Hull L, Wessely S, Fear N. Influence of pre –military conduct problems on behavioural outcomes among male UK military personnel.

*Pre-enlistment conduct problems were associated with negative military behavioural outcomes like alcohol misuse, interpersonal violence, risky driving and irritability and anger*

MacManus D, Dean K, Al-Bakir M, Iversen A, Hull L, Wessely S, Fear N. Violent behavior by UK military personnel on returning home after deployment.

*Violent behaviour on homecoming from deployment was associated with premilitary antisocial behaviour as expected, but it was also linked to exposure to combat and traumatic experiences while deployed, even taking into account the earlier link*

Pinder R, Iversen A, Kapur N, Wessely S, Fear N. Self-harm and attempted suicide in UK Armed Forces personnel: results of a cross-sectional survey

Seddon R, Jones N, Fear N, McAllister P, Wessely S, Greenberg N. What happens to mental health in a theatre of war? A study of British Forces in Afghanistan. sub

*Overall rates low. More traumatic stress symptoms in the dangerous forward operating bases, but more depression in the main bases. Leadership and group cohesions closely associated with mental health.*

Sundin J, Fear N, Wood P, Wessely S, Rona R. Risk factors for body mass index and waist circumference in the British Armed Forces.





