



Office for
Veterans' Affairs

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Office for Veterans' Affairs Final Report Health and Wellbeing Study of Serving and Ex-Serving UK Armed Forces Personnel: Phase 4

Authors: Marie-Louise Sharp, Sofia Franchini, Margaret Jones,
Ray Leal, Simon Wessely, Sharon A.M. Stevelink, Nicola T. Fear.

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Abbreviations and Glossary

- ♦ **AUDIT** - Alcohol Use Disorder Identification Test
- ♦ **CMD** – Common Mental Disorders
- ♦ **Comorbidity** - the simultaneous presence of two or more diseases or medical conditions.
- ♦ **COVID-19** - Coronavirus (SARS-CoV-2)
- ♦ **C-PTSD** – Complex PTSD
- ♦ **DEFSTATS** – Defence Statistics
- ♦ **DSM** - Diagnostic and Statistical Manual of Mental Disorders
- ♦ **GCSE** – General Certificate of Secondary Education
- ♦ **GHQ-12** – 12-item General Health Questionnaire
- ♦ **ITQ** – International Trauma Questionnaire
- ♦ **KCMHR** – King’s Centre for Military Health Research
- ♦ **MoD** – Ministry of Defence
- ♦ **MODREC** – Ministry of Defence Research Ethics Committee
- ♦ **NCO** – Non-Commissioned Officer
- ♦ **NATO** - North Atlantic Treaty Organization
- ♦ **NHS** – National Health Service
- ♦ **Op HERRICK** – Operation HERRICK (Afghanistan deployments)
- ♦ **Op TELIC** – Operation TELIC (Iraq deployments)
- ♦ **OR** – Odds Ratio
- ♦ **OSSS-3** – 3-item Oslo Social Support Scale
- ♦ **OVA** – Office for Veterans’ Affairs
- ♦ **PCL-C** – 17-item Post-Traumatic Stress Disorders (PTSD) Checklist
- ♦ **PCL-5** - PCL-5 Post-Traumatic Stress Disorders Checklist for DSM-5
- ♦ **PTSD** – Post-Traumatic Stress Disorder
- ♦ **RAF** – Royal Air Force
- ♦ **Replenishment sample** - a new group of participants added to the cohort study after the set-up of the initial cohort
- ♦ **RTS** – Return to sender
- ♦ **S.d.** – Standard Deviation
- ♦ **95% CI** – 95% Confidence Interval

In this report, we have used Iraq/Op TELIC and Afghanistan/Op HERRICK interchangeably to refer to the respective military operations in those regions.

Executive Summary



1.1 Context

1.1.1

Many UK service personnel who served during the era of the Iraq and Afghanistan conflicts have now transitioned to civilian life. However, 20 years on since the British involvement in the conflicts, the extent to which these deployments continue to impact the long-term health and wellbeing of the UK Armed Forces is unknown. Previously funded by the UK Ministry of Defence (MoD), the King's Centre for Military Health Research (KCMHR) set up a cohort study to investigate the impact of deployment to Iraq, which subsequently progressed to investigate the impact of deployment to Afghanistan. The cohort study developed further to investigate the health and wellbeing of serving and ex-serving personnel of the UK Armed Forces who served during the era of the Iraq and Afghanistan conflicts.

1.1.2

Participants of the KCMHR Health and Wellbeing Cohort Study have been followed up over three main cohort time points with data collected between 2004–2006 (Phase 1), 2007–2009 (Phase 2) and 2014–2016 (Phase 3). Over the three phases of the KCMHR cohort study, Common Mental Disorders (CMD) were the most prevalent outcome in Regular serving and ex-serving personnel ranging between 20–22%, followed by alcohol misuse reported at 10–15% and probable Post-Traumatic Stress Disorder (PTSD) at 4–6% prevalence [1-3]. CMD has remained relatively stable over the three phases, alcohol misuse has steadily declined, and probable PTSD increased from Phase 2 to Phase 3 from 4% to 6%. Broadly, the rates of CMD and probable PTSD at Phase 3 were similar to general population estimates, with alcohol misuse rates approximately two to three times higher than equivalent general population estimates [3, 4].

1.1.3

Phase 4 of the cohort study, now funded by the Office for Veterans' Affairs (OVA), was carried out between 2022-2023 and included participants who took part in Phase 3 of the cohort study. This phase enabled the continued investigation of the

health and wellbeing of both serving and ex-serving personnel. Phase 4 included additional topics such as the impact of the British withdrawal from Afghanistan in 2021, and new measures including complex PTSD (C-PTSD), illicit drug use, gambling, and loneliness.

1.2 Key Aim of Phase 4 of the Health and Wellbeing Cohort Study

1.2.1

The primary aim of Phase 4 of the cohort study is to continue to describe the health and wellbeing of UK serving and ex-serving personnel (Regulars and Reservists) who served during the era of the Iraq and Afghanistan conflicts, and to examine health outcomes over Phases 1–4.

1.3 Key Objectives of the Final Report

1.3.1

Key objectives of the current report are to:

- a) Report the rates of mental health outcomes by serving status (serving versus ex-serving personnel), deployment status (deployed to Iraq and/or Afghanistan versus not deployed to Iraq and/or Afghanistan) and combat role (combat versus combat support).
- b) Compare the rates of mental health outcomes across phases of the cohort study.
- c) Identify factors associated with mental health outcomes among ex-serving Regular personnel.
- d) Discuss findings in the context of research literature, including study strengths/limitations and recommendations for policy, practice, and research.

1.4 Methods

1.4.1

Participants were recruited from those who took part in Phase 3 of the cohort study and agreed to be contacted again (N=7608). Participants could take part in the study by completing a self-administered questionnaire available in online or paper versions. The questionnaire included the following key outcome measures; symptoms of CMD, probable PTSD, C-PTSD, and alcohol misuse.

1.4.2

Data collection was carried out between January 2022 and September 2023.

1.4.3

Analyses utilised descriptive statistics to report on key mental health outcomes and described the effect size in Regular personnel between those who were currently serving versus ex-serving and those deployed to Iraq and/or Afghanistan or not deployed respectively, reporting rates with 95% Confidence Intervals (CIs), and Odd Ratios (ORs) with 95% CI. Analyses conducted with ex-serving Regulars compared associations of mental health status with method of leaving service, caring responsibilities, loneliness, social support, and employment status. Weighted percentages calculated by survey weights are presented along with unweighted cell counts. Regression analyses controlled for a priori confounders including sex, age, educational status, marital status, service branch and rank.

1.5 Results

Whole sample

- The adjusted response rate was 54.6% (n=4104 out of 7520).
- Two-thirds of respondents did not report any adverse mental health outcomes or alcohol misuse.
- For the whole sample (Regulars/Reserves, serving/ex-serving), the most prevalent outcome reported was CMD (27.8%), followed by probable PTSD (9.4%) and alcohol misuse (8.4%).
- Of those who reported probable PTSD, 5.7% reported C-PTSD. Hence the majority of the PTSD experienced met the criteria for C-PTSD.
- From Phase 1 to Phase 4, there were overall increases in the rates of CMD and probable PTSD, and rates of alcohol misuse remained high but fairly stable.
- Male serving and ex-serving personnel reported higher levels of alcohol misuse compared to female serving and ex-serving personnel.

Serving and ex-serving Regular personnel analyses

- Levels of CMD and alcohol misuse were similar in serving and ex-serving Regular personnel but

there was a higher likelihood of reporting probable PTSD and C-PTSD in Regular ex-serving personnel compared to Regular serving personnel.

Deployment

- Deployment to Iraq and/or Afghanistan was not associated with any outcome in serving Regulars.
- Deployment to Iraq/and or Afghanistan was not associated with CMD or alcohol misuse in ex-serving Regulars, however there was a higher likelihood of reporting PTSD and C-PTSD if participants had deployed to Iraq and/or Afghanistan compared to no deployment to either of these conflicts.

Combat

- There was a higher likelihood of reporting PTSD and C-PTSD in both serving and ex-serving Regulars if deployed in a combat role on their last deployment to Op TELIC or Op HERRICK compared to combat support, but no association with CMD or alcohol misuse was found.
- The highest rates of probable PTSD were reported in serving and ex-serving Regulars who deployed in a combat role on their last deployment to Op TELIC or Op HERRICK.

Ex-serving Regular analyses

- Ex-serving Regulars were more likely to report CMD, PTSD and C-PTSD if they:
 - a) Had left service by medical discharge compared to having left in a planned manner.
 - b) Reported unpaid caring responsibilities compared to no unpaid caring responsibilities.
 - c) Reported low social support compared to moderate or high social support.
- Ex-serving Regulars were more likely to report CMD, PTSD, C-PTSD, and alcohol misuse if they endorsed feelings of loneliness compared to those who were not lonely.
- Being retired or economically inactive was associated with a higher likelihood of reporting CMD, PTSD and C-PTSD compared to those who were employed.
- Alcohol misuse was not associated with method of leaving service, caring responsibilities, social support or employment status in any analyses.



Defence Imagery: Photographer - Corporal Cameron Eden, RLC, 2021

1.6 Conclusion

1.6.1

It remains the case that the majority of those who served during the era of the Iraq and Afghanistan conflicts do not report adverse mental health outcomes or alcohol misuse.

1.6.2

There is however a substantial minority who do experience mental health problems and/or alcohol misuse. Of those who do report mental health problems, CMD remains the most prevalent condition. Probable PTSD has now become the second most prevalent condition (previously the third most prevalent in Phase 3) followed by alcohol misuse. The majority of the PTSD experienced met the criteria for C-PTSD.

1.6.3

The rates of those reporting CMD and probable PTSD both in-service and after leaving service have risen since the last phase of the cohort in 2014-2016.

1.6.4

Attention should continue to focus on the needs of the Iraq and Afghanistan era group, who for a substantial minority, continue to experience in part the effects of deployment and combat on their health.

1.6.5

The previous declines in alcohol misuse have levelled off in Phase 4. Alcohol misuse remains high but fairly stable. The rates of alcohol misuse remain higher in the cohort compared to general population levels of alcohol misuse.

1.6.6

It is important to acknowledge that other stressors may also impact ex-serving Regular personnel's health and wellbeing, as shown in our analysis that explored the impact of transition experiences, caring responsibilities, loneliness and social support. Additionally ex-serving Regulars' mental health may impact employment outcomes. Some of these stressors are not however unique to ex-serving personnel and can also be experienced by serving personnel and civilians.

Recommendations

Recommendation	Evidence	Where	Recommendation relevance	Potential benefits
<p>1. Reiterate the new Phase 4 evidence alongside previous cohort phases that the majority of serving and ex-serving personnel do not report adverse mental health outcomes or alcohol misuse.</p>	<p>For the whole sample, 66.9% of participants did not report any of the adverse mental health or alcohol misuse outcomes.</p>	<p>p. 26</p>	<p>Policy</p> <ul style="list-style-type: none"> - UK Government - MoD - OVA <p>Practice</p> <ul style="list-style-type: none"> - Employers <p>Research</p> <ul style="list-style-type: none"> - Research funders - Universities - Armed Forces charities 	<ul style="list-style-type: none"> - Bust myths and negative stereotypes such as the idea that serving and ex-serving personnel are ‘mad, bad or sad’. - Improve public and employer perceptions of service and ex-service personnel. - May encourage recruitment into Armed Forces. - Highlights need to also focus research on positive aspects of service and experiences.
<p>2. Provide continued investment in mental health services for both serving and ex-serving personnel.</p>	<p>The rate of CMD was 27.8% and 9.4% for probable PTSD with both of these rates rising since Phase 3. 10.7% of the cohort reported experiencing comorbid mental health and/or alcohol misuse outcomes.</p>	<p>p. 26, 27, 31</p>	<p>Policy</p> <ul style="list-style-type: none"> - UK Government - MoD - OVA - NHS - Devolved nations - Armed Forces charities <p>Practice</p> <ul style="list-style-type: none"> - NHS services - Armed Forces charities 	<ul style="list-style-type: none"> - Ensure sustained provision of mental health treatment to support the health and wellbeing of both serving and ex-serving personnel. - Meet demand of increased numbers of Iraq/Afghanistan service generation who will access mental health services for help. - Support resilience within the Armed Forces community and increase retention. - Fulfil intentions in the Armed Forces Covenant to address disadvantage in mental health outcomes.

Recommendation	Evidence	Where	Recommendation relevance	Potential benefits
<p>3. Review as to the current provision of treatment and care for C-PTSD, and investment in research to understand best treatment and support approaches for C-PTSD.</p>	<p>The majority of those who reported probable PTSD met the criteria for C-PTSD (72.7%). C-PTSD is therefore the more prevalent presentation of this condition than PTSD only in this cohort.</p>	<p>p. 26, 27</p>	<p>Policy</p> <ul style="list-style-type: none"> - UK Government - OVA - NHS - Devolved nations - Armed Forces charities <p>Practice</p> <ul style="list-style-type: none"> - NHS services - Healthcare practitioners - Armed Forces charities <p>Research</p> <ul style="list-style-type: none"> - Research funders - Universities 	<ul style="list-style-type: none"> - Help identify current provision for C-PTSD treatment and assess whether this capacity is adequate. - Help identify/research most effective interventions for treating C-PTSD, ensuring efficient use of resources. - Upskill healthcare practitioners to deliver the most effective C-PTSD treatment. - Upskill broader healthcare professionals and welfare providers to understand C-PTSD and accompanying holistic needs. - Direct research funding and attention to area of need.
<p>4. Need to review current policy and treatment services available for alcohol misuse.</p>	<p>The rate for alcohol misuse was 8.4%. Using AUDIT cut-off of 16 or more (alcohol misuse characterised as harmful or dependent drinking), both male and female serving and ex-serving personnel were drinking at two to three times higher rates than the general population.</p>	<p>p. 26, 42</p>	<p>Policy</p> <ul style="list-style-type: none"> - UK Government - MoD - OVA - NHS - Devolved nations <p>Practice</p> <ul style="list-style-type: none"> - NHS services - Armed Forces charities - Broader voluntary sector providing alcohol treatment services - Armed Forces charities 	<ul style="list-style-type: none"> - Help to address persistent issue of alcohol misuse in this cohort by understanding current landscape of policy and provision of alcohol treatment services. - Can assess whether provision is adequate and whether current policies promote alcohol use reduction. - Help identify if alcohol treatment services are joined up with other healthcare/welfare services for serving and ex-serving personnel. - Help prevent the development of diseases associated with alcohol misuse (e.g. liver disease).

