TRANSITION AND WELLBEING RESEARCH PROGRAMME

MENTAL HEALTH AND WELLBEING TRANSITION STUDY

Physical Health Status

Summary Report

2018

978-0-6481609-2-2 (PDF)
978-0-6481609-3-9 (print)

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Suggested citation:

Kelsall, H., Sim, M., Van Hooff, M., Lawrence-Wood, E., Hodson, S., Sadler, N., Benassi, H., Hansen, C., Avery, J., Searle, A., Ighani, H., Iannos, M., Abraham, M., Baur, J., Saccone, E., & McFarlane, A. (2018). *Physical Health Status Summary Report, Mental Health and Wellbeing Study*. Canberra: the Department of Defence and the Department of Veterans' Affairs.

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This report is available from:

Department of Defence
www.defence.gov.au/Health/DMH/ResearchSurveillancePlan.asp

Department of Veterans' Affairs
https://www.dva.gov.au/physical-health-status-summary-report

Published by the Department of Veterans' Affairs, Canberra, 2018

Publication no: P03636

Contents

Acknowledgments v

Context vii

Summary of key findings ix

1 Background 1

2 Methodology 3

3 How to interpret and discuss the findings in this report 6

4 Socio-demographic characteristics 9

5 Definition of key terms used in this report 10

6 Key findings 11

7 Estimated prevalence of physical health symptoms and conditions among Transitioned ADF members and 2015 Regular ADF members 16

8 Physical health in Transitioned ADF by DVA client status, transition status and medical discharge status 24

9 Smoking, quality of life and doctor-diagnosed asthma in Transitioned ADF compared with the Australian Community 27

10 Implications and future directions 30

Glossary of terms 37

References 43

Tables

Table 1 Unweighted demographic characteristics of respondents in Transitioned ADF and 2015 Regular ADF 5

Table 2 Estimated proportions of lifetime doctor diagnosed health conditions in Transitioned ADF and 2015 Regular ADF 17

Table 3 Most common ever reported doctor-diagnosed health conditions in Transitioned ADF and 2015 Regular ADF 17

Table 4 Estimated prevalence of respiratory symptoms and conditions in the preceding 12 months in Transitioned ADF and 2015 Regular ADF 18

Figures

Figure 1 Survey response rates for Transitioned ADF and 2015 Regular ADF 4

Figure 2 Prevalence estimates for the 10 most commonly reported health symptoms in Transitioned ADF members and 2015 Regular ADF members 16

Figure 3 Estimated proportions of service-related injury types sustained during military career in Transitioned ADF and 2015 Regular ADF 19

Figure 4 Estimated proportions of grades of pain intensity and disability in the preceding six months in Transitioned ADF and 2015 Regular ADF 20

Figure 5 Estimated proportions of insomnia severity in the preceding two weeks in Transitioned ADF and 2015 Regular ADF 20
Figure 6 Estimated prevalence of smoking in Transitioned ADF compared with the Australian Community 28
Figure 7 Estimated prevalence of self-perceived health in Transitioned ADF compared with the Australian Community 28
Figure 8 Estimated prevalence of doctor-diagnosed asthma in Transitioned ADF compared with the Australian Community 29

Acknowledgments

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First and foremost, we acknowledge all current and ex-serving Australian Defence Force personnel who generously gave their time to complete the study. This research was only made possible by their efforts and commitment to the study. Other key individuals include:

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Hunter Valley Foundation

Ms Shanti Ramanathan, Mr David Shellard, Dr Clare Hogue, Ms Phyllis Hartung, Mr Russ Redford and the team of CIDI interviewers

Nexview Systems

Mr Trevor Moyle, Ms Hong Yan

Australian Institute of Family Studies

Dr Galina Daraganova, Dr Jacquie Harvey

Australian Institute of Health and Welfare

Mr Phil Anderson, Mr Nick Von Sanden, Mr Richard Solon, Mr Tenniel Guiver

Australian Bureau of Statistics

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COL Laura Sinclair, Ms Jess Styles, Ms Kanny Tait, Mr Zushan Hashmi, Department of Defence

For their assistance in developing the **Military and Veteran Research Study Roll**: Mr Mark Watson and Ms Megan MacDonald, Department of Veterans' Affairs, and Ms Carolina Casetta and Warrant Officer Class One Iain Lewington, Health Policy Programs and Assurance Branch, Joint Health Command

Other key organisations

Australia Post

Context

In Australia military service is held in high regard. It is recognised that it places high demands on those who serve and that as a result of their service some personnel experience physical and psychological injuries (Tanielian & Jaycox, 2008) that can subsequently affect their longer term health and wellbeing (Ikin et al., 2007; Ikin et al., 2009). About 5000 serving men and women (9% of those serving) transition out of the Regular ADF each year (Department of Defence, 2016) and are faced with the challenge of re-integrating into civilian life. Some make the transition with relative ease, but others, particularly those who have developed mental and/or physical health conditions, can struggle with the adjustment (Kukla et al., 2015; Pease et al., 2016).

Despite the concerns expressed by the ex-serving community and the widespread acknowledgment that transitioning from the defence force and returning to civilian life are significant stressors (Forces in Mind Trust, 2013; Pease et al., 2016), there has been very little systematic research examining the physical health and wellbeing of transitioned military personnel after they leave the Australian Defence Force. Rather, much of the current literature in the field looks at the health impacts on deployed personnel, on veterans compared with non-deployed populations, or on specific deployment cohorts in Australia (Gwini et al., 2015; Gwini et al., 2016a; Gwini et al., 2016b; Ikin et al., 2007; Kelsall et al., 2004a; Kelsall et al., 2004b; McGuire et al., 2012; McKenzie et al., 2004; McKenzie et al., 2006; Zheng et al., 2016) and internationally (Fear et al., 2010; Hoge et al., 2004; Kang et al., 2009)

There is, however, a growing body of research showing that the first few years after separation from the military are crucial to the overall wellbeing of transitioned personnel (Pedlar & Thompson, 2016; Sheilds et al., 2016). It might also be that that those who have left the military have poorer health and so exhibit higher estimated rates of injury and illness compared with those who remain in the ADF. Furthermore, although research has shown that deployment can have longer term impacts on health and wellbeing (Ikin et al., 2007; Ikin et al., 2009; Ikin et al., 2017), the importance of the transition period in relation to this, and the longer term impacts of military service more generally, are not well researched or understood.

The present report

To date, most information about physical health among military personnel has come from studies of specific deployed populations from Australia or internationally (Ikin et al., 2017; Kelsall et al., 2004a; Kelsall et al., 2004b; Kang et al., 2000). Little is known about the physical health status of ADF members overall, as well as that of currently serving and recently transitioned members. Increasing our knowledge and evidence base in relation to this and mapping where the gaps in the research lie are central to developing and refining systems of care and health promotion and further developing policies and programs that will enhance physical health and support the military workforce and transitioned personnel in the future.

