TRANSITION AND WELLBEING RESEARCH PROGRAMME

Transition and Wellbeing Research Programme Key Findings Report

2019

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1 Key findings from the Programme

The Transition and Wellbeing Research Programme is the most comprehensive study undertaken in Australia to examine the impact of military service on the mental, physical and social health of serving and ex-serving Australian Defence Force (ADF) members and their families. This report is the final of eight reports and two papers that comprise the Transition and Wellbeing Research Programme (the Programme). The report summarises and consolidates the overall key findings from each of the three interrelated studies that make up the Programme: the Mental Health and Wellbeing Transition Study, the Impact of Combat Study and the Family Wellbeing Study. Chapter 2 of this report provides a summary of the methodology, describing each of the study cohorts and how this research programme is related to the Military Health Outcomes Program conducted in 2010. Chapter 3 presents a snapshot of the mental, physical and social health of each of the six study cohorts, and Chapter 4 discusses the nine key research themes to emerge from the Programme. The final chapter discusses the implications of these findings for both policy and service provision within the Department of Veterans' Affairs and the Department of Defence.

This Programme of research is the first in Australia to establish the prevalence and longitudinal course of mental disorder, mental and physical health symptoms, pathways to care and technology use in a representative cohort of ADF members who have recently (2010–2014) transitioned out of Regular ADF service. It is also the first study to map potential risk and protective factors associated with mental disorder, as well as the longitudinal course of mental disorder in this Transitioned ADF population, and compare the self-reported mental health and wellbeing outcomes of this population with a contemporary sample of ADF members still in regular military service in 2015, and the Australian community. Finally, it is the most comprehensive study undertaken to specifically examine the mental, physical and neurocognitive health and wellbeing of participants in the Middle East Area of Operations (MEAO) Health Study: Prospective Study (Davy et al., 2012) who deployed to the MEAO between 2010 and 2012.

The key findings presented in this report represent an overall summary of the Programme findings and should be considered in the context of prior Australian and international reports on mental health and wellbeing in both military and veteran populations. For a more detailed summary and discussion of any of the results presented in this report, we encourage you to refer the reports outlined in Table 1.1.

Table 1.1 Transition and Wellbeing Research Programme – objectives and reports

Programme objectives	Corresponding reports and papers
1. Determine the prevalence of mental disorders among ADF members who have transitioned from Regular ADF service between 2010 and 2014. 2. Examine self-reported mental health status of Transitioned ADF and the 2015 Regular ADF.	*Mental Health Prevalence Report*
3. Assess pathways to care for Transitioned ADF and the 2015 Regular ADF, including those with a probable 30-day mental disorder.	*Pathways to Care Report*
4. Examine the physical health status of Transitioned ADF and the 2015 Regular ADF.	*Physical Health Status Report*
5. Investigate technology and its utility for health and mental health programs, including implications for future health service delivery.	*Technology Use and Wellbeing Report*
6. Conduct predictive modelling of the trajectory of mental health symptoms/disorders of Transitioned ADF and the 2015 Regular ADF, removing the need to rely on estimated rates.	*Mental Health Changes Over Time: a Longitudinal Perspective Report*
7. Investigate the mental health and wellbeing of currently serving 2015 Ab-initio Reservists.	*The Health and Wellbeing of ADF Reservists Paper*
8. Examine the factors that contribute to the wellbeing of Transitioned ADF and the 2015 Regular ADF.	*Psychosocial Predictors of Health Paper*
9. Follow up on the mental, physical and neurocognitive health and wellbeing of participants who deployed to the Middle East Area of Operations between 2010 and 2012.	*Impact of Combat Report*
10. Investigate the impact of ADF service on the health and wellbeing of the families of Transitioned ADF and the 2015 Regular ADF.	*Family Wellbeing Study*
All objectives	*Transition and Wellbeing Research Programme Key Findings Report*

A summary of the key findings presented in this report are outlined below:

- There is a picture of increasing severity of both mental and physical symptoms from military service to transition out of full-time military service. This suggests that emerging psychological distress is likely to be a significant driver of an individual's decision to discharge or be medically discharged from military service, with mental ill health therefore being largely carried by those who have left Regular ADF service.
- Approximately one in two ADF members who transitioned from Regular ADF service between 2010 and 2015 experienced a 12-month ICD-10 mental disorder, which is higher than the rate reported by the Regular ADF in 2010 (one in five). Seventy-five percent of the Transitioned ADF experienced an anxiety, affective or alcohol disorder at some stage in their lifetime.
- Anxiety disorders were the most prevalent 12-month disorder category in the Transitioned ADF in 2015 (37.0%), and was the only disorder category to increase significantly between 2010 and 2015 among both those who remained in regular service and those who transitioned.
- Posttraumatic stress disorder (PTSD) was the most common 12-month anxiety disorder type, followed by panic attacks.

- Twelve-month affective disorders were reported by 23.1% of the Transitioned ADF in 2015, with rates of disorder remaining reasonably stable across 2010 and 2015, and no marked differences between those who had transitioned compared with those who remained in the Regular ADF.
- There is a potential association between military service and the development of bipolar disorder.
- There was a significantly greater severity of current self-reported symptoms of psychological distress, depression, anxiety, anger, and alcohol use in the Transitioned ADF compared with the 2015 Regular ADF.
- Similar to the mental health findings, the Transitioned ADF reported poorer physical health than the 2015 Regular ADF. This included more physical health symptoms; more service-related injuries; increased lifestyle risk factors; poorer self-perceived health, satisfaction and quality of life; and a greater risk of circulatory condition, high blood pressure, a musculoskeletal or connective tissue condition, chronic low back pain, a nervous system condition and hearing loss.
- Physical health outcomes should not be viewed in isolation; they can interact with each other and with mental health. Although this was not analysed specifically in the present Programme, the comorbidity and interrelationships of physical health and mental health are also important to recognise and consider. Although 43% of Transitioned ADF members reported no doctor-diagnosed medical conditions, 32% reported 1–2 doctor-diagnosed conditions, and a decreasing proportion of Transitioned ADF reported an increasing number of doctor-diagnosed conditions: 13% reported 3–4, 6% reported 5–6, 3% reported 7–8, and smaller proportions reported even more. This suggests a minority of Transitioned ADF reporting a high level of physical comorbidity.
- Compared with the Australian community, the Transitioned ADF reported higher levels of psychological distress and were more likely to report poorer self-perceived health. In contrast, they were less likely to be current smokers and to report doctor-diagnosed asthma.
- There are several subgroups within the transitioned population who were at greater risk of poor mental and physical health outcomes. These included early service leavers, those who had transitioned greater than one year ago, those who were medically discharged, Department of Veterans' Affairs (DVA) clients, and Ex-Serving Transitioned ADF members (in comparison to non-medically discharged, non-DVA clients, and Active or Inactive reservists).
- There is a significant aggregation of risk factors across a series of axes in relation to distress and impairment in particular; associations with insomnia and high-risk alcohol misuse exhibited more of a severity gradient across the levels of psychological distress, while the associations with resilience, physical health symptoms, and pain exhibited more of a severity gradient across the levels of functional impairment.

- The effects of deployment and combat exposure are cumulative, time dependent and emerge slowly across multiple domains over time. Specifically, the level of exposure to traumatic events while deployed accumulates over time, and it is the cumulative burden of exposure that is most important in relation to disorder emergence (in particular, PTSD and other anxiety disorders). Lifetime trauma exposure adds to this burden and risk.
- A substantial proportion of both the Transitioned ADF and Regular ADF in 2015 reported subsyndromal levels of mental health symptoms that are an indicator of risk for future progression to diagnosable disorder. These individuals should be targeted for early intervention.
- Furthermore, subtle shifts in mental health symptoms are detectable well before, and can predict the emergence of subthreshold or full disorder in ADF members. Anger, manifested as increasing reactivity to minor provocations, is likely to be one early indicator of emerging disorder; thus, anger is of great importance in the consideration of longitudinal health surveillance.
- In relation to objective neurocognitive measures, observed shifts in cortical arousal and the efficiency of working memory systems appear to predate the self-report of significant levels of psychological distress and posttraumatic stress symptoms that have emerged with time in this cohort and therefore may represent very early markers of emerging disorder/subsyndromal symptoms.
- Finally, while the rates of initial engagement and uptake of services were reasonably high in both the Transitioned and 2015 Regular ADF, there was an under-engagement with evidence-based treatment for those with a current disorder.
- The most common reason for accessing care in both the Transitioned and Regular ADF was depression and anxiety, followed by relationship problems and anger.
- Most sought help within 12 months of becoming concerned about their mental health; however, a small proportion (around 10% across both Transitioned and 2015 Regular ADF members) waited up to three years.
- The desire to 'manage myself' or 'solve my own problems' was evident in the Programme, with both Transitioned ADF and 2015 Regular ADF using technologies to support positive behaviours known to promote good mental health, such as physical activity, diet and sleep, and, importantly, using technology to connect socially. This approach is useful for self-management, but also equally important in the shared management of care with a professional.
- Most families of current serving and Ex-Serving ADF members seemed to be progressing well across many life areas with only a few exceptions, with both partners and friends being those most likely to suggest that the ADF member seek help for any mental health concerns they may have.

2 Overview of the Transition and Wellbeing Research Programme

2.1 Background

The Transition and Wellbeing Research Programme (the Programme) is the most comprehensive study undertaken in Australia to examine the impact of military service on the mental, physical and social health of:

- serving and Ex-Serving Australian Defence Force (ADF) members, including those who have been deployed in contemporary conflicts
- their families.

Built on the earlier experience of the 2010 Military Health Outcomes Program (MilHOP), this Programme of research was conducted in 2015 by a network of six of Australia's leading research institutions, led by the Centre for Traumatic Stress Studies at the University of Adelaide and the Australian Institute of Family Studies. The consortium included researchers from Phoenix Australia – Centre for Posttraumatic Mental Health, the University of New South Wales, Monash University, and the University of Sydney/InnoWell.

The strength of this network lies in the extensive combined research knowledge and content expertise of each of the individual investigators, together with their ability to work collaboratively to achieve outcomes, and to draw on expertise of relevant content specialists from within the Department of Defence (Defence) and the Department of Veterans' Affairs (DVA), ensuring the optimal usage of the data and translation of the research findings into policy, clinical interventions and service development.

The Programme is the first study in the world to combine both epidemiological and neurobiological data in order to understand the longitudinal course of mental health across the military lifespan and into the early stages of transition into civilian life.

This Programme provides valuable information on the long-term trajectory of the physical and psychological consequences of exposure to traumatic stress both within and outside the military environment. In doing so, it extends and builds on the findings of the world-leading research conducted with current serving members of the ADF in the 2010 ADF Mental Health Prevalence and Wellbeing Study (MHPWS) and the Middle

East Area of Operations (MEAO) Health Study – both components of the MilHOP. Figure 2.1 provides a schematic representation of the relationship between the two programs of research.

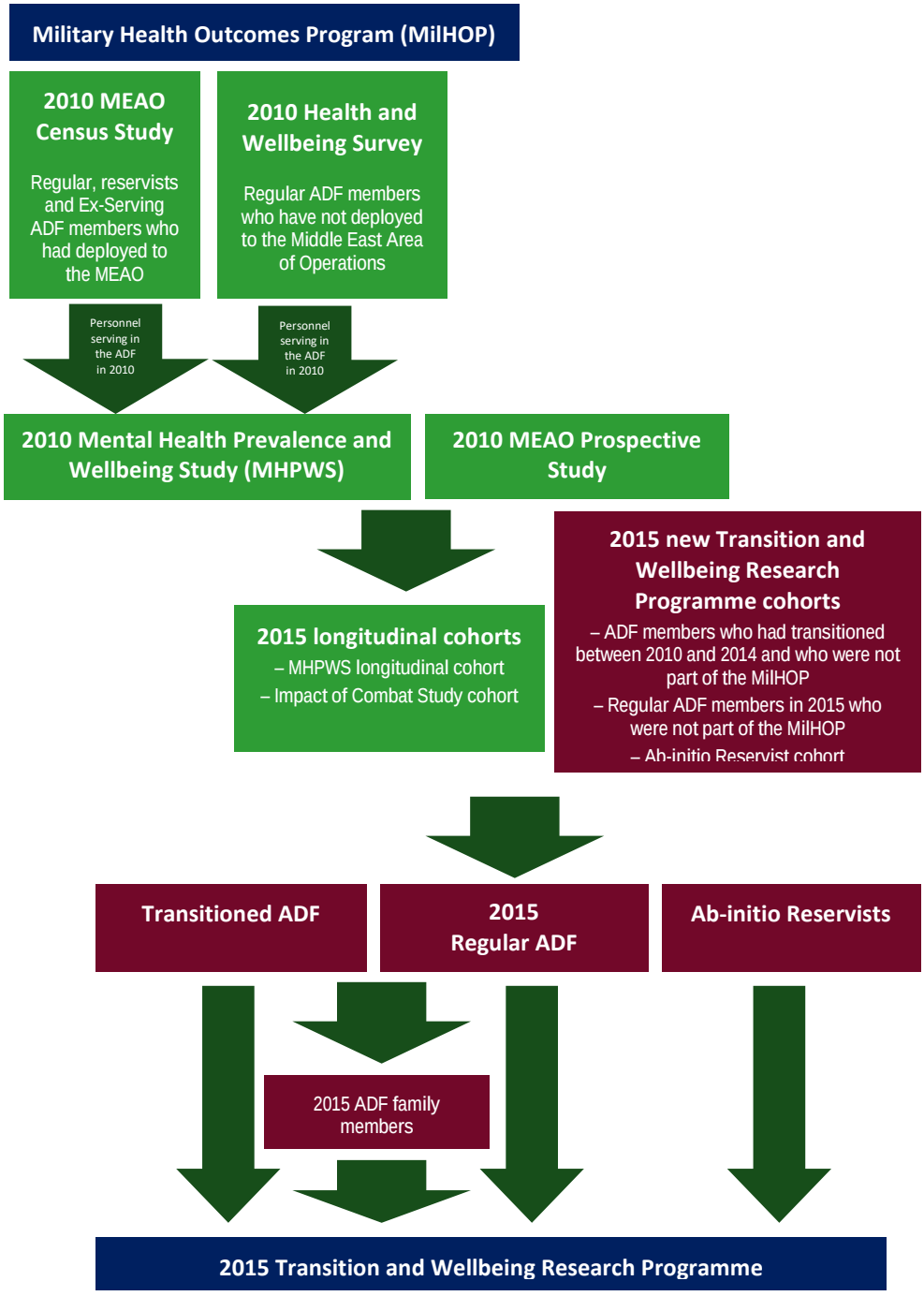
2.2 Overview of the Programme

This Programme constitutes a unique and valuable source of information about those who have recently transitioned from Regular ADF service (between 2010 and 2014), those who were still serving in the Regular (full-time) ADF in 2015, and those who have served on contemporary operations. A further unique component of this Programme is its examination of the mental and physical health of ADF Reservists, in particular Ab-initio Reservists who have never served in the Regular ADF. It is also the first Australian study to specifically examine the impact of military service (not operation specific) and transition on ADF family members (partners, parents and children), whereby data were collected on both the serving member and their nominated family members contemporaneously.

In addition to addressing the need to examine the health and wellbeing of those who have recently transitioned from Regular ADF service, this programme of research represents a critical initial step in the ongoing surveillance of ADF members across their military life course. Importantly, in addition to calculating robust prevalence estimates of mental disorder in a population of recently transitioned military personnel, this study documented the course of mental and physical health status over time in two longitudinal cohorts of ADF members recruited in 2010–2012. These cohorts comprise both those still in regular service as well as those who are in various stages of transition, allowing an examination of the course of mental and physical symptom development from pre- to post-transition. It also sets up a framework for the future prospective examination of the impact of transition on mental and physical health in the longer term.

The results from this programme of research have important implications for how both mental and physical health should be conceptualised within the military environment, particularly the importance of conducting targeted mental health assessments at pivotal touch points throughout a military member's career in order to prevent poor long-term outcomes, including during and following transition from full-time military service.

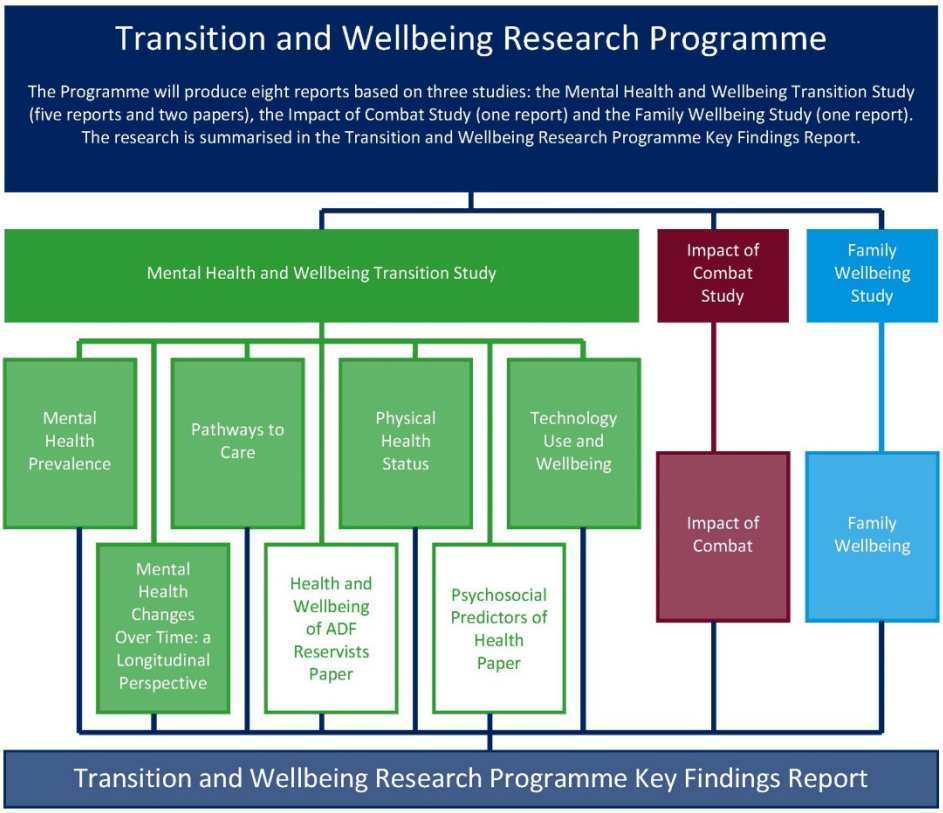
Figure 2.1 **Schematic representation of the relationship between the Military Health Outcomes Program and the Transition and Wellbeing Research Programme**



2.3 Objectives of the Programme

Ten objectives were developed to guide the Programme. The objectives have been realised through three studies comprising eight reports and two papers: the Mental Health and Wellbeing Transition Study (five reports and two papers), the Impact of Combat Study (one report), the Family Wellbeing Study (one report), and the *Transition and Wellbeing Research Programme Key Findings Report* (the current report), which summarises the research (see Figure 2.2).

Figure 2.2 Transition and Wellbeing Research Programme overview



2.4 Study cohorts

The study design comprised both a cross-sectional component and a longitudinal cohort component, with the core strength of the Programme lying in the multiple data collection techniques utilised, as well as the overlapping, but complementary, sampling strategies employed.

2.4.1 Cross-sectional cohorts

The cross-sectional component of the Programme examined four separate cohorts, including current and Ex-Serving ADF members in 2015 and their families. This component of the Programme allowed a cross-sectional and representative examination of the mental, physical and social health of both the Transitioned ADF members and current serving Regular ADF members in 2015, as well as a detailed examination of the mental, physical and social health of a sample of ADF reservists who have never been a regular serving ADF member and families of current and Ex-Serving ADF members. A description of each cohort is provided below.

Transitioned ADF

The Transitioned ADF cohort included ADF members who transitioned from the Regular ADF across a five-year time frame (January 2010 to December 2014). In Australia, when an ADF member leaves full-time regular service, they are either discharged completely (if they are involuntarily discharged – that is, on medical or administrative grounds – or retire) or they generally transfer into the Active or Inactive Reserves. Therefore, the term 'Transitioned ADF' is used to denote all regular service leavers, including Ex-Serving ADF members and Active (minimum requirement of 20 days' service per year and ongoing training) and Inactive Reserves (no minimum requirement and no training obligation). As such, Active Reservists are generally those most engaged with Defence and Ex-Serving members are least engaged, allowing the impact of this level of continued engagement to also be examined in this report.

2015 Regular ADF

The 2015 Regular ADF cohort included a stratified random sample of ADF members who were current serving Regular ADF members in 2015, individuals who participated in the 2010 MHPWS and who remained in the 2015 Regular ADF, and those who participated in the Middle East Area of Operations (MEAO) Prospective Study between 2010 and 2012, and who remained in the 2015 Regular ADF.

Ab-initio Reservists

The Ab-initio Reservists cohort comprised ADF members who joined the ADF Reserves, who continued to serve in a reserve capacity in 2015, and who have never been a member of the Regular ADF.

2015 ADF family members

The 2015 ADF family members cohort comprised a sample of ADF family members (spouses/partners, parents and adult children) nominated by 2015 Regular ADF and Transitioned ADF members participating in the Programme.

2.4.2 Longitudinal cohorts

By linking survey, interview, biological and neurocognitive data collected as part of the MilHOP with the data collected in 2015, the Programme was also able to address the issue of the longitudinal course of mental, physical and social health over a five-year period from 2010 to 2015. The longitudinal component of the Programme followed up two cohorts of current and Ex-Serving ADF members and involved five phases of data collection:

- Phase 1: self-report survey
- Phase 2: structured diagnostic interview using the Composite International Diagnostic Interview (CIDI)
- Phase 3: blood test
- Phase 4: neurocognitive assessment battery
- Phase 5: magnetic resonance imaging (MRI) assessment.

Impact of Combat Study cohort

The Impact of Combat Study cohort comprised current and Transitioned members of the ADF who deployed to the MEAO after June 2010, returned prior to June 2012, and completed a pre-deployment and/or post-deployment health survey as part of the MEAO Prospective Study in 2010–2012. The current study therefore represents the third wave of data collection on this cohort. The whole cohort (MEAO deployed cohort) completed the survey, and three nested subgroups were invited to participate in additional data collection components (see Figure 2.3):

- ***Combat Zone subgroup***

  The Combat Zone subgroup consisted of individuals within the broader cohort who participated in the physical testing component of the MEAO Prospective Study, in addition to the self-report survey. These individuals were invited to participate in a CIDI (Phase 2) and blood test (Phase 3), in addition to the Impact of Combat Study self-report survey (Phase 1).

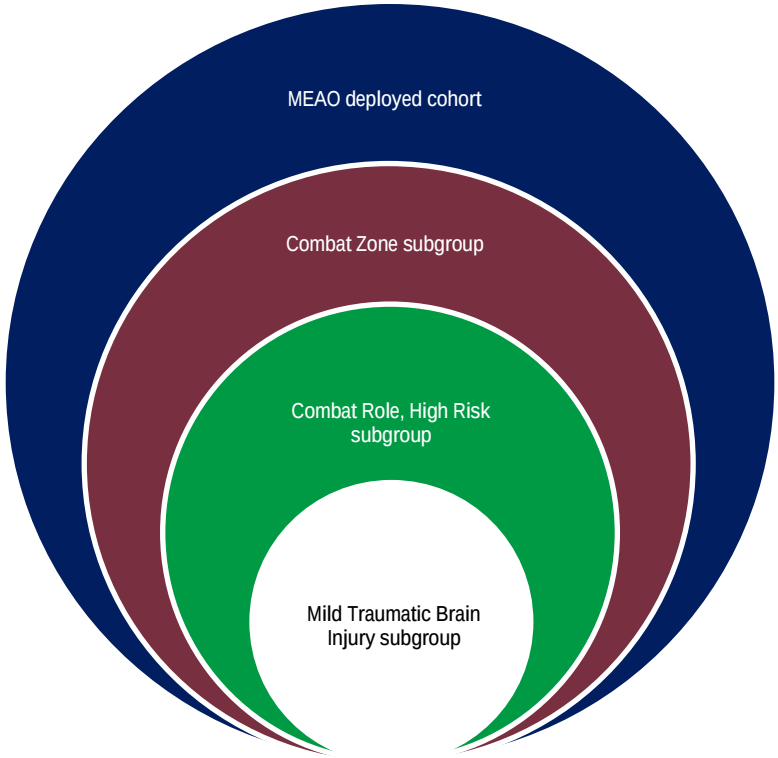
- ***Combat Role, High Risk subgroup***

  The Combat Role, High Risk subgroup consisted of individuals within the broader cohort who participated in the physical and neurocognitive testing components of the MEAO Prospective Study, in addition to completing the self-report survey. These individuals were invited to participate in a CIDI (Phase 2), blood test (Phase 3) and neurocognitive assessment battery (Phase 4), in addition to the Impact of Combat Study self-report survey (Phase 1).

- ***Mild Traumatic Brain Injury subgroup***

  The Mild Traumatic Brain Injury (mTBI) subgroup is a targeted group of individuals from within the Combat Role, High Risk subgroup who were also invited to participate in an MRI assessment (Phase 5), in addition to the self-report survey (Phase 1), CIDI (Phase 2), blood test (Phase 3) and neurocognitive test battery (Phase 4). These individuals were selected because they had previously completed a neurocognitive assessment as part of the MEAO Prospective Study and were identified as having high combat and blast exposure.

Figure 2.3 Impact of Combat Study nested subgroups



MHPWS longitudinal cohort

The Mental Health Prevalence and Wellbeing Study (MHPWS) longitudinal cohort comprised ADF members who participated in the 2010 MHPWS component of the MilHOP (2010 ADF). This sample included two groups: (1) MHPWS Transitioned ADF – ADF members who participated in the 2010 MHPWS as a Regular ADF member but have since transitioned; and (2) MHPWS 2015 ADF – Regular ADF members who participated in the 2010 MHPWS and were in the 2015 Regular ADF. The current study represents the second wave of data collection on this cohort.