Recommendation	Evidence	Where	Recommendation relevance	Potential benefits
<p>5. Must support and conduct further in-depth analyses on loneliness, socio-economic outcomes and other Phase 4 data topics not examined in this report.</p>	<p>In ex-serving Regular personnel, a third of the sample reported feelings of loneliness. Those who reported feelings of loneliness were more likely to report CMD, probable PTSD, C-PTSD, and alcohol misuse, compared to those who did not report feelings of loneliness. Those who were retired and economically inactive were more likely to report CMD, PTSD and C-PTSD compared to those who were employed.</p>	<p>p. 35, 37</p>	<p>Research</p> <ul style="list-style-type: none"> - Research funders such as MoD, OVA, Forces in Mind Trust, Research Councils and Armed Forces charities 	<ul style="list-style-type: none"> - Provide evidence to inform policies aimed at supporting serving and ex-serving personnel in terms of loneliness and employment trajectories post-service. - Provide evidence to inform policy and practice on further topics in Phase 4 (detailed in Future Directions section) - Help identify specific challenges faced by serving and ex-serving personnel and fulfil the Armed Forces Covenant where disadvantage is identified.
<p>6. Need to continue to invest in research to understand the longitudinal health outcomes of UK Armed Forces personnel (serving and ex-serving).</p>	<p>CMD has risen in Phase 4 from a prevalence of 20%-22% to 28%. Probable PTSD has seen a rise over Phases 1 - 4 from 4%-6% to approximately 10% (using the PCL-C measure), and alcohol misuse has seen a decline from 15% - 10% to 8% currently.</p>	<p>p. 31</p>	<p>Policy</p> <ul style="list-style-type: none"> - UK Government - MoD - OVA - Research Funders <p>Research</p> <ul style="list-style-type: none"> - Research Funders such as MoD, OVA, Forces in Mind Trust, Research Councils, Armed Forces charities - Universities 	<ul style="list-style-type: none"> - Allow for the long-term assessment of the impact of service on both serving and ex-serving personnel. - Help identify which groups within the community may be at higher risk of mental health problems. - Provide updated evidence ensuring that policies and services evolve to meet the changing needs of this specific cohort. - Ensure that different cohorts of Armed Forces generations have research that provides robust evidence on their experiences, health and wellbeing to inform policy and practice.

Introduction

2.1 Background

2.1.1

Approximately 46,000 UK service personnel were deployed to Iraq in 2003 (Operation TELIC (Op TELIC)) [5]. Concerns were raised regarding the possible consequences of the conflict on the physical and mental health of UK military personnel. The Ministry of Defence (MoD) funded the first large-scale cohort study to investigate the effects of deployment to Iraq on the health of UK Armed Forces personnel. Phase 1 was carried out between 2004 and 2006 and recruited a random sample of Regular and Reserve personnel who were deployed on Op TELIC 1 and, for comparison, a random sample of trained but non-deployed personnel. Overall, the prevalence of CMD was 20.0%, alcohol misuse 15.0% and PTSD 4.0% [1].

2.1.2

Phase 2 of the study was carried out between 2007 and 2009. Two additional samples were added: a sample of individuals who had deployed to Afghanistan (Operation HERRICK (Op HERRICK)) and a sample of individuals who had joined the Armed Forces since 2004 who were added as a replenishment sample [2]. The replenishment sample was added to ensure that the overall sample continued to be broadly representative of the UK Armed Forces. Findings from Phase 2 indicated that the most prevalent outcomes were still CMD (19.7%) and alcohol misuse (13.0%), followed by PTSD which remained stable at 4.0% [2]. Regular personnel who held a combat role were more likely to report probable PTSD, however there was no association of number of deployments with any outcome [2].

2.1.3

The UK military involvement in Afghanistan continued, and by 2014 approximately 280,000 UK service personnel had deployed to Afghanistan and Iraq since 2001 [6], with some participating in both missions. Although the mental health of the UK Armed Forces remained stable between Phase 1 and 2 [1, 2], the long-term investigation of the health and wellbeing of military personnel remained a key focus for the development of policy measures and support for service personnel.

2.1.4

A third phase of the study was conducted between 2014 and 2016. For Phase 3, the sample included all those who participated in the cohort study previously (the 'follow-up sample') and a sample of trained personnel who joined service after August 2009 (another 'replenishment sample'). By this stage approximately 40% of the sample had left service and transitioned to civilian life which meant analyses could compare health outcomes of serving and ex-serving personnel. Overall, the prevalence of CMD was reported at 21.9%, alcohol misuse 10.0% and PTSD at 6.2%.

2.1.5

Over the three phases, CMD remained relatively stable and alcohol misuse had seen a gradual decline, but PTSD saw a statistically significant rise from 4% to 6% [3]. Ex-serving Regulars were more likely to report probable PTSD compared to serving Regulars (7.4% v 4.8%) [3]. The highest levels of PTSD and CMD were found in ex-serving Regulars who had deployed in a combat role, which was reported at 17.1% and 30.7% respectively [3].

2.1.6

Over twenty years have now passed since British involvement in the Iraq and Afghanistan conflicts. Although the UK Armed Forces concluded their mission in Iraq in 2009 [7], the combat mission in Afghanistan formally ended in 2014 [8]. The remaining UK personnel in Afghan territories withdrew following the United States (US) and NATO announcements on troop withdrawal in August 2021 [9]. Many of those who served during these eras of conflicts have now left the Armed Forces and transitioned to civilian life. Phase 3 of the cohort study showed

that ex-serving personnel experienced worse mental health outcomes compared to those still serving, hence the continued investigation of the health consequences of service and deployment remains essential in this group.

2.1.7

In 2021, the Office for Veterans' Affairs (OVA), Cabinet Office, funded Phase 4 of the cohort study. Phase 4 of the study aimed to address questions regarding longer-term impacts of service, deployment and transition for this cohort that served during the Iraq and Afghanistan era of conflicts.



Defence Imagery: Photographer - CPO Owen Cooban, 2021

Overview

3.1 Key Aim of Phase 4 of the Health and Wellbeing Cohort Study

3.1.1

The primary aim of Phase 4 of this longitudinal cohort study is to continue to describe the health and wellbeing of UK serving and ex-serving personnel, Regulars and Reservists, who served during the time of conflicts in Iraq and Afghanistan.

3.2 Key Objectives of the Final Report

3.2.1

The Final Report will report on key outcomes as identified in discussions with the OVA. Key objectives of the current report are to:

- a) Report the rates of mental health outcomes by serving status (serving versus ex-serving personnel), deployment status (deployed to Iraq and/or Afghanistan versus not deployed to Iraq and/or Afghanistan) and combat role (combat versus combat support).
- b) Compare the rates of mental health outcomes across phases of the cohort study.
- c) Identify factors associated with mental health outcomes among ex-serving Regular personnel.
- d) Discuss findings in the context of research literature, including study strengths/limitations and recommendations for policy, practice, and research.

3.3 Research Team

Principal investigators

Professor Nicola Fear
Dr Sharon Stevelink
Professor Sir Simon Wessely

Study team

Lisa Hull - *Project Manager*
Dr Marie-Louise Sharp - *Senior Research Fellow*
Professor Dominic Murphy - *Professor/Clinical Adviser*
Professor Neil Greenberg - *Professor/Clinical Adviser*
Margaret Jones - *Research Associate*
Dr Deirdre MacManus - *Clinical Reader*
Major Amos Simms - *Lecturer*
Dr Howard Burdett - *Research Fellow*
Dr Daniel Leightley - *Research Fellow*
Ray Leal - *Senior Data Coordinator*
Rupa Bhundia - *Chief of Staff*
Rosie Duncan - *Communications Manager*
Steven Parkes - *Research Assistant*
Sofia Franchini - *Research Assistant*
Niamh Molloy - *Research Assistant*
Ella Buckroyd - *Research Support Officer*
Zoe Hardie - *Research Support Officer*
Nadine Loh - *Research Support Officer*
Charlotte Kelham - *Research Support Officer*
Daisy Tuckwell - *Admin support*
Harriette Burt - *Admin support*
Natalie Griffiths - *Admin support*

N.b., Not all individuals were involved for the entire duration of the study nor funded by the study grant.

3.4 Overview of Statistical Terms

Technical and Statistical Terms

Survey weights	Weights are numerical scores used to indicate how representative a respondent is of the population they come from according to characteristics known to affect likelihood of responding or being sampled. Data obtained from participants with greater weights contribute more to the final statistical results.
Logistic regressions	Binary logistic regressions are used to identify factors associated with an outcome. They are binary because the outcome of interest has only two possible responses (e.g., yes vs. no). For these analyses, participants meet the threshold for CMD, probable PTSD, C-PTSD and alcohol misuse or they do not.
Odds Ratios	The outcomes from logistic regressions are called odds ratios (OR). Odds ratios test the strength of the relationship between an exposure and an outcome. An OR=1 the exposure does not affect odds of outcome, OR>1 the exposure is associated with higher odds of outcome, OR<1 the exposure is associated with lower odds of outcome.
Confounders	Confounders are variables associated with both the exposure and outcome. They are variables whose presence affects the variables being studied so that the results do not reflect the actual relationship. When confounders are controlled or adjusted for, it aids a more precise estimate. Age for example is a common confounder in most epidemiological research.
Adjusted OR	The OR estimate is adjusted for key confounders (such as age and sex), so a more precise association can be estimated.
95% Confidence Interval	The 95% confidence interval of an OR tells us how precise the estimate is and the likely range in which a true estimate will fall. Wider confidence intervals suggest more uncertainty.
Statistical significance	Statistical significance is the likelihood that a relationship between two variables is caused by something other than chance. In accordance with the conventional acceptance of statistical significance at a P-value of 0.05 or 5%, CI are calculated at a confidence level of 95% in this study. In general, if an observed result is statistically significant at a P-value of 0.05, then the null hypothesis (that there is no difference between the two groups) should not fall within the 95% CI. For ORs if the CI crosses 1 (with an OR being the null hypothesis that there is no difference between the two groups) then the relationship is deemed to not be statistically significant.

Methods

4.1 Sampling

4.1.1

This study is a fourth wave of data collection (Phase 4 - 2022–2023) which includes both serving and ex-serving personnel (Regular and Reserves) from all three branches of the Armed Forces, who took part in Phase 3 of the cohort study and consented to be recontacted (N=7608).

4.1.2

In Phase 4, there was no replenishment sample, as the aim of this study was to transition to a legacy cohort, broadly representative of those who served during the era of the Iraq and Afghanistan conflicts and who are likely to have shared specific service, deployment, and combat experiences.

4.2 Measures

4.2.1

Taking part in the study involved a self-completion questionnaire which was available both in an online or paper version, giving participants the choice of how to participate. The questionnaire included a broad array of questions assessing health and wellbeing, however for the purposes of this report, the main areas of focus included questions on socio-demographic and military demographic characteristics, and key mental health outcomes of CMD, probable PTSD, C-PTSD, and alcohol misuse. Additional factors were investigated in ex-serving Regulars such as method of leaving service, caring responsibilities, loneliness, social support and employment status. The mental health measures have been validated and shown to appropriately identify individuals who may have a mental problem; however, they do not provide a

clinical diagnosis. For a full study protocol please see Sharp, Jones [10] <https://bmjopen.bmj.com/content/13/10/e079016>.

4.2.2

Veterans from the KCMHR Veterans Research Advisory Group tested the design and flow of the questionnaire and offered advice on outcome measures.

4.2.3

The main socio-demographic and military characteristic variables used for the Final Report are detailed in Table 1 (overleaf).

4.2.4

The health and wellbeing variables used for the Final Report include:

- ♦ *12-item General Health Questionnaire (GHQ-12)* as a measure of general (non-psychotic) psychiatric morbidity. Cut-off indicating the presence of a probable CMD such as depression or anxiety ≥ 4 [11].
- ♦ *17-item Post-Traumatic Stress Disorders (PTSD) Checklist (PCL-C)* to measure probable PTSD. Cut-off for probable PTSD ≥ 50 [12].
- ♦ *20-item PCL-5* to measure probable PTSD. Cut-off for probable PTSD ≥ 38 [13]. From 2013, the definition of PTSD changed from DSM-IV to DSM-5. A new PCL-5 measure was introduced in our cohort to reflect these changes. To continue to compare the level of probable PTSD across phases but to also be able to report current probable PTSD using the new definition, a blended PCL measure was included that allowed the creation of both a PCL-C and a PCL-5 measure. In the report we use the PCL-C when comparing across phases, the PCL-5 for other PTSD analyses.

Table 1 – Socio-demographic and military characteristic variables

Variable	Categories
Socio-demographic Variables	
Sex (at baseline)	<ul style="list-style-type: none"> ♦ Male ♦ Female
Age (at completion of Phase 4)	<ul style="list-style-type: none"> ♦ Years
Education level (Phase 4)	<ul style="list-style-type: none"> ♦ No qualifications or other qualification/O-levels/General Certificate of Secondary Education (GCSE) ♦ A Level ♦ Degree
Marital status (Phase 4)	<ul style="list-style-type: none"> ♦ Relationship ♦ Single/Ex-relationship
Employment (Phase 4)	<ul style="list-style-type: none"> ♦ Employed – <i>those in paid employment</i> ♦ Retired ♦ Economically inactive – <i>those not in paid employment, including those actively looking for paid work and those not looking for paid work</i>
Military Characteristics	
Service Branch (at baseline)	<ul style="list-style-type: none"> ♦ Naval Services ♦ Army ♦ Royal Air Force
Rank (Phase 4)	<ul style="list-style-type: none"> ♦ Officer ♦ Non-Commissioned Officer (NCO) ♦ Other rank
Enlistment status (at baseline)	<ul style="list-style-type: none"> ♦ Regular ♦ Reserve
Serving status (Phase 4)	<ul style="list-style-type: none"> ♦ Serving ♦ Ex-serving
Deployed theatre (Phase 3)	<ul style="list-style-type: none"> ♦ Not deployed to Iraq and/or Afghanistan ♦ Deployed to Iraq and/or Afghanistan
Deployed role (Phase 3, last Op TELIC or Op HERRICK deployment)	<ul style="list-style-type: none"> ♦ Combat ♦ Combat support ♦ Combat services support <p><i>(For analyses combat support and combat services support are combined into one category termed combat support)</i></p>
Method of leaving service (Phase 4)	<ul style="list-style-type: none"> ♦ Planned – <i>made up of those who endorsed – end of service term or run out date (last day of contracted service), premature voluntary release, voluntary redundancy</i> ♦ Medical discharge ♦ Unplanned – <i>made up of those who endorsed administrative discharge, temperamental unsuitability, disciplinary discharge, and compulsory redundancy</i>

- ♦ *The International Trauma Questionnaire (ITQ)* to measure C-PTSD, scoring as per Cloitre et al [14]. Utilising the ITQ measure, participants must first meet the criteria to be classed as a probable PTSD ‘case’ but then meet additional criteria to also be classed as a C-PTSD ‘case’. Hence all C-PTSD ‘cases’ are also PTSD ‘cases’, but individuals may only meet PTSD criteria and not meet additional C-PTSD criteria.
- ♦ *10-item Alcohol Use Disorder Identification Test (AUDIT)* to measure alcohol consumption and misuse. Cut-off for alcohol misuse ≥ 16 [15].
- ♦ *3-item UCLA Loneliness Scale*. Cut-off for loneliness ≥ 6 [16]. The scale measures three dimensions of loneliness: relational connectedness, social connectedness, and self-perceived isolation. The items are: a) How often do you feel that you lack companionship? b) How often do you feel left out? c) How often do you feel isolated from others? The scale uses three response categories of: hardly ever or never/some of the time/often.
- ♦ *3-item Oslo Social Support Scale (OSSS-3)* [17], scoring as per Bøen et al [18]. The items ask: a) How many people are so close to you that you can count on them if you have great personal problems? With response options of None/1-2/3-5/More than 5; b) How much interest and concern do people show in what you do? With response options of None/Little/Uncertain/Some/A lot; c) How easy is it to get practical help from neighbours if you should need it? With response options of Very difficult/Difficult/Possible/Easy/Very easy.
- ♦ *Caring responsibilities*. Participants were asked if they normally had (unpaid) caring responsibilities for family members, friends, or partners. Participants could answer yes/no. If participants answered ‘yes’, they were asked ‘how long in general do you spend carrying out your care responsibilities’, response options of up to 9 hours

per week/10-34 hours per week/35 hours or more per week). The question was based on UK 2021 Census unpaid caring question.