The *Physical Health Status Report* provides a comprehensive, high-level overview of the physical health and wellbeing of ADF personnel who transitioned between January 2010 and December 2014 and members of the 2015 Regular ADF in connection with several key health outcomes previously found to be of importance among deployed and non-deployed military and veteran populations in Australia and internationally. The five-year 'window' immediately after transition was chosen because this is a critical period to target for early intervention. The report assesses key service and transition factors that could be associated with better or poorer physical health in the Transitioned ADF, transition status (Ex-Serving, Active Reservist or Inactive Reservist), DVA client status (DVA client or non-DVA client) and medical discharge status (medical discharge or non-medical discharge). An assessment of Transitioned ADF members who are now in the Active and Inactive (or Standby) Reserves compared with members who have discharged completely into the community (Ex-Serving members) provides critical information on the health status of these groups with differing transition

status. Although protective factors such as the 'healthy worker' or 'healthy warrior' effect have been seen for full-time regular serving ADF members, they could lose strength as members transition out of the ADF. Furthermore, the Department of Veterans' Affairs is the primary conduit for care in the current eligible Transitioned ADF population, so it might be the case that Transitioned ADF members who have become DVA clients have poorer physical health compared with their non–DVA client counterparts. Similarly, members who are medically discharged from the military as a result of some type of physical or mental health condition are likely to exhibit poorer health compared with individuals who discharged on other grounds.

The report also compares the physical health profile of Transitioned ADF members with a matched Australian Community sample in relation to selected risk factors and key health indicators – smoking status, self-reported asthma and quality of life. An understanding of how Transitioned ADF members compare with the Australian community in this context offers a more thorough understanding of the role military service plays in physical health status.

Aims and objectives of this report

The primary aims of the *Physical Health Status Report* within the Mental Health and Wellbeing Transition Study, which itself is part of the Transition and Wellbeing Research Programme, were as follows:

- Examine the physical health status of ADF members who transitioned out of full-time regular service in the five-year period between January 2010 and December 2014 compared with that of Regular ADF members in 2015.
- Explore a range of potential demographic, service-related and transition-related predictors of physical health outcomes among Transitioned ADF members.
- Compare the physical health and wellbeing of Transitioned ADF with that of a comparable Australian Community sample on several health indicators.
- Compare the physical health and wellbeing of Transitioned ADF according to transition status (Ex-Serving, Active Reservist or Inactive Reservist), DVA client status (DVA client or non-DVA client) and medical discharge status (medical discharge or non-medical discharge).

This report assesses the physical health of current serving members (regular ADF members in 2015) and Transitioned ADF members (transitioned from regular ADF service between 2010 and 2014) in the following areas: self-reported health symptoms, self-reported doctor-diagnosed medical conditions, respiratory health, injuries, pain, sleep problems, lifestyle risk factors (body mass index, physical activity and smoking), self-perceived health and quality of life, and health service use.

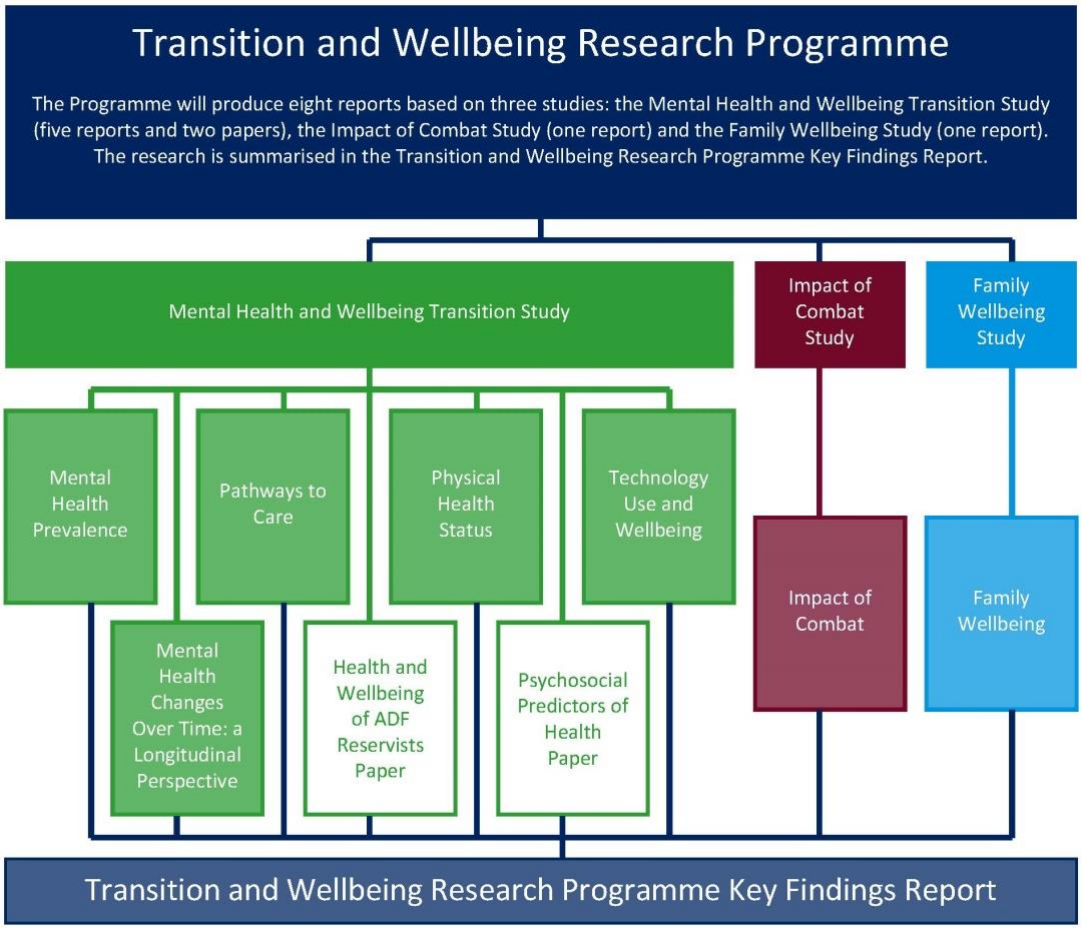
Summary of key findings

The Transition and Wellbeing Research Programme addresses key research priorities of both the Department of Veterans' Affairs and the Department of Defence with three studies – the Mental Health and Wellbeing Transition Study, the Impact of Combat Study and the Family Wellbeing Study. The *Physical Health Status Report* is the third in an initial series of eight reports and two research papers to be produced under the Programme. As one of the first studies internationally to investigate a comprehensive range of physical health indicators in recently transitioned military personnel, it provides a comprehensive dataset and framework for further detailed analysis of the physical health of both current and transitioned ADF members now and into the future and identifies several important implications for practice and future research.