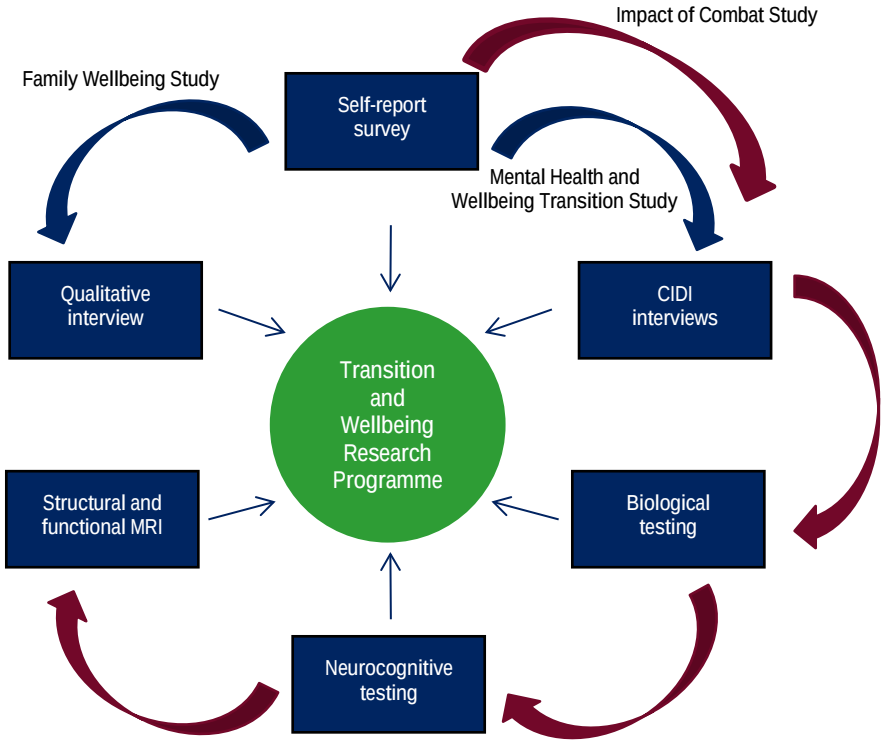
2.5 Methodology

The data collection components of the Programme are outlined in Figure 2.4 and include the following: (1) a population-specific self-report survey administered to all responders; (2) a one-hour diagnostic telephone interview using the World Mental Health Survey Initiative version of the World Health Organization's Composite International Diagnostic Interview Version 3 (CIDI 3.0), conducted with a stratified subsample of Transitioned ADF members and Impact of Combat Study participants; (3) biological testing (Impact of Combat Study participants only); (4) neurocognitive testing (Impact of Combat Study participants only); (5) structural and functional MRI (subgroup of Impact of Combat Study participants only); and (6) a qualitative interview (Family Wellbeing Study only).

Key self-report mental health measures utilised in the Programme included the Kessler Psychological Distress 10-item scale (K10) (Kessler & Ustun, 2004), the Post Traumatic Stress Disorder Checklist – civilian version (PCL-C) (Weathers, Litz, Herman, Huska, & Keane, 1993), the Alcohol Use Disorders Identification Test (AUDIT) (Saunders, Aasland, Babor, de la Fuente, & Grant, 1993), the Sheehan Disability Scale (Sheehan, 1983), the Patient Health Questionnaire 9-item scale (PHQ-9) for depression (Kroenke, Spitzer, & Williams, 2001), the Generalised Anxiety Disorder 7-item scale (GAD-7) (Spitzer, Kroenke, Williams, & Löwe, 2006), and the Dimensions of Anger Reactions 5-item scale (DAR-5) (Forbes et al., 2004).

Mental disorder prevalence estimates in the Programme were derived using a two-phase design. This approach is well accepted in the investigation of the prevalence of mental disorders in epidemiological samples. In Phase 1, participants were surveyed using a self-report screening questionnaire. Based on the results of this screening questionnaire and demographic information, a subset of participants were interviewed over the telephone using the World Mental Health Survey Initiative version of the CIDI in Phase 2. Interview priority was given to participants who were identified as being more likely to have a mental health disorder based on their screening questionnaire (determined using scores on the PCL-C and AUDIT) in order to more accurately detect low-prevalence disorders. This selection procedure for the CIDI was designed to ensure improved reliability of estimates for those who we know from previous research are underrepresented in the population (females) or less likely to respond (lower ranks, Army), as well as those with a mental disorder. This allows these groups to have a higher chance of selection, which in turn provides greater capacity and power to examine the risk factors and treatment outcomes of certain diagnostic groups, especially for disorders with a low prevalence.

Figure 2.4 Transition and Wellbeing Research Programme – data collection components



All data for the 2015 Transitioned ADF and the 2015 Regular ADF were weighted using a robust two-stage weighting process. This reduces the impacts of low response rates, as well as any selection and responder bias. Unlike other population prevalence studies where demographic characteristics of the entire population are not known, data from the Programme includes age, sex, rank and medical fitness data (e.g. was the responder classified as fit to deploy or not) on every member of the population, which was then used to weight the data from responders up to the entire population. The use of medical fitness data as a proxy measure for poor mental/physical health in this instance further allows the attenuation of the impact of any responder bias associated with mental health symptoms.

This methodology and weighting protocol replicates the gold standard methodology employed by the Australian Bureau of Statistics (ABS) in the 2007 National Survey of Mental Health and Wellbeing, which successfully weighted interview data from 8,841 individuals up to 16,015,033 Australian adults in the population (Australian Bureau of Statistics, 2008). The number of responders relative to non-responders in the

Programme is much greater, with data from 1,049 Transitioned ADF responders weighted up to 24,932 Transitioned ADF members in the entire population.

This methodology enabled us to ascertain diagnosable rates of 12-month and lifetime International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10) mental disorder that are representative of the entire population of interest rather than just those who have responded, which is extremely powerful and compatible with what is done by the ABS to establish Australian community norms (Slade, Johnston, Oakley Browne, Andrews, & Whiteford, 2009).

Sampling, methodology and weighting in the Programme were comprehensively reviewed and endorsed by the Programme's Scientific Advisory Committee, comprising leading Australian scientists and epidemiologists with extensive experience in conducting population-based research of the prevalence of mental and physical disorders. In addition, a consortium of investigators from eminent universities and other institutions across Australia – the Centre for Traumatic Stress Studies, Phoenix Australia, Monash University, the University of New South Wales and InnoWell (University of Sydney), as well as investigators representing Defence and DVA – were involved in the study design, protocol development and implementation.

2.6 Response rates

2.6.1 Cross-sectional cohorts

Figure 2.5 shows the Phase 1 survey response rates for each of the cross-sectional cohorts.

Transitioned ADF

Of the Transitioned ADF population of 24,932, 96% (n = 23,974) were invited to participate in Phase 1 of the study. Those not invited to participate included those individuals who either opted out of the study or the Military and Veteran Research Study Roll, or did not have any usable contact information. Of those invited, 18% (n = 4,326) of the Transitioned ADF population completed the Phase 1 survey. Phase 1 responders were predominantly Army (followed by Air Force and Navy), male and higher in rank, with the mean age of responders in both groups being approximately 41 years old. Transitioned females were more likely to respond than Transitioned males and, not unexpectedly, Transitioned ADF members were more likely to be classified as medically unfit on transition from the Regular ADF (31.1%) compared with the 2015 Regular ADF population (16.1%). In Phase 2, 1,807 Transitioned ADF members were selected for a CIDI, and 1,049 completed the interview (Figure 2.6).

Figure 2.5 Survey response rates for the cross-sectional cohorts

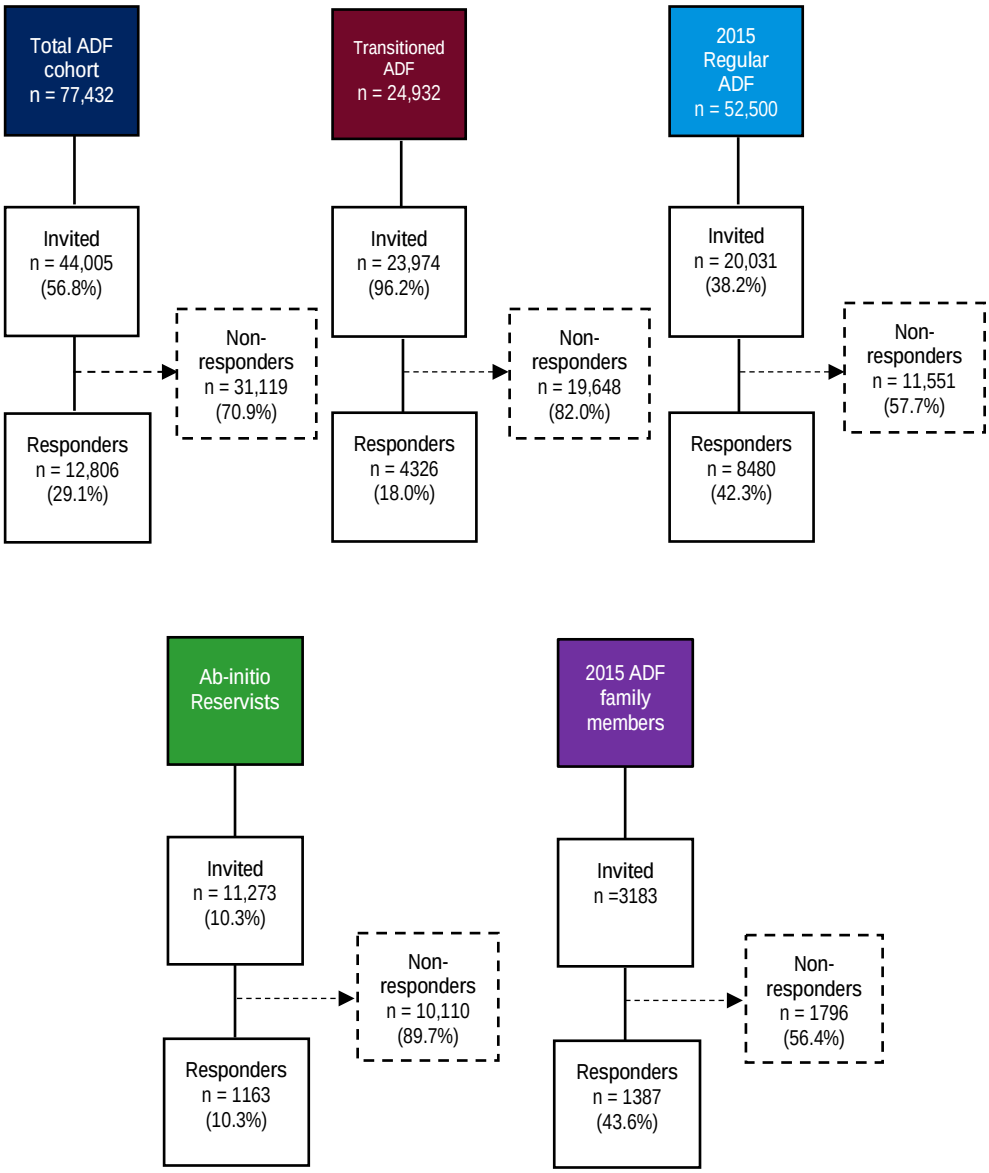
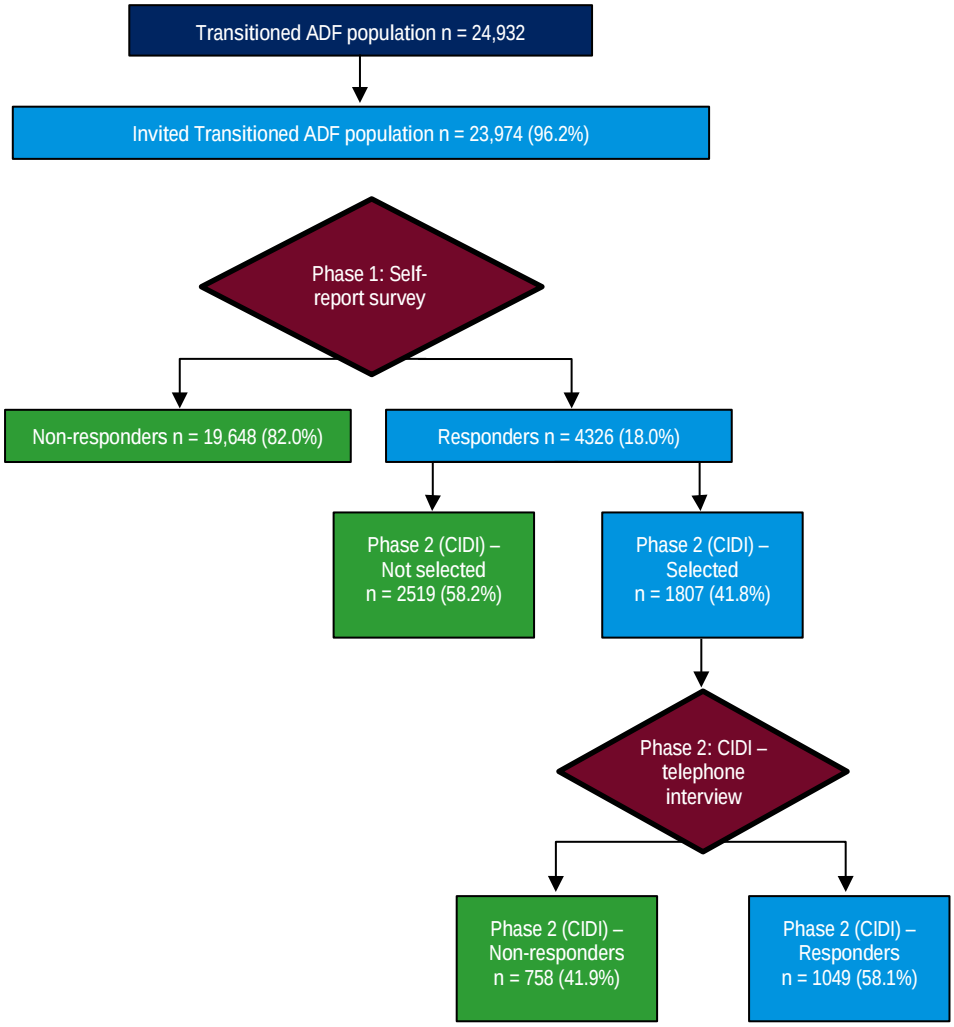


Figure 2.6 Flowchart of participation in Phase 2 of the Mental Health and Wellbeing Transition Study for Transitioned ADF members



2015 Regular ADF

Thirty-eight per cent (n = 20,031) of the 2015 Regular ADF population (N = 52,500) were invited to participate in Phase 1 of the study. This included a stratified random sample of 5,040 Regular ADF members in 2015, as well as those who had participated in the MilHOP between 2010 and 2012, and who were still serving in 2015. Of those invited, 42.3% (n = 8,480) of the 2015 ADF population completed the Phase 1 survey. Similar to the Transitioned ADF, Phase 1 responders were predominantly Army (followed by Air Force and Navy), male and higher in rank, with the mean age of

responders in both groups being approximately 41 years old. Female 2015 Regular ADF members were less likely to respond than their male counterparts.

Ab-initio Reservists

A total of 11,273 eligible Ab-initio Reservists (according to military records) were invited to participate in the Phase 1 survey, with a response rate of 10.3% (n = 1,163). The Ab-initio Reservist sample spanned both Active and Inactive Reservists, all Services and ranks, both sexes, and deployed and non-deployed members.

2015 ADF family members

Around 20% of Mental Health and Wellbeing Transition Study (MHWTS) respondents provided eligible nominations for family members (i.e. provided family contact details and agreed to inform family members about the Family Wellbeing Study) (n = 2,573), calculated by the number of MHWTS respondents with eligible nominations (n = 2,573) divided by the number of MHWTS respondents (n = 12,827). MHWTS respondents who provided nominations were also asked whether they agreed to link their survey data to their family member's Family Wellbeing Study survey data, with more than four in five (83.6%) agreeing to do so. In total, 3,183 family members (n = 2,085 family members of current serving ADF members, and n = 1,098 family members of Ex-Serving ADF members) were invited to participate in the Phase 1 survey.

A total of 1,387 family members (n = 929 (44.6%) family members of current serving ADF members, and n = 458 (41.7%) family members of Ex-Serving ADF members) provided usable survey data. Three main subgroups took part: 983 were spouses/partners (69%; 677 were spouses/partners of current serving and 306 of Ex-Serving ADF members); 275 were parents (20%; 182 were parents of current serving and 93 of Ex-Serving ADF members); and 102 were adult children (7%; 54 were adult children of current serving and 48 of Ex-Serving ADF members). The characteristics of current serving and Ex-Serving ADF members of Family Wellbeing Study participants were as follows:

- 81% were male.
- 68% were current serving, 10% were Active Reservists, 10% were Inactive Reservists, and 12% were discharged from the ADF.
- 21% had served in the Navy, 46% in the Army, and 33% in the Air Force.
- 42% had served in the ADF for between 1 and 14 years, 41% for between 15 and 29 years, and 17% for 30 or more years.
- 49% held a commissioned officer rank, 43% a non-commissioned officer rank, and 8% another type of rank.

- 89% had been deployed.
- 20% were classified as medically unfit for active service.

In Phase 2, semi-structured qualitative interviews were conducted with 25 adult family members (including partners, parents and children over 18) of Ex-Serving ADF members. Interviews were undertaken between March and July 2017. Participants in the interviews were drawn from a sampling frame of people who had completed the online survey component of the Family Wellbeing Study (for Part 1) and who had a family member who was an Ex-Serving member of the ADF.

2.6.2 Longitudinal cohorts

Impact of Combat Study cohort

In total, 1,350 members of the cohort who participated in the MEAO Prospective Study (Times 1 and 2) were invited to participate in the Impact of Combat Study (Time 3). Table 2.1 presents response rates for the Impact of Combat Study, for the MEAO deployed cohort, and each nested subgroup (Combat Zone subgroup, Combat Role, High Risk subgroup, and mTBI subgroup).

Impact of Combat Study responders were slightly older than non-responders, and among responders, those who remained in the Regular ADF were slightly older than those who had transitioned (M = 38.1 vs M = 35.6). The distribution of Service was similar for responders compared with non-responders; however, transitioned responders were more likely than Regular serving responders to be from the Army (87.1% vs 63.6%), while Regular serving responders were more likely to be from the Air Force (29.0% vs 10.0%). The distribution of sex was similar for responders compared with non-responders. Among responders, slightly more females remained in the Regular ADF (9.2% vs 5.0%). The distribution of rank among responders compared with non-responders was similar for those who remained in the Regular ADF, with the majority of responders being Non-Commissioned Officers (63.4%), followed by Officers (26.7%), then Other Ranks (9.9%). For those who had transitioned, the distribution of rank was different for responders compared with non-responders. Responders were more likely to be Non-Commissioned Officers (51.4%) or Officers (11.4%), and less likely to be from Other Ranks (37.1%). The distribution of medical fitness for responders compared with non-responders was similar. The majority of Transitioned ADF (83.6%) and 2015 Regular ADF (86.6%) responders were classified as fit.

Table 2.1 Cross-sectional response rates for study components in the MEAO deployed cohort and nested subgroups, according to whether members had transitioned or remained in the Regular ADF in 2015

	MEAO deployed cohort n = 1350				Combat Zone subgroup n = 563				Combat Role, High Risk subgroup n = 247				Mild Traumatic Brain Injury subgroup n = 75			
	Transitioned ADF n = 486		2015 Regular ADF n = 864		Transitioned ADF n = 244		2015 Regular ADF n = 319		Transitioned ADF n = 82		2015 Regular ADF n = 165		Transitioned ADF n = 21		2015 Regular ADF n = 54	
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Survey	129	26.5 (22.6–30.5)	431	49.9 (46.6–53.2)	49	20.1 (15.1–25.1)	135	42.3 (36.9–47.7)	15	18.3 (9.9–26.7)	66	40.0 (32.5–47.5)	7	33.3 (13.2–53.5)	28	51.9 (38.5–65.2)
CIDI*	71	48.6 (40.5–56.7)	95	20.9 (17.1–24.6)	37	56.1 (44.1–68.0)	83	52.2 (44.4–60.0)	17	60.7 (42.6–78.8)	45	54.9 (44.1–65.6)	5	50.0 (19.0–81.0)	14	46.7 (28.8–64.5)
Biological testing	–	–	–	–	16	6.6 (3.5–9.7)	86	27.0 (22.1–31.8)	7	8.5 (2.5–14.6)	44	26.7 (19.9–33.4)	2	9.5 (0.0–22.1)	18	33.3 (20.8–45.9)
Neurocognitive testing	–	–	–	–	–	–	–	–	18	22.0 (13.0–30.9)	66	40.0 (32.5–47.5)	7	33.3 (13.2–53.5)	25	46.3 (33.0–59.6)
MRI	–	–	–	–	–	–	–	–	–	–	–	–	9	42.9 (21.7–64.0)	27	50.0 (36.7–63.3)

* As a proportion of responders to any component (1 person completed wave 3 CIDI who did not respond to anything at Time 1, and was excluded from other analyses.

Notes

Unweighted data.

95% CI = 95% confidence interval.

Response rates are calculated as the proportion of those invited to participate in the study.

MHPWS longitudinal cohort

Phase 1 survey response rates for the Transitioned ADF and 2015 Regular ADF in the MHPWS longitudinal cohort are presented in Figure 2.7.

The 2010 MHPWS sample consisted of 54,009 individuals, of which 24,481 (48.9%) responded to the study. Of these responders, 20,908 (85.4%) were invited to participate in the Transition and Wellbeing Research Programme. This comprised 6,777 (32.4%) Transitioned ADF and 14,131 (67.6%) Regular ADF. Of those invited, 2,602 (38.4%) of Transitioned ADF and 7,042 (49.8%) of Regular ADF responded to the Programme. This sample was further reduced by the need to consent to the linkage of data at the two time points (2010 and 2015). The final sample comprised 8,497 (40.6% of invited) responders, 2,334 (34.4%) Transitioned ADF and 6,163 (43.6%) Regular ADF, who responded at both time points and provided consent to link their data.

Phase 2 CIDI response rates for the Transitioned ADF and 2015 Regular ADF in the MHPWS longitudinal cohort are presented in Figure 2.8.

In the 2010 MHPWS, 2,684 (58.8%) Regular ADF members completed a CIDI. Of these responders, 1,085 (40.4%) were selected to participate in a Transition and Wellbeing Research Programme CIDI. This comprised 368 (33.9%) Transitioned ADF and 717 (66.1%) Regular ADF. Of those selected, 266 (72.3%) Transitioned ADF and 567 (79.1%) Regular ADF members completed a Transition and Wellbeing Research Programme CIDI. The final sample comprised 820 (75.6% of CIDI selected) responders – 261 (70.9%) Transitioned ADF and 559 (70.8%) Regular ADF – who responded at both time points and provided consent to link their data.

Figure 2.7 **Phase 1 survey response rates for Transitioned ADF and 2015 Regular ADF in the MHPWS longitudinal cohort**

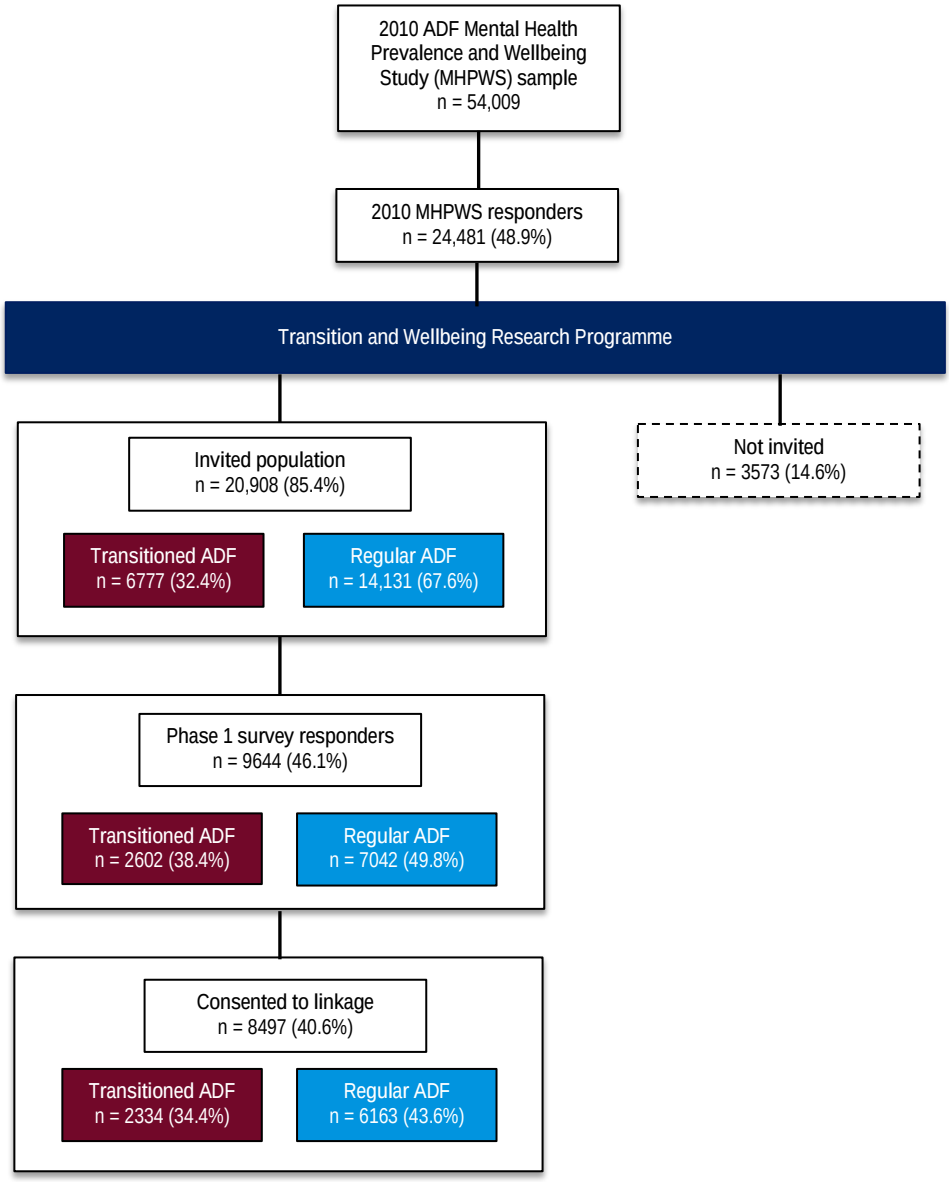
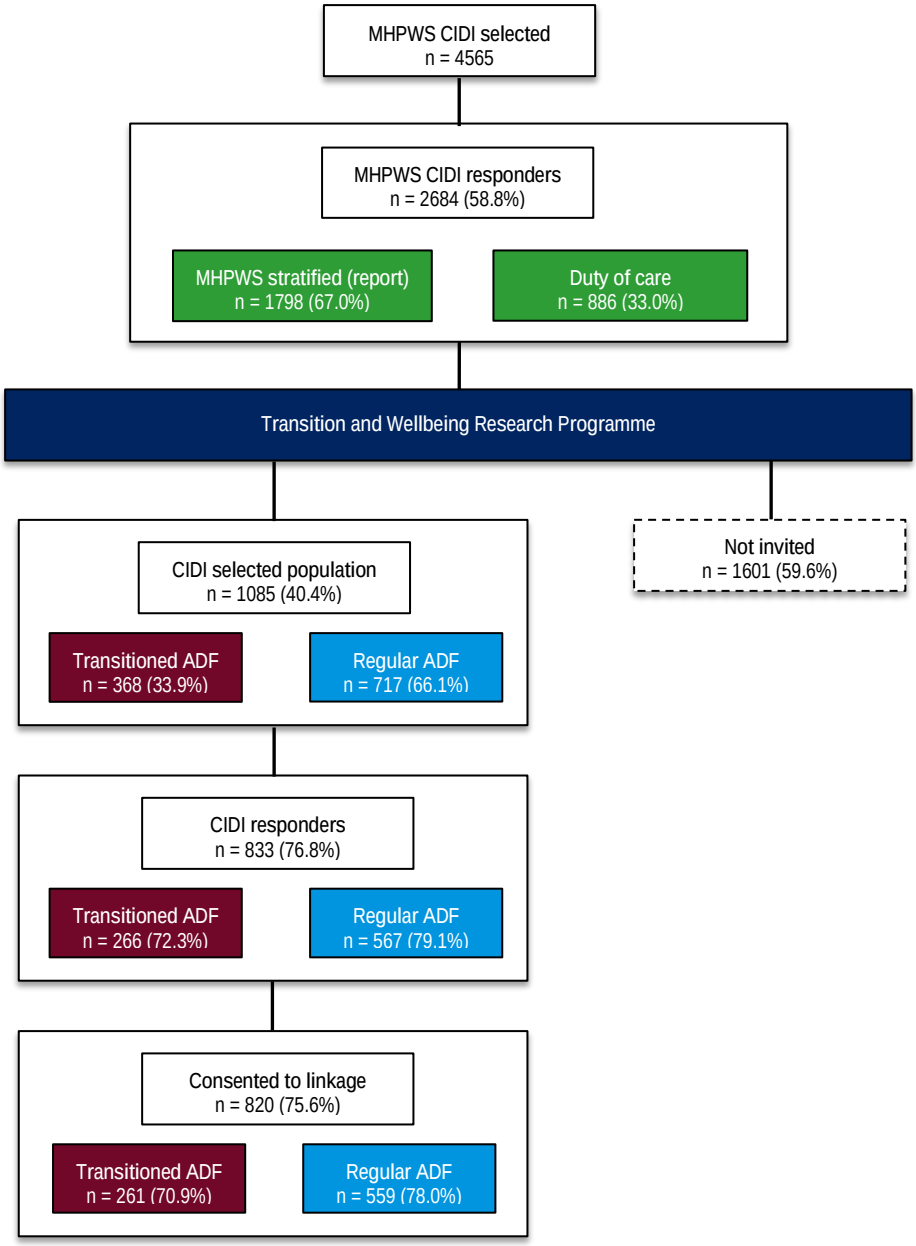


Figure 2.8 **Phase 2 CIDI response rates for Transitioned ADF and 2015 Regular ADF in the MHPWS longitudinal cohort**



3 Snapshot of the mental, physical and social health and wellbeing of Transition and Wellbeing Research Programme cohorts

The Transition and Wellbeing Research Programme aimed to address a number of key research priorities of both the Department of Veterans' Affairs (DVA) and the Department of Defence over three studies: the Mental Health and Wellbeing Transition Study, the Impact of Combat Study and the Family Wellbeing Study. This comprehensive programme of research aimed to provide a detailed understanding of the impact of contemporary military service on the mental, physical and social health of serving and Ex-Serving members and their families, to ensure policy and service delivery responds to future needs.