4.3 Procedures

4.3.1

Data were collected via online or paper questionnaire. The online questionnaire was accessed through Qualtrics software and took approximately 40-45 minutes to complete. Participants invited to take part provided contact details during previous phases of the study. The MoD (Defence Statistics) provided updated contact details for participants who were in-service at the time of Phase 3.

4.3.2

Data collection was carried out between January 2022 and September 2023.

4.3.3

Participants were invited to take part by email, post and text and sent reminders to complete the survey. The invitation emphasised that participation was voluntary, confidential, and included a personalised questionnaire link, a link to the Participant Information Sheet, and a link to the study website.

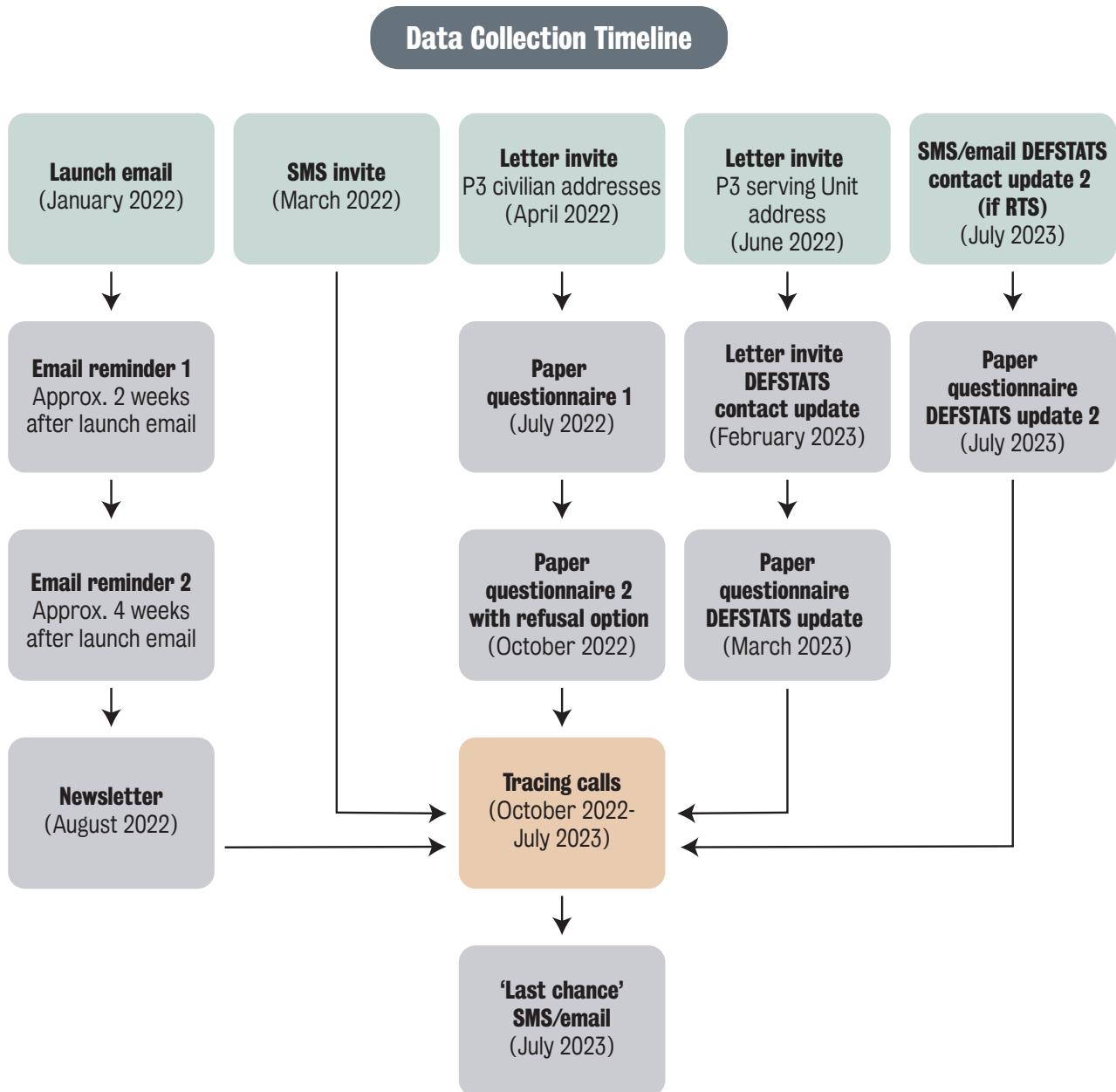
4.3.4

Following reminder invitations, several methods were used to follow up and trace participants. Please refer to Appendix 10.1 for a detailed account of all data collection activities.

4.3.5

Figure 1 (overleaf) details the timeline of data collection activities. Figure 2 (p. 22) details data collection activities and participant responses at each stage.

Figure 1 - Data collection activities and timeline

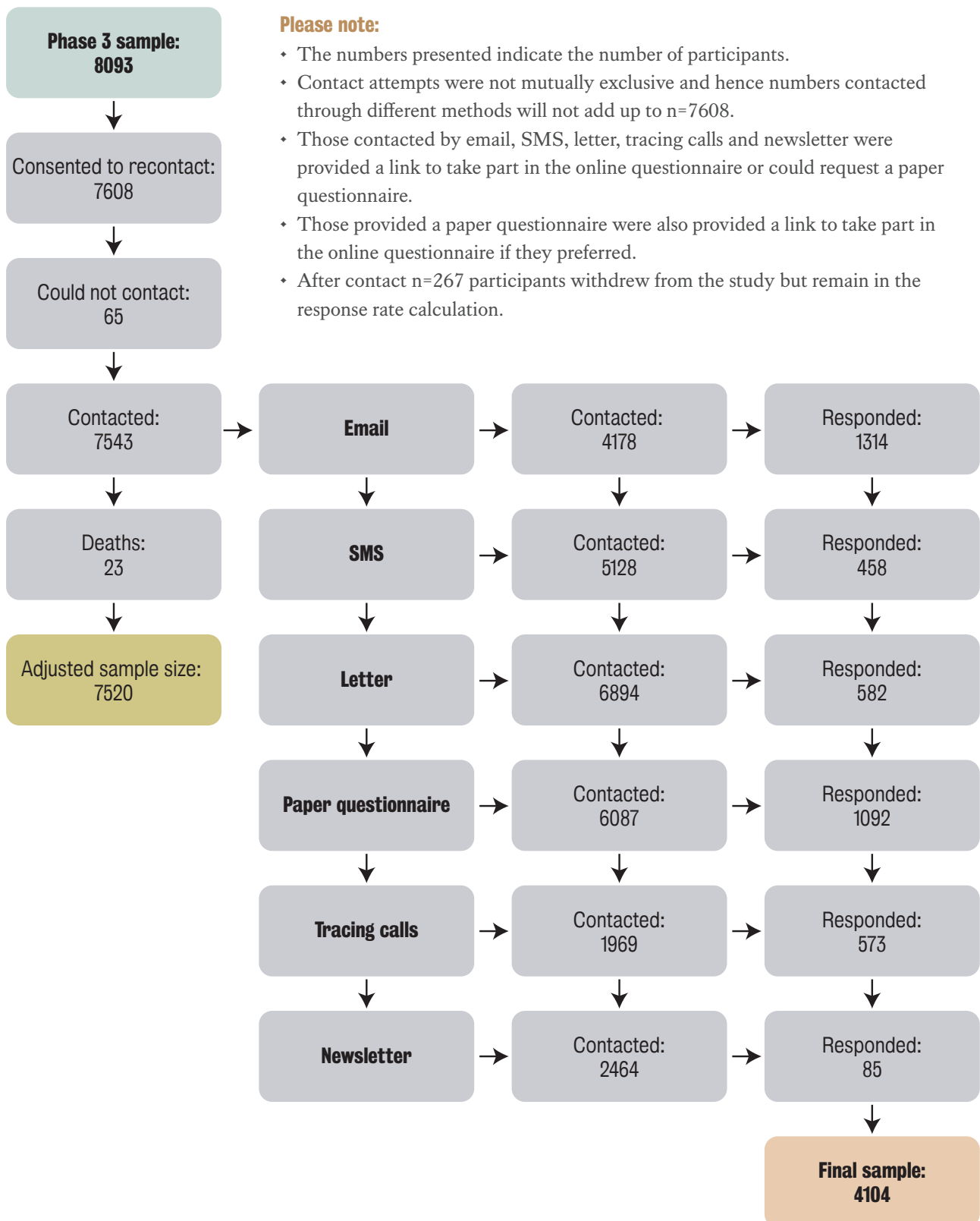


Possible outcomes at each contact attempt:

(i) Participant completed online/paper questionnaire (ii) No response (iii) Invitation pack returned undelivered (RTS)/email bounced back/incorrect phone number (iv) Participant withdrew or did not want to participate (v) Participant passed away.

- ♦ If no response, individual was filtered through into the next contact attempt.
- ♦ If pack returned undelivered and an alternative address was found/available, invitation pack was forwarded and/or individual was filtered through into the next contact attempt.

Figure 2 – Data collection activities and responses



4.4 Analysis

4.4.1

Response weights were calculated as the inverse probability of responding once sampled (at the appropriate phase) driven by factors shown empirically to predict response. Sample weights were calculated as the inverse probability of an individual being sampled at Phase 1, 2 or 3. Combined sample and response survey weights were used to account for differential response rates and sampling fractions in all analyses.

4.4.2

All screening measures were scored according to published instructions. Missing items on measures were handled according to the protocol used in the previous phases, that is, for example on GHQ-12, PCL-C, PCL-5 and AUDIT, the lowest value on participant scores were imputed if fewer than four items were missing on the measure.

4.4.3

Descriptive statistics were used to describe the prevalence of key mental health outcomes. The main analysis compared mental health outcomes according to serving status, deployment status, and combat role, reporting rates with 95% Confidence Interval (CI) and Odds Ratios (ORs) with 95%

CI, to describe the effect size between current serving Regular personnel versus ex-serving Regular personnel, groups deployed to Iraq and/or Afghanistan or not deployed to Iraq and/or Afghanistan, and those deployed in a combat role to Iraq or Afghanistan versus those deployed in a combat support role to Iraq or Afghanistan respectively. Analyses conducted with ex-serving Regulars compared associations of mental health status with method of leaving service, caring status, loneliness, social support, and employment status.

4.4.4

All statistical analyses were performed using the statistical package Stata (Version 18), with survey commands to account for weighting. Weighted percentages, ORs, and multinomial odds ratios (MORs) are presented along with unweighted cell counts. Regression analyses controlled for a priori confounders including sex, age (as a continuous variable), educational status, marital status, service branch and rank.

4.5 Ethics

4.5.1

Full ethical approval was granted by the UK Ministry of Defence Research Ethics Committee (Ref: 2061/MODREC/21).

Results

5.1 Response Rate and Characteristics of Responders

5.1.1.

The total number of responders in the Phase 4 sample was 4104. The adjusted response rate for the whole sample (serving and ex-serving personnel, Regulars and Reserves) was 54.6% (4104 out of 7520 - adjusted for deaths and those with no contact details). The majority of participants responded through the online survey (79.1%, n= 3245). Responders were more likely to be female, older, have held Reserve engagement status at baseline, hold or have held Officer rank, currently serve or have served in the RAF (compared to Army), and were slightly more likely to respond if they had reported symptoms of CMD at the previous phase of data collection (Phase 3), compared to those who did not report symptoms of CMD. Participants were less likely to respond

if they had been part of the Phase 3 replenishment sample (Supplementary Table 1). In general, response characteristics were similar to previous phases [3].

5.1.2.

Table 2 (overleaf) describes the socio-demographic and military characteristics of the whole sample. Most participants were male with a mean age of 50.8 years (standard deviation (s.d.) = 10.3 years) with an age range of 27.0 – 80.6 years old. The majority of participants reported education to degree level, were married, currently served or had served in the Army, were NCOs, and had Regular enlistment status. The large majority of the sample had left service at Phase 4 and had deployed to Iraq and/or Afghanistan. Of those who deployed, just under a third of participants reported a combat role on their last deployment to Iraq or Afghanistan.