This Physical Health Status Study compared the self-reported physical health of Transitioned ADF members who had transitioned out of full-time regular service in the five years between January 2010 and December 2014 with that of Regular ADF members in 2015, using general health indicators as well as indicators relevant to several body systems. Overall, Transitioned ADF members were more likely to report poorer physical health, to have increased lifestyle risk factors, and to report poorer self-perceived health, satisfaction and quality of life than 2015 Regular ADF. Among the Transitioned ADF, poorer physical health outcomes overall were reported for DVA clients compared with those who were not DVA clients, for Ex-Serving members compared with Active Reservists or Inactive Reservists, and for those who had been medically discharged compared with those who had been discharged for other reasons.

Physical comorbidities and their relationship with psychological health are an important consideration. Physical health status in the transitioning phase can have implications – for example, for general health and wellbeing, for psychological health, for re-integration and employment after transition, and in the longer term for later onset of chronic health conditions. The findings of the study can help with the development and refining of preventive health programs and individual and population-based health management programs. This is a relatively young cohort, and longitudinal follow-up to assess and monitor members' physical health over time and the development of chronic conditions with a longer latency period before onset will be important.

1 Background



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

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

The work extends and builds on the findings of the world-leading research conducted with current serving members of the ADF in the 2010 Military Health Outcomes Program, or MilHOP.

This current research, conducted in 2015, arises from the collaborative partnership between the Department of Veterans' Affairs and the Department of Defence. It aims to implement the Government's goal of ensuring that current and future policy, programs and services are responsive to the current and emerging health and wellbeing needs of serving and ex-serving ADF members and their families before, during and after transition from military life.

Ten objectives were developed to guide the Programme. The objectives are being realised through three studies comprising eight reports: 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, which summarises the research, as the diagram above shows. The table below shows which reports deliver on the objectives. This present report, the *Physical Health Status Summary Report*, addresses the fourth objective, which is to examine the physical health status of Transitioned ADF members and 2015 Regular ADF members.

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 programmes 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*

Two eminent Australian research institutions, one specialising in trauma and the other in families, have led the research programme. The Centre for Traumatic Stress Studies at the University of Adelaide is conducting the Mental Health and Wellbeing Transition Study and the Impact of Combat Study, and the Australian Institute of Family Studies is conducting the Family Wellbeing Study.

Their research expertise is enhanced through partner institutions from Monash University, the University of New South Wales, Phoenix Australia Centre for Posttraumatic Mental Health and, until June 2016, the Young and Well Cooperative Research Centre, the work of which is continued through the University of Sydney.

Through surveys and interviews, the researchers engaged with a range of DVA clients and ADF members including:

- ADF members who transitioned from the Regular ADF between 2010 and 2014 (including Ex-Serving, Active and Inactive Reservists)
- a random sample of Regular ADF members serving in 2015
- a sample of Ab initio Reservists serving in 2015 (who have never been full-time ADF members)
- 2015 Regular ADF and Transitioned ADF members who participated in MilHOP
- family members nominated by the above.

The Departments of Defence and Veterans' Affairs thank current and ex-serving ADF members and their families who participated in this research for sharing your experiences and insights. Your efforts will help inform and assist the ways you, your colleagues, friends and families, as well as those who come after you, can best be supported during and after a military career.

2 Methodology

2.1 Study design

Although prevalence estimates were obtained using a two-phase design, only the first phase is relevant to this report.

In phase 1 of the Mental Health and Wellbeing Transition Study, Transitioned ADF members and 2015 Regular ADF members were assessed for mental health problems, psychological distress, physical health problems, wellbeing factors, pathways to care and occupational exposures. This was done by using a 60-minute self-reporting questionnaire that participants completed either online or in hard copy. Each participating sample received a slightly different questionnaire relevant to their current ADF status – Transitioned ADF member, 2015 Regular ADF member or Ab-initio Reservist – and in relation to demographics, Service and deployment history. The core validated measures of psychological and physical health remained the same, however, and replicated where possible the measures previously administered as part of the 2010 Mental Health Prevalence and Wellbeing Study (McFarlane et al., 2011).

Because the demographic and service characteristics of the Transitioned ADF members and 2015 Regular ADF members were known – that is, sex, Service branch, rank and medical fitness (a dichotomous variable derived from the Medical Employment Classification Status) – it was possible to compare members who responded to the survey with members who did not. This allowed weighting of the data to provide estimates of self-reported physical health symptoms and other health indicators, which are more representative of each of the study populations: Transitioned ADF and 2015 Regular ADF. However, there are likely to be several other factors that could not be accounted for in the weighting but that would affect representativeness, especially for groups (such as the Transitioned ADF group) for which the participation rate was very low.

2.2 Study population

This report uses two of the Transition and Wellbeing Research Programme's six overlapping samples – Transitioned ADF members and 2015 Regular ADF members. 'Transitioned ADF' refers to the population of ADF members who transitioned from full-time ADF service between 2010 and 2014; that is, those who transitioned into the Active and Inactive Reserves and those who discharged completely (Ex-Serving). '2015 Regular ADF' refers to ADF members who were serving full time in the ADF in 2015.

The 2015 Regular ADF population consisted of three separate groups of Regular ADF members in 2015 who were invited to participate in the study – those who participated in the 2010 Mental Health Prevalence and Wellbeing Study and remained a Regular ADF member in 2015; those who participated in the MEAO Prospective Health Study between 2010 and 2012 and remained a Regular ADF member in 2015; and a stratified random sample of Regular ADF members from 2015 who were not part of the 2010 MHPWS or the MEAO Prospective Health Study. Combined results from these three groups were weighted to represent the entire Regular ADF in 2015.

Of the Transitioned ADF population of 24,932, 96% (23,974) were invited to participate; those not invited were individuals who opted out of the study or did not have any useful contact information. Thirty-eight per cent (20,031) of the total 2015 Regular ADF population of 52,500 were invited to participate; this included a stratified random sample of 5040 regular ADF members in 2015 as well as those who had participated in MilHOP between 2010 and 2012 and who were still serving in 2015.

2.3 Response rates

2.3.1 Phase 1 responders

Of the individuals invited to participate, 18% (n = 4326) of the Transitioned ADF population and 42.3% (n = 8480) of the 2015 Regular ADF population completed the phase 1 survey. Figure 1 shows the response rates for each sample.

Phase 1 respondents in both the Transitioned and 2015 Regular ADF groups were predominantly Army (followed by Air Force and Navy), male, and higher in rank (see Table 2), the mean age of responders in both groups being approximately 41 years. Transitioned females were more likely to respond than Transitioned males, while 2015 Regular ADF females were less likely to respond than their male counterparts. Transitioned ADF were more likely to be medically unfit on transition from the Regular ADF (31.1%) compared with the 2015 Regular ADF population (16.1%).