This chapter first presents a snapshot of the characteristics and health status of participants across all of the studies, organised according to the cohorts discussed in Chapter 2, commencing with the Transitioned and 2015 Regular ADF.

3.1 Transitioned ADF and 2015 Regular ADF

3.1.1 Demographic characteristics

When considering the characteristics of the Transitioned and Regular ADF in 2015, overall levels of work engagement were high. Approximately 84% of the Transitioned ADF (100% of the Regular ADF) were either working or engaged in some purposeful activity (62.8% employed), with the most commonly reported areas of employment being government administration and defence (16.8%), mining (9.9%), construction (8.8%), and transport and storage (8.6%). Just over 5.5% of the Transitioned ADF had retired.

The majority of both the Transitioned (56.2%) and Regular ADF (60.3%) were aged between 28 and 47 years. Most Transitioned and Regular ADF members were male (Transitioned ADF 86.9%, 2015 Regular ADF 90.8%), were in a significant relationship (Transitioned ADF 74.7%, 2015 Regular ADF 79.5%), were classified as 'Other Ranks' (able seaman, seaman, private, leading aircraftman, aircraftman or equivalent) (Transitioned ADF 52.2%, 2015 Regular ADF 41.1%), and were Army (Transitioned ADF 60.3%, 2015 Regular ADF 49.1%). The majority of the Transitioned ADF had served 4 to 7.9 years in the Regular ADF (36.2%), followed by 23.2% who had served for 20+ years. The majority of the 2015 Regular ADF had served 20+ years (26.0%). Just over a quarter

of the Transitioned ADF were classified as medically unfit upon transition from the ADF, compared with 12.3% of the 2015 Regular ADF at the time of the study.

Compared with the 2015 Regular ADF, Transitioned ADF were more likely to be aged over 58 years, female, lower in rank, from the Army, classified as medically unfit, and to have under eight years of service with the ADF. In contrast, Transitioned ADF were less likely than 2015 Regular ADF to be in a relationship where they are not living with their partner.

Just under half (43.3%) of the Transitioned ADF were Ex-Serving (discharged) at the time of survey completion and therefore no longer remained engaged with Defence in a Reservist role. A quarter of the Transitioned ADF had remained in an Active Reservist role (25.7%) and therefore continued to be engaged in service for a specified number of days per year; 30.1% were Inactive Reservists and therefore their contact with Defence would be variable, and for some there would be no ongoing contact.

Among the Transitioned ADF, the most common type of discharge/resignation reported was 'own request' (53.7%), with over 60% of these voluntarily discharging or discharging due to the end of a fixed period of service. Just over 20% of the Transitioned ADF were estimated to have been medically discharged, with their employment terminated by the ADF on the grounds of being permanently – or at least in the long term – not fit to serve, or not fit for deployment to operational (warlike) service. The most common self-reported reasons for transition were 'impact of service life on family' (10.2%), 'better employment prospects in civilian life' (7.2%), 'mental health problems' (6.5%) and 'physical health problems' (4.3%).

3.1.2 Health status

Consistent with the 2010 Mental Health Prevalence and Wellbeing Study (MHPWS) report (McFarlane, Van Hooff, Hodson, Verhagen, & Davies, 2011), which profiled mental disorder in the Regular ADF in 2010, this study examined three classes of common mental disorder among the Transitioned ADF: anxiety, affective and alcohol disorder. Almost three-quarters of the Transitioned ADF were estimated to have met International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10) criteria for any lifetime mental disorder, with the most common of these being alcohol disorders (Table 3.1). Forty-six per cent of the Transitioned ADF were estimated to have met criteria for a lifetime anxiety disorder, and one-quarter were estimated to have met criteria for posttraumatic stress disorder (PTSD) specifically in their lifetime. Just under 40% were estimated to have met criteria for a lifetime affective disorder.

Table 3.1 Estimated prevalence of lifetime ICD-10 anxiety, affective, alcohol and any disorders in Transitioned ADF

	Transitioned ADF n = 24,932		
Lifetime ICD-10 disorder	Weighted n	%	95% CI
Anxiety disorder (including PTSD)	11,378	46.1	41.4, 50.9
Anxiety disorder (excluding PTSD)	7976	31.9	27.7, 36.6
Anxiety disorder (ABS)	10,421	41.8	37.1, 46.6
Affective disorder	9769	39.6	35.0, 44.4
Alcohol disorder	11,714	47.5	42.8, 52.2
PTSD	6134	24.9	20.9, 29.3
Any disorder	18,435	74.7	70.5, 78.5

Note: 95% CI = 95% confidence interval.

In the past 12 months, it is estimated that nearly half of the Transitioned ADF met criteria for an ICD-10 mental disorder (Table 3.2). The most common class of 12-month mental disorder among the Transitioned ADF was anxiety, with more than one in three estimated to have met criteria for an anxiety disorder in the past 12 months. Posttraumatic stress disorder, panic attacks, agoraphobia and social phobia were the most common individual disorders, with 17.7% of the Transitioned ADF estimated to have met criteria for PTSD in the previous 12 months. An estimated 19.3% met criteria for an anxiety disorder other than PTSD. One in five Transitioned ADF members were estimated to have experienced an affective disorder in the past 12 months, with the most common type being depressive episodes. Alcohol disorders were the least prevalent 12-month mental disorders among the Transitioned ADF, with an estimated 12.9% meeting ICD-10 criteria for a 12-month diagnosis.

Table 3.2 Estimated prevalence of 12-month ICD-10 anxiety, affective, alcohol and any disorders in Transitioned ADF

	Transitioned ADF n = 24,932		
12-month ICD-10 disorder	Weighted n	%	95% CI
Any anxiety disorder	9232	37.0	32.6, 41.7
Panic attack	4244	17.0	13.8, 20.8
Panic disorder	1344	5.4	3.6, 8.0
Agoraphobia	2975	11.9	9.1, 15.5
Social phobia	2738	11.0	8.4, 14.3
Specific phobia	1936	7.8	5.8, 10.3
Generalised anxiety disorder	917	3.7	2.2, 6.0
Obsessive-compulsive disorder	1029	4.1	2.6, 6.6
Posttraumatic stress disorder	4408	17.7	14.5, 21.3
Any affective disorder	5755	23.1	19.2, 27.5
Depressive episodes	2783	11.2	8.6, 14.3
Dysthymia	1140	4.6	3.1, 6.7
Bipolar affective disorder	2443	9.8	7.0, 13.5
Any alcohol disorder	3219	12.9	9.8, 16.9
Alcohol harmful use	948	3.8	2.3, 6.3
Alcohol dependence	2271	9.1	6.4, 12.8
Any disorder	11,558	46.4	41.7, 51.1

Note: 95% CI = 95% confidence interval.

3.1.3 Current self-reported mental health

Mean scores on the self-report measures of mental health in the Transitioned ADF and 2015 Regular ADF are presented in Table 3.3. Current self-reported symptoms of psychological distress were moderate (scores 16–21 on the K10) for both the Transitioned and 2015 Regular ADF and low (scores of 0–7 on the AUDIT) for alcohol problems. Self-reported depression was mild (PHQ-9 scores of 5–9) for both the Transitioned and 2015 Regular ADF. The estimated mean DAR-5 scores for both the Transitioned (M = 9.8) and 2015 Regular ADF (M = 8.2) were below the cut-off of 12 (the score used to indicate problematic anger).

In relation to PTSD, anger and suicidality, however, a slightly different pattern emerged between the Transitioned and the 2015 Regular ADF. Current self-reported PTSD, for example, was low in the 2015 Regular ADF (PCL-C score of 17–29) but moderate in the Transitioned ADF (PCL-C score of 30–39). Similarly, current self-reported symptoms of generalised anxiety were moderate (scores 10–14 on the GAD-7) in the 2015 Regular ADF, but severe (15–21) in the Transitioned ADF. Finally, just over one in five of Transitioned ADF reported 12-month suicidality (either ideation, plans or attempts), compared with just under one in 10 of the 2015 Regular ADF.

Table 3.3 Estimated mean total scores on the self-report mental health measures in the Transitioned ADF and the 2015 Regular ADF

	Transitioned ADF n = 24,932		2015 Regular ADF n = 52,500	
	Mean	SE	Mean	SE
Psychological distress (K10) (range 10–50)	19.9	0.2	17.0	0.4
PTSD (PCL-C) (range 17–85)	31.2	0.3	24.2	0.4
Alcohol (AUDIT) (range 0–40)	7.2	0.1	5.3	0.2
Depression (PHQ-9) (range 0–27)	7.6	0.1	5.1	0.2
Anger (DAR-5)	9.8	0.1	8.2	0.5
Generalised anxiety (GAD-7) (range 0–21)	16.8	2.1	12.8	3.6
	%	CI	%	CI
Suicidality (ideation, plans or attempts)	21.72	20.23, 23.28	8.83	6.65, 11.63

Note: SE = standard error; CI = confidence interval.

3.1.4 Physical health

Transitioned ADF reported a higher mean number of symptoms (M = 16.4) and were more likely to report the majority of health symptoms compared with 2015 Regular ADF (M = 11.8). The four most common health symptoms, reported by both the Transitioned and 2015 Regular ADF, were fatigue (64.2% and 61.6%, respectively), sleeping difficulties (63.8% and 58.0%, respectively), feeling unrefreshed after sleep (60.3% and 50.9%, respectively) and headaches (60.3% and 60.7%, respectively), with 21.8% of the Transitioned ADF and 9.5% of the 2015 Regular ADF experiencing moderate or severe insomnia in the two weeks prior to completing the survey. These findings have important implications, both clinically and organisationally, due to the associated risk of sleep problems with occupational performance, fatigue and ability to concentrate (Filip et al., 2017; Kucharczyk, Morgan, & Hall, 2012).

Overall, Transitioned ADF (M = 1.9) and 2015 Regular ADF (M = 1.5) reported similar numbers of doctor-diagnosed conditions. For both the Transitioned ADF and the 2015 Regular ADF, musculoskeletal and connective tissue conditions were the most common type of doctor-diagnosed conditions (34.2% and 24.9%, respectively), followed by circulatory conditions (19.2% and 15.1%), hearing loss (15.7% and 9.1%) and digestive conditions (12.0% and 10.2%). Approximately 74% of the Transitioned ADF and 68% of the Regular ADF reported sustaining a service-related injury during their military career, with the most common injury types being fractured bones (30.0% and 27.9%) and other musculoskeletal injuries (64.3% and 58.6%). Furthermore, 19.7% of the Transitioned ADF reported experiencing high-intensity pain in the six months prior to completing the survey, compared with 14.1% of the 2015 Regular ADF. Although the reasons for the increased pain intensity in participants were not assessed in this study, the high prevalence of musculoskeletal injuries in combination with levels of pain intensity suggest an area for further investigation.

Self-reported asthma in the 12 months prior to the survey was reported in 11.5% of the Transitioned ADF and 5.8% of the 2015 Regular ADF. Although the proportion was significantly higher in those who had transitioned compared with those who remained in the ADF in 2015, the estimated prevalence of doctor-diagnosed asthma ever in the Transitioned ADF was significantly lower than a socio-demographically matched Australian community sample (15.3% vs 21.9%).

In terms of health risk factors, the Transitioned ADF and the 2015 Regular ADF were largely similar in relation to the proportion in the obese body mass index range (26.2% and 21.8%), and the proportion who were current smokers (15.2% and 14.1%, respectively). Overall, the proportion of current smokers in the Transitioned ADF was significantly lower than the proportion in the Australian community (15.2% vs 21.9%).

Finally, in relation to how they perceived their health, Transitioned ADF members were significantly more likely to perceive their health as fair (23.9%) or poor (11.2%) than both the 2015 Regular ADF (20.8% and 2.9%) and the Australian community more generally (10.1% and 3.1%).

3.1.5 Social health

Regarding social health, the majority of both the Transitioned ADF and the 2015 Regular ADF were in a relationship (74.7% vs 79.5%) and were in stable housing (93.8% vs 93.1%) at the time of the survey. For the Transitioned ADF, engagement with ex-service organisations and other voluntary groups was moderate, with 27.7% engaging with at least one ex-service organisation and 31.2% reporting engagement with at least one voluntary group. Of the Transitioned ADF who responded to the survey, just over one in five reported financial issues in the last 12 months, 11.1% reported housing concerns in the last 12 months, 36.9% reported currently experiencing social strain in their family, and 9.2% reported currently experiencing social strain with friends. These psychosocial issues were significantly greater in the Transitioned ADF compared with the 2015 Regular ADF, with only 11.0% of the 2015 Regular ADF responding to the survey reporting financial issues, 6.3% reporting housing concerns, 30.5% reporting currently experiencing social strain in their family, and 6.8% reporting currently experiencing social strain with friends. Finally, most Transitioned ADF (67.1%) and 2015 Regular ADF members (69.1%) reported having children.

3.2 Impact of Combat Study cohort

3.2.1 Demographic characteristics

The majority of the Impact of Combat Study's Middle East Area of Operations (MEAO) deployed cohort were in a relationship and living together (68.0%), and had completed education qualifications of certificate level or above (58.8%), with around one-third having completed primary or secondary school only.

Of those who had transitioned, 71.3% were in full- or part-time work, just under 10% were on a sickness allowance or disability support pension, and 7.0% were students. Only 3.5% were retired. The main source of income among the Transitioned ADF in this cohort was a wage or salary (69.6%), and around 10% reported being on some form of pension or compensation. Ninety per cent of the cohort reported being in stable housing at the time of the survey, with this figure slightly lower among those who had transitioned (87%).

Overall, 27.1% of the cohort were DVA clients, though among those cohort members who had transitioned, this proportion was much higher, with 45.2% being DVA clients. The majority of the cohort had served in the Regular ADF for eight or more years, with 20.7% having served for less than eight years. The distribution of years of service in the Regular ADF was markedly different among those cohort members who had transitioned, with approximately half having served less than eight years.

Transitioned ADF comprised 44.3% Inactive Reservists, 30.4% who were classified as Ex-Serving, and 24.3% Active Reservists. The majority of individuals reported transitioning three years prior (34.8%), 20.0% reported transitioning two years prior, and nearly one-quarter reported transitioning a year or less prior. The majority of individuals discharged at their own request (68.7%), and 8.7% reported a medical discharge. The most commonly reported reasons for transition were better civilian employment prospects (9.6%) and the impact of service life on family (9.6%).

Around two-thirds of the Transitioned ADF were employed (65.2%), with the majority working between 21 and 60 hours per week. The most common employment industries were construction (17.3%), and government administration and defence (17.3%). Just over one in three Transitioned ADF in this cohort reported a period of unemployment of at least three months since transition (34.8%).

In terms of DVA support, one in three Transitioned ADF reported treatment support of some form (White or Gold Card) (34.8%). Almost half reported no ex-service organisation engagement, with 17.4% reporting a single ex-service organisation engagement. Similarly, 53.0% had no voluntary organisation involvement, with approximately 15% having engagement with at least one voluntary group.

3.2.2 Health status

The Impact of Combat Study represents the third wave of data collection on the MEAO Prospective Study cohort, and the second longitudinal follow-up of this cohort post-deployment. As such, the Impact of Combat Study is able to map the longer-term trajectory of the health and functioning of a deploying cohort of ADF members. Findings demonstrated that the majority of cohort members remained healthy and largely asymptomatic, although this proportion reduced over time for most health

outcomes. Importantly, however, despite the substantial majority of the cohort remaining below screening thresholds on psychological symptom measures, and a very low proportion meeting criteria for probable disorder, rates of psychological and physical symptoms and mental disorder did increase over time in the cohort.

In the broader cohort, as well as the nested subgroups, there were clear differences in the symptom trajectories of those who were more psychologically symptomatic at the current time compared with those who remained relatively symptom free. In some cases, the pattern of change over time was in fact opposite between symptomatic and healthy subgroups (e.g. those with low versus elevated psychological symptoms exhibited contrasting patterns of some biological and neurocognitive markers over time), underscoring the importance of these subgroup examinations.

3.2.3 Mental health

Together, the patterns of change in mental health over time, as well as 12-month diagnosable mental disorder, indicate that overall this cohort is psychologically healthy with low rates of mental disorder in the previous month, and similar rates of 12-month disorder among the transitioned subset. This is consistent with a healthy worker effect, and in the case of 30-day probable disorder, it appears that the healthy worker effect may extend somewhat into the transitioned subset of the cohort. However, when considering mental health symptoms more generally, overall there was a general decline in the mental health of the cohort.

3.2.4 Physical health

Similar to their mental health, the physical health of the cohort had also declined with the passage of time, which may possibly reflect non-specific somatic distress. Together, physical health symptoms and biological markers are an important domain to document and monitor over time, particularly due to the importance of managing the emergence of mortality in this population. At a cohort level, there does not appear to be evidence of systemic dysregulation in physiological stress response systems; however, in light of the observed shifts in psychological and somatic symptoms over time, it is possible that shifts in physiological systems, and the development of physical conditions, may emerge with the further passage of time.

3.3 MHPWS longitudinal cohort

3.3.1 Demographic characteristics

In the MHPWS longitudinal cohort, there were similar proportions of Transitioned ADF and 2015 Regular ADF who were ‘in a relationship and living together’ and ‘in a relationship not living together’; however, 2015 Regular ADF had a higher proportion reporting being ‘not in a relationship’ (12.2% vs 6.3%). The cohort was generally well educated, with similar proportions of Transitioned ADF and Regular ADF reporting their

highest level of education to be primary/secondary school or a diploma. Slightly more Transitioned ADF reported completing a certificate (26.6% vs 20.2%), and slightly more Regular ADF reported a university qualification as their highest level of education (35.0% vs 30.9%). There were no differences in whether the respondents reported having stable housing over the past two months.

Compared with 2015 Regular ADF, more Transitioned ADF served in the Regular ADF one month to 7.9 years, or 20+ years, whereas more Regular ADF served 8 to 19.9 years. Almost half of responders in both groups reported serving 20+ years. In this cohort, 38.4% of Transitioned ADF responders remained in the ADF as Active Reservists and 30.1% as Inactive Reservists. Regardless of Reservist status, the majority reported transitioning between one and four years ago. The most common type of discharge/resignation reported was 'own request', which was the case for more than half of the Transitioned ADF (57.7%), with this percentage increasing to over 60% when including 'end of fixed period' (1.9%) and 'end of initial enlistment period' (1.5%). The second most common type of discharge was 'medical discharge', with almost one-fifth (18.6%) of Transitioned ADF reporting this type of discharge. The most commonly reported reasons for transition were 'impact of service life on family' (11.0%), 'better employment prospects in civilian life' (6.2%), 'posting issues' (6.1%), 'physical health problems' (6.1%), and 'mental health problems' (5.9%). A large proportion of Transitioned ADF did not report their main reason for transition (47.1%).

Just over half of the Transitioned ADF responders reported being engaged in civilian employment (55.3%). For those individuals, the most common industries of employment were government administration and defence (29.0%), transport and storage (9.1%), and health and community services (9.0%). Industry of employment was not reported for 1.4%. Of those who were not engaged in civilian employment, a considerable proportion reported a period of three months or longer in which they were unemployed (38.8%) since transitioning from the Regular ADF. Over 45% of Transitioned ADF members reported accessing DVA-funded treatment through either a DVA White Card (39.3%) or DVA Gold Card (5.9%).

Just under half of the Transitioned ADF in this cohort reported joining an ex-service organisation or voluntary group. An extremely small proportion of the Transitioned ADF reported having been arrested (1.1%) or convicted (0.9%) since transitioning from Regular ADF service.

3.3.2 Health status

Overall, more than half of the longitudinal cohort reported having no mental disorder in both 2010 and 2015 (58.0% in 2010 and 54.0% in 2015). Thus, the majority of personnel across both the 2015 Regular ADF and Transitioned ADF demonstrated a pattern of resilience over time, with some individuals, particularly those who remain in

the ADF, even showing a remission in symptoms to the point where they had no disorder in 2015.

Of those who did go on to develop problems, anxiety disorders and PTSD were the disorder types that were most likely to worsen following transition, with this risk being heightened if there were indications of risk of these problems during ADF service. This pattern was consistent for depressive disorders, anger and suicidality, indicating that psychologically healthier individuals tend to remain in the ADF, whereas those who are more symptomatic are more likely to discharge. Alcohol disorders, in contrast, showed a slightly different pattern. Although there was a significant increase in the rate of alcohol abuse disorder in Transitioned ADF members relative to Regular ADF members, this level of difference was not apparent during ADF service in 2010, indicating that the higher rate of alcohol abuse in those who transitioned out of the ADF cannot be attributed to drinking habits during military service.

Although this pattern of resilience has been reported previously in personnel deployed to the Gulf War (Orcutt, Erickson, & Wolfe, 2004), Kosovo (Dickstein, Suvak, Litz, & Adler, 2010), Afghanistan (Berntsen et al., 2012), and Iraq (Bonanno et al., 2012b), evidence for resilient trajectories during transition specifically are only beginning to emerge (Hatch et al., 2013; Thompson et al., 2015). Results of this study therefore support and extend this previous military and veteran (Bonanno et al., 2012b), and civilian (Bonanno, Kennedy, Galatzer-Levy, Lude, & Elfström, 2012a; Bryant et al., 2015; Orcutt, Bonanno, Hannan, & Miron, 2014), literature.

3.4 Ab-initio Reservists

Another important strength of the Programme is its examination of the mental and physical health of ADF Reservists. In surveillance programs in both the United States and the United Kingdom, the reservist population has been one of considerable interest because of their potential isolation from the broader supports of the military system, which may have adverse effects on their reintegration and long-term health following deployment. In considering this, the structure of the reserves highlights the complexity when making comparisons between different nations and different groups of reservists. In particular, in Australia there is a greater dependence on certain classes of Reservists, such as medical specialists and other technical trades, than is the case in other defence forces. It was therefore considered important in the current Programme to separately study Ab-initio Reservists (those who had entered the military as Reservists, never having first served in the full-time military), as they are a distinct group within the general body of ADF Reservists (those who have transitioned from the Regular ADF, either into the Active or Inactive Reserves). The latter group carry with them the potential risk factors and exposures that cumulated from their Regular ADF service. In contrast, the Ab-initio Reservists are a more fluid group in the sense that

they are not bound by any long-term contracts for continued service within the ADF. Hence, their general health and willingness to engage with health care is much more likely to be determined by the ongoing stresses and strains in their civilian life. Those individuals who develop mental health conditions that are prevalent in the Australian community are also likely to disengage from their Reserve service. Thus, these are likely to be a healthy group of individuals whose engagement in Reserve service is reflective of their general sense of service and desire to contribute to the broader community.

This section summarises data from 1,163 of 11,273 eligible ADF Ab-initio Reservists; therefore, caution should be exercised when interpreting the results. While spanning both Active and Inactive Reservists, all Services and ranks, both sexes, and deployed and non-deployed members, this sample represented only 10% of all eligible Ab-initio Reservists and therefore results cannot necessarily be considered as representative of the broader Ab-initio Reservist population. Despite this limitation, this remains the largest study conducted to date to examine predictors of the psychological distress of Australian Ab-initio Reservists, and therefore provides considerable initial insight into the overall mental physical and social health of this population.

3.4.1 Demographic characteristics

The Ab-initio Reservist cohort was slightly older than other ADF cohorts in the Programme, aged on average 38.4 years, and mostly male (76.8%). The sample comprised members from all ranks (36.7% Commissioned Officers, 13.7% Non-Commissioned Officers, and 49.6% Other Ranks) and Services (5.7% Navy, 79.3% Army, and 15.0% Air Force). Most participants were married/partnered (78.2%), Active serving (77.3%), and had never deployed (64.6%).

3.4.2 Health status

Together, the initial Programme findings indicate that Australian Ab- initio Reservists have good mental health and wellbeing, with the sample generally reporting positive attitudes, high levels of social support and low levels of stressors. Additionally, the majority reported experiencing low psychological distress, demonstrated by a low mean K10 score (M = 14.5, SE = 0.3) that was below clinical cut-offs, with just over one in 10 (13.0%) reporting psychological distress levels suggestive of at least mild disorder (K10 total score > 20) and potential referral within the ADF screening system. These K10 scores are not dissimilar to those seen in the wider Australian community (Slade et al., 2009).

Results of the Programme identified a different pattern of predictors in the Ab-initio Reservists compared with the broader Transitioned and 2015 Regular ADF. It was found that psychological distress in this cohort was impacted by more general family and social factors, rather than anything associated specifically with Reserve service.

Specifically, family/employer support and Reserve service satisfaction were negatively related to psychological distress. Perceptions of ADF Reserve management were also negatively related to psychological distress. Recent stressful life events were positively related to psychological distress and deployment did not have an impact.