Defence Imagery: Photographer - Harland Quarrington, 2003

Table 2 - Description of responders (Whole sample)

Characteristic	n* (%)
Sex (at baseline)	
Male	3531 (86.0)
Female	573 (14.0)
Age band (yrs) (at completion of Phase 4)	
25-39	679 (16.5)
40-44	604 (14.7)
45-49	602 (14.7)
50-54	758 (18.5)
55-59	699 (17.0)
60-64	413 (10.1)
65 and over	349 (8.5)
Education level (at Phase 4)	
No qual or other qual or O level/GCSE	729 (17.9)
A level	789 (19.4)
Degree	2545 (62.6)
Marital status (at Phase 4)	
Relationship	3459 (84.6)
Single or Ex-relationship	632 (15.5)
Service Branch (at baseline)	
Naval Services	682 (16.6)
Army	2516 (61.3)
RAF	906 (22.1)
Rank (At Phase 4)	
Officer	1417 (34.5)
NCO	2350 (57.7)
Other rank	337 (8.2)
Enlistment status (at baseline)	
Regular	3223 (78.5)
Reserve	881 (21.6)
Serving status (at Phase 4)	
Serving	1157 (28.2)
Ex-serving	2944 (71.8)
Deployed theatre (at Phase 3)	
Not deployed Iraq and/or Afghanistan	1270 (31.0)
Deployed to Iraq and/or Afghanistan	2827 (69.0)
Deployed role (at Phase 3, last deployment to Op TELIC or Op HERRICK)	
Combat	807 (28.6)
Combat support	349 (12.4)
Combat service support	1671 (59.1)

* please note n may not add up to 4104 due to missing data.

Abbreviations: GCSE, General Certificate of Secondary Education; RAF, Royal Air Force; NCO, Non-Commissioned Officer.

5.2 Rates of Mental Health Outcomes

5.2.1

For the whole sample, 66.9% (n=2782) of participants did not report any of the mental health or alcohol misuse outcomes.

5.2.2

The rate of CMD was 27.8% (n=1051), 9.4% for probable PTSD (n=313) and 8.4% (n=306) for alcohol misuse. Of those reporting PTSD, 5.7% reported C-PTSD (n=191) (Table 3).

5.2.3

Marital status, age and deployment status were associated with each mental health outcome (CMD,

PTSD, C-PTSD, and alcohol misuse). Education level was associated with C-PTSD only. Service branch and enlistment status were associated with PTSD and C-PTSD. Role during last deployment was associated with CMD, PTSD and C-PTSD. (Supplementary Table 2).

5.2.4

In the whole sample, men and women reported similar levels of PTSD and C-PTSD. Women reported higher rates of CMD compared to men (32.3% v 27.3%) however this difference was not statistically significant. Men reported statistically significant higher levels of alcohol misuse compared to women (8.7% v 5.0% respectively) (Supplementary Table 2).

Table 3 - Rates of mental health outcomes (Whole sample)

Mental Health Outcome Measure	n/N	Percentage %* (95% Confidence Interval)
Common Mental Disorders	1051/4037	27.8 (26.1 – 29.6)
Probable PTSD	313/4016	9.4 (8.3 – 10.7)
Complex PTSD	191/4005	5.7 (4.8 – 6.7)
Alcohol misuse	306/3969	8.4 (7.3 – 9.5)

* Percentages are weighted



Defence Imagery: Photographer - Harland Quarrington, 2006

5.3 Percentage of Complex PTSD (C-PTSD)

5.3.1

Utilising the ITQ measure (as opposed to the PCL-5 reported in Table 3), the rate of probable PTSD in the whole sample is 7.8% (n=275), with 5.7% (n=191) meeting the additional criteria for C-PTSD (with the remaining 2.1% (n=84) meeting PTSD criteria only). Hence the percentage of PTSD that is complex in the sample is 72.7% (Figure 3).

5.4 Presence of Two or More Mental Health Conditions

5.4.1

Of the 33.1% (n=1255) who reported experiencing CMD, probable PTSD or alcohol misuse, 22.3% (n=888) were case positive on one outcome (one of either the GHQ-12, PCL-5, or AUDIT-10), 9.2% (n=319) positive on two outcomes and 1.5% (n=48) positive on all three outcomes.

5.4.2

Out of the 313 participants reporting probable PTSD, 270 were case positive for both probable PTSD and CMD. Hence 88.9% (weighted percentage) of those reporting probable PTSD were

case positive for CMD, indicating a high level of comorbidity.

5.5 Mental Health Outcomes by Serving Status in Regulars

5.5.1

The sample size of serving and ex-serving Regulars personnel was n=3222.

5.5.2

The rate of PTSD and C-PTSD was higher in ex-serving Regular personnel compared to serving Regular personnel. In all analyses, serving status was not associated with reporting CMD or alcohol misuse (Table 4 and Figure 4).

5.6 Mental Health Outcomes by Deployment in Regulars

5.6.1

For serving Regular personnel, there were no statistically significant associations between reporting of mental health outcomes or alcohol misuse and deployment, i.e. whether participants had or had not deployed to Iraq and/or Afghanistan (Table 5).

Figure 3 - Percentage meeting C-PTSD criteria in PTSD cases

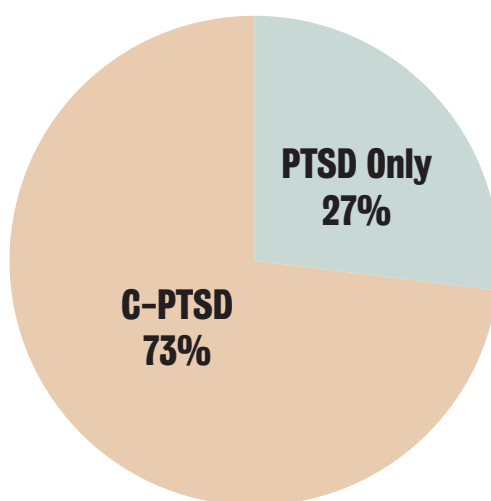


Table 4 - Mental health outcomes by serving status at Phase 4 (Regulars only)

	Serving n=928 (24.5%)	Ex-serving n=2294 (75.5%)		
	n (%)*	n (%)*	OR (95% CI)	Adjusted OR** (95% CI)
Common Mental Disorders	251 (27.9)	578 (27.9)	1.0 (0.8 - 1.2)	1.1 (0.9 - 1.4)
Probable PTSD	58 (7.4)	202 (10.5)	1.5 (1.0 - 2.1)	1.7 (1.1 - 2.5)
Complex PTSD	31 (3.9)	127 (6.5)	1.7 (1.1 - 2.7)	1.8 (1.1 - 3.1)
Alcohol misuse	64 (7.6)	184 (8.7)	1.1 (0.8 - 1.6)	1.5 (1.0 - 2.2)

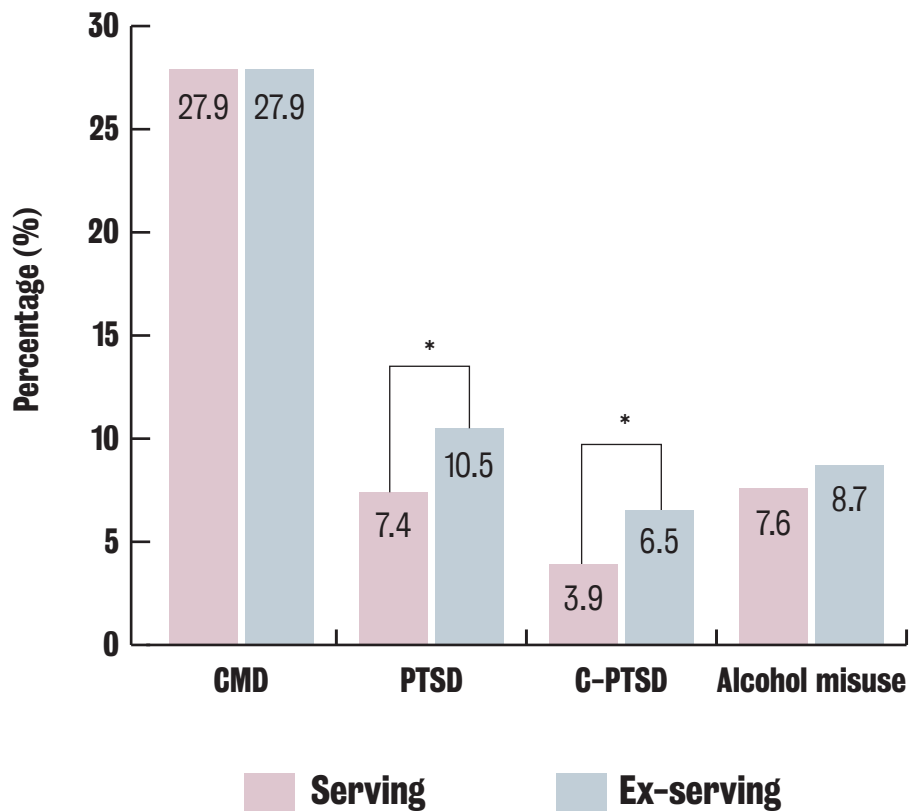
* percentages are weighted.

** adjusted for sex, age (continuous), educational status, marital status, service branch, rank.

N.b., Statistically significant results in bold.

Abbreviations: PTSD, Post-Traumatic Stress Disorder; OR, Odds Ratio; CI, Confidence Interval.

Figure 4 - Mental health outcomes by serving status in Regulars



* statistically significant

5.6.2

In contrast to serving Regular personnel, in adjusted analyses, ex-serving Regular personnel who had deployed to Iraq and/or Afghanistan were more likely to report probable PTSD and C-PTSD compared to those who had not deployed to Iraq and/or Afghanistan (Table 6).

5.6.3

With regards to CMD and alcohol misuse, in unadjusted analyses, ex-serving Regular personnel who had deployed to Iraq and Afghanistan were more likely to report alcohol misuse and CMD compared to those who had not deployed to Iraq and/or Afghanistan, however these associations became non-significant in adjusted analyses (Table 6).

Table 5 - Mental health outcomes by deployment to Iraq and/or Afghanistan (Serving Regulars)

	Not Deployed to Iraq and/or Afghanistan n=195 (24.6%)	Deployed to Iraq and/or Afghanistan n=732 (75.4%)		
	n (%)*	n (%)*	OR (95% CI)	Adjusted OR** (95% CI)
Common Mental Disorders	56 (31.5)	195 (26.8)	0.8 (0.5 - 1.2)	0.8 (0.5 - 1.3)
Probable PTSD	14 (7.0)	44 (7.5)	1.1 (0.5 - 2.2)	0.7 (0.4 - 1.4)
Complex PTSD	8 (3.5)	23 (4.1)	1.2 (0.5 - 2.9)	0.8 (0.3 - 1.9)
Alcohol misuse	15 (8.4)	49 (7.6)	0.9 (0.5 - 1.8)	1.0 (0.5 - 2.2)

Table 6 - Mental health outcomes by deployment to Iraq and/or Afghanistan (Ex-serving Regulars)

	Not Deployed to Iraq and/or Afghanistan n=783 (41.4%)	Deployed to Iraq and/or Afghanistan n=1508 (58.7%)		
	n (%)*	n (%)*	OR (95% CI)	Adjusted OR** (95% CI)
Common Mental Disorders	171 (24.6)	406 (30.5)	1.4 (1.1 - 1.7)	1.3 (0.9 - 1.6)
Probable PTSD	53 (7.6)	149 (12.6)	1.8 (1.2 - 2.5)	1.5 (1.0 - 2.2)
Complex PTSD	27 (3.7)	100 (8.6)	2.4 (1.5 - 3.9)	2.0 (1.3 - 3.3)
Alcohol misuse	43 (6.1)	139 (10.4)	1.8 (1.2 - 2.6)	1.4 (0.9 - 2.1)

* percentages are weighted.

** adjusted for sex, age (continuous), educational status, marital status, service branch, rank.

N.b., Not deployed to Iraq and/or Afghanistan as baseline. Statistically significant results in bold.

Abbreviations: PTSD, Post-Traumatic Stress Disorder; OR, Odds Ratio; CI, Confidence Interval.

5.7 Mental Health Outcomes by Combat Role on Last Deployment to Op TELIC or Op HERRICK

5.7.1

In adjusted analyses, serving Regular personnel who deployed in a combat role were more likely to report probable PTSD and C-PTSD compared

to those deployed in a combat support role (Table 7). Please note the low numbers in PTSD and C-PTSD categories where analyses may lack power and provide a less precise estimate. In all analyses for serving Regular personnel, there was no association between combat role and CMD or alcohol misuse.

Table 7 - Mental health outcomes by role on last deployment to Op TELIC or Op HERRICK (Serving Regulars)

	Combat (services) support n=501 (66.2%)	Combat n=231 (33.8%)		
	n (%)*	n (%)*	OR (95% CI)	Adjusted OR** (95% CI)
Common Mental Disorders	134 (25.2)	61 (29.8)	1.3 (0.8 - 1.9)	1.4 (0.9 - 2.3)
Probable PTSD	23 (4.7)	21 (13.0)	3.0 (1.5 - 6.1)	2.7 (1.3 - 5.7)
Complex PTSD	12 (2.5)	11 (7.1)	3.0 (1.2 - 7.4)	3.5 (1.3 - 8.9)
Alcohol misuse	31 (6.7)	18 (9.3)	1.4 (0.7 - 3.0)	1.4 (0.7 - 3.1)

Table 8 - Mental health outcomes by role on last deployment to Op TELIC or Op HERRICK (Ex-serving Regulars)

	Combat (services) support n=1089 (67.9%)	Combat n=419 (32.1%)		
	n (%)*	n (%)*	OR (95% CI)	Adjusted OR** (95% CI)
Common Mental Disorders	282 (28.4)	124 (35.1)	1.4 (1.0 - 1.9)	1.2 (0.9 - 1.7)
Probable PTSD	85 (9.9)	64 (18.4)	2.1 (1.4 - 3.1)	1.8 (1.2 - 2.8)
Complex PTSD	53 (6.1)	47 (13.9)	2.5 (1.5 - 4.0)	2.3 (1.4 - 3.7)
Alcohol misuse	94 (10.1)	45 (10.9)	1.1 (0.7 - 1.7)	0.9 (0.5 - 1.5)

* Percentages are weighted

** adjusted for sex, age (continuous), educational status, marital status, service branch, rank.

N.b., Combat (services) support as baseline. Statistically significant results in bold.

Abbreviations: PTSD, Post-Traumatic Stress Disorder; OR, Odds Ratio; CI, Confidence Interval.

5.7.2

In adjusted analyses, ex-serving Regular personnel who deployed in a combat role were more likely to report probable PTSD and C-PTSD compared to those who deployed in a combat support role (Table 8).