In addition to the substantially lower response rates overall for Transitioned ADF members compared with 2015 Regular ADF members, there were a number of subgroup differences. As noted, female Transitioned ADF members were significantly more likely to respond to the survey than male Transitioned ADF members, and in the 2015 Regular ADF population female members were less likely to respond than male members. The Transitioned ADF population had significantly lower response rates for Officers and Non-Commissioned Officers but significantly higher response rates for Other Ranks compared with the 2015 Regular ADF. In both groups the lower ranks were the poorest responders. When response rates in the different Services were compared, Transitioned Air Force members were most likely to respond, whereas Transitioned Navy and Transitioned Army members were least likely. Among the 2015 Regular ADF, Army had the highest response rate, at 41.3%. Finally, Transitioned ADF members who were classified as medically unfit had a response rate of only 20.9%; this compares with a response rate of 46.5% in the 2015 Regular ADF population.

Figure 1 shows the breakdown of Transitioned ADF and 2015 Regular ADF members who provided enough data to be included in the survey. Table 1 shows the unweighted demographic characteristics of Transitioned ADF and 2015 Regular ADF survey respondents.

Figure 1 Survey response rates for Transitioned ADF and 2015 Regular ADF

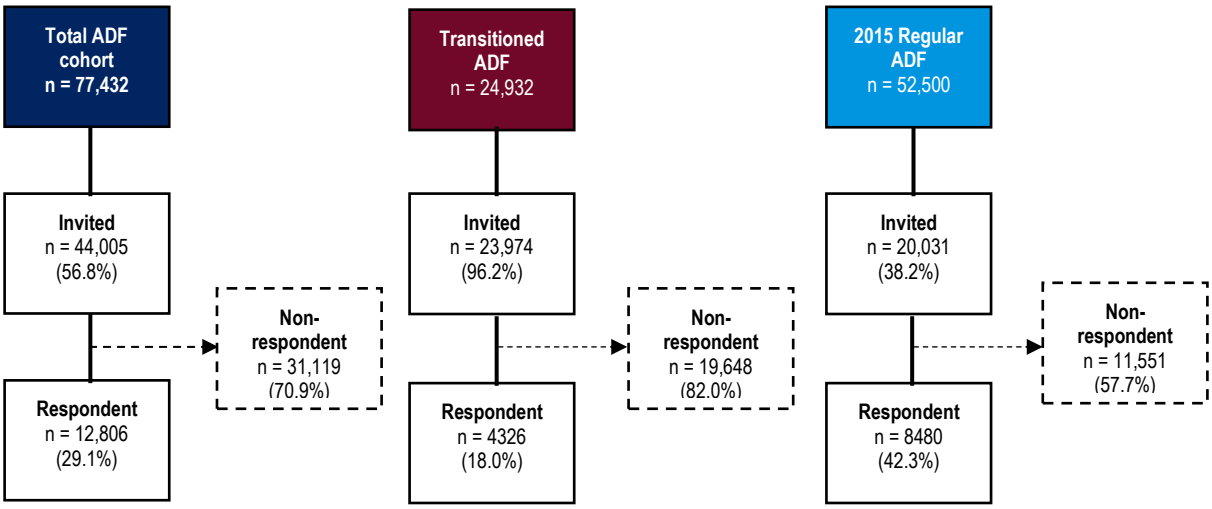


Table 1 Unweighted demographic characteristics of respondents in Transitioned ADF and 2015 Regular ADF

	Transitioned ADF n = 4326			2015 Regular ADF n = 8480		
	n	%	95% CI	n	%	95% CI
Age (M, SE)	41.9	0.2		41.1	0.1	
Age group						
18–27	471	10.9	(10.0, 11.9)	602	7.1	(6.6, 7.7)
28–37	1262	29.2	(27.8, 30.5)	2484	29.3	(28.3, 30.3)
38–47	1119	25.9	(24.6, 27.2)	2976	35.1	(34.1, 36.1)
48–57	871	20.1	(19.0, 1.4)	2069	24.4	(23.5, 25.3)
58+	548	12.7	(11.7, 13.7)	201	2.4	(2.1, 2.7)
Sex						
Male	3646	84.3	(83.2, 85.3)	6693	78.9	(78.0, 79.8)
Female	680	15.7	(14.7, 16.8)	1787	21.1	(20.2, 22.0)
Rank						
OFFR	1259	29.1	(27.8, 30.5)	3538	41.7	(40.7, 42.8)
NCO	2097	48.5	(47.0, 50.0)	4336	51.1	(50.1, 52.2)
Other Ranks	970	22.4	(21.2, 23.7)	606	7.2	(6.6, 7.7)
Service						
Navy	863	19.9	(18.8, 21.2)	2940	34.7	(33.7, 35.7)
Army	2463	56.9	(55.5, 58.4)	3500	41.3	(40.2, 42.3)
Air Force	1000	23.1	(21.9, 24.4)	2040	24.1	(23.2, 25.0)
Medical fitness						
Fit	2981	68.9	(67.5, 70.3)	7116	83.9	(83.1, 84.7)
Unfit	1345	31.1	(29.7, 32.5)	1364	16.1	(15.3, 16.9)

2.4 Ethics

The study protocol was approved by the DVA Human Research Ethics Committee (E014/018) and was recognised under expedited review processes by Defence and the University of Adelaide Human Research Ethics Committee. The study protocol was also submitted to the Australian Institute of Health and Welfare Ethics Committee, which granted approval (EO 2015/1/163). The study was conducted in accordance with the Australian Code for the Responsible Conduct of Research (https://www.nhmrc.gov.au/guidelines-publications/r39).

3 How to interpret and discuss the findings in this report

3.1 Weighted prevalence estimates

- Where the report refers to prevalence estimates, this refers to the *estimated* prevalence of a particular outcome within the entire population or subpopulation. It is important to understand that these are estimates. These estimates represent the proportion of cases we would predict to observe in the total population, based on the proportion of actual cases detected in the subpopulation who completed the outcome measure.
- When considering prevalence, estimated proportions are more informative than estimated numbers.
- The results presented in this report were weighted to represent the total population, and this weighting was performed on the basis of four variables – sex, rank, Service (Navy, Army or Air Force) and medical fitness. This assumes a general consistency among individuals with each combination of these characteristics (strata) and does not account for individual differences or other factors that might influence the outcomes of interest.
- The relatively low response rates observed in the study mean that the weighted estimates shown might have a lower level of accuracy, the estimates being more highly dependent on the characteristics used for weighting.
- Estimates for subpopulations (strata) with higher response rates more accurately represent those subpopulations than do those for subpopulations with lower response rates.
- The low response rates also mean that the numbers of cases for some health outcomes of interest were small. The analyses therefore had limited statistical power to investigate differences between groups in the health outcomes of interest, and in the study populations directly, than might have been achieved with a higher participation rate and consequent higher numbers.
- The subpopulations (strata) used for weighting are shown in Tables C.1, C.2 and C.3 of the technical report. The tables show how many individuals in the population each respondent represents for each stratum. The higher this number, the more caution should be applied when interpreting the associated estimates.
- When an outcome is relatively rare and is detected at a high prevalence in individuals who share characteristics with a large proportion of the population (such as Other Ranks), the estimated proportion of the entire population predicted to have achieved that outcome should be higher than the proportion of cases detected.
- When an outcome is relatively common and is detected at high prevalence rate in individuals who share characteristics with a small proportion of the population, the estimated proportion of the total population predicted to have achieved that outcome should be lower than the proportion of cases detected.