3.5 2015 ADF family members

One unique component of the Programme is the inclusion of the Family Wellbeing Study, led by the Australian Institute of Family Studies (Daraganova et al., 2018; Muir, 2018.). This mixed-methods study (comprising both a quantitative survey and a qualitative interview) was undertaken as a response to the lack of knowledge about the impact of ADF service on the health and wellbeing of Australian families, and aimed to increase understanding of the experiences and challenges of families during and following military service. The quantitative component examined the health and wellbeing of families of Transitioned and 2015 Regular ADF members who participated in the Mental Health and Wellbeing Transition Study and the Impact of Combat Study, while the qualitative component specifically focused on the Transitioned ADF, exploring how military families approach and manage the transition from regular service to civilian life.

Although the role played by families in supporting the health and wellbeing of military members is relatively well acknowledged and understood, much less is known about how family members themselves fare. To narrow this gap, the Family Wellbeing Study aimed to find out how family members (as reported by spouses/partners, parents and adult children) were progressing over a wide range of life areas (e.g. employment and careers; financial wellbeing; living arrangements; household and school relocations; physical and mental health; risky behaviours; need for services; and services access and barriers).

3.5.1 Demographic characteristics

When examining the characteristics of participants in the Family Wellbeing Study, the majority of family members were aged between 38 and 57 years (51.8%), with the smallest proportion aged 18 to 27 years (7.6%). Family members of Transitioned ADF members tended to be significantly older when compared with family members of the 2015 Regular ADF members. The majority of the study participants were the spouses/partners of their ADF members (69.4%), 1.5% were ex-spouses/ex-partners, 19.8% were their parents, 7.3% were their adult offspring and 1.9% were ‘other’ (for example, siblings).

Consistent with the high proportion of males in the Regular and Transitioned ADF (81%), and the high proportion of respondents who were the spouse/partner of the ADF member, the majority of Family Wellbeing Study participants were female

(85.3%). The sample was also highly qualified, with 42.7% having attained a university degree, 34.2% a certificate or diploma, and 23.0% a primary or secondary school qualification. A total of 33.1% of Family Wellbeing Study participants were not working at the time of the study, 39.7% were working full-time and 27.2% were part-time. Of those who were working (n = 608), 17.4% had been in their current employment for under a year, 28.8% had been there for 2 to 4 years, 17.8% for 5 to 9 years, and 26.0% for 10 or more years. Around four in five had taken one or more periods of leave for six months or longer while at their current employment. There were no significant differences in the employment characteristics of family members of Regular and Transitioned ADF members. A total of 17.0% of Family Wellbeing Study participants had served in the ADF and 45.4% of those who served had been deployed. Again, this did not significantly differ across families with Regular or Transitioned ADF members.

Among Family Wellbeing Study participants, only 5.7% were living on their own, 35.0% were living in a household with 2 people, 19.0% with 3 people, 26.5% with 4 people and 13.7% with 5 or more people. Household size did not significantly differ across Family Wellbeing Study participants whose ADF members were Regular ADF or Transitioned ADF. However, the length of time Family Wellbeing Study participants had lived in their current household did show significant differences, with family members of Regular Serving ADF members tending to have lived in their present household for less time than family members of Transitioned ADF. The most commonly reported living arrangements in the study were living with a spouse/partner and child(ren) (66.7%), or as a couple on their own (21.0%). Regular ADF members were more likely to be living with a spouse/partner and child(ren) and less likely to be living just with a spouse/partner. Approximately two in three ADF members were living in the same households as Family Wellbeing Study participants (68.3%), while just under one in four were living 100 or more kilometres away (23.7%). Regular ADF members were more likely to be living a long distance away than Transitioned ADF members.

The military service history of Family Wellbeing Study participants' servicemen and women was as follows: 67.5% were ADF members, 10.4% were Active Reservists, 10.0% were Inactive Reservists, and 12.1% were Transitioned ADF members; 21.3% had served in the Navy; 46.1% in the Army, and 32.7% in the Air Force; 42.2% had served in the ADF for between 1 and 14 years; 41.0% for between 15 and 29 years, and 16.8% for 30 or more years; 49.5% held a Commissioned Officer rank, 42.8% a Non-Commissioned Officer rank, and 7.8% another type of rank; 83.2% had been deployed; and 19.9% were classified as medically unfit for active service.

3.5.2 Health status

Overall, the Family Wellbeing Study provided a positive picture of how Australian families of military members were faring. Most families of Current Serving and Transitioned ADF members seemed to be progressing well across many life areas, with only a few exceptions.

Most spouses/partners and parents of servicemen and women were not currently experiencing mental or physical health problems (Table 3.4), and the rate of problems for female Family Wellbeing Study participants was similar to those found for similarly aged females in the Australian general population. However, almost three in 10 adult children of servicemen and women reported high psychological distress, which was above the rate for comparable general community populations. While adult children more frequently engaged in substance use and gambling than spouses/partners and parents (Table 3.4), their rates were in line with those found for similar age groups in the Australian population, and the rates for spouses/partners and parents were lower than their general community counterparts.

Table 3.4 Percentage of Family Wellbeing Study subgroups reporting health problems, substance use, and gambling

	Spouses/partners %	Adult children %	Parents %
Mental health			
High to very high psychological distress	16.8	29.0	14.4
High levels of PTSD symptoms	11.1	12.0	11.9
Suicidal ideation in last 12 months	13.4	18.0	10.6
Physical health			
Poor general physical health	13.7	8.8	8.4
Substance use			
Problem drinking in last 12 months	10.0	18.6	8.1
Illicit drug use in lifetime	18.5	39.2	8.7
Illicit drug use in last 12 months	2.0	14.9	1.5
Gambling			
Gambled in last 12 months	28.4	44.1	31.4
Problem levels of gambling	2.7	9.8	4.7

Spouse/partner reports of behaviour problems among 2- to 17-year-old children revealed that Family Wellbeing Study rates were higher than in the child general population on peer problems (16.9%), emotional symptoms (16.9%) and hyperactivity (15.8%), but not on prosocial behaviour, conduct problems or total behaviour problems. Nevertheless, more than four in five children did not show high levels of behaviour problems.

3.5.3 Family relationships

Only around one in five spouses/partners and servicemen and women reported being dissatisfied or unhappy with their couple relationship (21.4% of spouses/partners and 17.5% of servicemen and women). Spouses/partners also tended to rate elements of their couple relationship very positively (e.g. how well their partner met their needs). The occurrence of abuse at some stage of the couple relationship was rare (reported by 4.8% of spouses/partners). Thus, couple relationships seemed to be healthy and strong in most Family Wellbeing Study families.

3.5.4 Employment and financial wellbeing

The majority of spouses/partners were in employment (68.8%), with rates similar to the general Australian population of a comparable age and sex. In relation to financial wellbeing in the past 12 months, 67.1% of Family Wellbeing Study families had not experienced any of the hardships measured (for example, not been able to pay electricity, gas or telephone bills on time; needed to seek financial help from families or friends). However, 20.2% had experienced two or more hardships. This was higher than in some other Australian general community studies.

Interestingly, this generally positive picture was somewhat at odds with family members' perceptions of how military service had affected them. For example, over half of spouses/partners reported that military service had negatively affected their employment and careers. This is despite the fact that their actual rate of employment was reasonably high and similar to the general population.

Likewise, the family members of both Current Serving and Transitioned ADF members often felt there had been negative effects on their mental health. Among civilian spouses/partners, over four in 10 felt there had been negative effects on their mental health; among adult children, one in three perceived there had been negative effects; while among parents, one in four felt there had been negative effects. Despite this, the study's measures of psychological wellbeing did not reveal high rates of mental health problems.

Overall, these findings suggest that, despite the pressures of a military family lifestyle, Australian military families are generally resilient and find ways of coping.

3.5.5 Relocations and school moves

Civilian spouses/partners had most often lived in 3 to 4 differing places during their ADF member's military career (30.3%), followed by 5 to 6 places (21.5%). The most common number of residential moves made because of spouses'/partners' own ADF service was 7+ (25.6%), then 3–4 (21.8%) and 5–6 (19.5%). Over one in three school-aged children had attended four or more schools (37.5%), while another one in five had attended three schools (19.8%). Around four in 10 had attended only one or two

schools (42.7%). These rates of residential and school mobility are much higher than in the Australian general population. Such a frequent rate of mobility can place strain on individual and family wellbeing, employment and careers, and social networks.

3.5.6 Families of Regular and Transitioned ADF members

A key issue examined by the Family Wellbeing Study was the welfare of families during the potentially difficult first years of servicemen and women's transition out of ADF service.

Families of Current Serving and Ex-Serving ADF members were similar on many of the aspects examined. However, there were some signs that spouses/partners of Ex-Serving ADF members were experiencing more difficulties. While couple relationships were generally very strong, spouses/partners of Ex-Serving members tended to be somewhat less positive about the quality of their couple relationship. Additionally, the rate of abuse in couple relationships was higher among spouses/partners with Ex-Serving ADF members (although was very low overall). Spouses/partners of Ex-Serving members had more often reported instances of suicidality in the previous 12 months (suicidal thoughts, ideation, plans or attempts). Finally, they had also more often engaged in problem drinking and illicit drug use in this time period than had spouses/partners of Current Serving ADF members, although not in their lifetimes. However, they did not experience significantly more physical health or other types of mental health problems.

Families of Ex-Serving ADF members had also more often experienced particular financial hardships in the past two years, such as not being able to pay the mortgage or rent on time, or needing to sell or pawn something, although they did not differ on the total number of hardships experienced. Overall, these findings are consistent with other research showing that the period following exit from service can be a vulnerable time for families.

There were some specific difficulties for spouses/partners of Current Serving ADF members as well. They more frequently perceived that their employment and careers had been negatively affected by their serving members' military career, and their families had experienced significantly more residential moves or relocations, with these two characteristics likely to be related. Both factors can be a source of stress for families.

Parents and the adult children of ADF members did not seem to be affected by whether their family members were Current Serving or Ex-Serving. Thus, effects of transition from military service seem to mainly be borne by spouses/partners. The qualitative study showed that spouses/partners are a crucial source of support for transitioning ADF members and are often the main facilitators of members' access to

services. As one partner said, 'He actually would ring them and say, "I'm not talking to you, you need to talk to my wife". So I'd have to relay because … he just couldn't deal with them'. Another partner said, 'It's not just one person in it'. This is at a time when spouses/partners may also be under pressure and in need of support.

3.5.7 Spouses/partners who had served in the ADF

Spouses/partners who had themselves served in the ADF significantly more often reported psychological distress and PTSD, and lower warmth when parenting dependent children, than civilian spouses/partners. These findings suggest a greater mental health vulnerability among Family Wellbeing Study spouses/partners who have served in the ADF, which is likely due to military lifestyle experiences such as deployment experiences or high rates of residential relocations.

In summary, the Family Wellbeing Study revealed that most military families who took part were progressing well. It also provided insight into subgroups experiencing more difficulties and identified some potential areas for policy development and support.

4 Key findings to emerge from the Programme

This chapter discusses the Transition and Wellbeing Research Programme outcomes in relation to the following nine key research findings:

1. ADF members transitioning from military service are at high risk of poor mental and physical health outcomes.

2. At a population level, overall mental health has deteriorated in the Regular ADF between 2010 and 2015.

3. There is a strong association between military service and the development of anxiety disorders.

4. There is a potential association between military service and the development of bipolar affective disorder.

5. There are a number of observable early indicators of emerging disorder that can be used to predict poor outcomes in ADF members over time.

6. Certain subgroups of ADF members who transition to civilian life are at greater risk of poor outcomes than others.

7. Psychological distress and impairment in work, social and family functioning are associated with a different pattern of psychosocial predictors in both Transitioned and Regular ADF members.

8. Despite best efforts, there remains an under-engagement with evidence-based care in both Transitioned ADF and Regular ADF, particularly in those with probable disorder.

9. Effects of deployment and combat exposure are cumulative, time dependent and emerge slowly across multiple domains over time.

4.1 ADF members transitioning from military service are at high risk of poorer mental and physical health outcomes

Based on the 2010 ADF Mental Health Prevalence and Wellbeing Study (MHPWS) (McFarlane et al., 2011), which reported higher rates of affective and anxiety disorders in younger ADF members compared with the Australian community, it was predicted

that younger ADF members who developed mental disorders were at particular risk of transitioning. One potential contributing factor to this was the recent intensity of deployments to the Middle East Area of Operations (MEAO), which meant there was an accumulated risk as a consequence of trauma-related exposures in warlike environments. Similarly, the growing body of literature about the prevalence of delayed-onset posttraumatic stress disorder (PTSD) suggested that the MEAO Census Study and MEAO Prospective Study were likely to underestimate the rates of disorder that would later emerge as a consequence of these deployments (Davy et al., 2012; Dobson et al., 2012).

As anticipated, findings from the Programme did indeed show that those ADF members transitioning from military service represent a group at particular risk of poor mental and physical health. This was evidenced by the following:

- higher rates of 12-month mental disorder in the Transitioned ADF compared with the Regular ADF in 2010
- higher rates of 12-month mental disorder in the Transitioned ADF compared with the Regular ADF in 2015
- higher self-reported symptoms of psychological distress, PTSD, depression, anxiety, alcohol abuse and anger compared with the Regular ADF in 2015
- higher rates of 12-month suicidality in the Transitioned ADF compared with the Regular ADF in 2015
- higher rates of mental disorder comorbidity and physical health problems in Transitioned ADF compared with the Regular ADF in 2015, representing a marker of severity of poor health
- higher rates of lifetime trauma and deployment traumas in Transitioned ADF compared with the 2015 Regular ADF, which are known risk factors for disorder
- higher rates of psychological distress and lower self-perceived health in Transitioned ADF members compared with a socio-demographically matched Australian community sample.

Each of these findings are discussed in detail in the following subsections.

4.1.1 12-month ICD-10 mental disorder in the Transitioned ADF compared with the 2010 Regular ADF

The 2010 MHPWS reported an estimated lifetime prevalence of mental disorder of 54%, a 12-month prevalence of 22%, and a 31% prevalence of comorbid disorder in Regular ADF members in 2010. In contrast, in the current study, approximately three

out of four Transitioned ADF members (74.7%) were estimated to meet criteria for any International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10) mental disorder in their lifetime, with a 12-month prevalence of 46.4% and a rate of 55% for comorbid mental disorder. The fact that rates of 12-month disorder were closer than might be expected to lifetime disorder rates in the Transitioned ADF (McFarlane et al., 2011) suggests the increasing chronicity and severity of mental disorder (Morina et al., 2013), and highlights the cumulative psychological morbidity in this population.

The 12-month estimated rates of PTSD, panic attacks and panic disorder in the Transitioned ADF (17.7%, 17.0% and 5.4%) were more than double those of the Regular ADF in 2010 (8.0%, 7.1% and 1.4%, respectively), as were the rates of social phobia (11.0% vs 3.8% in the 2010 Regular ADF), affective disorder (23.1% vs 9.5% in the 2010 Regular ADF), and in particular bipolar disorder (9.8% vs 2.8% in the 2010 Regular ADF), alcohol disorder (12.9% vs 5.2% in the 2010 Regular ADF), and suicidality (21.7% vs 4.0% in the 2010 Regular ADF).

These results suggest that ADF members with a mental disorder have a greater probability of transitioning from military service with emerging psychological distress that is likely to be a significant driver of an individual's decision to discharge or be medically discharged from military service.

In contrast, rates of obsessive-compulsive disorder and generalised anxiety disorder were relatively similar to those reported in 2010 and generally low in both groups.

These findings combined not only highlight why ADF members transitioning from regular service might be at high risk of poorer mental and physical health outcomes, but they also shed light on why the costs of deployment may not be readily visible *within* the ADF. The ADF members with emerging symptomatic distress have a substantially greater probability of transitioning from full-time service, whereas as those who remain in the ADF following a deployment are more likely to be those who remained mentally well. Together, these results highlight the importance of studying transitioning members in addition to Regular ADF members if the true risks associated with combat exposure are to be defined.

The comparisons made here between the mental health of the Transitioned ADF and the 2010 Regular ADF results should be considered, noting two primary caveats: first, that these two populations are not entirely separate (i.e. Transitioned ADF members in 2015 may have been Regular ADF members in 2010 and hence are included in both populations); and second, that the prevalence estimates have been established five years apart.

A more detailed and contemporaneous comparison of the mental health of Transitioned and Regular ADF is provided in subsection 4.1.3 of this report using data collected from both populations in the same year – 2015.

4.1.2 12-month ICD-10 mental disorder in the Transitioned ADF compared with the 2015 Regular ADF

Although representative prevalence estimates of ICD-10 disorder among the 2015 Regular ADF were not established in this study, findings from the Impact of Combat Study and the MHPWS longitudinal cohort further support the suggestion that symptoms and disorder are greater among those who transition from service.

While the Impact of Combat Study MEAO deployed cohort as a whole was generally healthy, there was a clear progression of symptoms and disorder emergence with the passage of time, particularly in those who had transitioned. Almost 80% (79.2%) who had transitioned met criteria for any ICD-10 mental disorder in their lifetime, compared with approximately two-thirds (66.7%) of those who remained in the Regular ADF in 2015. When considering 12-month disorder rates, half of those who had transitioned compared with a much lower 21.9% of those who remained in the Regular ADF met criteria for any mental disorder class in the previous 12 months.

Similarly, in the MHPWS longitudinal cohort, rates of any 12-month ICD-10 disorder were higher among those members of the cohort who had transitioned in 2015 (51.7%) compared with those who remained in the Regular ADF (43.3%), though the difference here was substantially less than the difference observed in the Impact of Combat Study. This is likely to reflect a 'healthy warrior effect', as the Impact of Combat Study MEAO deployed cohort were selected at the time of their first wave of data collection on the basis that they were about to deploy. Those still serving within this cohort are likely to still be healthy and deployable. In contrast, the longitudinal cohort was an enriched sample (i.e. included a higher proportion of those with significant mental health symptoms in 2010), and when unweighted, was likely to have an overrepresentation of disorder, partly accounting for this difference.

4.1.3 Current self-reported mental health symptoms in the Transitioned ADF compared with the 2015 Regular ADF

Across the various Programme cohorts and studies, there was also a significantly greater severity of current self-reported symptoms of psychological distress, depression, anxiety, anger, and alcohol use in the Transitioned ADF compared with the 2015 Regular ADF, further underscoring the role that symptoms may play in influencing the decision to leave the military, as well as the impact of transition on mood more generally.

For example, the *Mental Health Prevalence Report* (Van Hooff et al., 2018) finds that, compared with 2015 Regular ADF:

- nearly twice as many Transitioned ADF reported high to very high psychological distress (33.1% vs 18.7%)
- nearly three times as many Transitioned ADF reported high to very high posttraumatic stress symptoms (24.3% vs 8.7%)
- nearly four times as many Transitioned ADF reported alcohol use at levels that suggest the need for further assessment (this included significantly higher Alcohol Use Disorders Identification Test (AUDIT) total scores, more frequent drinking, and drinking more standard drinks on a typical day)
- nearly three times as many Transitioned ADF had moderately severe to severe depressive symptoms (19.5% vs 7.4%)
- more than twice as many Transitioned ADF had moderate to severe general anxiety disorder symptoms (22.4% vs 9.6%)
- Transitioned ADF experienced significantly greater levels of anger.

Together, these findings emphasise the importance of investigating the early stages of symptom development (particularly while in service) and how these relate to later disorder (McFarlane, Lawrence-Wood, Van Hooff, Malhi, & Yehuda, 2017). More generally, these increased rates of mental health symptoms observed among the Transitioned ADF also raise important questions about the access to care, as well as adequacy of care, provided for mental health conditions upon leaving the ADF.

4.1.4 12-month suicidality in the Transitioned ADF compared with the 2015 Regular ADF

Due to the high level of community interest and concern – for example, as reflected through the review into the suicide and self-harm prevention services available to current and former serving ADF members and their families (National Mental Health Commission, 2017) – and the significance and risk of suicidality in the broader Australian community, 12-month suicidality was also examined in both the Transitioned and Regular ADF.

Similar to the other self-report findings described above, the Transitioned ADF were significantly more likely to report suicidal ideation, plans and attempts than the 2015 Regular ADF (Table 4.1). This is consistent with the 2017 Australian Institute of Health and Welfare (AIHW) report into the incidence of suicide among serving and Ex-Serving ADF members, which found rates of completed suicide were lower than the general population among those still serving in the ADF (Regular and Reserve), but higher in

those who were Ex-Serving (Australian Institute of Health and Welfare, 2017). The consistency of the self-reported suicidality observed in the current study with data regarding completed suicide is of high importance, as it strongly indicates that the Ex-Serving Transitioned ADF are at increased risk of suicidal ideation escalating to suicidal behaviour.

Table 4.1 Estimated proportions of suicidality in Transitioned ADF and 2015 Regular ADF

	Transitioned ADF 2015 n = 24,932			2015 Regular ADF n = 52,500		
	Weighted n	%	95% CI	Weighted n	%	95% CI
Felt life not worth living	7208	28.9	27.3, 30.6	6927	13.2	10.7, 16.2
Felt so low thought about committing suicide	5294	21.2	19.8, 22.8	4493	8.6	6.4, 11.3
Made a suicide plan	1965	7.9	6.9, 8.9	950	1.8	1.0, 3.3
Attempted suicide	505	2.0	1.6, 2.6	311	0.6	0.2, 1.6
Any suicidality*	5342	21.7	20.2, 23.3	4533	8.8	6.7, 11.6

* 'Any suicidality' includes those who endorsed 'felt so low thought about committing suicide', 'made a suicide plan', 'attempted suicide'.
Note: 95% CI = 95% confidence interval.

Mental disorder is a known significant risk factor for suicidal ideation and completed suicide (Beautrais et al., 1996), with the high rates of suicidality observed in the Transitioned ADF (i.e. 7.9% reported making a suicide plan and 2.0% reported trying to take their own life in the past 12 months) likely to be another indicator of the severity of associated mental disorder for some individuals in this population.

Furthermore, exposure to death and suffering, cumulative trauma exposure (LeBouthillier, McMillan, Thibodeau, & Asmundson, 2015; Stanley, Hom, Hagan, & Joiner, 2015) and PTSD convey further risk (Krysinska & Lester, 2010). Defence has undertaken initiatives to manage and prevent suicide among members. While the 2010 MHPWS showed high rates of suicidal ideation compared with the Australian community, the rates of *attempted* suicide were significantly lower. These findings, combined with the recent AIHW findings, suggest that the various programs put in place have been beneficial while personnel are in ADF service. However, once personnel have fully transitioned to the civilian community, there appears to be a significant rise in suicidal behaviour that needs to be addressed.

4.1.5 Mental disorder comorbidity as a marker of increased severity and impairment in the Transitioned ADF

Mental disorder comorbidity among the Transitioned ADF was high, and this is an important issue as it is a marker of the severity of disorder and associated impairment in functioning and presents a significant challenge in obtaining optimal treatment outcomes (Hruska, Irish, Pacella, Sledjeski, & Delahanty, 2014).

In the Transitioned ADF, just over half of those with a mental disorder had at least one comorbid mental disorder, with one in four Transitioned ADF meeting criteria for two

or more mental disorder classes (two classes: 15.1%; three classes: 8.2%; four classes: 1.9%). Alcohol disorders were the most common comorbid condition, with approximately 95% of those meeting 12-month criteria for an alcohol disorder also having another mental disorder. This indicates that very few people have an alcohol disorder in isolation, and supports a known relationship between the consumption of alcohol and mental disorders such as PTSD (Boscarino, Kirchner, Hoffman, Sartorius, & Adams, 2011). Although the literature generally supports a self-medication model, with elevated PTSD symptoms predictive of greater alcohol use (Haller & Chassin, 2014; Simpson, Stappenbeck, Luterek, Lehavot, & Kaysen, 2014), it is also important to consider the potential bidirectional relationship between psychological symptoms and alcohol consumption that may be at play, with some evidence that excessive regular consumption of alcohol could impact on psychological symptoms (Rumpf, Hapke, Meyer, & John, 2002; Saunders et al., 1993).

In relation to PTSD specifically, over 80% of those meeting 12-month criteria had another comorbid mental disorder. The comorbidity observed between PTSD and affective disorders deserves specific consideration because traumatic stress exposure also plays a role in the onset of affective disorder. The neurobiology of PTSD and major depressive disorder have many shared elements (Dekel, Solomon, Horesh, & Ein-Dor, 2014; Rytwinski, Scur, Feeny, & Youngstrom, 2013), and it is likely that the coexistence of an affective disorder indicates a greater degree of severity and general psychological stress among those diagnosed with PTSD (Morina et al., 2013).

Rates of comorbidity were also higher in the Transitioned ADF compared with those who were in the Regular ADF in 2010 (55% vs 31%), as were lifetime rates of disorder (74.7% vs 54%), indicating an overall increase in the chronicity, severity and cumulative psychological morbidity in those who had transitioned from Regular ADF service by 2015 (Morina et al., 2013).

Finally, just over 16% (16.4%) of Transitioned ADF reported using illicit drugs, and 6.7% reported using prescription drugs for non-medical purposes in the past 12 months. Furthermore, almost 10% of Transitioned ADF reported a possible or definite problem with drinking, and over 8% of Transitioned ADF reported that they thought they would have difficulty reducing their alcohol consumption, with self-reported alcohol use and problem drinking significantly greater in the Transitioned ADF compared with the 2015 Regular ADF. These rates represent a significant comorbidity that has the potential to exacerbate the behavioural disinhibition in those with a mental disorder, further increasing the risk of developing a full-blown disorder into the future.

High rates of physical symptoms/conditions were also observed among a minority of the Transitioned ADF. Approximately a quarter (24.2%) of the Transitioned ADF, for example, reported having been diagnosed with three or more doctor-diagnosed

medical conditions (i.e. skin or subcutaneous tissue conditions, respiratory conditions, digestive conditions, nervous system conditions, circulatory system conditions, musculoskeletal conditions, and skin cancers/neoplasms) during the course of their lifetime, compared with 17% of the 2015 Regular ADF. The number of current (past month) self-reported general health symptoms across multiple body symptoms was also higher (M = 16.4, SE = 0.3) compared with 2015 Regular ADF (M = 11.8, SE = 0.5), with over half of the Transitioned ADF (58.6%) – compared with just under half (44.6%) of the 2015 Regular ADF – reporting more than 10 concurrent health symptoms in the past month.

Both the *Physical Health Status Report* (Kelsall et al., 2018) and the *Impact of Combat Report* (Lawrence-Wood et al., 2019) reported a high prevalence of non-specific health-related symptoms and pain, particularly in those who have transitioned from regular service (19.7% high-intensity pain). This is consistent with previous studies, which have reported a high level of comorbidity between the self-reported general health symptoms reported in this study and psychiatric disorders (McFarlane, Ellis, Barton, Browne, & Van Hooff, 2008). Some of these non-specific health symptoms have been shown to be associated with low-grade inflammation (Tak, Bakker, Slaets, & Rosmalen, 2009), a factor that studies have found to be part of the underpinnings of PTSD (Spitzer et al., 2010). Some of these symptoms may be a consequence of shared neurobiological dysregulation, such as that which exists between depression, PTSD and pain (Baune, Caniato, Garcia-Alcaraz, & Berger, 2008; Moeller-Bertram et al., 2014). Other health indicators such as sleep, pain and quality of life are also related to both physical health and mental health.