5.7.3

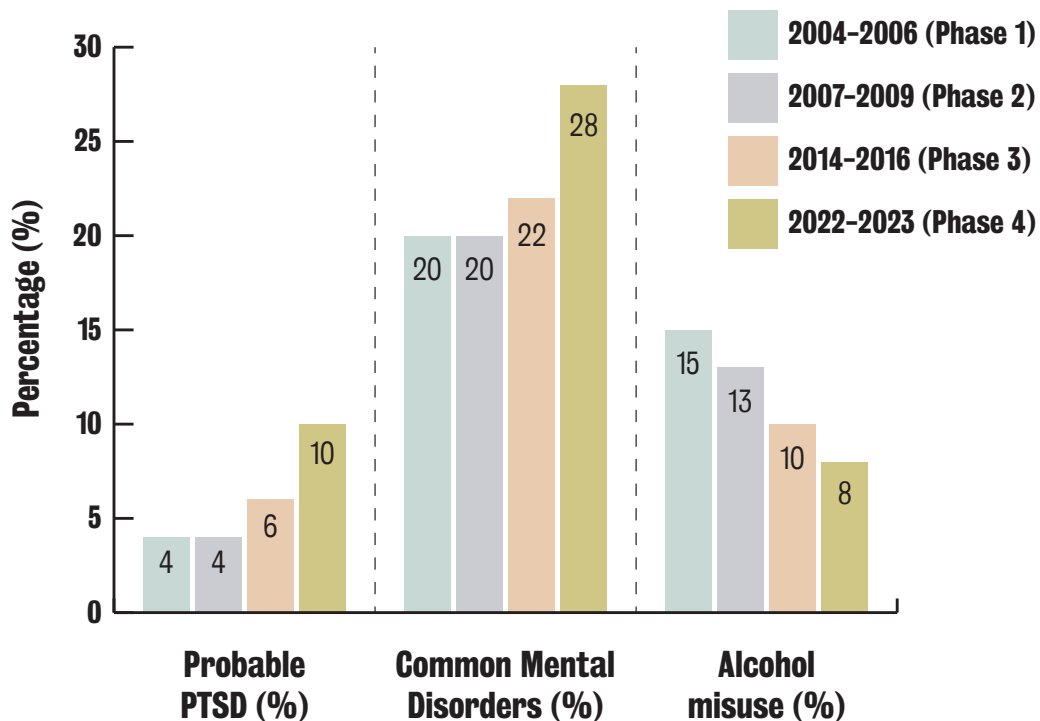
In unadjusted analyses, those who deployed in a combat role were more likely to report CMD compared to those who deployed in a combat support role; however, this association became non-significant in adjusted analyses. In all analyses for ex-serving Regular personnel, there was no association between combat role and alcohol misuse (Table 8).

5.8 Comparison of Mental Health Outcomes Across Phases

5.8.1

In the whole sample (n=4104), comparing relative frequencies of mental health outcomes across Phases 1 - 4, CMD has risen in Phase 4 from a prevalence of 20%-22% to 28%. Probable PTSD has seen a rise over Phases 1 - 4 from 4%-6% to approximately 10% (using the PCL-C measure). Whilst alcohol misuse has seen a decline from 15% - 10% to 8% currently, this is a statistically non-significant reduction, meaning previous declines in alcohol misuse have levelled off, with alcohol misuse remaining high but fairly stable (Figure 5).

Figure 5 - Relative frequency of mental health outcomes across cohort phases (Whole sample)



5.9 Exploration of Ex-serving Regular Personnel's Mental Health Outcomes by Socio-demographic, Military, Transition, and Civilian Life Factors

5.9.1

In the ex-serving Regular sample (n=2294), most participants were male, with a mean age of 51.9 years (s.d. = 10.0 years) and a range of 27.4 – 77.9 years old. The majority reported education to degree level, were married, had served in the Army, and held the rank of NCO. Nearly two-thirds of the sample had deployed to Iraq and/or Afghanistan, and of those who deployed, just below a third had deployed in a combat role on their last deployment to Op TELIC or Op HERRICK. Over half the sample reported it was over 10 years or more since they left the Armed Forces.

5.9.2

In adjusted analyses, ex-serving Regulars differed to serving Regulars in socio-demographic and military characteristics by sex (more likely to be female), age (more likely to be older), service branch (less likely to have served in RAF), rank (more likely to be other rank and less likely to be Officer rank) and deployment status (less likely to have deployed to Iraq and/or Afghanistan) (Table 9 overleaf).

5.9.3

In contrast to the whole sample, within the ex-serving Regular group, female ex-serving Regulars had a higher likelihood of reporting CMD compared to male ex-serving Regulars (35.5% v 27.2%). Male ex-serving Regulars reported higher levels of alcohol misuse compared to female ex-serving Regulars (9.0% v 5.0% respectively), however this was not a statistically significant difference. Female ex-serving Regulars reported a similar prevalence of PTSD and C-PTSD compared to male ex-serving Regulars. Within the ex-serving Regular sample, reporting mental health problems was associated with similar characteristics as the whole sample (Supplementary Table 3).

Method of leaving service

5.9.4

In the ex-serving Regular personnel sample, the majority of participants left service as planned (such as end of service term or voluntary redundancy) (87.8%, n=1932), 9.7% (n=189) of the sample left service through a medical discharge, and 2.5% (n=41) left in an unplanned manner (such as administrative discharge or compulsory redundancy).



iStock: Credit – mcdermp, 2016

Table 9 - Comparison of socio-demographic and military characteristics of serving and ex-serving Regular personnel

	Serving n=928	Ex-serving n=2294	Adjusted OR* 95% CI
Characteristic			
Sex (at baseline)			
Male	788 (84.9)	2024 (88.2)	1.00
Female	140 (15.1)	270 (11.8)	1.4 (1.1-1.8)
Age band (yrs) (at completion of Phase 4)			
25-39	268 (28.9)	303 (13.2)	0.2 (0.1-0.3)
40-44	217 (23.4)	299 (13.0)	0.4 (0.3-0.5)
45-49	181 (19.5)	316 (13.8)	0.6 (0.5-0.8)
50-54	157 (16.9)	449 (19.6)	1.00
55-59	85 (9.2)	453 (19.8)	2.3 (1.7-3.1)
60 and over	20 (2.2)	474 (20.7)	14.5 (8.7-24.0)
Education level (at Phase 4)			
No qual or other qual or O-level/GCSE	112 (12.3)	434 (19.0)	1.1 (0.8-1.4)
A level	173 (19.0)	496 (21.7)	1.1 (0.9-1.4)
Degree	628 (68.8)	1351 (59.2)	1.00
Marital status (at Phase 4)			
Relationship	775 (83.9)	1972 (86.2)	1.00
Single or Ex-relationship	149 (16.1)	317 (13.9)	0.8 (0.6-1.0)
Service Branch (at baseline)			
Naval Services	148 (16.0)	435 (19.0)	0.9 (0.7-1.1)
Army	538 (58.0)	1297 (56.5)	1.00
RAF	242 (26.1)	562 (24.5)	0.6 (0.5-0.7)
Rank (at Phase 4)			
Officer	423 (45.6)	707 (30.8)	0.3 (0.3-0.4)
NCO	493 (53.1)	1376 (60.0)	1.00
Other rank	12 (1.3)	211 (9.2)	17.8 (9.4-33.4)
Deployed theatre (at Phase 3)			
Not deployed Iraq and/or Afghanistan	195 (21.0)	783 (34.2)	1.00
Deployed to Iraq and/or Afghanistan	732 (79.0)	1508 (65.8)	0.7 (0.6-0.9)
Deployed role (at Phase 3, last deployment to Op TELIC or Op HERRICK)			
Combat	231 (31.6)	419 (27.8)	0.9 (0.7-1.2)
Combat support	107 (14.6)	206 (13.7)	1.0 (0.8-1.4)
Combat service support	394 (53.8)	883 (58.6)	1.00

* adjusted for sex, age (continuous), educational status, marital status, service branch, rank.

N.b., Statistically significant results in bold. Analysis is unweighted.

Abbreviations: GCSE, General Certificate of Secondary Education; RAF, Royal Air Force; NCO, Non-Commissioned Officer; OR, Odds Ratio; CI, Confidence Interval.

5.9.5

In adjusted analyses comparing medical discharge to planned leaving (unplanned category numbers were too small for a robust comparison and were dropped), those who left service by medical

discharge were more likely to report CMD, probable PTSD and C-PTSD compared to those that left service in a planned manner. Alcohol misuse was not associated with method of leaving (Table 10).

Table 10 – Association of mental health outcomes and method of leaving service in ex-serving Regular personnel

	Planned leaving n=1932 (90.1%)	Medical discharge n=189 (9.9%)		
	n (%)*	n (%)*	OR (95% CI)	Adjusted OR** (95% CI)
Common Mental Disorders	440 (24.5)	88 (48.9)	3.0 (2.1 - 4.2)	2.6 (1.7 - 3.8)
Probable PTSD	131 (8.1)	62 (33.7)	5.8 (3.9 - 8.6)	5.2 (3.3 - 8.2)
Complex PTSD	74 (4.1)	44 (26.7)	8.5 (5.3 - 13.4)	8.8 (5.3 - 14.6)
Alcohol misuse	157 (8.8)	14 (5.6)	0.6 (0.3 - 1.2)	0.5 (0.3 - 1.0)

*Percentages are weighted.

** adjusted for sex, age (continuous), educational status, marital status, service branch, rank.

N.b., Planned leaving as base. Statistically significant results in bold.

Abbreviations: PTSD, Post-Traumatic Stress Disorder; OR, Odds Ratio; CI, Confidence Interval.

Table 11 – Association of mental health outcomes in ex-serving Regular personnel by caring responsibilities

	No caring responsibilities n=1922 (86.1%)	Caring responsibilities n=280 (13.9%)		
	n (%)*	n (%)*	OR (95% CI)	Adjusted OR** (95% CI)
Common Mental Disorders	463 (26.2)	96 (37.6)	1.7 (1.2 - 2.4)	1.8 (1.3 - 2.5)
Probable PTSD	157 (9.5)	35 (16.0)	1.8 (1.1 - 2.9)	2.0 (1.2 - 3.2)
Complex PTSD	96 (5.8)	24 (10.2)	1.8 (1.1 - 3.1)	2.0 (1.2 - 3.6)
Alcohol misuse	151 (8.5)	27 (9.4)	1.1 (0.7 - 1.9)	1.3 (0.7 - 2.2)

* Percentages are weighted.

** adjusted for sex, age (continuous), educational status, marital status, service branch, rank.

N.b., No caring responsibilities as a base. Statistically significant results in bold.

Abbreviations: PTSD, Post-Traumatic Stress Disorder; OR, Odds Ratio; CI, Confidence Interval.

Caring responsibilities

5.9.6

Within ex-serving Regular personnel, 13.9% (n=280) reported having unpaid caring responsibilities. Of those with unpaid caring responsibilities, 54.5% (n=160) reported up to 9 hours of caring per week, 27.4% (n=69) reported 10-34 hours of caring per week and 18.1% (n=50) reported over 35 hours of caring per week. In adjusted analyses, those who reported caring responsibilities were more likely to report CMD, probable PTSD and C-PTSD compared to those with no caring responsibilities. Those with and without caring responsibilities reported similar levels of alcohol misuse (Table 11).

Loneliness

5.9.7

In ex-serving Regular personnel, a third of the sample reported feelings of loneliness (33.6%, n=683). In adjusted analyses, those who reported feelings of loneliness were more likely to report CMD, probable PTSD, C-PTSD, and alcohol misuse, compared to those who did not report feelings of loneliness (Table 12). Please note the low numbers in PTSD and C-PTSD categories where analyses may lack power and provide a less precise estimate.

Table 12 - Association of mental health outcomes by loneliness in ex-serving Regular personnel

	Not lonely n=1500 (66.4%)	Lonely n=683 (33.6%)		
	n (%)*	n (%)*	OR (95% CI)	Adjusted OR** (95% CI)
Common Mental Disorders	208 (14.6)	345 (53.5)	6.7 (5.2 – 8.6)	6.1 (4.7 – 8.0)
Probable PTSD	35 (3.1)	154 (24.2)	9.9 (6.3 – 15.4)	8.1 (5.1 – 12.9)
Complex PTSD	18 (1.4)	100 (15.8)	13.2 (7.4 – 23.7)	11.1 (6.0 – 20.3)
Alcohol misuse	84 (6.0)	93 (13.8)	2.5 (1.7 – 3.7)	2.5 (1.7 – 3.7)

* Percentages are weighted.

** adjusted for sex, age (continuous), educational status, marital status, service branch, rank.

N.b., Not lonely as a base. Statistically significant results in bold.

Abbreviations: PTSD, Post-Traumatic Stress Disorder; OR, Odds Ratio; CI, Confidence Interval.

Social support

5.9.8

In the ex-serving Regular personnel sample, 40.6% (n=780) reported poor social support. In adjusted analyses, reporting poor social support was associated with increased odds of reporting CMD,

probable PTSD and C-PTSD, compared to those who reported moderate or strong social support. In all analyses, alcohol misuse was not associated with social support (Table 13).

Table 13 – Association of mental health outcomes and levels of social support in ex-serving Regular personnel

	Moderate or strong social support n=1368 (59.4%)	Poor social support n=780 (40.6%)		
	n (%)*	n (%)*	OR (95% CI)	Adjusted OR** (95% CI)
Common Mental Disorders	239 (19.0)	306 (40.8)	2.9 (2.3 – 3.7)	2.7 (2.1 – 3.5)
Probable PTSD	57 (4.9)	129 (18.2)	4.3 (2.9 – 6.4)	3.8 (2.5 – 5.6)
Complex PTSD	35 (2.9)	82 (11.4)	4.3 (2.7 – 6.8)	3.7 (2.3 – 5.8)
Alcohol misuse	98 (8.2)	79 (9.6)	1.2 (0.8 – 1.7)	1.1 (0.7 – 1.6)

* Percentages are weighted

** adjusted for sex, age (continuous), educational status, marital status, service branch, rank.

N.b., Moderate/strong social support as base. Statistically significant results in bold.

Abbreviations: PTSD, Post-Traumatic Stress Disorder; OR, Odds Ratio; CI, Confidence Interval.



iStock: Credit – VictorHuang, 2018

Employment

5.9.9

In the ex-serving Regular personnel sample, most participants were employed (82.4%, n=1764), 10.7% (n=290) were retired, and 7.0% (n=183) were economically inactive. In adjusted analysis, those who were retired and economically inactive were more likely to report probable CMD, PTSD and C-PTSD compared to those who were employed. Employment status was not associated with alcohol misuse (Table 14).