To interpret the precision or imprecision of a given estimate, readers might consider additional information supplied with the estimates, such as confidence intervals.

- *Confidence intervals.* These represent the possible range of values within which the presented estimate falls. Where the value of interest is a prevalence estimate, confidence intervals show the range of error in the estimate. In general, confidence intervals that are very close to the estimate value indicate that the

estimate is more precise, while very wide confidence intervals suggest that the estimate is imprecise. When the confidence intervals are wide, the associated estimates should be interpreted cautiously.

- *Standard errors.* Like confidence intervals, standard errors indicate the range of error in an average score.

- *Between-group comparisons.* When comparing prevalence estimates between groups, the overlap in confidence intervals provides an indication of between-group differences. Where there is significant overlap, any apparent difference in estimates is more likely to reflect an error in measurement or estimation. In general, the smaller the subpopulation of interest the greater the error, so when a stratification variable has a very small number in some categories the estimates are likely to have large associated confidence intervals or standard errors.

- *Odds ratios.* When estimating the prevalence of a particular health outcome, there could be differences in the prevalence rates between two groups – for example, between 2015 Regular ADF members and Transitioned ADF members. This could be a result of differences in extraneous factors other than transition status (such as sex, age, Service or rank) across the comparison groups, particularly if these other factors are associated with the health outcome. If this is the case, these factors might inadvertently influence the results, resulting in a spurious association between the comparison group (that is, transition status) and the outcome. One way to address this is to use a logistic regression model that controls for (adjusts for) these factors. The statistical output from a logistic regression model is an odds ratio, or OR, which denotes the odds of a particular group (such as Transitioned ADF) having a particular health outcome compared with a reference group (such as 2015 Regular ADF).

  An OR greater than 1 suggests increased odds of having the particular health outcome compared with the reference group, whereas an OR less than 1 suggests less likelihood of having the outcome compared with the reference group. For example, an OR of 1.7 for the Transitioned ADF (compared with the 2015 Regular ADF) suggests that the Transitioned ADF members have 70% increased odds of having that particular health outcome. Conversely, an OR of 0.7 suggests that the Transitioned ADF members are 30% less likely to have the particular health outcome compared with the 2015 Regular ADF. When an OR is greater than 2, we can then say that the Transitioned ADF members are twice as likely to have the particular health outcome compared with the 2015 Regular ADF member. Similarly, if the OR is greater than 3 they would be three times as likely to have the particular health outcome, and so forth.

Last 12 months: Where reference is made in the text to the 'last 12 months', this refers to the 12 months preceding the date of participation in the study, all data collection having been done between 1 June 2015 and 15 December 2015.

Significance: When the text describes a between-group difference as significant, this means the difference between groups was statistically tested then adjusted for sex, age and Service, and there was no overlap in the associated confidence intervals between groups.

There are a number of further caveats to be considered when reading and discussing the findings from this study:

- The overall response rate for the study was moderate, at 29.1%. Among Transitioned ADF members the response rate was low, at 18% (n = 4326). This was largely due to the limited contact information available for this group which may not have been updated for several years. While data on respondents were able to be statistically weighted up to the total population, the lower the number of respondents, the less accurate the resulting weighted population estimates are likely to be.

- Response rate data show that some subpopulations had substantially lower response rates, and this affects the accuracy of the associated estimates. In particular, among the ranks, Officers and Non-Commissioned Officers were over-represented among respondents, while Other Ranks were highly under-

represented despite accounting for the largest proportion of the total population in question. Any estimates stratified by rank should therefore be interpreted with a degree of caution.

- A large proportion of this study relates to self-reported measures, which are subject to potential biases, among them recall bias and other response biases (systematic error caused by differences in the accuracy of the recollections retrieved by study participants in relation to experiences from the past).
- Overall, the weighted demographic and service characteristics of Transitioned ADF members compared with 2015 Regular ADF members showed between-groups differences, some of which were statistically significant. Many of the differences were small (for example, proportion of females 13.1% vs 9.2% or university qualification 20.4% vs 22.9%); other differences were of relatively greater absolute magnitude (lower rank 52.2% vs 41.1%, having served in the Army 60.3% vs 49.1%, or having been classified as medically unfit 26.7% vs 12.3%).
- Statistical adjustment for possible confounding factors was made during regression analyses for age, sex, Service and rank, and for smoking in analyses related to respiratory health.
- Many analyses were performed in order to prepare this report, so there is also the potential problem of multiple comparisons and statistically significant findings occurring due to chance.
- Cell sizes of equal to or less than 5 are suppressed in tables in order to preserve the anonymity of participants.

Glossary: Refer to the glossary for definitions of key terms.

4 Socio-demographic characteristics

In order to fully understand how Transitioned ADF members are functioning in their civilian lives, it is important to consider their current socio-demographic profile and the circumstances associated with their transition. The literature discusses risk factors for social disadvantage that can contribute to mental health problems (Australian Bureau of Statistics, 2010), among them unemployment, incarceration, housing instability (including homelessness) and being in receipt of disability payments. Understanding the extent to which Transitioned ADF members are exposed to these factors can provide valuable insights into the overall mental, physical and social health of this population.

Overall, at the time of the survey an estimated 84% (based on weighted prevalence estimates) of Transitioned ADF members were either working or engaged in some purposeful activity (62.8% of them employed), 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 Transitioned ADF had retired.

Like the 2015 Regular ADF members, the majority of Transitioned ADF members were aged 28–47 years (56.2%), were male (86.9%), were in a significant relationship (74.7%), were of lower rank (52.2%) and were Army personnel (60.3%). Just over one-third of them had served four to 7.9 years in the Regular ADF (36.2%); this was followed by 23.2% who had served for 20+ years. Compared with 2015 Regular ADF, Transitioned ADF were *more likely* to be aged over 58 years, female, lower in rank and from the Army, to be classified as medically unfit, and to have had less than 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 did not live with their partner.

Just under half (43.3%) of 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 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 a year; 30.1% were Inactive Reservists, so their contact with Defence would have been variable or, for some, there would be no ongoing contact.

The most common type of discharge or resignation reported was 'own request' (53.7%), and over 60% of these individuals voluntarily discharged or did so because they came to the end of a fixed period of service. Just over 20% of Transitioned ADF were estimated to have been medically discharged, their employment being terminated by the Australian Defence Force on the grounds of being permanently unfit, or at least in the long-term unfit, to serve or being unfit for deployment to operational (warlike) service. The most common 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%).