Furthermore, there is an established relationship between PTSD and depression and cardiovascular risk (Rosenbaum et al., 2015) that is relevant to this Programme. This is as a consequence of a greater propensity in those with PTSD and depression to develop metabolic syndrome, hypertension (Sumner et al., 2016), and hypoglycaemia (Vaccarino et al., 2014). A recent study of Australian Vietnam veterans highlighted that when controlling for combat exposure, those with PTSD had a significantly greater risk of respiratory illnesses, including asthma, rheumatoid arthritis, cancer, pain, epilepsy, and renal and autoimmune disorders (McLeay et al., 2017). This is important in the context of the current study, given that the Transitioned ADF cohort is a relatively young population where these morbidities are yet to be fully manifest (McFarlane et al., 2017).

The *Impact of Combat Report* (Lawrence-Wood et al., 2019) further speaks to this issue. A unique characteristic of the Impact of Combat Study was the capture of not only self-report measures of mental and physical health, but also objective markers of neurobiology. Preliminary examination of both biological and neurocognitive markers highlighted their association with measures of psychological symptom status. While at

a cohort level clear evidence did not emerge of systemic dysregulation in physiological stress response systems, there were distinct patterns consistent with early neurobiological dysregulation among those cohort members who went on to develop elevated psychological distress and posttraumatic stress symptoms over time. In light of this, and the more general observed shifts in psychological and somatic symptoms over time, it is possible that shifts in physiological systems, and the development of physical conditions, may also emerge in the broader cohort with the further passage of time. There is some evidence that the relationship between psychological distress and shifts in the physiological stress regulation system are bidirectional (Renoir, Hasebe, & Gray, 2013); thus, with the further recruitment of symptoms over time, it is possible that biological systemic dysregulation may emerge (McFarlane, 2017). Together, physical health symptoms and biological markers are an important domain to document and monitor over time, particularly due to the importance of managing the emergence of physical and mental disorder morbidity.

In conclusion, understanding mental and physical comorbidities provides a major opportunity for more targeted preventative interventions. For example, a recent cohort study demonstrated that individuals with PTSD who are placed on a selective serotonin reuptake inhibitor have a lower rate of autoimmune disease (Song et al., 2018). The significance of these morbidities should not be underestimated. This further argues for the importance of the ongoing monitoring of both the mental and physical health trajectories of both Regular and Transitioned ADF members in order to ensure the adequacy of their management both within the ADF and by the Australian health system.

4.1.6 Self-reported physical health in the Transitioned ADF compared with the 2015 Regular ADF

Similar to the mental health findings, overall, poorer physical health outcomes were reported for Transitioned ADF members compared with 2015 Regular ADF members. Although the majority of both Transitioned ADF and 2015 Regular ADF reported their health to be excellent, very good or good, self-reported use of any health service in the preceding 12 months was significantly lower among Transitioned ADF. In particular, compared with the 2015 Regular ADF, the Transitioned ADF:

- reported a greater mean number of symptoms and were more likely to report the majority of general physical health symptoms
- were significantly more likely to report a doctor-diagnosed circulatory condition, high blood pressure, a musculoskeletal or connective tissue condition, chronic low back pain, a nervous system condition and hearing loss
- were significantly more likely to report a number of respiratory symptoms but not self-reported asthma ever

- reported a slightly greater mean number of service-related injury types
- had a higher level of reporting physical inactivity, but did not differ on the risk factors of being categorised as having a body mass index in the pre-obese and obese range, and current, former or ever smoking status
- were more likely to report clinical insomnia and moderate or severe insomnia during the preceding two weeks
- were more likely to report poorer self-perceived health, poorer physical health, and dissatisfaction with their health, and to have low perceived quality of life
- were less likely to report use of any health services in the preceding 12 months; and were less likely to consult dentists, other dental professionals and specialist doctors, and more likely to consult general practitioners, in the preceding 12 months.

This pattern of increased physical symptoms in the Transitioned ADF further substantiates the pattern of poor overall health in ADF members who leave Regular ADF service.

4.1.7 Transitioned ADF report higher rates of lifetime trauma and deployment traumas than 2015 Regular ADF, which are risk factors for disorder

Cumulative trauma exposure played an important role in predicting the course of mental disorder in the MHPWS longitudinal cohort, as well as predicting the trajectory of increasing posttraumatic stress symptoms in the deployed cohort from the Impact of Combat Study. It was also a key factor of differentiation between ADF members who had transitioned and those who remained in service.

For example, results indicated that those who had transitioned from the ADF had substantially higher levels of deployment-related traumas in contrast to those who remained in the ADF in 2015. For example, in the Transitioned ADF, 38.3% reported they had gone on combat patrols, in contrast to 29.9% of the 2015 Regular ADF. Similarly, among the Transitioned ADF, 37.4% had either handled or seen dead bodies, in contrast to 30.2% of the 2015 Regular ADF. While it is important not to minimise the significant exposures of those who remain in the Regular ADF, these findings suggest that those who transition have, on average, endured a slightly greater history of a range of traumatic exposures related to deployment. The relationship between these exposures and the levels of psychological symptoms and mental disorder in this population requires further exploration. This is particularly important longitudinally, given recent research highlighting the role of sensitisation following deployment as a risk factor for the development of delayed-onset PTSD and other mental disorders (McEwen, 2003; Smid, Kleber, Rademaker, van Zuiden, & Vermetten, 2013).

It is important not to conclude that deployment-related trauma is the substantial cause of the majority of the morbidity identified in the Transitioned ADF until further analyses are conducted; however, the findings summarised in this report highlight the potential impact of these exposures. This trend was not apparent in the 2010 MHPWS (McFarlane et al., 2011), which found no significant differences in the rates of mental disorder between those who had been deployed and those who had not. The reason for the latter finding may be that those who had developed mental health symptoms as a consequence of deployment-related trauma had already self-selected for discharge. Transitioned ADF members (M = 2.9, SE = 0.1) also reported being exposed to a greater number of different lifetime traumatic events (M = 2.2, SE = 0.09) than 2015 Regular ADF members (M = 2.2, SE = 0.09). The impact of this cumulative exposure to lifetime trauma requires further investigation.

In the MHPWS longitudinal cohort, greater lifetime trauma exposure was associated with progression from no disorder to subsyndromal disorder, as well as worsening from subsyndromal to probable disorder in 2015. There is abundant evidence for the dosage effect between trauma exposure and likelihood of developing PTSD (May & Wisco, 2016), with some evidence suggesting that the influence of trauma severity may be more pronounced in military than civilian samples (Brewin, Andrews, & Valentine, 2000). This also accords with evidence that exposure to death and trauma is a vulnerability factor for suicidality (LeBouthillier et al., 2015; Stanley et al., 2015). Importantly, the measure of lifetime trauma exposure used in the Programme represents all types of trauma experienced across the lifetime, and not simply traumatic events experienced during deployments or other ADF service. It has previously been noted that lifetime rates of sexual trauma, such as experiencing rape and sexual assault, as well as interpersonal traumas, were found to be more prevalent in the Regular ADF than in the Australian community, with the majority of these events first occurring before enlistment (Van Hooff et al., 2012).

While rates of different types of deployment exposures were significantly higher among the Transitioned ADF, rates of deployment-related trauma exposure in general were high, with at least 85% of *both* Transitioned ADF and 2015 Regular ADF reporting having experienced at least one deployment exposure. This additional cumulative trauma exposure is an important risk factor for psychiatric disorder. When considering the increased rates of disorder in 2015 compared with 2010, in conjunction with evidence of delayed emergence of PTSD, particularly indicated by findings from both the *Mental Health Changes Over Time: a Longitudinal Perspective* report (Bryant et al., 2019) and the *Impact of Combat Report* (Lawrence-Wood et al., 2019), the high rates of deployment exposure in the ADF sample may provide some explanation. In the Impact of Combat Study, extent of career deployment exposures was the strongest independent predictor of mental health outcomes.

Against this background regarding trauma exposure, consideration of ongoing monitoring should be given to those ADF members who are more highly exposed to traumatic events (either prior to or during ADF service, and occurring either in the context of their military or personal lives), as this represents a marked risk factor for worsening of symptoms following discharge.

4.1.8 Transitioned ADF report poorer health than the Australian community

The Programme was designed and conducted in a way that acknowledges the particular challenges of conducting epidemiological research on military populations. In contrast to civilian populations, which are essentially closed populations in that once you are born or have migrated into a population you remain in that population until death or emigration, a military population is fluid, with people entering service and leaving voluntarily or involuntarily. To accurately establish the mental health of a military population, therefore, it is critical that, as well as including those who remain within the service, those individuals who leave are also followed up. Personnel who develop psychiatric disorders or physical injuries or illnesses may have to leave because medical employment standards demand minimum standards of fitness (physical and psychological). Also, those who struggle to adapt to military service are more likely to leave prematurely, rather than serve out their career in the military, and these individuals may also be at greater risk of emerging morbidity. This Programme was designed in such a way that allows examination of this question.

Overall psychological distress was higher in the Transitioned ADF compared with a matched sample of the Australian community. Almost three times more Transitioned ADF members scored in the high to very high psychological distress bands (33.1%) compared with the Australian community (12.8%). The largest difference between the Transitioned ADF and the Australian community – across the various sex and age groups – was in the very high scoring band on the Kessler Psychological Distress 10-item scale (K10). Nearly one in five Transitioned ADF scored in this band compared with just under 5% of the Australian community. Psychological distress was also found to decrease overall with age in the Transitioned ADF, while in the Australian community, it remained relatively stable across age groups.

In relation to physical health, Transitioned ADF were less likely to be current smokers and to have doctor-diagnosed asthma ever, but more likely to report poorer self-perceived health than the Australian community. Self-reported doctor-diagnosed asthma ever in Transitioned ADF and doctor-diagnosed asthma in the Australian community sample were used to define asthma for comparative purposes. In Transitioned ADF, doctor-diagnosed asthma ever prevalence was significantly lower (15.3% vs 21.9%) than in the Australian community. This pattern of lower prevalence was the same in males and females, and lower in all age brackets in Transitioned ADF

compared with the Australian community, and is likely to reflect the expected medical standards in the ADF.

The proportion of Transitioned ADF who rated their health as fair or poor was higher compared with the Australian community. This pattern of poorer self-perceived health in Transitioned ADF compared with the Australian community was similar in males and females and by age groups. The implications of an increased proportion of Transitioned ADF reporting their health as fair or poor are not clear. For instance, comparisons between the Transitioned ADF and the community sample on the number of comorbidities were not undertaken, and self-perceived health was measured by a single-item question that was not specifically directed towards physical health but towards self-perceived health in general.

Furthermore, this Programme also reported few observed differences in the rates of alcohol consumption between the Transitioned ADF and an age-, sex- and employment-matched Australian community sample. Overall, the Australian community drank more standard drinks on a single occasion in the last 12 months than the Transitioned ADF, with this difference particularly notable in Australian males. Interestingly, a significantly higher proportion of Transitioned ADF females reported drinking daily, weekly and monthly compared with Australian community females. The finding of increased rates of alcohol consumption in the Transitioned ADF overall, which closely replicated the Australian community, may possibly reflect the loosening of institutional controls around alcohol consumption that exist during full-time military service, and therefore a movement towards the general population drinking behaviour among the Transitioned ADF. This further underscores the challenges of transitioning out of full-time military service.

4.1.9 Implications

Overall, these results suggest a picture of increasing severity of both mental and physical symptoms from service to transition, specifically for those disorders that carry particular risks of impairment and disability. This suggests that emerging psychological distress is likely to be a significant driver of an individual's decision to discharge or be medically discharged from military service, with mental and physical ill health therefore being largely carried by those who have left Regular ADF service. Together, this supports the need for longitudinal health surveillance and a detailed mental and physical health assessment prior to transition in order to ensure individuals are channelled into the appropriate health services in the civilian sector, regardless of their length of service or the type of transition from the Regular ADF.

4.2 At a population level, overall mental health has deteriorated in the Regular ADF between 2010 and 2015

When compared with the entire Regular ADF in 2010, the 2015 Regular ADF population as a whole reported significantly higher psychological distress, posttraumatic stress symptoms, anger, suicidality, and depressive symptoms (Table 4.2). This pattern of increase in psychological symptoms between 2010 and 2015 at a population level suggests a progression to more severe symptoms in a proportion of individuals who remain in the Regular ADF.

Table 4.2 Estimated mean total scores on the self-report mental health measures in the 2010 Regular ADF and the 2015 Regular ADF

	2015 Regular ADF n = 52,500		2010 Regular ADF n = 52,049	
	Mean	SE	Mean	SE
Psychological distress (K10) (range 10–50)	17.0	0.4	15.4	0.03
PTSD (PCL-C) (range 17–85)	24.2	0.4	22.7	0.1
Alcohol (AUDIT) (range 0–40)	5.3	0.2	6.0	0.1
Depression (PHQ-9) (range 0–27)	5.1	0.2	2.9	0.0
Anger (DAR-5)	8.2	0.5	7.1	0.02
	%	CI	%	CI
Suicidality (ideation, plans or attempts)	8.83	6.65, 11.63	4.0	3.7, 4.2

Note: SE = standard error; CI = confidence interval.

In keeping with the elevated levels of psychological distress, posttraumatic stress symptoms, depressive symptoms and anger, the 2015 Regular ADF sample were significantly more likely to report suicidal ideation than the 2010 Regular ADF cohort (accounting for the fact that suicidality overall in the 2015 Regular ADF was double that of the 2010 Regular ADF). This pattern, however, did not apply to plans and attempts.

Similarly, in the Impact of Combat Study and the MHPWS longitudinal cohort, self-reported mental health symptoms across multiple measures were also found to show a pattern of increase over time among those who remained in the Regular ADF in 2015, though this was less pronounced than the increase observed in the subset who had transitioned.

In contrast to findings regarding most mental health symptoms, alcohol use in the Regular ADF *decreased* from 2010 to 2015, with the 2015 Regular ADF reporting significantly lower alcohol use compared with the 2010 Regular ADF across all alcohol use indicators. This finding of the decrease in alcohol use from 2010 to 2015 potentially highlights the impact that new and ongoing Defence and DVA preventive health programs and initiatives are having on the prevalence of disorder and symptoms at a population level, in particular, in this example, the effectiveness of the ongoing alcohol intervention and preventive strategies employed by the ADF. It

supports the need for preventive health programs and initiatives that target other symptoms and disorders showing an *increase* over time – in particular, PTSD, depression and suicidality.

Together, these findings suggest an increase in self-reported mental health symptoms for the ADF population as a whole, which may be indicative of substantial ongoing consequences of the high operational deployment tempo of the last decade. Importantly, they underscore the need for regular mental health assessments in order to detect and prevent symptom progression at an individual level in ADF members over time.

4.3 There is a strong association between military service and the development of anxiety disorders

Fear circuitry disorders (panic disorder, agoraphobia, specific phobia, and PTSD) are characterised by dysfunction in how the neurobiological system processes and maintains stress responses to the environment. These emerged as a dominant theme across both the Mental Health and Wellbeing Transition Study and the Impact of Combat Study. It is theorised that these disorders commence because stimuli that are present at the time of a traumatic event (e.g. loud noises, smell of petrol, sight of blood) are paired with fear. Accordingly, when one is subsequently exposed to these stimuli, there is the perception that the threat is present again, leading to the experience of anxiety (Milad et al., 2008). This is also relevant to the concept of sensitisation, with the generalisation of threat responsivity following successive exposures to trauma ultimately resulting in the emergence of disorders such as PTSD over time.

Among the Transitioned ADF, anxiety disorders were the most prevalent category, with 37% meeting ICD-10 criteria for an anxiety disorder in the last 12 months. The estimated 12-month prevalence rate of PTSD was 17.7%, which was very similar to panic attacks, with a prevalence of 17%. This replicated findings from the 2010 MHPWS, which also found anxiety disorders (in particular, PTSD (8.3%) and panic attacks (7.1%)) to be the most common class of mental disorder in current serving Regular ADF members in 2010. The similarity in the prevalence rates of PTSD and panic attacks in both the 2010 and 2015 studies is interesting; panic attacks, like PTSD, involve a pattern of reactivity to environmental triggers that therefore have the capacity to increase in frequency and severity by the process of sensitisation (McFarlane, 2010a), and as such may be indicative of subsyndromal PTSD (Goodwin et al., 2004; Marshall-Berenz, Vujanovic, & Zvolensky, 2011).

Phobic disorders were also common in this population, with 11.9% of the Transitioned ADF meeting criteria for agoraphobia and 11.0% meeting criteria for social phobia.

Interestingly, agoraphobia is closely related to panic disorder as it represents the avoidance behaviour associated with panic attacks that occur in public environments. Similarly, social phobia represents the fear or avoidance behaviour associated with panic attacks in situations of public attention. As such, both of these disorders may also be indicative of some level of social impairment. Importantly, phobic disorders were found to be a significant predictor of PTSD in a longitudinal study of Australian Vietnam veterans (O'Toole & Catts, 2017). Given the possible relationship between panic attacks, agoraphobia and other phobic disorders on the one hand, and PTSD on the other, the progression of these disorders in ADF members is an important consideration.

The *Mental Health Changes Over Time: a Longitudinal Perspective* report (Bryant et al., 2019) further corroborated the pervasiveness of anxiety disorders. This cohort included both 2015 Regular ADF and Transitioned ADF members. Anxiety disorders were the only disorder category that significantly increased over time among both those who remained in the Regular ADF and those who had transitioned. Importantly, those cohort members who transitioned had higher rates of anxiety disorders while still in Regular ADF service and following transition. Being transitioned in 2015 (compared with remaining in Regular ADF service) was also associated with greater likelihood of *retention* of an anxiety disorder over time. Together, these findings suggest that those who transitioned from the ADF may have had a more severe anxiety disorder initially, and accordingly these individuals were more at risk of retaining their disorder. Interestingly, the specific conditions that tended to increase with time were once again panic disorder, agoraphobia, specific phobia and PTSD. These are all disorders that are likely to be associated with neurobiological processing systems that maintain the stress response to the environment and are more reactive to multiple triggers. With specific reference to PTSD, in the longitudinal cohort, 13.4% met criteria for this disorder in 2010 and 16.7% met criteria in 2015. Compared with those who remained in the ADF, those members who had transitioned in 2015 also had higher rates of PTSD both in 2010 and 2015.

The *Impact of Combat Report* (Lawrence-Wood et al., 2019) also followed this pattern of findings. Anxiety disorders were the most prevalent disorder category in this cohort, with rates among those who had Transitioned in 2015 more than twice as high as those who remained in the Regular ADF. Regarding specific mental disorders, among those who had transitioned, the most common disorder was PTSD (22.2%), followed by panic attacks (15.3%) and agoraphobia (12.5%). A slightly different pattern was observed among those cohort members who remained in the Regular ADF, with panic attacks (10.5%) the most common 12-month anxiety disorder, followed by PTSD (7.0%). These findings are in line with the proposal that panic attacks may precede the development of other disorders such as PTSD, which emerge with the passage of time.

This convergent evidence suggests that ADF personnel who experience some form of fear circuitry disorder (PTSD, panic attack or panic disorder, social phobia, specific phobia, or agoraphobia) during the period when they are a Regular ADF member may be prone to retaining this group of disorders following transition out of full-time service. Furthermore, it also suggests that they may develop further disorder following transition, potentially because fear circuitry mechanisms are thought to include sensitisation to later stressors that can exacerbate the condition (Post & Weiss, 1998).

4.4 There is a potential association between military service and the development of bipolar affective disorder

Similar to the high prevalence of anxiety disorders in the Transitioned ADF, affective disorders, which carry a significant level of impairment, were also prevalent, with 23.1% of the Transitioned ADF meeting criteria in the last 12 months. Similar to what was reported in current serving Regular ADF members in 2010, depressive episodes were the most prevalent affective disorder type, with 11.2% meeting criteria for this disorder in the last 12 months. Overall, rates of affective disorders remained reasonably stable across the 2010 and 2015 assessments (18.3% in 2010, and 21.1% in 2015), and there were no marked differences between those who had transitioned compared with those who remained in the Regular ADF.

Of particular concern was the prevalence of bipolar disorder in the Transitioned ADF (9.8%) – and especially in the Ex-Serving, with an estimated 13.9% meeting 12-month ICD-10 criteria. These high rates of bipolar affective disorder represent more than four times the Australian rates reported in the 2007 National Survey of Mental Health and Wellbeing (0.9%–1.7%) (Mitchell et al., 2013), and more than double the highest lifetime rate reported in other non-military population-based studies (0.1%–7.5%) (Dell'Aglio, Basso, Argimon, & Arteche, 2013). For bipolar affective disorder, slightly more of those who had transitioned (6.5%) became new cases in 2015 compared with those who remained in the Regular ADF (3.7%), and a slightly smaller proportion of those who transitioned (30.8%) retained their disorder in 2015 compared with those who remained in the Regular ADF (38.1%).

To date, the prevalence of bipolar disorder in serving and ex-serving military and veteran populations has been largely unaddressed in the published literature. Only one study has focused on bipolar disorder among military combat members. In this study, McLay et al. (2014) examined the rates of bipolar disorder among 109 active duty US combat veterans with PTSD, using a structured clinical interview. The study found that 54% of those with PTSD also met criteria for bipolar disorder. The authors provided two fundamentally opposite explanations for this. First, rates of bipolar disorder are high in combat-exposed populations but are often missed by military medical providers, due to 'lack of insight into mania by patients, lack of systematic assessment

of mania by clinicians, stigma and aggressive marketing of antidepressants' (McLay et al., 2014, p. 160). This underdiagnosis of bipolar disorder is not specific to military populations, with studies reporting that milder forms of bipolar disorder are frequently missed in clinical practice (Carvalho et al., 2015). Furthermore, a third of individuals with bipolar disorders report being misdiagnosed at least once, with a proper diagnosis taking, on average, 10 years from the initiation of affective symptoms (Drancourt et al., 2013; Lish, Dime-Meenan, Whybrow, Price, & Hirschfeld, 1994).

Alternatively, the diagnostic criteria for bipolar disorder, as strictly interpreted, are not appropriate for individuals with combat-related PTSD, with many symptoms of bipolar disorder appearing normally in the course of deployment and therefore may be circumstantial – for example, 'persistently irritable for several days that you had arguments, physical fights or shouted at people outside your family', 'do things others couldn't do', 'prolonged sleeplessness', 'increased goal-directed behaviour', 'easily distracted', and 'racing thoughts'.

It is also possible that the prevalence estimates in the current study are identifying subthreshold bipolar disorder; however, these are still clinically important (Marangell, 2004). Subthreshold bipolar disorder is also associated with significant morbidity, including criminal behaviour and substance abuse (Zimmermann et al., 2009). Prospective studies have also found that subthreshold bipolar disorder converted more often into bipolar disorder during follow-up. Hence, this group is at significant risk, including of suicide and suicidal ideation, in addition to disorder severity, particularly when it is comorbid with PTSD (Reddy, Meyer, Wittlin, Miller, & Weinstock, 2017).

More generally, evidence also suggests that the Transitioned ADF may be at particular risk of bipolar disorder because they have a high rate of anxiety disorders (as discussed above), which epidemiological research has shown pose a greater risk for developing an affective disorder (Goldstein & Levitt, 2007). Other research findings have also concluded that PTSD may predict the incidence of major depressive disorder and bipolar disorder in civilian populations (Chou, Mackenzie, Liang, & Sareen, 2011). Hence, the unexpected rate of bipolar disorder in this population may arise as a secondary consequence of the rates of other disorders in the Transitioned ADF.

Whatever the cause or consequence of the elevated rate of bipolar disorder in the Transitioned ADF, this issue requires further detailed examination. It also highlights the importance of ensuring that mental health professionals who provide clinical services to current and ex-serving ADF members are adequately trained in differential diagnosis and can detect a comprehensive range of emerging disorders.

4.5 A number of observable early indicators of emerging disorder can be used to predict poorer outcomes in ADF members over time

4.5.1 Anger as an early marker of increasing reactivity and emerging disorder

In relation to the issue of sensitisation for anxiety disorders and PTSD, and relatedly, subsyndromal disorder, anger is of relevance. Overall, in the *Mental Health Prevalence Report* (Van Hooff et al., 2018), the *Mental Health Changes Over Time: a Longitudinal Perspective* report (Bryant et al., 2019), and the *Impact of Combat Report* (Lawrence-Wood et al., 2019), self-reported anger followed the same patterns as for other psychological symptoms and for diagnosable mental disorder, with Transitioned ADF members reporting significantly greater levels of anger than the 2015 Regular ADF. Furthermore, in the *Mental Health Changes Over Time* report, while there was a trend for the Transitioned ADF to report experiencing more anger problems than those who remained in the Regular ADF in 2015, the *rate of increase* in anger problems was similar for both groups, with anger doubling in this population between 2010 and 2014. However, rates of problematic anger were higher in 2010 among those who went on to transition compared with those who remained in regular service. Coupled with the elevated rates of anxiety disorders and PTSD among Transitioned ADF, this is consistent with anger potentially representing an early manifestation of distress and reactivity associated with development of anxiety disorders and PTSD. In the *Impact of Combat Report*, the proportion of participants who had problematic anger also increased steadily from Time 1 through to Time 3.

Anger is a phenomenon of particular interest in relation to common mental disorders, as it is indicative of affect dysregulation. While anger is associated with all anxiety disorders and depression, it has a particularly strong association with PTSD (Olatunji, Ciesielski, & Tolin, 2010; Forbes et al., 2014). Anger and anxiety are linked as being defensive reactions to threat, marked by activation of the sympathetic nervous system (Lang, Cuthbert, & Bradley, 1998; Forbes et al., 2008). In particular, in the military context, anger is also primed as a response to threat in order to facilitate and mobilise engagement with, rather than avoidance of, the source of threat. This emotional response, however, if it persists, can inhibit the potential to process emotional states more associated with fear, anxiety and vulnerability, and hence a risk that these unprocessed emotions will escalate into disorder. Taken together, anger is likely to be an early indicator of increasing reactivity to minor provocations, inhibiting adequate processing of early emotional vulnerability in anxiety and mood, as well as potentially representing emerging disorder; thus, anger is of great importance in the consideration of longitudinal health surveillance.

4.5.2 Prevalence of subsyndromal mental health symptoms and the risk of later disorder

There is substantial evidence in the scientific literature that subsyndromal symptoms across the spectrum of anxiety and depression are associated with significant levels of impairment and distress (Judd, Paulus, Wells, & Rapaport, 1996; Karsten, Penninx, Verboom, Nolen, & Hartman, 2013), and that they represent a significant risk for further escalation of symptoms and development of disorder with the passage of time (O'Donnell, 2013; Pietrzak et al., 2013). Individuals experiencing subsyndromal symptoms are also at significant risk due to the potential associated suicidal ideation and levels of impairment that may accompany these, coupled with the likelihood of not receiving treatment for them (Marshall et al., 2001). Subsyndromal symptoms, therefore, have significant relevance from a public health perspective. Importantly, some subsyndromal symptoms may be less entrenched and more susceptible to brief interventions than fully established mental disorders (Haller & Chassin, 2014; McFarlane, 2017; Scott et al., 2013).