Table 14 - Association of employment status and mental health outcomes in ex-serving Regular personnel

Employment status	Common Mental Disorders n=562/2228 (27.5%)			Probable PTSD (PCL-5) n=202/2258 (10.7%)			Complex PTSD n=127/2255 (6.7%)			Alcohol misuse n=184/2237(8.6%)		
	n (%)*	MOR (95% CI)	Adjusted MOR** (95% CI)	n (%)*	MOR (95% CI)	Adjusted MOR** (95% CI)	n (%)*	MOR (95% CI)	Adjusted MOR** (95% CI)	n (%)*	MOR (95% CI)	Adjusted MOR** (95% CI)
Employed	439/1756 (27.2)	1.0	1.0	140/1750 (9.5)	1.0	1.0	87/1749 (5.6)	1.0	1.0	148/1736 (8.8)	1.0	1.0
Retired	58/290 (21.7)	0.7 (0.5-1.1)	1.9 (1.1-3.0)	23/290 (9.8)	1.0 (0.6-1.7)	5.2 (2.5-11.0)	15/287 (6.2)	1.1 (0.6-2.1)	6.6 (3.0-14.7)	14/285 (5.3)	0.6 (0.3-1.1)	1.3 (0.6-2.8)
Economically inactive	65/182 (41.0)	1.9 (1.3-2.7)	2.4 (1.6-3.6)	29/180 (17.6)	2.0 (1.2-3.4)	2.9 (1.7-5.1)	16/180 (11.6)	2.2 (1.2-4.2)	3.0 (1.5-5.9)	15/176 (7.7)	0.9 (0.5-1.6)	1.1 (0.6-2.1)

*Percentages are weighted.

** adjusted for sex, age (continuous), educational status, marital status, service branch, rank.

N.b., Employed as base. Statistically significant results in bold.

Abbreviations: PTSD, Post-Traumatic Stress Disorder; MOR, Multinomial Odds Ratio; CI, Confidence Interval

Discussion

6.1 Main Findings Summary

6.1.1

The majority of participants in the cohort study do not report adverse mental health outcomes or alcohol misuse. A substantial minority of the cohort however do report problems, with CMD the most prevalent, followed by probable PTSD and alcohol misuse. The majority of PTSD experienced in the cohort met the criteria for C-PTSD. Ex-serving Regulars compared to serving Regulars reported higher rates of PTSD and C-PTSD. Higher rates of PTSD and C-PTSD were reported in serving and ex-serving Regulars who deployed in a combat role to Op TELIC or Op HERRICK. Rates of CMD and PTSD have increased, and alcohol misuse remained high but fairly stable since the last phase of the study. In ex-serving Regular analyses, factors associated with mental health outcomes were method of leaving service, caring responsibilities, loneliness, social support, and employment status.

6.2 Explanation of Main Findings

Overall rates of mental health and alcohol misuse outcomes

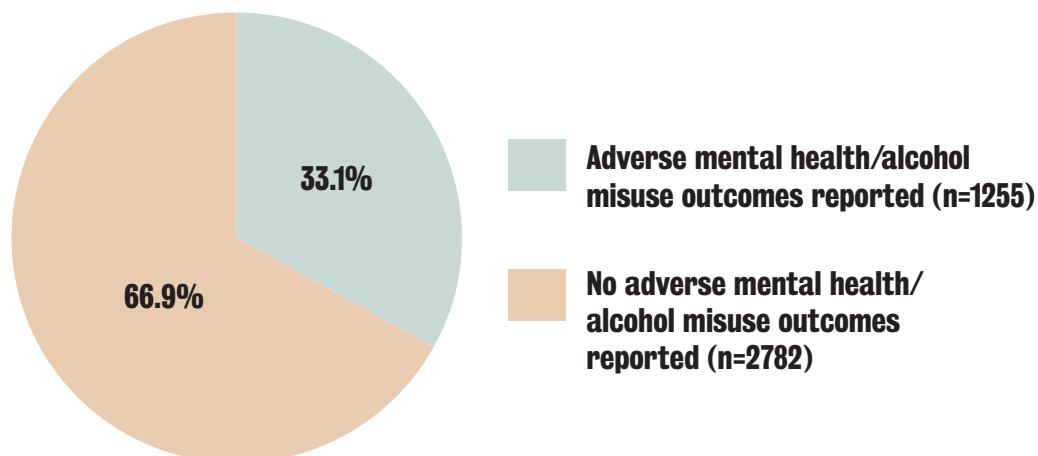
6.2.1

Two thirds of the cohort did not report any adverse mental health outcomes or alcohol misuse (Figure 6). This aligns with previous phases of the cohort study where most individuals did not report experiencing problems [1-3].

6.2.2

CMD remains the most prevalent condition, which is the same as previous phases, however probable PTSD is now the second most reported mental health problem, followed by alcohol misuse (comparatively alcohol misuse at Phase 3 was the second most prevalent condition followed by probable PTSD [3]). This change at Phase 4 is due to the increases in probable PTSD rates and decline in alcohol misuse rates which is discussed further below.

Figure 6 – Overall rates of mental health and/or alcohol misuse outcomes reported (Whole sample)



Enduring impact of deployment in a combat role

6.2.3

In both serving and ex-serving Regulars we found reporting PTSD and C-PTSD was associated with deployment in a combat role to Op TELIC or Op HERRICK.

6.2.4

Our previous research supports the argument that it is not deployment or number of deployments per se that affects PTSD outcomes [2], but it is the combat exposures experienced when on deployment that are relevant to rates of PTSD [19].

6.2.5

The increase risk of PTSD associated with deployment in a combat role for ex-serving Regulars replicates our previous finding at Phase 3, however combat role was not associated with PTSD for serving Regulars at Phase 3 [20]. This may have changed for serving Regular personnel, as international Allied Armed Forces research has identified the long-term impact of trauma or combat exposure on Armed Forces health outcomes. For example, a 20-year review of US Millennium Cohort data found that combat experience increased the risk of adverse mental health outcomes, and found a three-fold increased risk of PTSD in those deployed versus non-deployed [21]. Other research in the Australian Defence Force (ADF) [22] and Canadian Armed Forces [23] found an impact of deployment trauma and combat associated with PTSD outcomes.

6.2.6

We must however note that not all PTSD outcomes are explained by combat exposures. In post-hoc analyses we found that 28.5% of PTSD cases in the Phase 4 sample were in the non-deployed group to Iraq and/or Afghanistan. Previous research has identified that whilst combat is one factor associated with PTSD, reporting PTSD is also associated with childhood adversity, leaving service

or experiencing a serious accident, which may be at least as important in predicting PTSD [24].

Rates of probable PTSD

6.2.7

Rates of probable PTSD have risen from 6.2% in Phase 3 to 9.9% in Phase 4 (utilising the PCL-C as a comparative measure). The prevalence of probable PTSD in Phase 4 is higher than in the general population which is estimated at 4.4% [4]. However, this UK general population data is older (from 2014) and for better comparisons, the cohort data would benefit from a more up to date, age, and sex matched sample study.

6.2.8

The prevalence of PTSD may have comparatively risen because there is a higher risk of probable PTSD in ex-serving Regulars compared to serving Regulars (10.5% v 7.4%), and the Phase 4 cohort sample has a larger majority of those who are ex-serving now compared to Phase 3 (71.8% v 42.8% respectively).

6.2.9

Similar to Phase 3 findings, the higher risk of PTSD in ex-serving Regulars may be explained by several factors. 1) Those who are unwell may be more likely to leave service and enter the ex-serving group, 2) Individuals who leave service may find aspects of transition and integration into civilian life difficult which may exacerbate PTSD symptoms [25], 3) Practical and cultural support structures in service can buffer the emergence of PTSD symptoms, however when leaving service, the loss of these structures may be a factor in the development or worsening of PTSD symptoms [26], 4) Ex-serving personnel may be more open to answer survey questionnaires honestly after leaving service due to reduced stigma or reduced concerns about career impact [27], and 5) Individuals may experience delayed onset PTSD where the full impact of trauma exposure arises after leaving service [28].

6.2.10

PTSD trajectory analyses of Phase 1 to Phase 3 data in the cohort found that ex-serving personnel compared to serving personnel had higher PTSD symptom levels among the symptomatic classes, ex-serving personnel with chronic PTSD were additionally worsening over time, and more ex-serving followed worsening/chronic trajectories compared to currently serving personnel [29].

High percentage of PTSD experienced is C-PTSD

6.2.11

This is the first time C-PTSD has been measured in the cohort study. The prevalence of C-PTSD utilising the ITQ measure was 5.7%. As a percentage of the PTSD experienced in the cohort, the vast majority of PTSD experienced was complex (72.7%). Ex-serving Regular personnel

were more likely to report C-PTSD compared to serving personnel, but in both serving and ex-serving personnel, C-PTSD was associated with deployment in a combat role to Op TELIC or Op HERRICK. For those who deployed in combat roles, C-PTSD rose to 7.1% in serving personnel and 13.9% in ex-serving personnel.

6.2.12

In general population samples in the US and Germany, C-PTSD was found to be a smaller percentage of PTSD. A 2010 US study including a representative US community panel sample reported C-PTSD at 0.6% out of an overall PTSD rate of 2.4%. A nationwide representative German sample in 2016 found C-PTSD at 0.5% out of an overall PTSD rate of 2.0%. Hence C-PTSD as a percentage of PTSD was approximately 25.0% in both studies [30, 31].



Defence Imagery: Photographer - Harland Quarrington, 2011

6.2.13

Broadly there is growing evidence in trauma-exposed or treatment seeking samples, that the prevalence of C-PTSD within PTSD as a diagnosis is high. For example, in a trauma exposed sample of Northern Ireland veterans, C-PTSD was estimated at 23.3% which as a percentage of the PTSD experienced was 80.1%. In a UK veteran treatment seeking sample, 56.7% of the sample reported C-PTSD which as a percentage of PTSD was 80.2% [32]. In a trauma exposed UK general population sample, the prevalence of C-PTSD was 12.9% which as a percentage of the PTSD in the sample was 70.9% [33].

6.2.14

Our cohort study is a community-based sample (not selected on the basis of trauma/treatment seeking) and may suggest higher rates of C-PTSD and a higher percentage of PTSD that is C-PTSD compared to general population studies.

6.2.15

Whilst we would expect trauma-exposed or treatment seeking samples to have a higher prevalence of C-PTSD compared to the cohort study due to the basis of their sample selection, our cohort study percentage of PTSD that is C-PTSD is more akin to these trauma-exposed/treatment seeking samples.

6.2.16

Research in veteran samples also demonstrates that those experiencing C-PTSD have more complex treatment profiles and will need increased support compared to those with PTSD. Veterans with C-PTSD take longer to seek help, have a greater burden of comorbid mental health conditions, and greater degrees of impairment in social isolation [34, 35].

Rates of Common Mental Disorders

6.2.17

For the whole sample, rates of CMD have risen from 21.9% in Phase 3 [3] to 27.8% in Phase 4. Overall, rates of CMD were similar in serving and ex-serving personnel and hence the rates have therefore risen to a similar extent in both groups since Phase 3. This rate is slightly higher compared to levels of CMD reported in the Veterans-CHECK study of 26.1% in 2020 that assessed the impact of the pandemic on the ex-serving (veteran) community [36].

6.2.18

Rates of CMD however were not uniform and were higher in female ex-serving Regular personnel. The higher rates in female personnel reflect findings in our previous work [37, 38] and in general population literature that females report higher levels of CMD compared to males [4].

6.2.19

This rise in mental health problems may in part reflect a broader rising trend of those in-service accessing MoD services for mental health conditions over the last 11 years [39].

6.2.20

When interrogating whether this rise in CMD reflects general UK population trends; Zhang, Gagné [40] found a rising trend in mental health problems (1991-2019) in the general population pre-COVID-19 which may also be reflected in the cohort sample.

6.2.21

Two UK studies utilising five UK general population cohort studies, found that there were significant rises in psychological distress/CMD up to the end of 2020 (reaching approximately 29.0%), however, these rises reduced in some cohort studies back to expected levels by the end of 2021 (reducing to approximately 21.0%) [41, 42]. Taxiarchi, Senior

[41] concluded that despite periods of distress in the pandemic there were not enduring effects on mental health outcomes in the UK.

6.2.22

It is difficult to make direct comparisons to the general population without an age and sex matched sample, however, the cohort study trend of sustained rises in CMD may not match recent UK population trends in psychological distress which has declined post-pandemic. These comparisons need further investigation to extrapolate more robust conclusions.

High levels of alcohol misuse

6.2.23

Serving and ex-serving Regular personnel reported similar levels of alcohol misuse (8.7% v 7.6%).

6.2.24

Whilst there has been a relative decline in alcohol misuse over the four phases of the cohort, the reduction between Phase 3 and Phase 4 is a statistically non-significant reduction, and therefore the previous declines in alcohol misuse have levelled off with alcohol misuse remaining high but fairly stable. The reduction in alcohol misuse seen in ex-serving personnel during the pandemic (2020) [36], a reduction to 3.7%, has not been sustained in the years since the Veterans-CHECK study.

6.2.25

In the whole sample, male serving and ex-serving personnel were statistically significantly more likely to report alcohol misuse compared to female serving and ex-serving personnel (8.7% v 5.0%) which replicates previous findings [3, 37].

6.2.26

The general decline in alcohol misuse is positive and reflects more recent UK population trends of high-risk drinkers reducing their alcohol

consumption [43, 44]. However, using an AUDIT cut-off of 16 or more (alcohol misuse characterised as harmful or dependent drinking), male serving and ex-serving personnel in the cohort were still drinking at twice the level of the UK male general population (8.7% v 4.4%). Female serving and ex-serving personnel were drinking at over two times the rate in the UK female general population (5.0% v 1.8%) [4]. These UK general population figures are from the APMS in 2014 and hence the rates of alcohol misuse might also be lower in the general population since these data were collected, making these differences wider.

6.2.27

The persistence of alcohol misuse in the cohort may continue to reflect the stability of drinking trajectories found in the first three phases of the cohort where 68% of the cohort remained drinking at hazardous or harmful levels consistently over 12-years. In the cohort data, there was only one group of severe drinkers that reduced their alcohol use from severe to hazardous levels over the 12-year period, again possibly reflecting some of the reduction we see in Phase 4 [45].

6.2.28

In post hoc analyses (data not reported in tables), in serving Regular personnel, there was not a difference in alcohol misuse by age. However, amongst ex-serving Regular personnel there was a significant association of alcohol misuse and age, such that alcohol misuse was higher in younger groups compared to older. For example, those in the 25-39 age group reported 13.0% alcohol misuse compared to 55-59 age group of 6.1% and 60 and over age group of 4.3%.

6.2.29

Further analyses will need to be conducted to understand more in-depth age related, socio-demographic, risk factors, comorbidities, and trajectories of alcohol misuse.