Among those Transitioned ADF members potentially at increased 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 three months or more after transitioning from Regular ADF service. There was also a very small proportion (an estimated 5.1%) who reported having been arrested, convicted or incarcerated since transition, and approximately 3.4% reported that they had not been living in stable housing in the two months before completing the survey.

One final group of particular interest – and who could be at increased risk because they reported they had a known or diagnosed physical or mental health condition – were the 9.8% who were on some form of disability support pension, as well as those discharged from the ADF on medical grounds but who had not yet had contact with DVA. Although over 43% of Transitioned ADF members reported currently accessing DVA-funded treatment, there is likely a proportion of those who had been medically discharged who were not.

5 Definition of key terms used in this report

- *2015 Regular ADF.* ADF members who were serving full time in the ADF in 2015.
- *Active Reservists.* Individuals who were Regular ADF members before 2010 but who had transitioned into an Active Reservist position. Active Reservists are required to complete a minimum number of service days each year.
- *DVA client.* These include individuals receiving a fortnightly payment, treatment card holders, and individuals who have had their illness or injury liability claim accepted as service-related.
- *Ex-Serving members.* Individuals who had been a Regular (full-time) ADF member before 2010, who transitioned from the Regular ADF between 2010 and 2014, and who no longer remain engaged with Defence in a Reservist role. These individuals are classified as discharged from Defence. The discharge can have occurred for medical or administrative reasons or because the person reached compulsory retirement age.
- *Inactive Reservists.* Individuals who were Regular ADF members before 2010 but who had transitioned into the Inactive Reserves. They represent a latent capability that Service Chiefs can call on as required to provide voluntary service. Defence can call on them to perform a specific task.
- *Medical discharge.* This refers to involuntary termination of a person's employment by the ADF on the grounds of permanent or at least long-term unfitness to serve or unfitness for deployment to operational (warlike) service or non-medical discharge.
- *Transitioned ADF members.* The population of ADF members who transitioned from full-time ADF service between January 2010 and December 2014, including those who transitioned into the Active and Inactive Reserves and those who had discharged completely (Ex-Serving members).

6 Key findings

Demographics

- More than half of Transitioned ADF members remained in the ADF as Reservists (55.8%). Of Transitioned ADF, 25.7% were Active Reservists.
- Approximately 84% of Transitioned ADF members were either working or engaged in some purposeful activity, 62.8% of them being employed. Just over 5.5% of the Transitioned ADF had retired.
- More than 43% of Transitioned ADF members reported accessing DVA-funded treatment through either a DVA White Card (39.4%) or a DVA Gold Card (4.2%).
- Just over one-fifth of Transitioned ADF were estimated to have been medically discharged.
- The most commonly 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%).
- There were no significant differences in housing stability between Transitioned ADF members and 2015 Regular ADF members. More than 93% were estimated to have been in stable housing in the previous two months.
- Just over 40% of Transitioned ADF members and 36% of 2015 Regular ADF members reported having a diploma or university qualification.
- Twice as many members of the Transitioned ADF were classified as medically unfit compared with 2015 Regular ADF members.

Physical health outcomes in Transitioned ADF members compared with 2015 Regular ADF

Health symptoms

- Transitioned ADF members reported a higher mean number of symptoms (M = 16.4) compared with 2015 Regular ADF members (M =11.8).
- Transitioned ADF were more likely to report the majority of health symptoms compared with 2015 Regular ADF.
- The 10 most common symptoms reported by both groups were fatigue, sleeping difficulties, headaches, feeling unrefreshed after sleep, muscle aches or pains, low back pain, irritable outbursts, joint stiffness, difficulty finding the right word, and ringing in the ears.

Self-reported lifetime doctor-diagnosed conditions

- Overall, Transitioned ADF members (M = 1.9) and 2015 Regular ADF members (M = 1.5) reported similar numbers of lifetime doctor-diagnosed conditions.
- The five most commonly reported doctor-diagnosed conditions among Transitioned ADF were chronic low back pain (18.5%), hearing loss (15.7%), high cholesterol (12.8%), other musculoskeletal condition (12.2%) and high blood pressure (12.0%).
- The five most commonly reported doctor-diagnosed conditions among 2015 Regular ADF were chronic low back pain (11.7%), other musculoskeletal condition (11.1%), high cholesterol (11.0%), hearing loss (9.1%) and sinus problems (8.2%).

- Compared with 2015 Regular ADF members, Transitioned ADF members were significantly more likely to report a circulatory condition, high blood pressure, a musculoskeletal or connective tissue condition, chronic low back pain, a nervous system condition, and hearing loss.
- The estimated proportions reporting traumatic brain injury among Transitioned ADF members and 2015 Regular ADF members were low, at 1.2% in both groups, and there were no differences in weighted prevalence between the groups.

Respiratory health

- Compared with 2015 Regular ADF members, Transitioned ADF members were significantly more likely to report many respiratory symptoms – for example, shortness of breath and phlegm from the chest during winter.
- Although there was no difference between Transitioned ADF members and 2015 Regular ADF members in the rates of self-reported asthma ever, among those who reported asthma ever Transitioned ADF were more likely to have had treatment in the preceding year and to have taken asthma medication in the preceding month when compared with the 2015 Regular ADF.

Service-related Injuries

- Transitioned ADF members were slightly more likely to have reported any service-related injury compared with 2015 Regular ADF members. Approximately three-quarters of Transitioned ADF and two-thirds of 2015 Regular ADF reported having had a service-related injury.
- Transitioned ADF reported slightly more service-related injury types compared with 2015 Regular ADF.
- The two most common service-related injury types reported by Transitioned ADF and 2015 Regular ADF were musculoskeletal injury (64.3% and 58.6%) and fracture/broken bone (30.0% and 27.9%).
- The most common musculoskeletal injury location for both groups was the knee.
- Overall, the pattern of service-related injury types in Transitioned ADF members and 2015 Regular ADF members was similar. Transitioned ADF were, however, significantly more likely to have reported heat stress, exhaustion or dehydration, or a burn injury compared with the 2015 Regular ADF.
- In general, service-related injuries were more likely to have been sustained during training than on deployment in both Transitioned ADF and 2015 Regular ADF.

Pain intensity and disability

- The majority of Transitioned ADF members and 2015 Regular ADF members reported experiencing some pain intensity and disability. Only 11.8% of Transitioned ADF and 10.1% of 2015 Regular ADF reported being free of pain.
- Low pain intensity was experienced by 53.2% of Transitioned ADF and 60.9% of 2015 Regular ADF and high pain intensity by 19.7% of Transitioned ADF and 14.1% of 2015 Regular ADF. Transitioned ADF and 2015 Regular ADF were not significantly different in relation to pain intensity and disability groupings.