Results from the Mental Health and Wellbeing Transition Study indicated that a substantial proportion of both the Transitioned ADF and Regular ADF in 2015 reported subsyndromal levels of mental health symptoms across a range of measures. This represents a significant risk of the emergence of later disorder in this population. For example, between 20% and 50% of Transitioned ADF scored equal to or above the screening cut-offs on the self-reported measures of depression, psychological distress, posttraumatic stress, problematic alcohol use, anger and generalised anxiety disorder, indicating problematic levels of symptoms and the need for further diagnostic assessment. These individuals are at risk of developing further symptoms and/or disorder as evidenced by the pattern observed below.

In the *Mental Health Changes Over Time* report (Bryant et al., 2019), among those who transitioned, 25.2% reported subsyndromal disorder and 11.5% had probable disorder in 2010 as measured by the K10. In contrast, in 2015, the rates of probable disorder had almost doubled to 22.6%, while the rate of subsyndromal disorder had decreased slightly to 21.1%. Of those with subsyndromal disorder in 2010, 25.2% had probable disorder, 32.7% remained with the same level of symptomatology, whereas this had resolved in 42.2%. This highlights the fluctuation of symptomatology across time in this population, but equally that this disorder is predictive of the development of later symptomatology. These findings highlight the importance of determining predictors of the risk of progressing to disorder.

A similar pattern was highlighted with PTSD. In 2010, while only 5.4% met the criteria for probable disorder, 19.6% had subsyndromal PTSD. In 2015, subsyndromal PTSD had increased to 25.0%, while probable disorder had increased to 12.2%. Those who remained in the ADF in 2015 had a probable rate of PTSD of 3.0% and a subsyndromal

disorder rate of 17.1%, a slight increase from 2010. In contrast, the transitioned personnel who had either subsyndromal or full PTSD increased from 25.0% in 2010 to 37.2% in 2015. This highlights how subsyndromal disorder is a marker of risk for transition, but that equally a cohort remains within the ADF who are at risk.

Members of the longitudinal cohort were more likely to worsen from no disorder in 2010 to subsyndromal or probable disorder in 2015, if they had high levels of deployment or other lifetime trauma exposures. Those who reported problematic anger in 2010, and who were not officers or members of the Navy, were at particular risk. Similarly, more lifetime trauma predicted subsyndromal disorder as well as probable disorder in 2015.

Findings from the *Impact of Combat Report* (Lawrence-Wood et al., 2019) also highlight a general pattern of increasing symptomatic distress in MEAO deployed personnel across all measures over time. This is consistent with the phenomenon of time-dependent sensitisation, characterised by an increasing reactivity with the passage of time and difficulty in modulating distress (McFarlane, 2010a).

For example, 13.9% of the Impact of Combat Study cohort reported having a probable disorder on the K10 five years post-combat, in contrast to 3.9% immediately post-deployment and 3.7% prior to deployment. Rates of subsyndromal psychological distress increased from pre- to post-deployment (12.0% to 16.7%), then remained relatively stable at 16.4% five years post-deployment. A somewhat different pattern was observed for PTSD. With subsyndromal symptoms, there was a progressive increase with the passage of time. A total of 7.1% had subsyndromal symptoms prior to deployment, with this increasing to 13.4% post-deployment, then increasing to 21.7% five years later. At the five-year follow-up, 3.6% had probable PTSD, in contrast to just 0.2% prior to the index deployment. A similar pattern was observed for depressive symptoms. These results highlight the progressive recruitment of symptoms with the passage of time, which was also reflected in suicidality, with this being present in 3.6% post-deployment, and more than tripling to 12.7% at the five-year follow-up.

Other axes of distress also demonstrated a pattern of significant increase with time in this cohort. Anger problems, for example, increased from 5.5% prior to deployment, doubling to 11.6% post-deployment, then doubling again to 19.2% at the five-year follow-up. Physical symptoms are an important axis of distress to monitor because they are a frequent cause of medical consultations; mean scores similarly increased from 7.7 (SE 0.4) with symptoms prior to deployment to 12.8 (SE 0.5) at the five-year follow-up.

In relation to objective neurocognitive measures captured in the Impact of Combat Study, observed shifts in cortical arousal and the efficiency of working memory systems

appear to predate the self-report of significant levels of psychological distress and posttraumatic stress symptoms that have emerged with time in this cohort. This suggests that abnormalities that have previously been shown to be associated with PTSD in the literature antedate the diagnosable disorder in this population, and as such may be markers of emerging disorder or subsyndromal symptoms.

Importantly, the results from all reports in the Programme underscore the significance of subsyndromal symptoms as an indicator of risk for future progression to diagnosable disorder. This highlights the importance of early identification of symptoms of depression, psychological distress and PTSD in particular. The pattern of symptom recruitment over time is consistent with a substantial body of literature identifying subsyndromal PTSD as a significant risk factor for the later emergence of diagnosable disorder (Smid, Mooren, van der Mast, Gersons, & Kleber, 2009). An extensive study of Israeli veterans of the 1982 Lebanon War highlighted that while, in general, PTSD emerged relatively soon in the aftermath of the war, it again peaked much later: 17 years after the period of military service (Solomon & Mikulincer, 2006). In fact, 23% of those veterans who did not develop an immediate acute stress disorder subsequently developed delayed-onset PTSD. Similarly, in a study of Australian Vietnam veterans, rates of lifetime PTSD were found to increase over a decade, going from 20% in the 1990s to 28% in the 2000s (O'Toole, Catts, Outram, Pierse, & Cockburn, 2009). Subthreshold PTSD symptoms have also been found to be associated with development of anxiety and depression over time (Lawrence-Wood, Van Hooff, Baur, & McFarlane, 2016). As with posttraumatic stress symptoms, there is also evidence that subthreshold depressive symptomatology is an important predictor of emerging anxiety and depressive disorder (Karsten, Nolen, Penninx, & Hartman, 2011).

It has further been recognised that subsyndromal symptoms represent a significant risk in terms of impairment in their own right, and represent an important focus for clinical intervention, despite not satisfying the full diagnostic criteria (Kornfield, Klaus, McKay, Helstrom, & Oslin, 2012). Subsyndromal PTSD, in particular, has been found to be associated with significant health-related difficulties and functional impairment (Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2009). For example, among a cohort of emergency service workers, four years after the World Trade Center collapse in New York on 11 September 2001, 5.4% had full PTSD, whereas 15.4% had subsyndromal PTSD. Importantly, both full PTSD and subsyndromal PTSD were significantly associated with alcohol abuse and somatic symptoms (Pietrzak et al., 2012). Pietrzak et al. (2012) concluded that it was important to have a dimensional perspective of PTSD, 'as operational definitions and conventional screening cut points may underestimate the psychological burden for this population'.

4.5.3 Implications

Subsyndromal symptoms and anger represent a significant risk in terms of impairment in their own right, and represent an important focus for clinical intervention, despite not satisfying the full diagnostic criteria for a mental disorder. Subsyndromal levels of anxiety and PTSD, in particular, pose a marked risk for subsequent worsening of symptoms after discharge as a function of the sensitisation of neural processes that occur following initial exposure to stressful events.

The results from all reports in the Programme underscore the significance of subsyndromal symptoms as an indicator of risk for future progression to diagnosable disorder. This supports the need to think about mental health as a continuum, rather than looking at symptoms at discrete periods of time (screening) and determining risk solely on scores on a single health assessment. The creation of systems that monitor *changes* in an individual's health over time would therefore be better placed to assist in the early intervention and prevention of disorder progression by allowing a more individualised approach to mental health monitoring.

4.6 Certain ADF members who transition to civilian life are at greater risk of poor mental and physical health outcomes than others

Results from the Programme identified several subgroups within the transitioned population who were at greater risk of poor mental and physical health outcomes. These are described in detail below.

4.6.1 Early service leavers

The concept of early service leavers (generally defined as those who leave before completing their minimum three to four years of service) being at particular risk was supported by the results of the Programme. This risk can be exacerbated among those who leave at short notice with little time to plan the transition to civilian life (that is, those whose military career was cut short by a medical or disciplinary discharge).

In the current study, affective disorders were most commonly observed in members of the Transitioned ADF with fewer years of service. There was an overall trend for rates of anxiety disorders to decrease with increasing service length, with the highest rates among those with less than four years of service. Alcohol disorders were also most commonly observed in Transitioned ADF members with fewer years of service.

These findings are also consistent with other national and international research. In one study of the UK armed forces, for example, common mental disorders were found to be more prevalent among early service leavers compared with non–early service leavers (45.6% vs 26.5%) (Buckman et al., 2013). Similarly, Giebel, Clarkson and Challis

(2014), in a study of 952 treatment-seeking UK veterans, reported higher levels of anxiety disorder (9%) and depression (30.8%) in early service leavers compared with non–early service leavers (5.3% and 24.2%, respectively). More recently, in Australia, rates of completed suicide were 2.4 times greater in those with less than one year of service compared with those with 10+ years. These individuals were also more likely to be younger than others in the Ex-Serving cohort. These results combined highlight the need to conduct a comprehensive assessment at the time of transition and then regularly follow up ADF members who leave military service early in order to prevent the development of mental disorders as well as potential suicide.

4.6.2 Years since transition from the Regular ADF

For most mental disorder types (in particular, suicidality, PTSD and depression), estimated rates of 12-month mental disorder were lowest in those who had transitioned less than one year ago. After the first year following discharge, the rates of disorder substantially increase, and appear to escalate with the passage of time. This is in keeping with the anticipated process of time-dependent sensitisation and the reactivity of those with subsyndromal symptoms to intercurrent life stressors (McFarlane, 2010a). This was not a linear association and varied according to mental health outcome.

This is a particularly important finding, as it suggests that the most critical time for mental health surveillance may occur a significant time after transition from Regular ADF service. Furthermore, it may be indicative of the first 12 months following transition being a critical risk period for future disorder emergence.

The rate for PTSD in the Transitioned ADF (17.7%) was also more than double that of the Regular ADF in 2010 (8%). These results indicate that ADF members with PTSD have a greater probability of transitioning from military service. However, it is only after the first year following discharge that rates substantially increase and appear to escalate with the passage of time. This is in keeping with the anticipated process of time-dependent sensitisation and the reactivity of those with subsyndromal symptoms to intercurrent life stressors (McFarlane, 2010a).

Combined with findings from both the *Impact of Combat Report* (Lawrence-Wood et al., 2019) and the *Mental Health Changes Over Time* report (Bryant et al., 2019), showing that symptom emergence often predates transition, this again reinforces the importance of longitudinal surveillance and taking a life-course approach to understanding the health of ADF members. This suggests that early intervention before transition, and 12 months after transition, may be critical times for intervention and building key coping skills. Intervention could include screening for early identification, engagement in evidence-based care and connecting to services for Transitioned ADF and their families. The first year post-transition appeared to be a particularly

vulnerable period for alcohol disorder, suggesting that separation from the ADF is an immediate risk factor for increased drinking.

4.6.3 Medical discharge

Consistent with the findings of the 2017 Australian Institute of Health and Welfare report on suicide incidence among serving and Ex-Serving members, which reported the crude suicide rate to be 2.4 times higher in those who have medically discharged, those discharging medically are one of the highest-risk groups identified in this report and should be a priority for further evaluation and follow-up (Australian Institute of Health and Welfare, 2017). This was not unexpected, given that medical discharge refers to an involuntary termination of an ADF member's employment by the ADF on the grounds of a permanent or long-term inability (unfitness) to serve, or unfitness for deployment to operational service.

Transitioned ADF who were medically discharged were more likely to report poorer mental and physical health compared with those who were not medically discharged. Specifically, Transitioned ADF with a medical discharge had significantly greater rates of affective (39.5%), anxiety (51.3%), and alcohol disorder (20.3%), and greater suicidality (42.6%), than those who transitioned for another reason (17.4%, 30.3%, 10.4% and 16.0%, respectively).

Transitioned ADF who were medically discharged compared with those who were non-medically discharged were also significantly more likely to report all general health symptoms (with the exception of skin ulcers), most categories of doctor-diagnosed medical conditions, all respiratory symptoms or conditions with the exception of nasal allergies and asthma ever, every injury type except burn injuries, and higher pain levels, and were more likely to have insomnia than those non-medically discharged. They were more likely to be physically inactive, to be categorised as obese and to be a current smoker. Transitioned ADF who were medically discharged were also more likely to report poorer self-perceived health, satisfaction and quality of life compared with personnel who were non-medically discharged. In relation to the use of health services, Transitioned ADF who had been medically discharged were more likely to consult a range of health professionals and services than the non-medically discharged. This pattern of increased health services use is consistent with the increased self-reporting of most of the medical conditions and other physical health outcomes examined in the study and has implications for health service planning (Kelsall et al., 2018).

There is also a large proportion of Transitioned ADF who were not medically discharged but who met criteria for a mental disorder in the last 12 months (i.e. 62.3% of those with a 12-month affective disorder; 70.5% of those with 12-month PTSD). Thus, many of these individuals may not have been referred to the appropriate mental

health providers at the point of transition. This raises important questions as to whether these disorders emerged following discharge, or failed to be declared or identified during the discharge medical. It also raises questions as to whether there should be a more systematic mental health assessment during military service and/or the discharge process using structured diagnostic interviews. Furthermore, as has been planned by Defence, referral of discharging members to a primary healthcare provider should increasingly become a priority, as this is likely to significantly assist in both the diagnosis of emerging disorders as well as referral to treatment networks.

4.6.4 DVA client status

The Department of Veterans' Affairs (DVA) works with transitioned members who present to them and require assistance, and/or are seeking compensation for a condition/injury linked to their service with the military. In the current study, DVA clients included treatment card holders, those receiving a fortnightly payment, and those who have had their physical and/or psychological illness or injury liability claim accepted as military service–related. Given that DVA clients were more likely to have physical and/or psychological health conditions that met eligibility requirements according to the criteria listed above, it was anticipated that DVA clients may have poorer physical health outcomes compared with their non–DVA client counterparts. The findings of this study are consistent with DVA being the conduit for care in this population, and therefore with DVA clients being more likely to have poorer physical and mental health and engage in greater health service use compared with non–DVA clients.

The current Programme found that Transitioned ADF who were DVA clients were more likely to report poorer health on several physical health outcomes compared with those who were not DVA clients. Specifically, DVA clients were more likely to report all health symptom types; more doctor-diagnosed conditions overall, as well as most individual condition types; high pain intensity/disability compared with no pain; clinical insomnia; all respiratory symptoms or conditions with the exception of wheeze, nasal allergies or asthma ever; and any type of injury, compared with non–DVA clients.

Transitioned ADF who were DVA clients were more likely to be categorised as obese, but there were no significant differences in physical activity. DVA clients were also more likely to report poorer self-perceived health compared with non–DVA clients, which may reflect their poorer physical health overall. DVA clients were more likely to report consulting health professionals or services than non–DVA clients in the preceding 12 months (for example, general practitioners, psychologists, specialist doctor, an alcohol or drug worker, or an audiologist). It is important to acknowledge that in the non–DVA client group, there is a significant range of morbidity. Members may not have come into contact with DVA since their discharge, or might not be

entitled to DVA benefits that include health services. They do, however, have access to a health system through Medicare and/or private health insurance.

Given that DVA clients were more likely to have physical and/or psychological health conditions that met eligibility requirements according to the criteria listed above, it was anticipated that DVA clients may have poorer physical health outcomes compared with their non–DVA client counterparts. The findings of this study are consistent with DVA being the conduit for care in this population, and therefore with DVA clients being more likely to have poorer physical and mental health and engage in greater health service use compared with non–DVA clients.

In relation to mental disorder, those who were DVA clients had significantly greater estimated rates of affective, anxiety and alcohol disorder, and greater suicidality. These findings, while highlighting areas of interest for further examination, are not unexpected for the reasons outlined above.

Of the greatest concern, however, is the remaining, relatively large proportion of Transitioned ADF who met criteria for a 12-month ICD-10 mental disorder but who are not recorded as DVA clients (i.e. 40% of those with 12-month PTSD, and 51% of those with a 12-month affective disorder). This highlights that many transitioned members who have a mental disorder in the first five years following discharge from military service are not DVA clients, and therefore are not receiving support through DVA.

Taken together, these findings suggest a need to address how ADF members are screened, assessed and monitored for mental health conditions both pre- and post-transition. The data also reinforce the importance of a range of initiatives currently being implemented by DVA and Defence to enhance early identification and intervention, including through the transition process.

4.6.5 Transition status

Transitioned ADF members who were Ex-Serving (discharged) reported higher rates of mental and physical health problems than both Inactive Reservists and Active Reservists. This is likely related to the higher proportion of individuals who were medically discharged with a physical or psychological health condition rendering them ineligible for the Reserves among the Ex-Serving group.

In relation to mental health, for example, Transitioned ADF reported significantly higher rates of affective disorders and anxiety disorders relative to Active Reservists and Inactive Reservists. This is consistent with what was observed previously among ADF members deployed to the MEAO as reported in the MEAO Census Study (Dobson et al., 2012).

In terms of physical health, Ex-Serving ADF members were more likely to report poorer health on several outcomes than Active Reservists or Inactive Reservists; this included reporting of most individual health symptoms, some but not all doctor-diagnosed conditions, injuries, respiratory symptoms (but not asthma ever), high pain intensity and disability, and clinical insomnia. Ex-Serving ADF were more likely to be physically inactive, to be categorised as obese and to be current smokers. In relation to health service use, the proportions of Ex-Serving ADF, Active Reservists and Inactive Reservists who reported visiting any health service in the preceding 12 months were similar. Overall, however, Ex-Serving ADF were more likely than both Active and Inactive Reservists to have visited most types of health professionals or services in the preceding 12 months and to have visited general practitioners or specialists in the preceding two weeks.

Together, these patterns of higher morbidity among the Ex-Serving compared with Reservists suggest that Reserve status is in part a proxy for health, with those ADF members completely discharged more likely to have mental and physical health problems. Furthermore, in relation to the mental health outcomes in particular, these findings are also consistent with the proposal that mental health symptoms and disorder emerge with the passage of time, and the further along the process of transition ADF members are, the greater the likelihood of disorder emergence. Just under half (43.3%) of the Transitioned ADF were Ex-Serving (discharged) at the time of survey completion, and a quarter remained in an Active Reservist role (25.7%) and therefore continued to be engaged in service for a specified number of days per year. Thirty per cent were Inactive Reservists and therefore their contact with Defence would be variable – for most, there would be no ongoing contact. This indicates that additional monitoring, support and resources should be provided to ADF members as they transition out of Regular ADF service, including through the Active and Inactive Reserves.

In relation to the Transitioned ADF, potentially at greatest risk were a small subset (5.2%) who reported being unemployed at the time of the survey. In addition, just under half of Transitioned ADF members reported being unemployed for a period of three months or more after transitioning from Regular ADF service. There were also a very small proportion who reported having been arrested, convicted or incarcerated since transition (an estimated 5.1%), and approximately 3.4% who reported that they had not been living in stable housing in the two months prior to completing the survey. These findings further support the work underway in Defence, DVA and the broader community to assist transitioning ADF personnel with securing employment options.

4.6.6 Other service-specific factors

Finally, service-specific factors such as Service branch and rank had mixed associations with mental disorder and suicidality prevalence among the Transitioned ADF. Service

branch at time of transition had some association with rates of PTSD, alcohol disorder and suicidality, and rank at time of transition from regular service had some association with 12-month mental disorder more generally, with Other Ranks (i.e. those who were not officers or non-commissioned officers) and Army being a particular risk.

4.6.7 Implications

Taken together, this combination of potential risk factors points to the need for early intervention – prior to transition and 12 months after transition may be critical times for intervention and building key coping skills. It also indicates there is a need to address how ADF members are screened, assessed and monitored for mental health conditions both pre- and post-transition. Finally, it is clear that support and resources should be provided to ADF members not just as they transition out of regular service, but also out of the Active and Inactive Reserves.

4.7 Psychological distress and impairment in work, social and family functioning are associated with a different pattern of psychosocial predictors in both Transitioned and Regular ADF members

An important axis of consideration in the Programme was to examine the patterns of impairment and their relation to psychological distress. The importance of this analysis is that it showed that there is a significant aggregation of risk factors across a series of axes in relation to distress and impairment (Hansen et al., forthcoming).

Results of this component of the Programme showed that insomnia, low resilience, self-reported physical health symptoms, high risk of alcohol misuse, and high levels of pain all showed the strongest associations with a combined measure of psychological distress and functional impairment. The strength of associations was similar across the Transitioned ADF and Regular 2015 ADF for most factors examined, except for physical health symptoms being stronger within the Transitioned ADF. Of particular note was that associations with insomnia and high-risk alcohol misuse exhibited more of a severity gradient across the levels of psychological distress, while the associations with resilience, physical health symptoms, and pain exhibited more of a severity gradient across the levels of functional impairment.

These findings alert the health systems that support both serving and Ex-Serving ADF personnel to the interdependence of many dimensions of health-related concerns, namely psychological disorders, health-related physical symptoms, and risk factors for physical illness. In contrast to a diagnosis-specific approach to health management, these data highlight the importance of a biopsychosocial approach that looks at axes of

symptomatic complaint, including pain, physical health symptoms, insomnia and psychological symptoms.

4.8 Despite best efforts, there remains an under-engagement with evidence-based care in both Transitioned ADF and Regular ADF, particularly in those with probable disorder

An essential aspect of any research program examining the impact of military service on physical and mental health is to establish the access to care and the adequacy of treatment being received by those individuals who report adverse physical and mental health outcomes from their military service. This is critical in terms of the translation of findings in order to ensure that services are better targeted to improve the outcomes of those receiving care.

The *Pathways to Care Report* (Forbes et al., 2018) showed that, in general, engagement with mental health services among those with a concern about their mental health was high. For example, approximately three in four Transitioned ADF and 2015 Regular ADF members who were concerned about their mental health sought care at some time in their life, with between 50% and 65% of those reportedly being in care either currently or in the last 12 months. This rate was slightly higher in those with a current probable 30-day disorder, with 63% of the Transitioned ADF who reported being concerned and qualified as having a probable 30-day disorder seeking care, compared with 66% of 2015 Regular ADF. Also, on a positive note, this care is commonly provided not only by psychologists, general practitioners and medical officers, but also by psychiatrists and a range of other allied mental health providers.

Unfortunately, however, while the rates of initial engagement and uptake of services was reasonably high, there was also an under-engagement with evidence-based treatment for those with a current disorder. Approximately a quarter of those with a probable current mental disorder were estimated to have received evidence-based care in the last 12 months. This was due to an accumulation of factors that occur at each phase of the help-seeking process, and suggest the need to bolster the system at each touch point in relation to engagement, retention and delivery of best practice care, so we get the best possible outcomes for those who reach out for care.

For the majority of the 2015 Regular ADF and the Transitioned ADF populations with a mental health concern, initial steps in seeking care were taken within 12 months of becoming concerned, with a considerable number doing so within the first three months. This is a positive finding; however, there was still a significant minority of Transitioned ADF (14.4%) and 2015 Regular ADF (7.6%) who waited more than three years to seek care. Prolonged help-seeking latency can result in single disorders

progressing to more complex disorders, which often therefore become more difficult to treat.

The *Pathways to Care Report* (Forbes et al., 2018) presented a very interesting picture in relation to the types of preferred models of service delivery. For example, although about 50% reported a preference for face-to-face delivery of mental health information, about 30% of both the Transitioned ADF and the 2015 Regular ADF reported an interest in, and a preference for, information delivered online, with Transitioned ADF in particular tending to access the information late at night. This is a relevant finding for practitioners and policymakers, as this approach has usually been put forward as a cost-efficient means of delivering services, but it is clear from the data that it is also seen as convenient, non-stigmatising and an opportunity to provide choice about how and where the service is delivered. Current DVA and ADF websites were preferred over community-based websites, with utilisation rates sitting at around 40%.

As discussed in the *Technology Use and Wellbeing Report* (Burns et al., 2019), half of the Transitioned ADF and 2015 Regular ADF reported using new and emerging technologies, with 80% using apps and a third using wearable devices. Of those who used new and emerging technology, half used them to improve their health and wellbeing, with a focus on improving fitness, tracking progress and staying organised. A quarter of the Transitioned ADF and Regular ADF used them to 'improve sleep'. Apps, when not being used to improve health and wellbeing, were being used for fun or recreation, for study and work, or to enhance social interaction. Among those who reported using new or emerging technology, around 20% of Transitioned ADF and almost 10% of the Regular ADF met criteria for a probable disorder. Transitioned ADF with a probable disorder were more likely to use new and emerging technology to improve their mood.

A consideration for policymakers will be how to support and guide the implementation of apps and the use of technology, such as wearable technologies or biometrics, to measure outcomes and promote self-monitoring and shared evaluation within the serving and Ex-Serving communities. In the United States, this challenge has been addressed by the development of a Mobile Health Practice Guide and an app store accessible via the US Department of Veterans Affairs, highlighting defence- and veteran-specific apps (https://mobile.va.gov) (Armstrong et al., 2017), and a similar approach could be considered within Australia.

The desire to 'manage myself' or 'solve my own problems' was evident in the Programme, with both Transitioned ADF and 2015 Regular ADF using technologies to support positive behaviours known to promote good mental health, such as physical activity, diet, sleep and, importantly, using technology to connect socially. This

approach is useful for self-management, but also equally important in the shared management of care with a professional. Data from apps and wearable technologies could be used to discuss progress in treatment, and responses to medication or evidence-based care, such as cognitive behavioural therapy, and when in recovery, used to potentially identify early warning signs of relapse, such as sleep disturbance, lack of social engagement, or a reduction in physical activity.

The Programme also highlighted the role of both families and friends in regard to both the reasons for accessing care as well the pathways into care. For example, the most common reasons for accessing care beyond depression and anxiety in both the Transitioned and Regular ADF were for relationship problems and anger, with partners and friends also being those most likely to suggest that the ADF member seek help for their mental health concerns. Families themselves acknowledged in the Family Wellbeing Study the need for more responsive and streamlined service provision, with more proactive and less complex processes and services for gaining mental health support for the ADF member.

Finally, a growing body of literature now exists around the important role that peers can play in supporting mental health and wellbeing and encouraging help seeking due to the benefits of lived experience. This role can be formal, that is, as part of a shared-management, multidisciplinary team such as the peer-to-peer support network trial currently being conducted by Open Arms in Townsville, which is showing early promising results. Alternatively, peer support networks can be informal through social networks that allow people to connect and communicate. Increasingly, defence- and veteran-specific forums are providing opportunities for online chats; however, they tend to be non-moderated (without facilitation and rules for engagement). Structured forums with peer facilitation, guided safety recommendations and principles of engagement are another area of support that could be explored further.