Comparisons with Allied countries' Armed Forces

6.2.30

Broadly other international Allied countries find increases in mental health problems over time within their cohorts that have served in the conflicts of Iraq and Afghanistan and find higher rates of mental health problems particularly in ex-serving personnel.

6.2.31

For example, a US Millennium Cohort study assessed PTSD trajectories and found higher estimated PTSD symptoms in veterans compared to serving personnel in all PTSD trajectory classes. The study found large increases in PTSD after individuals had left service. The study also found a higher proportion of veterans in the delayed-onset PTSD class, which may provide support for the argument of delayed onset of PTSD in some ex-serving personnel [46].

6.2.32

Studies of the ADF find similarly higher levels of mental health problems in veterans compared to current ADF. For example, the estimated prevalence of previous 12-month PTSD levels was 8.3% in current ADF [47] and 17.7% in transitioned ADF [48]. Transitioned ADF were also twice as likely to experience psychological distress and high impaired functioning compared to current ADF [49].

6.2.33

A representative cohort study of Canadian Regular serving personnel and veterans found consistent rises in mental health problems from 2002 to 2018 which aligns with the trend found in our study. Similar to Phase 4 of the cohort study, the proportion of ex-serving personnel in the Canadian study increased to 65.5% by the second time point in 2018 (from a base of a nationally representative sample of active-duty Regular Armed Forces in 2002). In the Canadian sample, the past year

prevalence of mood or anxiety disorders rose from 7.6% to 19.5% and PTSD rose from 2.2% to 9.9% [50].

Ex-serving Regulars - other factors affecting mental health outcomes

6.2.34

This study provides further evidence that those who leave service by medical discharge experience worse mental health outcomes compared to those who leave service in a planned manner. To some extent this finding makes logical sense, in that those who have a mental health problem may be more likely to leave service by medical discharge. Those who leave service by medical discharge are an at risk group who have a higher risk of suicide [51] and a higher risk of unemployment and financial hardship [52]. They are therefore a group to continue to support through their transition to civilian life (and beyond).

6.2.35

The percentage reporting unpaid caring responsibilities was slightly higher in the cohort study (13.9%) compared to levels reported in the England and Wales Census 2021 that compared veterans and non-veterans (11.6% v 10.6% respectively) [53]. Broadly in the 2021 Census, older age groups have higher levels of unpaid caring responsibilities. For example, veterans and non-veterans in the age group 50-54 years in the Census, report 12.7% and 12.5% with unpaid caring responsibilities. Our cohort has an average age of 51 years old and hence these levels of unpaid caring may be similar.

6.2.36

Nonetheless those who had caring responsibilities were more likely to report CMD, probable PTSD and C-PTSD. It is not possible to say whether an individual's caring responsibilities have caused or worsened participants' health, however it is widely documented in the academic literature that those with caring responsibilities experience increased levels of depression, stress, and reduced levels of

wellbeing compared to those without unpaid caring responsibilities [54]. Research has also identified that opportunities given to carers to participate in social activities can be protective against poor mental health outcomes and should be a key point of intervention [55].

6.2.37

Loneliness was associated with all mental health outcomes and alcohol misuse. This finding reflects previous research where loneliness was associated with alcohol misuse in treatment seeking ex-serving personnel [56]. We do not know the direction of causation in our study, however academic literature suggests a bidirectional relationship where loneliness can be a risk factor for CMD and CMD a risk factor for loneliness [57]. Loneliness in general population research is associated with increased all-cause mortality, poorer mental health outcomes [58], and has been identified by the UK Government, World Health Organization and US Surgeon General as a distinct and growing public health concern [59].

6.2.38

Whilst it is difficult to assess whether the prevalence of loneliness is higher in Armed Forces populations compared to the general population, there are certain risk factors that may increase the risk of loneliness in serving and ex-serving personnel. These include: service life/mobility, military identity and cultures impacting integration, transition from service fracturing social networks, increased risk of mental and physical health conditions in some groups, and barriers to seeking help [60].

6.2.39

This issue of loneliness also combines with the finding that a large proportion of the cohort reported poor social support (40.6%), and poor social support was associated with CMD, probable PTSD and C-PTSD. Poor social support or social engagement in previous Armed Forces research is well documented to be associated with poor mental

health outcomes [25] and barriers to help-seeking [61]. Whilst we cannot state the direction of causation in our study, the need to encourage social participation and alleviate loneliness in the Armed Forces community will be important for future health and wellbeing outcomes.

6.2.40

Employment levels for ex-serving Regular personnel were high at 82.4%. When assessing mental health as a risk factor for employment outcomes those who were retired or economically inactive were more likely to report CMD, PTSD and C-PTSD. It may be that individuals have chosen to retire or are economically inactive (not in paid employment whether by choice or not) because of their CMD or PTSD health condition. Further in-depth analyses will be needed to understand socio-economic outcomes in the cohort.

6.3 Strengths and Limitations

6.3.1

The study strengths include recruitment from a population where underlying characteristics are known, providing longitudinal data on health and wellbeing, and the use of harmonised and validated measures for mental health and wellbeing outcomes. Additional study strengths include a good response rate (54.6%), and new psychological measures and topics added into Phase 4 to keep the study relevant to cohort experiences.

6.3.2

Study limitations include recruitment from a specific era cohort that served during the Iraq and Afghanistan conflicts; hence the study may not reflect experiences of older era cohorts or more recent recruits in the UK Armed Forces. Whilst the study has experienced high levels of response rates over this and previous cohort phases (44–59% [1-3]), and has consistently applied response and sample weights to mitigate bias, the study has limitations by loss to follow-up.



Defence Imagery: Photographer - Jamie Hart, 2020

Summary & Recommendations

7.1. Summary

7.1.1

It remains the case that the majority of those who served during the era of the Iraq and Afghanistan conflicts do not report adverse mental health outcomes or alcohol misuse.

7.1.2

There is however a substantial minority who do experience mental health problems and/or alcohol misuse. Of those who do report mental health problems, CMD remains the most prevalent condition. Probable PTSD has now become the second most prevalent condition (previously the third most prevalent in Phase 3) followed by alcohol misuse. The vast majority of the PTSD experienced met the criteria for C-PTSD.

7.1.3

The rates of those reporting CMD and probable PTSD both in-service and after leaving service have risen since the last phase of the cohort in 2014-2016.

7.1.4

Attention should continue to focus on the needs of the Iraq and Afghanistan era group, who for a substantial minority, continue to experience in part the effects of deployment and combat on their health.

7.1.5

Previous declines in alcohol misuse have levelled off with alcohol misuse remaining high but fairly stable. The rates of alcohol misuse remain higher in the cohort compared to general population levels of alcohol misuse.

7.1.6

It is important to acknowledge that other stressors may also impact ex-serving Regular personnel's health and wellbeing, as shown in our analysis that explored the impact of transition experiences, caring responsibilities, loneliness and social support. Additionally ex-serving Regulars' mental health may impact employment outcomes. Some of these stressors are not however unique to ex-serving personnel and can also be experienced by serving personnel and civilians.

Recommendations

Recommendation	Evidence	Where	Recommendation relevance	Potential benefits
1. Reiterate the new Phase 4 evidence alongside previous cohort phases that the majority of serving and ex-serving personnel do not report adverse mental health outcomes or alcohol misuse.	For the whole sample, 66.9% of participants did not report any of the adverse mental health or alcohol misuse outcomes.	p. 26	<p>Policy</p> <ul style="list-style-type: none"> - UK Government - MoD - OVA <p>Practice</p> <ul style="list-style-type: none"> - Employers <p>Research</p> <ul style="list-style-type: none"> - Research funders - Universities - Armed Forces charities 	<ul style="list-style-type: none"> - Bust myths and negative stereotypes such as the idea that serving and ex-serving personnel are 'mad, bad or sad'. - Improve public and employer perceptions of service and ex-service personnel. - May encourage recruitment into Armed Forces. - Highlights need to also focus research on positive aspects of service and experiences.
2. Provide continued investment in mental health services for both serving and ex-serving personnel.	The rate of CMD was 27.8% and 9.4% for probable PTSD with both of these rates rising since Phase 3. 10.7% of the cohort reported experiencing comorbid mental health and/or alcohol misuse outcomes.	p. 26, 27, 31	<p>Policy</p> <ul style="list-style-type: none"> - UK Government - MoD - OVA - NHS - Devolved nations - Armed Forces charities <p>Practice</p> <ul style="list-style-type: none"> - NHS services - Armed Forces charities 	<ul style="list-style-type: none"> - Ensure sustained provision of mental health treatment to support the health and wellbeing of both serving and ex-serving personnel. - Meet demand of increased numbers of Iraq/Afghanistan service generation who will access mental health services for help. - Support resilience within the Armed Forces community and increase retention. - Fulfil intentions in the Armed Forces Covenant to address disadvantage in mental health outcomes.

Recommendation	Evidence	Where	Recommendation relevance	Potential benefits
<p>3. Review as to the current provision of treatment and care for C-PTSD, and investment in research to understand best treatment and support approaches for C-PTSD.</p>	<p>The majority of those who reported probable PTSD met the criteria for C-PTSD (72.7%). C-PTSD is therefore the more prevalent presentation of this condition than PTSD only in this cohort.</p>	<p>p. 26, 27</p>	<p>Policy</p> <ul style="list-style-type: none"> - UK Government - OVA - NHS - Devolved nations - Armed Forces charities <p>Practice</p> <ul style="list-style-type: none"> - NHS services - Healthcare practitioners - Armed Forces charities <p>Research</p> <ul style="list-style-type: none"> - Research funders - Universities 	<ul style="list-style-type: none"> - Help identify current provision for C-PTSD treatment and assess whether this capacity is adequate. - Help identify/research most effective interventions for treating C-PTSD, ensuring efficient use of resources. - Upskill healthcare practitioners to deliver the most effective C-PTSD treatment. - Upskill broader healthcare professionals and welfare providers to understand C-PTSD and accompanying holistic needs. - Direct research funding and attention to area of need.
<p>4. Need to review current policy and treatment services available for alcohol misuse.</p>	<p>The rate for alcohol misuse was 8.4%. Using AUDIT cut-off of 16 or more (alcohol misuse characterised as harmful or dependent drinking), both male and female serving and ex-serving personnel were drinking at two to three times higher rates than the general population.</p>	<p>p. 26, 42</p>	<p>Policy</p> <ul style="list-style-type: none"> - UK Government - MoD - OVA - NHS - Devolved nations <p>Practice</p> <ul style="list-style-type: none"> - NHS services - Armed Forces charities - Broader voluntary sector providing alcohol treatment services - Armed Forces charities 	<ul style="list-style-type: none"> - Help to address persistent issue of alcohol misuse in this cohort by understanding current landscape of policy and provision of alcohol treatment services. - Can assess whether provision is adequate and whether current policies promote alcohol use reduction. - Help identify if alcohol treatment services are joined up with other healthcare/welfare services for serving and ex-serving personnel. - Help prevent the development of diseases associated with alcohol misuse (e.g. liver disease).

Recommendation	Evidence	Where	Recommendation relevance	Potential benefits
<p>5. Must support and conduct further in-depth analyses on loneliness, socio-economic outcomes and other Phase 4 data topics not examined in this report.</p>	<p>In ex-serving Regular personnel, a third of the sample reported feelings of loneliness. Those who reported feelings of loneliness were more likely to report CMD, probable PTSD, C-PTSD, and alcohol misuse, compared to those who did not report feelings of loneliness. Those who were retired and economically inactive were more likely to report CMD, PTSD and C-PTSD compared to those who were employed.</p>	<p>p. 35, 37</p>	<p>Research</p> <ul style="list-style-type: none"> - Research funders such as MoD, OVA, Forces in Mind Trust, Research Councils and Armed Forces charities 	<ul style="list-style-type: none"> - Provide evidence to inform policies aimed at supporting serving and ex-serving personnel in terms of loneliness and employment trajectories post-service. - Provide evidence to inform policy and practice on further topics in Phase 4 (detailed in Future Directions section) - Help identify specific challenges faced by serving and ex-serving personnel and fulfil the Armed Forces Covenant where disadvantage is identified.
<p>6. Need to continue to invest in research to understand the longitudinal health outcomes of UK Armed Forces personnel (serving and ex-serving).</p>	<p>CMD has risen in Phase 4 from a prevalence of 20%-22% to 28%. Probable PTSD has seen a rise over Phases 1 - 4 from 4%-6% to approximately 10% (using the PCL-C measure), and alcohol misuse has seen a decline from 15% - 10% to 8% currently.</p>	<p>p. 31</p>	<p>Policy</p> <ul style="list-style-type: none"> - UK Government - MoD - OVA - Research Funders <p>Research</p> <ul style="list-style-type: none"> - Research Funders such as MoD, OVA, Forces in Mind Trust, Research Councils, Armed Forces charities - Universities 	<ul style="list-style-type: none"> - Allow for the long-term assessment of the impact of service on both serving and ex-serving personnel. - Help identify which groups within the community may be at higher risk of mental health problems. - Provide updated evidence ensuring that policies and services evolve to meet the changing needs of this specific cohort. - Ensure that different cohorts of Armed Forces generations have research that provides robust evidence on their experiences, health and wellbeing to inform policy and practice.

Future Directions

8.1 Further Data and Topics in Phase 4

8.1.1

Further data collected in Phase 4 of the Health and Wellbeing Cohort study aims to address a wider range of outcomes relevant to UK serving and ex-serving personnel including (topics are not an exhaustive list):

- ♦ Post-service mental health, lifestyle behaviours, social support, and social exclusion.
- ♦ The predictors and associations of separation from service for both Regulars and Reservists.
- ♦ The prevalence of help-seeking for physical, mental health and alcohol problems and types of healthcare sources used.
- ♦ The prevalence and factors associated with problem gambling.
- ♦ The prevalence and factors associated with illicit drug use.
- ♦ Marital/relationship satisfaction and the effect of military service on relationships and children.
- ♦ The long-term health and social impact of alcohol misuse.
- ♦ The prevalence and factors associated with self-harm and suicidal ideation before, during and after service.
- ♦ The prevalence and factors associated with mild traumatic brain injury (mTBI) and post-concussion symptoms.
- ♦ The prevalence and factors associated with anger, aggressive behaviour, and interpersonal violence.
- ♦ The prevalence and factors associated with mild cognitive decline.
- ♦ The health and wellbeing of LGBTQ + serving and ex-serving personnel.
- ♦ The prevalence and factors associated with loneliness.
- ♦ The impact of the British withdrawal from the NATO mission in Afghanistan on the health and wellbeing of service and ex-serving personnel.