Insomnia severity

- Approximately half of Transitioned ADF members (47.3%) and nearly 60% of 2015 Regular ADF members (58.0%) reported no clinically significant insomnia in the preceding two weeks.
- Transitioned ADF were more likely than 2015 Regular ADF to report moderate (16.2% vs 7.9%) and severe (5.6% vs 1.6%) insomnia.

Lifestyle risk factors

- Nearly half of Transitioned ADF members (45.5%) and 2015 Regular ADF members (49.1%) reported a body mass index in the pre-obese range and around one-quarter of Transitioned ADF (26.8%) and 2015 Regular ADF (27.5%) reported a BMI in the obese range.

- Transitioned ADF were significantly less likely to be physically active at a health-enhancing level compared with 2015 Regular ADF.
- Similar proportions of Transitioned ADF (15.2%) and 2015 Regular ADF (14.1%) were current smokers.

Self-perceived health and quality of life

- Nearly half of Transitioned ADF (48.7%) and 58.2% of 2015 Regular ADF reported their physical health as 'good–excellent'.
- Transitioned ADF were significantly more likely to perceive their health as fair-poor compared to 2015 Regular ADF (35% and 23.7% respectively).
- Transitioned ADF were significantly more likely to report dissatisfaction with their health (40.1%) than 2015 Regular ADF (30.1%).
- Approximately two thirds of Transitioned ADF rated their quality of life as good-very good (62.8%), compared to 72.0% of 2015 Regular ADF. Transitioned ADF were significantly more likely to perceive their quality of life as poor compared to 2015 Regular ADF.
- Transitioned ADF and 2015 Regular ADF showed no differences on self-perceived satisfaction with life.

Health service use

- In total, 87.1% of Transitioned ADF members reported visiting any health service in the preceding 12 months compared with 90.7% of 2015 Regular ADF members. This difference persisted after controlling for sex, age, rank and Service.
- Transitioned ADF were significantly less likely to report seeing a dentist or dental professional, a dietician/nutritionist, or a specialist doctor in the preceding 12 months compared with 2015 Regular ADF and were significantly more likely to have seen a chiropractor, diabetes educator or osteopath in the preceding 12 months compared with 2015 Regular ADF.
- Transitioned ADF members were significantly less likely to have seen a general practitioner or specialist doctor in the preceding two weeks compared with 2015 Regular ADF.
- The most commonly consulted health professionals or services for both Transitioned ADF and 2015 Regular ADF in the preceding 12 months were GPs (78.9% and 72.4% respectively), dentists or dental professionals (41.6% and 70.2%) and specialist doctors (38% and 47.4%).

Physical health outcomes in Transitioned ADF by transition factors (DVA client status,

DVA client status

- Compared with Transitioned ADF members who were non-DVA clients, Transitioned ADF members who were DVA clients were more likely to report all types of health symptoms, most doctor-diagnosed conditions, high levels of pain intensity and disability compared with no pain, clinical insomnia, all types of respiratory symptoms with the exception of wheeze, nasal allergies and asthma, and a service-related injury.
- In terms of health professionals sought, DVA clients were significantly more likely than non-DVA clients to report having seen a GP, a psychologist, a specialist doctor, an alcohol/drug worker, an audiologist or a dietician/nutritionist in the preceding 12 months and were significantly more likely to report having seen a GP or specialist doctor in the preceding two weeks.
- In relation to lifestyle risk factors, DVA clients were more likely to be categorised as obese compared with non-DVA clients.

- DVA clients were more likely than non-DVA clients to report lower self-perceived health, dissatisfaction with health, dissatisfaction with life, poor–fair physical health and lower quality of life.

Transition status

- Transitioned ADF members who were Ex-Serving at the time of the survey consistently reported poorer health outcomes compared with Transitioned ADF members who were Active or Inactive Reservists.
- Similar patterns of physical health were observed for Inactive and Active Reservists.
- In relation to doctor-diagnosed conditions, Ex-Serving Transitioned ADF were more likely to report circulatory, musculoskeletal and nervous system conditions compared with Active Reservists and were more likely to report digestive, musculoskeletal and nervous system conditions compared with Inactive Reservists.
- Ex-serving Transitioned ADF were more likely to report a service-related injury compared with Active Reservists and were more likely to report three injury types compared with Inactive Reservists.
- Ex-Serving Transitioned ADF members were more likely to report the majority of respiratory symptoms (but not asthma), high pain intensity and disability, and clinical insomnia compared with Active and Inactive Reservists.
- In terms of lifestyle risk factors, Ex-Serving Transitioned ADF members were more likely to be physically inactive and obese compared with Active Reservists. Furthermore, Ex-Serving ADF were more likely than Active Reservists to be current smokers.
- Ex-Serving Transitioned ADF were more likely to report lower self-perceived health, dissatisfaction with health, dissatisfaction with life, poorer physical health and lower quality of life compared with Active Reservists and Inactive Reservists.
- 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.
- Ex-Serving ADF were more likely than both Active Reservists and Inactive Reservists to have visited most types of health professionals or services in the preceding 12 months and to have visited GPs or specialists in the preceding two weeks.

Medical discharge status

- Transitioned ADF who had been medically discharged were significantly more likely to report all health symptoms (with the exception of skin ulcers) and most doctor-diagnosed conditions, respiratory symptoms (except nasal allergies and asthma), most injury types (except burn injuries), higher pain levels and insomnia than those not medically discharged.
- In terms of lifestyle risk factors, Transitioned ADF who had been medically discharged were more likely to be inactive or minimally active, more likely to be categorised as obese, and more likely to currently smoke than Transitioned ADF who had been discharged on other grounds.
- Transitioned ADF who had been medically discharged were more likely to report lower self-perceived health, dissatisfaction with health, dissatisfaction with life, poorer physical health and lower quality of life compared with personnel who had been non-medically discharged.
- In relation to health service use, Transitioned ADF who had been medically discharged were significantly more likely to consult a range of health professionals and services in the preceding 12 months compared with Transitioned ADF discharged on non-medical grounds.
- Transitioned ADF who had been medically discharged were significantly more likely to have consulted a GP or specialist doctor in the preceding two weeks compared with Transitioned ADF who had not been medically discharged.