4.9 Effects of deployment and combat exposure are cumulative, time dependent, and emerge slowly across multiple domains

At a population level, the Programme results showed Transitioned ADF who had ever deployed were more likely to meet criteria for an anxiety disorder than those who had not. While there was a trend for Transitioned ADF who had ever deployed to be more likely to meet criteria for all of the individual anxiety disorders, obsessive-compulsive disorder and PTSD were the only disorders that were significantly more prevalent in the deployed versus the non-deployed group. These findings contrast with those from the 2010 MHPWS, where rates of diagnosable mental disorder were *no different* among those who had deployed compared with those who had never deployed. At that time, it was proposed that while deployment may have appeared to convey no particular risk, it was likely that the full effects of deployment would not emerge

immediately, particularly as those who deploy are required to be mentally and physically fit (McFarlane et al., 2011). However, as a whole, members of the ADF carry with them often extensive trauma histories, including those who deploy; thus, deployment, particularly in combat roles, may convey risk for the development of mental disorder by adding to the cumulative trauma load carried by each individual. The effects of trauma exposure have been shown to not only be cumulative, but also time dependent due to the process of sensitisation; thus, any impacts in a healthy population may not emerge for a number of years.

Findings from the Impact of Combat Study further support this. A key contribution of this study was the ability to examine the impacts of deployment and combat over time in a single cohort, who had known high levels of physical and psychological health at the time of their initial participation and deployment. Findings from the study showed that on both self-report and objective measures, minor degrees of distress and related biological and neural dysregulations that can be detected prior to deployment appear to be an indicator of risk of further dysregulation after the deployment cycle. Even relatively minor shifts at post-deployment appear to represent a substantial risk for the emergence of subsyndromal or diagnosable disorder *over time*. This is again consistent with a pattern of sensitisation and increasing dysregulation.

The Dutch have also conducted a research program that has measured the emergence of symptoms, as well as the associated neurobiology, among a deployed cohort, following a similar methodology. This program examined 1,007 personnel one month prior to deployment and at one month after and has followed them for five years (Eekhout, Reijnen, Vermetten, & Geuze, 2016). They identified a series of health trajectories: while there was one group who reported a pattern of early recruitment of symptoms, at five years the most common pattern was the progressive recruitment of symptoms over time among those who had some low-level symptomatic distress prior to deployment, but who returned from deployment with relatively low levels of symptoms. Other cohort studies have also demonstrated the significance of subsyndromal symptoms, with a UK study showing that these were a significant predictor of later PTSD (Goodwin et al., 2012). In that study, 46% of cases of PTSD were delayed in onset.

In the Impact of Combat Study, there was also clear evidence that a key predictor of the emergence of psychological distress and posttraumatic stress symptoms over time in this cohort was the cumulative load of traumatic exposures experienced on deployment, in addition to lifetime trauma. Consistent with this, the Canadians, in a nationally representative sample, highlighted the role of cumulative trauma exposure in land-based troops, as well as childhood trauma, as being predictors of psychological morbidity (Fikretoglu & Liu, 2012).

Importantly, in terms of future monitoring, factors identified as markers of risk for mental disorder more generally within the Transitioned ADF population appear to be somewhat magnified in the Impact of Combat Study cohort. That is, there is a preponderance of younger males of lower to middle rank with relatively high levels of deployment exposure. The pattern of demographic findings also suggests that they are likely to have reasonably low years of service at the time of their transition. While those of the cohort remaining in Regular ADF service appear healthy at the current time point (as evidenced by their substantially lower raw rates of diagnosable mental disorder), much as was observed in the 2010 MHPWS population, the morbidity among those who have transitioned, coupled with what has been observed at a population level among the broader Transitioned ADF cohort, would suggest that this is a group at particular risk of increasing rates of disorder following transition into the future.

This finding of increased rates of disorder in deployed members of the military has been reported elsewhere (Interian, Kline, Callahan, & Losonczy, 2012; Institute of Medicine, 2013; Iversen et al., 2005). The US Veterans Affairs Cooperative Studies Program, which followed a cohort from 2003 (prior to deployment) to 2014, similarly has demonstrated increasing rates of PTSD from 7.4% pre-deployment to a long-term follow-up rate of 24.7% (Vasterling et al., 2016). Likewise, the US Millennium Cohort Study identified a population who had pre-deployment measures and a minimum of a three-year follow-up (Bonanno et al., 2012b). Findings showed that the most common pattern of emerging symptomatic distress was increased symptoms at the *second follow-up* in contrast to the initial post-deployment wave, much as was observed in the Impact of Combat Study. This emphasises that the maximal point of distress is not in the immediate aftermath of a traumatic event. In these longitudinal cohort studies, there has been an increasing attempt to characterise the risk factors that are indicative of these patterns of increasing or persistent symptoms (Armenta et al., 2018). A study of military service members and veterans, examining the period 2001 to 2013, reported the risk factors of deployment with high-combat exposure, initial PTSD symptom severity, a history of assault and somatic symptoms. Those who were older in age and enlisted rank were also at greater risk. This emphasises the need for the development of risk factor models that map changes in symptoms that begin to emerge during military service.

In relation to delayed onset of disorder, in particular PTSD, the longest follow-up of a deployed military cohort has been the US National Vietnam Veterans Longitudinal Study, which has followed up the National Vietnam Veterans Readjustment Study cohort over 25 years. In combat-exposed veterans, 16% reported an increase in PTSD symptoms over time, in contrast to 7.6% reporting a decrease in symptoms (Marmar et al., 2015). This demonstrates that even decades after the end of a conflict, symptoms of PTSD tend to increase. Thus, the continued follow-up of the population cohort established for the current Programme is of great importance. While no other defence

force has been followed using the same methodology as was used in the Programme, a comprehensive assessment of the Canadian Armed Forces was conducted in 2013 and was contrasted to an earlier assessment in 2002 (Zamorski et al., 2016), which allowed for the examination of the mental health of the Canadian Armed Forces across the duration of their deployments to the Middle East. An increased prevalence of PTSD, generalised anxiety disorder and panic disorder was noted. This was attributed to the burden of the Afghanistan and humanitarian deployments, despite having an improved healthcare system. This study was conducted by Statistics Canada at the same time as conducting a study of the general Canadian population. In contrast to the Canadian civilian population, the military population demonstrated increased rates of major depressive disorder, generalised anxiety disorder, alcohol dependence and suicide attempts. It was recognised that those who had left the military were likely to carry the significantly greater burden of morbidity and that the healthy 'survivors' were those who remained within the military (McFarlane, 2016).

Taken together, the findings from the Programme, coupled with international evidence, show that:

1. Deployment does convey risk for the future development of mental disorder, particularly PTSD and other anxiety disorders.

2. The level of exposure to traumatic events while deployed accumulates over time, and it is the cumulative burden of exposure that is most important in risk for disorder emergence. Lifetime trauma exposure adds to this burden and risk.

3. Mental disorder morbidity is largely carried by those ADF members who have transitioned from regular service. Where ADF members are still in service and able to deploy, their rates of disorder and symptoms remain low.

4. The effects of deployment and trauma exposure on mental health manifest across multiple domains, and gradually emerge with time.

5. Subtle shifts in symptoms are detectable well before, and can predict, the emergence of subthreshold or full disorder.

5 Implications

The Transition and Wellbeing Research Programme addressed a number of limitations of previous research, and its design afforded a number of important advantages. It is the first study in the world to combine both epidemiological and neurobiological data in order to understand the longitudinal course of mental health across the military lifespan and into the early stages of transition into civilian life. As well as recruiting an entire cohort of ADF members as they transitioned from regular service, it incorporates a longitudinal component, which has allowed the first steps in understanding the complex interplay of factors, some occurring pre-service, some during service, and some during transition, that may influence mental and physical health and wellbeing in veterans as they transition from their military careers. Findings from this programme of research have a number of important implications.

5.1 Importance of longitudinal health surveillance

The most fundamental implication to emerge from this Programme is the importance of adopting a longitudinal perspective of the mental and physical health of those who serve. The health of the ADF can only be fully understood if it is considered from the perspective of a trajectory of health of a cohort across the passage of time (McFarlane et al., 2017). The pattern of emerging health difficulties observed in this Programme is not one of sudden transitions from health to disease. Rather, it is a pattern of incremental recruitment of lifetime exposure and adversity that leads to a cumulative risk. It is therefore critical to monitor the health of those who have transitioned from service, as well as of those who have prolonged military careers and remain within the ADF, in order to accurately understand the experience and long-term consequences of ADF service, both on those who serve as well as their families.

This Programme has identified areas where the physical and mental health of Transitioned ADF is poorer than that of 2015 Regular ADF. For example, those who remain in the ADF have substantially better mental health than those who transition. Interestingly, when contrasted to the 2010 ADF Mental Health Prevalence and Wellbeing Study, the subcohort that remained within the ADF also demonstrated increasing psychological distress from 2010 to 2015, albeit at a relatively low level. This highlights the continued burden of the deployments to the Middle East Area of Operations (MEAO), as well as peacekeeping, humanitarian and border protection deployments, all of which have an accumulative cost burden on the mental health of ADF personnel. Health, therefore, should be considered along a continuum including

both human performance and resilience, and the shifting into emerging states of dysregulation that are transitional states to emerging disease. The pattern of symptom recruitment over time is consistent with a substantial body of literature identifying subsyndromal posttraumatic stress disorder (PTSD) as a significant risk factor for the later emergence of diagnosable disorder (Smid et al., 2009). Symptoms emerge in many individuals before the development of clinically diagnosable disorder, and there are a series of transitional stages of minor symptomatic distress through to subsyndromal disorder.

In addition to mental health, the connections between mental and physical health and the comorbidity of mental and physical health should also be considered. It is well documented that the mental health impact of trauma exposure can have 'downstream' effects on physical health, and there is now a substantial body of research demonstrating that repeated exposure to mental trauma over a prolonged period increases the risk of psychological morbidity and related physical symptoms (Krysinska & Lester, 2010; Richardson, Frueh, & Acierno, 2010). These are complex interactions of psychological and physical effects of combat exposure and repeated deployments, comorbidities and longitudinal effects for which longitudinal health surveillance data are required, and which were beyond the scope of the current Programme.

The corelationship between physical and mental health is particularly important as Regular ADF and Transitioned ADF personnel age and become more likely to develop multiple morbidities. Age at transition and comorbidities are factors that can have an impact on physical health at discharge or during transition, and on the need for health services. Risk factors for chronic diseases such as hypertension, and the incidence of chronic conditions such as cardiovascular disease and musculoskeletal disorders such as arthritis, become increasingly important with age.

5.2 Subthreshold symptoms

Results from the Programme provide overwhelming support for the significance of subsyndromal mental health symptoms as an indicator of risk for future progression to diagnosable disorder. This highlights the importance of early identification of symptoms of depression, psychological distress and PTSD in particular, in order to prevent long-term morbidity.

Over recent years, many militaries, including the ADF, have initiated programs to proactively screen for emerging disorders. This study highlights the importance of these programs in order to counteract the likely progressive emergence of symptoms over time via the mechanisms of sensitisation and increasing biological dysregulation (Yehuda et al., 2015). Furthermore, data from this Programme highlight the role of

affect regulation and environmental reactivity as drivers of future disorder. Anger dysregulation, in particular, was noted to be of importance, but often receives little attention in clinical practice and clinical training (Olatunji et al., 2010). Results of this Programme indicate anger may, in fact, represent a useful target for early intervention.

Because clinical services have little concern generally with subsyndromal disorder, this is an area where knowledge is currently underdeveloped. Experience from other physical (i.e. cancer) and mental disorders (i.e. schizophrenia) has argued for the importance of a staging model in relation to diagnosis and care. If more targeted interventions are to be defined, that allow for refined assessments and methods of intervention, then it is critical that a staging model is used to understand the trajectories identified in the current Programme. In particular, distinct therapeutic approaches need to be utilised according to the disease of biological progression, including those that antecede the development of the full diagnosable disorders.

5.3 Monitoring change

Additionally, the findings regarding the prevalence of subthreshold symptoms highlight the need to move away from models focusing on the acute impacts of stress and trauma exposure to one that acknowledges the propensity for symptom recruitment and emergence over time. Relatedly, findings regarding the trajectories of symptom emergence, and their role in predicting disorder emergence, demonstrate the importance of monitoring change in symptoms across time at an individual level, rather than simple threshold screening.

A recent editorial in *JAMA Psychiatry* highlighted that one of the greatest contributors to improving health outcomes has been the investment in community-based longitudinal studies (Gur, 2018). This is demonstrated clearly by the longitudinal results from the Impact of Combat Study. As was anticipated in this study, low levels of morbidity were observed in MEAO-deployed ADF personnel six months post-deployment. Once we combine these data with longitudinal data collected five years later, however, what we see are distinct patterns of morbidity among different subgroups of individuals. As such, it becomes clear just how invaluable these baseline data were, as they allow the characterisation of the different trajectories that are emerging among ADF personnel, as well as the risk factors and their neurobiological underpinnings. The strength of a longitudinal research design in terms of its ability to assist in the prediction of who will become unwell, however, should not be underestimated.

5.4 Multiple symptom domains

An important dimension of the Programme was to demonstrate the neurobiological underpinnings of emerging symptoms of mental disorder. These results highlighted that, prior to developing a diagnosable disorder, there are measurable changes in patterns of underlying inflammatory reactivity, information processing and cortical arousal. The value of these data are that they demonstrate that it is possible to conduct objective biological and neurocognitive assessments of ADF members across their career and to identify emerging shifts in regulation. These do not depend upon self-report.

Given the increasing recognition that PTSD is a systemic illness that is underpinned by a range of dysregulation of neurobiological systems, it is critical that this underlying dysregulation remains a focus of continued investigation in order to develop appropriate preventive interventions (Yehuda et al., 2013). This is particularly important given that the current treatments for PTSD, while providing some benefit, particularly with military personnel, leave more than 50% with a diagnosis (Steenkamp, Litz, Hoge, & Marmar, 2015). A better understanding of these neurobiological mechanisms is also essential to improving the psychopharmacology of disorder treatment (Shekhar, 2014). Hence, it is critical that the systems of care for the mental health of serving and ex-serving ADF members take a more comprehensive view of the biological dysregulations that underpin psychiatric disorders and their relationship to the extensive comorbidities that are documented in this research program.

5.5 Service delivery and access

While the Programme demonstrated significant recent gains in ensuring the access to services for both currently serving and transitioned ADF personnel, significant levels of symptomatic morbidity remain, despite contact with health services. This raises important questions about the availability and provision of evidence-based care to this population, as well as the limitations of current evidence-based treatments. Consideration should be given to the improved monitoring of treatment response in transitioned personnel, as well as those still in the Regular ADF. Consideration should also be given to the development of second-order interventions that are more systematically assessed and monitored and related to the underlying neurobiology in relation to the individual's disorders.

It is key that the findings regarding access to services and pathways to care are used to inform future system and service reforms for this population. Considering the health and wellbeing of members of the ADF – from a civilian to military and back to civilian life cycle – is critical in designing and targeting services. For example, a critical issue highlighted by the findings of this study is that the morbidity of the substantial portion

of ADF members is not fully manifest in the course of their military service. As a consequence, health professionals seeing ADF personnel have little sense from their clinical practice of the long-term trajectories of many of the symptoms, complaints and comorbidities that they will be observing. This has the potential to lead to minimisation of these complaints and undertreatment.

Furthermore, the findings of this study highlight a particular conundrum about the current structure of health service delivery for ADF personnel and veterans. Critically, there is a disjunction between the health service that they utilise during their military service and the services that are utilised at and following transition. An issue that is seldom fully addressed is that only those with Department of Veterans' Affairs (DVA) entitlements use DVA services and are funded through the repatriation health schemes. Despite significant initiatives, such as the White Card for mental health disorders, it is apparent that a significant percentage of ex-serving (and even some current serving) ADF members use health services funded by Medicare. This includes the use of private health insurance–funded care. This means that there are a series of disjunctions in the health service that a veteran may utilise in his or her lifetime. This is likely to result in both diminished access to services and low uptake of evidence-based care, and hence needs to be addressed.

5.6 Retention of institutional and organisational knowledge

It is important to recognise that the development and successful completion of this research program was dependent upon the expertise, cooperation and capacity of a team of experienced investigators and their universities, DVA, Defence and ADF personnel, and veterans and their families.

5.7 Conclusion

This Programme highlights the need to move away from a model of acute impacts of stress and trauma exposure to one that acknowledges the propensity for symptom recruitment and emergence over time. It is also key that the findings regarding access to services and pathways to care are used to inform future system and service reforms for this population. Consideration of the health and wellbeing of members of the ADF – from a civilian to military and back to civilian life cycle – is critical in designing and targeting services. Finally, conducting longitudinal health surveillance requires a considerable investment, both financially and in terms of organisational time.

Annex A Background and context to the Programme

The Transition and Wellbeing Research Programme (the Programme) is the strategically designed corollary of decades of Australian and international research into the mental and physical health of Australian military personnel. The Programme is one component of the ongoing Deployment Health Surveillance Program, which began in 1999. The strength of this ongoing program lies in the longitudinal assessment of the mental, physical and neurocognitive health of both deployed and non-deployed Australian Defence Force (ADF) personnel (McFarlane, 2010b) during military service and throughout transition to civilian life.

The first three studies to be conducted as part of the original Deployment Health Surveillance Program were the East Timor Health Study (McGuire et al., 2009b), the Bougainville Health Study (McGuire et al., 2009a) and the Solomon Islands Health Study (McGuire et al., 2009c). These studies compared the health outcomes of a sample of ADF personnel who served in the specified region of interest with a sample who could have been deployed but were not. Interestingly, results found little difference in health outcomes between those who deployed and those who didn't.

Around the same time that these studies were being conducted, deployments to the Middle East Area of Operations (MEAO) commenced. This change in operational tempo led to the formulation of the MEAO Health Study protocol, again intended to examine the health effects of deployment to this region. However, by the time the program gained significant traction in 2009, the original proposed strategy of comparing a group who had deployed to the MEAO with a sample who could have been deployed but had not yet done so, was no longer feasible. The operational tempo was such that the significant majority of those who could have been deployed to the MEAO had already been deployed. As a consequence, all 24,000 MEAO-deployed personnel were instead targeted for a survey as part of the MEAO Census Study.

Further complicating the study design was the fact that many MEAO veterans had had multiple deployments and were continuing to be deployed, including a group of veterans who had deployed both to Iraq and Afghanistan. This posed some significant challenges in documenting combat exposures and other possible deployment-related hazards and the impact of these on mental and physical health. Against this background, an alternative prospective study design examining the effects of deployment to the MEAO was proposed. This period of ongoing deployment provided

a unique opportunity to conduct a prospective study of personnel who were being redeployed or deployed for the first time to the MEAO. Specifically, all ADF members who deployed to the MEAO after June 2010 and returned from that particular deployment by June 2012 were invited to participate in the MEAO Prospective Study. In addition, a subsample of primarily combat personnel belonging to certain pre-selected units were invited to provide additional objective health measures, including physical tests (including blood tests) and/or neurocognitive assessments. All data for the MEAO Prospective Study were collected at two time points for each participant. In the first instance, participants provided data not more than four months prior to their index deployment (Time 1: pre-deployment), and again, on average, 4.2 months after they returned home (Time 2: post-deployment). Importantly, individual units deployed at varying times between June 2010 and June 2012, and for varied lengths of time; thus, the time frame of data collection within the study period (2010–2012) varied for each participant. A major strength of this methodology was the ability to document change within individuals over time, including their responses to varied levels of combat exposure and experiences. Furthermore, with individuals acting as their own control, this somewhat mitigated the need for a control comparison group.

The design of the MEAO Prospective Study, where the individual acts as their own control, and the range of both subjective and objective (physiological, biochemical, immunological, and neurocognitive) data collected, overcame the reliance on self-report measures and cross-sectional retrospective studies of deployment, which had been the ubiquitous methodology of most deployment health surveillance programs conducted thus far.

An important turning point occurred in the midst of the planning of the MEAO studies. The 2009 *Review of Mental Health Care in the Australian Defence Force and Transition through Discharge* (known as the Dunt Report) recommended that a mental health prevalence study be conducted of the entire ADF so as to map both prevalence and clinical service need in the entire Defence population (Dunt, 2009). It was in this setting that a clear opportunity arose. As the MEAO Census Study was going to survey nearly half of the ADF, extending this program to encompass all ADF members would provide a unique opportunity to also establish prevalence estimates of mental disorder in the entire ADF population. Thus, it was decided to include the entire ADF, and together with the MEAO Census Study and MEAO Prospective Study, this formed the Military Health Outcomes Program (MilHOP). The timing of this program of research was also ideal as it offered a further unique opportunity to compare with recent mental health data collected on the Australian civilian population by the Australian Bureau of Statistics in 2007 as part of the second National Survey of Mental Health and Wellbeing. By using the same methodology, rates of mental disorder in the ADF could be directly compared with a contemporaneous civilian population based on the results obtained from the same diagnostic interview.

Thus, the MilHOP examined the mental and physical health of three distinct populations: (1) Regular, Reservist and Ex-Serving ADF personnel who had deployed to the MEAO (MEAO Census Study) (Dobson et al., 2012); (2) a cohort of ADF personnel deploying to the MEAO between 2010 and 2012 (MEAO Prospective Study) (Davy et al., 2012); and (3) Regular ADF personnel serving in the ADF in 2010 who had not deployed to the MEAO (Health and Wellbeing Survey).

Data pertaining to 2010 Regular ADF members were then combined from the three studies to produce the 2010 ADF Mental Health Prevalence and Wellbeing Study (MHPWS) dataset in order to examine the prevalence of 12-month and lifetime International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10) disorder in the entire 2010 Regular ADF population. This was the first study conducted in Australia to use a robust, standardised, two-phase design for estimating prevalence in epidemiological research; the internationally acclaimed, gold-standard structured interview for assessing ICD-10 and *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition (DSM-IV) mental disorder – the Composite International Diagnostic Interview (CIDI) (Kessler & Ustun, 2004); and a two-stage statistical weighting methodology to correct for differential non-response and systematic selection and response biases. This allowed the generation of prevalence estimates that were representative of the entire Regular ADF in 2010.

A series of unexpected findings emerged from the MilHOP, which, when coupled with an emerging body of knowledge highlighting the prevalence of delayed-onset posttraumatic stress disorder (PTSD), played a major role in the design and development of the Transition and Wellbeing Research Programme.

First, results from the MEAO Census Study identified poorer mental and general health (in particular, PTSD, major depressive disorder, alcohol misuse, and suicidal ideation) among ADF members who had been discharged or transitioned into the Reserves, compared with those who remained in regular service (Dobson et al., 2012). However, a limitation of this study was that the Ex-Serving and Transitioned ADF members comprised just one-fifth of the total MEAO Census Study sample; therefore, overall, they represented only a small proportion of the 5,000 ADF members who transition from the Regular ADF every year. This highlighted the need to examine a more representative population of Transitioned ADF members.

Furthermore, results from the MHPWS showed that the rates of depressive and anxiety disorders, particularly in younger males in the ADF in the age bands 18–27 and 28–35, were significantly higher than in the Australian community, with few differences in the older age groups. The presence of only a slight difference in rates of mental disorders between the ADF and the Australian community in the 38–47 age group, compared with the earlier age groups, suggests that those who developed

mental disorders early in their career are likely to have left the ADF, meaning the morbidity related to their military service was no longer visible in the older and healthier cross-sectional population. This result cannot simply be explained by the general propensity of rates of depression to drop with age, as the decline over time was significantly greater in the ADF than in the Australian community (Slade et al., 2009). As the MHPWS only examined mental disorder in current serving Regular ADF members, it was unable to comment on those who were no longer serving or had transitioned to the Reserves.

Third, there were no significant differences in the rates of diagnosable disorder among 2010 Regular ADF members who had been on operational deployment compared with those who hadn't. This is in stark contrast to previous studies, which have reported poor outcomes in deployed cohorts over time (Fear et al., 2010; Ikin et al., 2016; Marmar et al., 2015). It was therefore postulated that at the time of the study in 2010, this risk had not fully manifested; and that with the passage of time, and through the effects of sensitisation (progressive amplification of responses brought about by repeated exposure to a stimulus (i.e. a traumatic event)), an increase in the emergence of symptoms and disorders was deemed likely in this population. This concept of sensitisation is one which is evidenced by the current findings from the Programme and was one of the drivers of the research design.

The MEAO Prospective Study examined a cohort of current serving ADF members prior to deployment and following an index deployment, where individuals served as their own controls (Davy et al., 2012). This methodology has many strengths because the confounds of differential recruitment of participants and controls do not exist and the use of an individual as their own control mitigates the potential confounds of other risk factors such as genetics, and differential prior trauma exposure and health prior to deployments. Findings from the MEAO Prospective Study highlighted that the majority of this deployed ADF cohort were psychologically, physically and socially healthy before and after deployment (Davy et al., 2012). This was not surprising for a number of reasons. First, initial recruitment into the ADF is stringent; thus, this group represents a relatively healthy workforce compared with the general Australian population. Furthermore, the additional health checks that are required prior to deployment ensure that this cohort would have comprised some of the fittest and healthiest members of the ADF. Interestingly, while the study found very little evidence of mental or physical health changes between pre- and post-deployment, small but significant changes in some symptoms were identified. Importantly, these were more likely in those with higher rates of combat and deployment exposures, and among those in combat roles (Davy et al., 2012). It was therefore anticipated that these small initial documented shifts may be indicative of emerging stress-related physiological dysregulation, which may later manifest in more prominent mental health symptoms.

In summary, the Transition and Wellbeing Research Programme was designed and implemented based on a culmination of research and observations regarding the long-term consequences of exposure to traumatic stress and its physical and psychological sequelae (McFarlane, 2010b). As a consequence, one of the major strengths of the Programme has been the ability to draw on the lessons learned from these previous studies in order to conduct long-term follow-up of the ADF workforce using both an epidemiological and neurobiological methodological approach. Not only has this allowed an examination of the health consequences of military service and transition, but it has also provided insight into the sequence of, and relationship between, emerging neurobiological dysregulation and symptoms development in order to improve the understanding of the mechanisms and risk factors for long-term adverse mental and physical health outcomes. To date, this has not occurred systematically in any other defence force.

Acronyms and abbreviations

ABS	Australian Bureau of Statistics
ADF	Australian Defence Force
AIFS	Australian Institute of Family Studies
AIHW	Australian Institute of Health and Welfare
AUDIT	Alcohol Use Disorders Identification Test
CI	confidence interval
CIDI	Composite International Diagnostic Interview
CTSS	Centre for Traumatic Stress Studies
DAR-5	Dimensions of Anger Reactions 5-item scale
Defence	Department of Defence
DSM-IV	*Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition
DVA	Department of Veterans' Affairs
GAD-7	Generalised Anxiety Disorder 7-item scale
ICD-10	International Statistical Classification of Diseases and Related Health Problems, 10th Revision
K10	Kessler Psychological Distress 10-item scale
MEAO	Middle East Area of Operations
MEC	Medical Employment Classification
MECRB	Medical Employment Classification Review Board
MHPWS	Mental Health Prevalence and Wellbeing Study
MHWTS	Mental Health and Wellbeing Transition Study
MilHOP	Military Health Outcomes Program
MRI	magnetic resonance imaging
mTBI	mild traumatic brain injury
NHMRC	National Health and Medical Research Council

PBS	Pharmaceutical Benefits Scheme
PCL-C	Posttraumatic Stress Disorder Checklist – civilian version
PHQ-9	Patient Health Questionnaire 9-item scale
PMKeyS	Personnel Management Key Solution
Programme	Transition and Wellbeing Research Programme
PTSD	posttraumatic stress disorder
RPBS	Repatriation Pharmaceutical Benefits Scheme
SE	standard error

Glossary

Affective disorders. A class of mental disorders. The Mental Health and Wellbeing Transition Study examined three types of affective disorder: depressive episodes, dysthymia and bipolar affective disorder. A key feature of these mental disorders is mood disturbance.