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Appendix

10.1 Data Collection Procedures

10.1.1

Data were collected via online or paper questionnaire. The online questionnaire was accessed through Qualtrics software and took approximately 40-45 minutes to complete. Participants invited to take part provided contact details during previous phases of the study. The MoD provided updated contact details for participants who were in-service at the time of Phase 3. This data sharing was carried out under a data usage agreement between the MoD and KCMHR which adhered to relevant data protection legislation.

10.1.2

Data collection was carried out between January 2022 and September 2023.

10.1.3

In the first instance, participants who provided a personal email address at a previous phase were invited to take part in the online survey by email. The email invite emphasised that participation was voluntary, confidential, and included a personalised questionnaire link, a link to the Participant Information Sheet and a link to the study website. Where we did not hold a personal email address, participants were invited to take part by post. An initial invite letter was sent detailing how to take part in the study online. Where email or postal addresses were found to be invalid, we sent invitations to alternative contact details that we held, and we also sent a text message where possible to participants to invite them to take part and provide details of how to find out more about the study.

10.1.4

We sent up to two reminders to those who had not completed the survey and had not refused participation. For those who had been contacted

by email, a first reminder was sent approximately two weeks after the initial invitation, and a second reminder approximately two weeks later. For those who had been invited to take part by post, we sent a postal pack including a personal link to take part in the online survey and a paper questionnaire, a reply-paid return envelope and a Participant Information Sheet. This was mailed to either the most recent address held on our database, or any updated addresses provided by the MoD.

10.1.5

Following the reminder invitations, we used several methods to follow-up and trace non-responders. We attempted to contact non-responders by telephone to check whether participants had received the study invitation and to answer any queries they may have had about the study. Those who wished to take part were sent a new invitation by email, text, or post as preferred. If we were unable to reach participants by telephone or telephone numbers are no longer valid, we checked Directory Enquiries for updated numbers.

10.1.6

Approximately one month before the end of data collection, all non-responders were sent a 'final chance' email, text or letter detailing that the study data collection would close and described how they could take part in the survey online or request a paper questionnaire.

10.1.7

Information about the study was shared on the KCMHR website (kcmhr.org) through blogs, through social media posts in the KCMHR Twitter (now X) profile and through Armed Forces stakeholders' newsletters and websites. Newsletters were shared with the cohort members during data collection, informing participants of progress providing further information about the study.

10.2 Supplementary Tables

**Supplementary Table 1: Characteristics of responders and non-responders contacted at Phase 4
Number attempted to contact n=7520**

	Number (%) not responding n=3416	Number (%) responding n=4104	Adjusted* OR of responding (95% CI)
Sex (at baseline)			
Male	3024 (46.1)	3531 (53.9)	1.0
Female	392 (40.6)	573 (59.4)	1.4 (1.2-1.6)
Age band (yrs) (at completion of Phase 4)			
<35	624 (67.2)	305 (32.8)	0.7 (0.5-0.8)
35-39	602 (57.2)	450 (42.8)	0.8 (0.7-0.9)
40-49	1134 (48.0)	1228 (52.0)	1.0
50-59	786 (35.5)	1430 (64.5)	1.6 (1.4-1.8)
60 and over	270 (28.1)	691 (71.9)	1.9 (1.6-2.3)
Enlistment status (at baseline)			
Regular	2853 (47.0)	3223 (53.0)	1.0
Reserve	563 (39.0)	881 (61.0)	1.2 (1.1-1.4)
Rank (at Phase 4)			
Officer	750 (35.9)	1337 (64.1)	1.4 (1.2-1.5)
NCO	2025 (46.8)	2304 (53.2)	1.0
Other rank	641 (58.1)	463 (41.9)	0.9 (0.8-1.1)
Service Branch (at baseline)			
Naval services	523 (43.4)	682 (56.6)	1.1 (1.0-1.3)
Army	2247 (47.2)	2517 (52.8)	1.0
RAF	646 (41.7)	905 (58.4)	1.2 (1.0-1.3)
Serving status (at Phase 3)			
Serving	1976 (51.1)	1889 (48.9)	1.0
Ex-serving	1440 (39.4)	2215 (60.6)	1.2 (1.0-1.3)
Sample			
Phase 2 follow up	1889 (39.5)	2893 (60.5)	1.0
Phase 2 HERRICK & Phase 2 replenishment	707 (47.6)	777 (52.4)	1.0 (0.9-1.2)
Phase 3 replenishment	820 (65.4)	434 (34.6)	0.7 (0.6-0.9)
Deployment to Iraq and/or Afghanistan (at Phase 3)			
Not deployed	1093 (46.2)	1270 (53.8)	1.0
Deployed	2312 (45.0)	2827 (55.0)	1.0 (0.9-1.2)
Role during last deployment (at Phase 3 to Op TELIC or Op HERRICK)			
Combat	782 (49.2)	807 (50.8)	0.9 (0.8-1.1)
Combat (service) support	1531 (43.1)	2020 (56.9)	1.0
Phase 3 health for Phase 4 follow up sample			
Symptoms of Common Mental Disorders	698 (21.0)	900 (22.3)	1.2 (1.1-1.3)
Probable PTSD (PCL-5)	189 (5.7)	204 (5.1)	1.0 (0.8-1.2)
Alcohol misuse	349 (10.55)	339 (8.41)	0.9 (0.7-1.0)

Abbreviations: NCO, Non-Commissioned Officer; RAF, Royal Air Force; OR, Odds Ratio; CI, Confidence Interval; PTSD, Post-Traumatic Stress Disorder.;

P-value based on Chi squared test. Numbers and frequencies are unweighted.

*adjusted for sex, age, enlistment status, rank, service, serving status and sample.

Alcohol misuse defined as scoring 16 or more for the Alcohol Use Disorders Identification Test (AUDIT) (usually defined as hazardous use that is also harmful for health).

Supplementary Table 2: Prevalence of mental health outcomes by socio-demographic, military factors, and deployment history (Whole sample)

	Common Mental Disorders n=1051/4037 (27.4%)		Probable PTSD (PCL-5) n=513/4016 (9.4%)		Complex PTSD n=191/4005 (5.7%)		Alcohol misuse n=306/3969 (8.4%)	
	n (%)*	P value	n (%)*	P value	n (%)*	P value	n (%)*	P value
Sex (at baseline)								
Male	888 (27.3)	0.05	272 (9.4)	0.88	166 (5.7)	0.89	283 (8.7)	<0.05
Female	163 (32.3)		41 (9.2)		25 (5.9)		23 (5.0)	
Age group (years) (at completion of Phase 4)		<0.0001		<0.0001		<0.01		<0.01
25-39	220 (34.4)		74 (11.9)		41 (6.6)		66 (10.7)	
40-44	196 (35.4)		60 (13.8)		42 (9.0)		51 (10.1)	
45-49	160 (27.8)		47 (9.6)		30 (6.0)		48 (8.3)	
50-54	204 (28.2)		63 (9.5)		31 (5.3)		59 (9.0)	
55-59	147 (20.7)		40 (5.3)		30 (3.9)		43 (5.9)	
60-64	62 (16.2)		18 (5.3)		14 (4.6)		28 (5.5)	
65 and over	62 (15.8)		11 (3.4)		3 (0.5)		11 (3.7)	
Education level (at Phase 4)		0.06		0.06		<0.01		0.22
No qual or other qual or O level/GCSE	196 (28.5)		82 (12.1)		57 (8.7)		70 (10.3)	
A level	224 (31.4)		60 (9.8)		38 (5.9)		60 (8.3)	
Degree	621(26.1)		169 (8.3)		96 (4.6)		174 (7.7)	
Marital status (at Phase 4)		<0.0001		<0.0001		<0.0001		0.40
Relationship	842 (26.3)		231 (8.0)		134 (4.5)		258 (8.2)	
Single or Ex-relationship	206 (36.5)		82 (17.1)		57 (12.4)		48 (9.5)	
Service Branch (at baseline)		0.38		<0.01		<0.001		0.08
Naval Services	155 (25.3)		40 (6.8)		19 (2.9)		49 (8.5)	
Army	649 (28.2)		223 (11.0)		142 (7.0)		202 (9.1)	
RAF	247 (29.0)		50 (6.6)		30 (4.1)		55 (6.0)	

Supplementary Table 2: Continued

	Common Mental Disorders n=1051/4037 (27.4%)		Probable PTSD (PCL-5) n=513/4016 (9.4%)		Complex PTSD n=191/4005 (5.7%)		Alcohol misuse n=306/3969 (8.4%)	
	n (%)*	P value	n (%)*	P value	n (%)*	P value	n (%)*	P value
Rank (at Phase 4)								
Officer	296 (20.8)	<0.0001	58 (4.8)	<0.0001	33 (2.5)	<0.0001	91 (7.1)	0.43
NCO	629 (27.7)		207 (9.7)		127 (6.1)		191 (8.8)	
Other rank	126 (42.6)		48 (16.9)		31 (9.9)		24 (8.4)	
Enlistment status (at baseline)		0.73		<0.01		<0.05		0.63
Regular	829 (27.9)		260 (9.8)		158 (5.9)		248 (8.4)	
Reserve	222 (27.1)		53 (6.2)		33 (3.8)		58 (7.7)	
Serving status (at Phase 4)		0.87		0.03		<0.05		0.36
Serving	306 (27.6)		69 (7.2)		37 (3.8)		75 (7.5)	
Discharged	745 (27.9)		244 (10.1)		154 (6.3)		231 (8.6)	
Deployed theatre (at Phase 3)		0.04		<0.01		<0.001		<0.05
Not deployed Iraq and/or Afghanistan	296 (25.4)		76 (7.1)		40 (3.5)		75 (6.5)	
Deployed to Iraq and/or Afghanistan	752 (29.3)		236 (10.8)		150 (7.0)		228 (9.4)	
Deployed role (at Phase 3, last deployment to Op TELIC or Op HERRICK)		0.03		<0.0001		<0.0001		0.28
Combat	213 (33.9)		95 (16.8)		66 (12.1)		68 (10.5)	
Combat support	90 (29.5)		25 (10.6)		12 (4.5)		31 (11.6)	
Combat service support	448 (26.9)		115 (7.8)		71 (5.0)		129 (8.4)	

* Percentages are weighted
Abbreviations: NCO, Non-Commissioned Officer; RAF, Royal Air Force; OR, Odds Ratio; CI, Confidence Interval; PTSD, Post-Traumatic Stress Disorder;

Supplementary Table 3: Prevalence of mental health outcomes in ex-serving Regular personnel by socio-demographic, military factors, and deployment history

	Common Mental Disorders n=578/2267 (27.9%)		Probable PTSD (PCL-5) n=202/2258 (10.5%)		Complex PTSD n=127/2255 (6.5%)		Alcohol misuse n=184/2237 (8.7%)	
	n (%)*	P value	n (%)*	P value	n (%)*	P value	n (%)*	P value
Sex (at baseline)								
Male	499 (27.2)	0.0190	177 (10.4)	0.7061	114 (6.5)	0.9695	172 (9.0)	0.0660
Female	79 (35.5)		25 (11.4)		13 (6.6)		12 (5.0)	
Age group (years) (at completion of Phase 4)		<0.0001		<0.0001		0.0011		0.0089
25-39	104 (37.6)		46 (15.7)		27 (9.3)		36 (13.0)	
40-44	94 (35.2)		39 (16.9)		28 (11.1)		30 (10.0)	
45-49	87 (29.4)		30 (10.4)		18 (6.5)		31 (8.9)	
50-54	126 (28.5)		43 (10.2)		23 (5.9)		38 (9.3)	
55-59	94 (21.0)		28 (5.9)		22 (4.5)		29 (6.1)	
60-64	40 (17.0)		10 (5.2)		8 (4.7)		14 (4.8)	
65 and over	33 (14.5)		6 (3.4)		1 (0.2)		6 (3.7)	
Education level (at Phase 4)		0.0752		0.1559		0.0138		0.2379
No qual or other qual or O level/GCSE	121 (29.9)		54 (13.3)		39 (9.8)		46 (11.0)	
A level	142 (31.7)		42 (11.1)		30 (7.0)		39 (8.6)	
Degree	313 (25.6)		106 (9.3)		58 (5.1)		98 (7.8)	
Marital status (at Phase 4)		<0.0001		<0.0001		<0.0001		0.8004
Relationship	465 (26.0)		145 (8.7)		88 (5.1)		156 (8.6)	
Single or Ex-relationship	111 (39.6)		57 (21.6)		39 (15.1)		28 (9.1)	
Service Branch (at baseline)		0.6559		0.0108		0.0041		0.1161
Naval Services	97 (25.9)		32 (8.3)		16 (3.7)		32 (8.1)	
Army	330 (28.6)		137 (12.4)		91 (8.1)		115 (9.7)	
RAF	151 (27.9)		33 (7.2)		20 (4.5)		37 (6.2)	

Supplementary Table 3: Continued

	Common Mental Disorders n=1051/4037 (27.4%)		Probable PTSD (PCL-5) n=313/4016 (9.4%)		Complex PTSD n=191/4005 (5.7%)		Alcohol misuse n=306/3969 (8.4%)	
	n (%)*	P value	n (%)*	P value	n (%)*	P value	n (%)*	P value
Rank (at Phase 4)								
Officer	131 (19.2)	<0.0001	31 (4.7)	<0.0001	15 (2.3)	<0.0001	49 (6.9)	0.4339
NCO	361 (27.1)		135 (10.5)		89 (6.9)		120 (9.3)	
Other rank	86 (44.2)		36 (18.7)		23 (10.9)		15 (8.0)	
Deployed theatre (at Phase 3)		0.0079		0.0024		<0.001		0.0043
Not deployed Iraq and/or Afghanistan	171 (24.2)		53 (7.6)		27 (3.7)		43 (6.1)	
Deployed to Iraq and/or Afghanistan	406 (30.5)		149 (12.6)		100 (8.6)		139 (10.4)	
Deployed role (at Phase 3, last deployment to Op TELIC or Op HERRICK)								
Combat	117 (36.0)	0.0538	60 (18.6)	0.0017	45 (14.3)	<0.001	42 (11.2)	0.1355
Combat support	55 (31.5)		19 (14.1)		9 (5.8)		24 (15.1)	
Combat service support	234 (27.5)		70 (9.1)		46 (6.2)		73 (8.9)	

* Percentages are weighted
Abbreviations: NCO, Non-Commissioned Officer; RAF, Royal Air Force; OR, Odds Ratio; CI, Confidence Interval; PTSD, Post Traumatic Stress Disorder.