Agoraphobia. Marked fear or avoidance of situations such as crowds, public places, travelling alone, or travelling away from home, which is accompanied by palpitations, sweating, shaking, or dry mouth, as well as other anxiety symptoms such as chest pain, choking sensations, dizziness, and sometimes feelings of unreality, fear of dying, losing control, or going mad.

Alcohol dependence. Characterised by an increased prioritisation of alcohol in a person's life. The defining feature of alcohol dependence is a strong, overwhelming desire to use alcohol, despite experiencing a number of associated problems. A diagnosis was given if the person reported three or more of the following symptoms in the previous 12 months:

- a strong and irresistible urge to consume alcohol
- a tolerance to the effects of alcohol
- an inability to stop or reduce alcohol consumption
- withdrawal symptoms upon cessation or reduction of alcohol intake
- continuing to drink despite it causing emotional or physical problems
- reduction in important activities because of drinking or in order to drink.

Alcohol harmful use. Diagnosis of 'alcohol harmful use' not only requires high levels of alcohol consumption, but that the alcohol use is damaging to the person's physical or mental health. Each participant was initially asked if they consumed 12 or more standard alcoholic drinks in a 12-month period. If so, they were then asked a series of questions about their level of consumption. A diagnosis of alcohol harmful use was applied if the alcohol interfered with either work or other responsibilities; caused arguments with their family or friends; was consumed in a situation where the person could get hurt; resulted in being stopped or arrested by police; or if the participant continued to consume alcohol despite experiencing social or interpersonal problems as

a consequence of their drinking during the previous 12 months. A person could not meet criteria for alcohol harmful use if they met criteria for alcohol dependence.

Alcohol Use Disorders Identification Test (AUDIT). Alcohol consumption and problem drinking was examined using the Alcohol Use Disorders Identification Test (Saunders et al., 1993), a brief self-report screening instrument developed by the World Health Organization. This instrument consists of 10 questions to examine the quantity and frequency of alcohol consumption, possible symptoms of dependence, and reactions or problems related to alcohol. The AUDIT is widely used in epidemiological and clinical practice for defining at-risk patterns of drinking.

Anxiety disorders. A class of mental disorder that involves the experience of intense and debilitating anxiety. The anxiety disorders covered in the survey were panic attacks, panic disorder, social phobia, specific phobia, agoraphobia, generalised anxiety disorder, PTSD and obsessive-compulsive disorder.

Australian Bureau of Statistics (ABS). Australia's national statistical agency, providing trusted official statistics on a wide range of economic, social, population and environmental matters of importance to Australia. To enable comparison of estimates in the Transitioned ADF with an Australian community population, direct standardisation was applied to estimates in the 2014–2015 ABS National Health Survey data. The National Health Survey is the most recent in a series of Australia-wide ABS health surveys, assessing various aspects of the health of Australians, including long-term health conditions, health risk factors and health service use.

Australian Defence Force (ADF). The ADF is constituted under the *Defence Act 1903* (Cth) and, together with the Department of Defence, is collectively known as Defence. Defence's mission is to defend Australia and its national interests. In fulfilling this mission, Defence serves the government of the day and is accountable to the Australian Parliament, which represents the Australian people to efficiently and effectively carry out the government's defence policy. The current program of research aims to examine the mental, physical and social health of serving and ex-serving ADF members, and their families. It builds on previous research to inform effective and evidence-based health service provision for contemporary service members and veterans.

Australian Institute of Family Studies (AIFS). The Australian Government's key research body in the area of family wellbeing. AIFS conducts original research to increase understanding of Australian families and the issues that affect them. The current research was conducted by a consortium of Australia's leading research institutions led by the Centre for Traumatic Stress Studies at the University of Adelaide, and AIFS.

Australian Institute of Health and Welfare (AIHW). Australia's national agency for health and welfare statistics and information. The AIHW was commissioned in this Programme to develop the Military and Veteran Research Study Roll by integrating contact information from various sources and databases.

Bipolar affective disorder. A class of mental disorder associated with fluctuations of mood that are significantly disturbed. These fluctuations of mood are markedly elevated on some occasions (hypomania or mania) and can be markedly lowered on other occasions (depressive episodes). A diagnosis of bipolar affective disorder was applied in this study if the individuals met criteria for mania or hypomania in the previous 12 months.

Centre for Traumatic Stress Studies (CTSS). A centre at the University of Adelaide that seeks to improve evidence-based practice by informing and applying scientific knowledge in the field of trauma, mental disorder and wellbeing in at-risk populations. The Transition and Wellbeing Research Programme was conducted by a consortium of Australia's leading research institutions, led by the CTSS and the Australian Institute of Family Studies.

Class of mental disorder. Mental disorders are grouped into classes of disorder that share common features. Three classes of mental disorders were included in the survey: affective disorders, anxiety disorders and alcohol disorders.

Comorbidity. The occurrence of more than one disorder at the same time. Comorbidity was defined by grouping any alcohol disorders, any affective disorders, any anxiety disorders (excluding PTSD), and PTSD according to their co-occurrence. In addition to a breakdown of the individual patterns of co-occurrence, five categories were defined representing those with no mental disorder, and those with one, two, three or four disorder categories.

Composite International Diagnostic Interview (CIDI). The World Mental Health Survey Initiative version of the World Health Organization's Composite International Diagnostic Interview Version 3 (CIDI 3.0) (Kessler & Ustun, 2004) provides an assessment of mental disorders based on the definitions and criteria of two classification systems: the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition (DSM-IV) (American Psychiatric Association, 1994) and the World Health Organization's International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10) (World Health Organization, 1994). This instrument was used in Phase 2 of the current research Programme.

Confidence interval (CI). This measurement gives an estimated range of values that is likely to include an unknown population parameter – the estimated range being calculated from a given set of sample data.

Department of Veterans' Affairs (DVA). Delivers government programs for war veterans, and members of the ADF and the Australian Federal Police and their dependants. In 2014, DVA, in collaboration with the Department of Defence, commissioned the Transition and Wellbeing Research Programme, one of the largest and most comprehensive military research projects undertaken in Australia.

Deployment status. The Mental Health and Wellbeing Transition Study defined deployment status, based on survey responses, as:

- **Never deployed:** Individuals who did not endorse any deployments listed in the self-report survey (Your Military Career: Deployments) and did not endorse any deployment exposures (Your Military Career: Deployment Exposure)
- **Deployed:** Individuals who endorsed one or more of the listed deployments (Your Military Career: Deployments) or endorsed one or more of the deployment exposures (Your Military Career: Deployment Exposure).

Depressive episodes. Characteristic of a major depressive disorder, an episode requires that an individual has suffered from depressed mood lasting a minimum of two weeks, with associated symptoms or feelings of worthlessness, lack of appetite, difficulty with memory, reduction in energy, low self-esteem, concentration problems and suicidal thoughts. Depressive episodes can be mild, moderate or severe. All three are included under the same heading. Hierarchy rules were applied to depressive episodes, such that a person could not have met criteria for either a hypomanic or manic episode.

Diagnostic criteria. The survey was designed to estimate the prevalence of common mental disorders defined according to clinical diagnostic criteria, as directed by the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10). Diagnostic criteria for a disorder usually involve specification of:

- the nature, number and combination of symptoms
- the time period over which the symptoms have been continuously experienced
- the level of distress or impairment experienced
- the circumstances for exclusion of a diagnosis, such as it being due to a general medical condition or the symptoms being associated with another mental disorder.

Dimensions of Anger Reactions 5-item scale (DAR-5). A concise measure of anger consisting of five items that address anger frequency, intensity, duration, aggression and interference with social functioning. Items are scored on a five-point Likert scale,

generating a severity score ranging from 5 to 25, with higher scores indicating worse symptomatology. This scale has been used previously to assess Australian Vietnam veterans, as well as US Afghanistan and Iraq veterans, and shows strong unidimensionality, and high levels of internal consistency and criterion validity.

DVA client. A term used when referring to Department of Veterans' Affairs (DVA) clients for the purpose of analyses.

In constructing the DVA dataset for the Military and Veteran Research Study Roll, DVA created an indicator for assessing confidence in the accuracy of veterans' address details, based on the level of DVA's interaction with each veteran. Each of the following groups were considered a DVA client:

- High – where a veteran is in receipt of a fortnightly payment (such as income support or compensation pension) from DVA, it was a sign of regular ongoing contact with the client, and therefore DVA would have a high level of confidence that the client's address would be up to date and correct.

- Medium – where a veteran only holds a treatment card (i.e. does not also have an ongoing payment), there is a lower level of ongoing contact with the department, and therefore the level of confidence that DVA can assign to the accuracy of the client's address is lower.

- Low – not all veterans who have their illness/injury liability claim accepted as service-related by DVA automatically receive a treatment card or pension payment; however, they would still be considered DVA clients.

For the purposes of this report, any individual in the study population who met the above criteria was flagged as a 'DVA client'. Those with this flag were compared against those without this flag.

Dysthymia. Characterised as a chronic or pervasive disturbance of mood, lasting several years, that is not sufficiently severe or in which the depressive episodes are not sufficiently prolonged to warrant a diagnosis of a recurrent depressive disorder. Hierarchy rules were applied to dysthymia such that in order to have this disorder, a person could not have met criteria for either a hypomanic or manic episode and could not have reported episodes of severe or moderate depression within the first two years of dysthymia.

Ex-service organisation. Provides assistance to current and former ADF members. Services can include, but are not necessarily limited to, welfare support, help with DVA claims, and employment programs and social support.

Generalised anxiety disorder. A generalised and persistent worry, anxiety or apprehension about everyday events and activities, lasting a minimum of six months, that is accompanied by anxiety symptoms as described under 'agoraphobia'. Other symptoms may include symptoms of tension, such as inability to relax and muscle tension, and other non-specific symptoms, such as irritability and difficulty in concentrating.

Generalised Anxiety Disorder 7-item scale (GAD-7). A brief seven-item screening measure based on the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition (DSM-IV) criteria for generalised anxiety disorder. Originally validated for use in primary care, the GAD-7 performs well in detecting probable cases of the disorder, with a sensitivity of 89% and a specificity of 82%.

Gold Card. A DVA health card for all conditions. Gold Card holders are entitled to DVA funding for services for all clinically necessary healthcare needs and all health conditions, whether or not they are related to war service. The card holder may be a veteran or the widow/widower or dependant of a veteran. Only the person named on the card is covered.

Help-seeking latency. The delay in time between first becoming concerned about a health problem and first seeking help for that problem. To assess help-seeking latency in the study, participants were asked to indicate when they first sought help for their own mental health. Options included 'within three months of becoming concerned' or 'within one year of becoming concerned'. Alternatively, participants were able to specify the number of years since becoming concerned. This item was developed by researchers for use in the study.

Hypomanic episodes. Episodes that last at least four consecutive days and are considered abnormal to the individual. These episodes are characterised by increased activity, talkativeness, elevated mood, disrupted concentration, decreased need for sleep and disrupted judgement, manifesting as risk-taking (for example, mild spending sprees). In a subgroup of people, these disorders are particularly characterised by irritability. To meet criteria for the 'with hierarchy' version, the person cannot have met criteria for an episode of mania.

Kessler Psychological Distress 10-item scale (K10). A short 10-item screening questionnaire that yields a global measure of psychological distress based on symptoms of anxiety and depression experienced in the most recent four-week period. Items are scored from 1 to 5 and are summed to give a total score of between 10 and 50. Various methods have been used to stratify the scores of the K10. The categories of low (10–15), moderate (16–21), high (22–29) and very high (30–50) that are used in this report are derived from the cut-offs of the K10 that were used in the 2007

Australian Bureau of Statistics National Survey of Mental Health and Wellbeing (Slade et al., 2009).

Lifetime prevalence. A prevalence that meets diagnostic criteria for a mental disorder at any point in the respondent's lifetime.

Lifetime trauma. Exposure questions used in this study were drawn from the PTSD module of the Composite International Diagnostic Interview (Haro et al., 2006). Participants were asked to indicate whether or not they had experienced the following traumatic events: combat (military or organised non-military group); being a peacekeeper in a war zone or a place of ongoing terror; being an unarmed civilian in a place of war, revolution, military coup or invasion; living as a civilian in a place of ongoing terror for political, ethnic, religious or other reasons; being a refugee; being kidnapped or held captive; being exposed to a toxic chemical that could cause serious harm; being in a life-threatening automobile accident; being in any other life-threatening accident; being in a major natural disaster; being in a man-made disaster; having a life-threatening illness; being beaten by a spouse or romantic partner; being badly beaten by anyone else; being mugged, held up or threatened with a weapon; being raped; being sexually assaulted; being stalked; having someone close to you die; having a child with a life-threatening illness or injury; witnessing serious physical fights at home as a child; having someone close experience a traumatic event; witnessing someone badly injured or killed or unexpectedly seeing a dead body; accidentally injuring or killing someone; purposefully injuring, torturing or killing someone; seeing atrocities or carnage such as mutilated bodies or mass killings; experiencing any other traumatic event.

Mania. Similar to hypomania but more severe in nature. Lasting slightly longer (a minimum of a week), these episodes often lead to severe interference with personal functioning. In addition to the symptoms outlined under 'hypomania', mania is often associated with feelings of grandiosity, marked sexual indiscretions and racing thoughts.

Medical discharge. The involuntary termination of an ADF member's employment on the grounds of permanent or at least long-term unfitness to serve, or unfitness for deployment to operational (warlike) service.

Medical Employment Classification (MEC). An administrative process designed to monitor physical fitness and medical standards in the ADF. The MEC is divided into four levels (either current or on discharge from Regular ADF service):

- **MEC 1:** Members who are medically fit for employment in a deployed or seagoing environment without restriction.

- **MEC 2:** Members with medical conditions that require access to various levels of medical support or employment restrictions. However, they remain medically fit for duty in their occupation in a deployed or seagoing environment. In allocating subclassifications of MEC 2, access to the level of medical support will always take precedence over specified employment restrictions.

- **MEC 3:** Members who are medically unfit for duty in their occupation in a deployed or seagoing environment. The member so classified should be medically managed towards recovery and should be receiving active medical management with the intention of regaining MEC 1 or 2 within 12 months of allocation of MEC 3. After a maximum of 12 months, their MEC status is to be reviewed. If still medically unfit for military duties in any operational environment, they are to be downgraded to MEC 4 or, if appropriate, referred to a Medical Employment Classification Review Board (MECRB) for consideration of an extension to remain at MEC 3.

- **MEC 4:** Members who are medically unfit for deployment or seagoing service in the long term. Members who are classified as MEC 4 for their military occupation will be subject to review and confirmation of their classification by an MECRB.

Medical fitness. A status defined as:

- **Fit:** Those who are categorised as fully employable and deployable, or deployable with restrictions. Participants are classified as 'fit' if they fall into MEC 1 or 2 as described above, or are assigned a perturbed MEC value of 'fit'.

- **Unfit:** Those not fit for deployment, their original occupation and/or further service. This can include those undergoing rehabilitation or transitioning to alternative return-to-work arrangements or in the process of medically separating from the ADF. Participants are classified as 'unfit' if they fall into MEC 3 or 4 as described above, or are assigned a perturbed MEC value of 'unfit'.

Mental disorders. Defined according to the detailed diagnostic criteria within the World Health Organization's International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10). This publication reports data for ICD-10 criteria.

Mental Health Prevalence and Wellbeing Study (MHPWS). A 2010 study that was part of the Military Health Outcomes Program, the first comprehensive investigation of the mental health of serving ADF members.

Middle East Area of Operations (MEAO). Australia's military involvement in Afghanistan and Iraq is often referred to as the Middle East Area of Operations.

Thousands of members have deployed to the MEAO since 2001, with many completing multiple tours of duty. The Transition and Wellbeing Research Programme builds on the Military Health Outcomes Program, which detailed the prevalence of mental disorder in serving ADF members.

Military and Veteran Research Study Roll. Participants' contact details and demographic information were obtained via the creation of a study roll by the Australian Institute of Health and Welfare. This process involved integrating contact information from the following sources:

- Defence's Personnel Management Key Solution (PMKeyS) database
- DVA client databases
- National Death Index
- ComSuper member database
- Military Health Outcomes Program (MilHOP) dataset.

Military Health Outcomes Program (MilHOP). A program that investigated the prevalence of mental disorders among serving ADF members in 2010, as well as deployment-related health issues for those deployed to the Middle East Area of Operations. The Transition and Wellbeing Research Programme addresses a number of gaps identified following the MilHOP, including the mental health of Reservists, ex-serving members and ADF members in high-risk roles, as well as the trajectory of disorder and pathways to care for individuals previously identified with a mental disorder in 2010.

National Death Index. A Commonwealth database that contains records of deaths registered in Australia since 1980. Data comes from the Registry of Births, Deaths and Marriages in each jurisdiction, the National Coronial Information System and the Australian Bureau of Statistics. Before contacting participants, the Military and Veteran Research Study Roll was cross-checked against the National Death Index to ensure we did not attempt to approach deceased members.

National Health and Medical Research Council (NHMRC). Australia's peak funding body for medical research. The NHMRC has funded previous investigations undertaken by the Centre for Traumatic Stress Studies.

National Health Survey. The 2014–2015 National Health Survey is the most recent in a series of Australia-wide ABS health surveys, assessing various aspects of the health of Australians, including long-term health conditions, health risk factors, and health service use.

Obsessive-compulsive disorder. A disorder characterised by obsessional thoughts (ideas, images, impulses) or compulsive acts (ritualised behaviour). These thoughts and acts are often distressing and typically cannot be avoided, despite the sufferer recognising their ineffectiveness.

Optimal epidemiological cut-off. The value that brings the number of false positives (mistaken identifications of a disorder) and false negatives (missed identifications of a disorder) closest together, thereby counterbalancing these sources of error most accurately. Therefore, this cut-off would give the closest estimate to the true prevalence of a 30-day ICD-10 disorder as measured by the Composite International Diagnostic Interview and should be used to monitor disorder trends.

Optimal screening cut-off. The value that maximises the sum of the sensitivity and specificity (the proportion of those with and without a disease who are correctly classified). This cut-off can be used to identify individuals who might need further care.

Panic attack. Sudden onset of extreme fear or anxiety, often accompanied by palpitations, chest pain, choking sensations, dizziness, and sometimes feelings of unreality, fear of dying, losing control or going mad.

Panic disorder. Recurrent panic attacks that are unpredictable in nature.

Patient Health Questionnaire 9-item scale (PHQ-9). Self-reported depression was examined using the PHQ-9. The nine items of the PHQ-9 are scored from 0 to 3 and summed to give a total score of between 0 and 27. The PHQ-9 provides various levels of diagnostic severity, with higher scores indicating higher levels of depression symptoms.

Personnel Management Key Solution (PMKeyS). An integrated human resource management system that provides the ADF with a single source of personnel management information. PMKeyS manages information about the entire ADF workforce – Navy, Army and Air Force.

Pharmaceutical Benefits Scheme (PBS). Began as a limited scheme in 1948, offering free medicines for pensioners and a list of 139 'life-saving and disease-preventing' medicines free to other members of the community. Today, the PBS provides timely, reliable and affordable access to necessary medicines for all Australians. The PBS is part of the Australian Government's broader National Medicines Policy. Healthcare utilisation and cost data, including PBS and Repatriation Pharmaceutical Benefits Scheme data, were obtained for consenting serving and ex-serving ADF members as part of the current program of research. (*See also* 'Repatriation Pharmaceutical Benefits Scheme'.)

Posttraumatic stress disorder (PTSD). A stress reaction to an exceptionally threatening or traumatic event that would cause pervasive distress in almost anyone. Symptoms are categorised into three groups: re-experiencing memories or flashbacks, avoidance symptoms, and either hyperarousal symptoms (increased arousal and sensitivity to cues) or inability to recall important parts of the experience.

Posttraumatic Stress Disorder Checklist – civilian version (PCL-C). A 17-item self-report measure designed to assess the symptomatic criteria of PTSD according to the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition (DSM-IV). The 17 questions of the PCL-C are scored from 1 to 5 and are summed to give a total symptom severity score of between 17 and 85. An additional four items from the newly released PCL-5 were also included, giving researchers flexibility to also measure PTSD symptoms according to the most recent definitional criteria.

Prevalence of mental disorders. The proportion of people in a given population who meet diagnostic criteria for any mental disorder in a given time frame. (*See also* 'twelve-month prevalence' and 'lifetime prevalence'.)

Probable mental disorder. Where probable rates of mental disorder are presented, these are based on self-report epidemiological cut-offs.

Rank status. Three levels of rank were used in the Mental Health and Wellbeing Transition Study:

- **Commissioned Officer (referred to as 'Officers' in current report):** Senior Commissioned Officers (Commander, Lieutenant Colonel, Wing Commander and above) and Commissioned Officers (Lieutenant Commander, Major, Squadron Leader and more junior ranks)
- **Non-Commissioned Officer:** Senior Non-Commissioned Officers (Petty Officer, Sergeant and more senior ranks), and Junior Non-Commissioned Officers (Leading Seaman, Corporal and more junior ranks)
- **Other Ranks:** Able Seaman, Seaman, Private, Leading Aircraftman, Aircraftman or equivalent.

Reason for discharge. The reason for transitioning out of the ADF. In the Transition and Wellbeing Research Programme, the reason for discharge was derived from responses on the self-report survey, and classified accordingly:

- **Medical discharge:** Involuntary termination of the ADF member's employment on the grounds of permanent or at least long-term unfitness to serve, or unfitness for deployment to operational (warlike) service

- **Other:** All other types of discharge, including compulsory age retirement, resignation at own request, assessed as unsuitable for further training, end of fixed-period engagement, end of initial enlistment period or return of service obligation, end of limited-tenure appointment, not offered re-engagement, accepted voluntary redundancy, compassionate grounds, and non-voluntary administrative discharge.

Repatriation Pharmaceutical Benefits Scheme (RPBS). The benefits listed in the RPBS can only be prescribed for Department of Veterans' Affairs beneficiaries who hold a Gold, White or Orange card. Healthcare utilisation and cost data, including Pharmaceutical Benefits Scheme and RPBS data, were obtained for consenting serving and ex-serving ADF members as part of the current program of research. (*See also* 'Pharmaceutical Benefits Scheme'.)

Service status. The ADF comprises:

- **the Royal Australian Navy:** A maritime force that contributes to regional security, supports global interests, shapes the strategic environment and protects national interests

- **the Australian Army:** The military land force, a potent, versatile and modern army that contributes to the security of Australia, protecting its interests and people

- **the Royal Australian Air Force:** Provides immediate and responsive military options across the spectrum of operations as part of a whole-of-government joint or coalition response, either from Australia or deployment overseas. The Air Force does this through its key air power roles – control of the air; precision strikes; intelligence, surveillance and responses; and air mobility – enabled by combat and operational support.

Social phobia. The marked fear or avoidance of being the centre of attention or in situations where it is possible to behave in a humiliating or embarrassing way, accompanied by anxiety symptoms, as well as either blushing, fear of vomiting, or fear of defecation or micturition.

Specific phobia. The marked fear or avoidance of a specific object or situation, such as animals, birds, insects, heights, thunder, flying, small enclosed spaces, sight of blood or injury, injections, and dentists or hospitals, and accompanied by anxiety symptoms as described under 'agoraphobia'.

Stratification. Grouping outcomes by variables of interest. In the *Mental Health Prevalence Report* (Van Hooff et al., 2018), 12-month diagnosable mental disorder and self-reported suicidality were stratified by age, sex, rank, Service, years of service in the

Regular ADF, deployment status, transition status, years since transition, reason for transition, and DVA client status.

Study Roll. *see* Military and Veteran Research Study Roll.

Subsyndromal disorder. Characterised by or exhibiting symptoms that are not severe enough for diagnosis as a clinically recognised syndrome.

Suicidal ideation. Serious thoughts about taking one's own life.

Suicidality. Suicidal ideation (serious thoughts about taking one's own life), and suicide plans and attempts.

Transitioned ADF members. ADF members who have left military service. For the purpose of the current study, this includes all ADF members who transitioned from the Regular ADF between 2010 and 2014, including those who transitioned into the Active Reserves and Inactive Reserves.

Transitioned status. Transitioned ADF members were categorised into one of three groups, which broadly represented their level of continued association and contact with Defence and their potential access to support services provided by Defence:

- **Ex-Serving:** A person who was a Regular ADF member before 2010, has since transitioned out of the ADF and is no longer engaged with Defence in a Reservist role – the individual is classified as discharged from Defence
- **Inactive Reservist:** A person who was a Regular ADF member before 2010, but has since transitioned into an Inactive Reservist role
- **Active Reservist:** A person who was a Regular ADF member before 2010, but has since transitioned into an Active Reservist role.

Twelve-month prevalence. Meeting diagnostic criteria for a lifetime ICD-10 mental disorder and then having reported symptoms in the 12 months before the interview.

Two-phase design. A well-accepted epidemiological approach to investigating the prevalence of mental disorders. In the first phase, participants completed a screening questionnaire, which was generally economical in terms of time and resources. Based on the results of this screening and the demographic information provided, certain participants were selected for a more accurate but costly formal diagnostic interview.

Veterans' health cards. DVA, on behalf of the Australian Government, uses health cards as a convenient method for veterans, war widows/widowers and their eligible dependants to access health and other care services. Arrangements are based on

providing access to clinically appropriate treatment that is evidence-based. There are Gold, White and Orange cards.

Weighting. Allowing for the inference of results for the entire population. Weighting involved allocating a representative value or 'weight' to the data for each responder, based on key variables. The weight indicated how many individuals in the entire population were represented by each responder. Weighting was applied to:

- correct for differential non-response
- adjust for any systematic biases in the responders (for example, oversampling of high scorers for the Composite International Diagnostic Interview).

White Card. A DVA health card for specific conditions. A White Card entitles the holder to care and treatment for:

- injuries or conditions that are accepted as being caused by war or service-related
- malignant cancer, pulmonary tuberculosis, PTSD, anxiety and/or depression, whether or not it was caused by war
- symptoms of unidentifiable conditions that arise within 15 years of service (other than peacetime service).

Services covered by a White Card are the same as those for a Gold Card, but must be for treatment of conditions that are accepted as being caused by war or service-related.

World Mental Health Survey Initiative version of the World Health Organization's Composite International Diagnostic Interview. *see* Composite International Diagnostic Interview (CIDI).

Years of regular service. The following categories were used in the Mental Health and Wellbeing Transition Study to define the number of years of regular service: 3 months to 3.9 years, 4 to 7.9 years, 8 to 11.9 years, 12 to 15.9 years, 16 to 19.9 years and 20+ years.

Years since transition. To ascertain the number of years since transition from regular service, participants were asked to indicate what year they transitioned to Active Reserves, Inactive Reserves or were discharged out of the Service (Ex-Serving). Options included zero, one, two, three, four or five years.

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