Smoking, quality of life and doctor-diagnosed asthma in Transitioned ADF and the

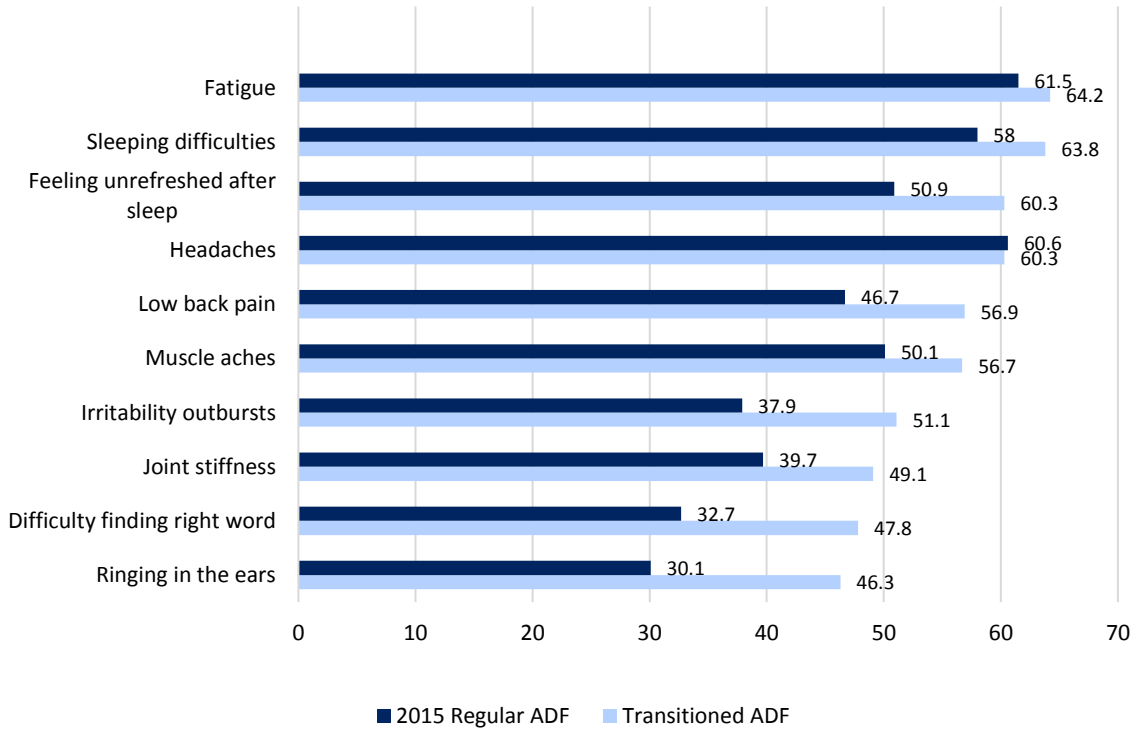
- Compared with the Australian Community sample, the proportion of Transitioned ADF members reporting 'current smoking' was significantly lower (21.9% vs 15.2%), reporting being 'former smokers' was significantly higher (28.8% vs 53.9%), and reporting having 'never smoked' was significantly lower (49.2% vs 29.5%).
- Compared with the Australian Community sample, the proportion of Transitioned ADF members who rated their self-perceived health as excellent (19.2% vs 8.9%) or very good (37.5% vs 26.4%) was significantly lower and who rated their self-perceived health as fair (10.1% vs 23.9%) or poor (3.1% vs 11.1%) was significantly higher.
- The proportion of Transitioned ADF who reported doctor-diagnosed asthma was significantly lower compared with the Australian Community sample (Transitioned ADF, 15.3%; Australian Community, 21.9%).

7 Estimated prevalence of physical health symptoms and conditions among Transitioned ADF members and 2015 Regular ADF members

7.1 Health symptoms in the preceding month

General health symptoms in the preceding month were measured using a 67-item adapted version of the self-report symptom questionnaire used in the Australian Gulf War Follow up Health Study (Ikin et al., 2016; Sim et al., 2015). Transitioned ADF members reported a higher mean number of symptoms (M = 16.4, SE = 0.3) compared with 2015 Regular ADF members (M = 11.8, SE = 0.5) and were significantly more likely to report most types of health symptoms compared with 2015 Regular ADF. The 10 most commonly reported health symptoms were the same for both groups; the prevalence estimates are shown in Figure 2.

Figure 2 Prevalence estimates for the 10 most commonly reported health symptoms in Transitioned ADF members and 2015 Regular ADF members



7.2 Self-reported lifetime doctor-diagnosed conditions

Self-reported doctor-diagnosed conditions were assessed using a 43-item self-report questionnaire derived from the measure used in the 2011–12 Australian Gulf War Veterans' Health Study Follow Up (Ikin et al., 2017; Sim et al., 2015), which asked participants about medical problems or conditions they had been diagnosed with or treated for by a medical doctor during their lifetime.

The mean number of lifetime doctor-diagnosed conditions was similar in Transitioned ADF members (M = 1.9, SE = 0.1) and 2015 Regular ADF members (M = 1.5, SE = 0.3). Table 2 shows the prevalence of the doctor-diagnosed conditions, categorised by body system. Compared with 2015 Regular ADF members, Transitioned

ADF members were significantly more likely to report a circulatory condition (19.2% vs 15.1%; OR 1.4, 95% CI 1.1, 1.8); this was largely due to a 60% increase in the likelihood of high blood pressure, a musculoskeletal and connective tissue condition (34.2% vs 24.8%; OR 1.5, 95% CI 1.1, 2.0) and a nervous system condition (10.4% vs 7.1% (OR 1.5, 95% CI 1.0, 2.2).

The six most commonly reported doctor-diagnosed conditions in Transitioned ADF members and 2015 Regular ADF members are shown in Table 3. In Transitioned ADF the most commonly reported doctor-diagnosed conditions were generally chronic medical conditions. The pattern of increased reporting for some doctor-diagnosed conditions was not as consistent as it was for increased reporting of symptoms by Transitioned ADF. This is similar to findings in the Australian Gulf War Veterans' Health Studies (Kelsall et al., 2004a; Sim et al., 2015) and in international studies of US and UK veterans (Kang et al., 2009; Unwin et al., 1999).

Table 2 Estimated proportions of lifetime doctor diagnosed health conditions in Transitioned ADF and 2015 Regular ADF

	Transitioned ADF (n = 24,932)			2015 Regular ADF (n = 52,500)		
Condition type (any)	**n**	**Weighted n**	**% (95% CI)**	**n**	**Weighted n**	**% (95% CI)**
Circulatory conditions[a]	968	4782	19.2 (18.0, 20.5)	1610	7916	15.1 (13.1, 17.3)
Musculoskeletal and connective tissue conditions[a]	1443	8513	34.2 (32.4, 35.9)	2150	13,046	24.9 (21.5, 28.5)
Digestive conditions	547	3001	12.0 (10.9, 13.3)	875	5327	10.2 (7.9, 12.9)
Nervous system conditions[a]	449	2602	10.4 (9.4, 11.6)	699	3718	7.1 (5.4, 9.3)
Respiratory system conditions	423	2404	9.6 (8.6, 10.8)	778	5014	9.6 (7.3, 12.4)
Skin cancers including melanoma	450	2244	9.0 (8.1, 10.0)	760	4928	9.4 (7.3, 12.1)
Skin and subcutaneous tissue conditions	334	2007	8.1 (7.1, 9.2)	670	4550	8.7 (6.6, 11.4)

a. Estimated prevalence significantly greater in Transitioned ADF compared with the 2015 Regular ADF.

Table 3 Most common ever reported doctor-diagnosed health conditions in Transitioned ADF and 2015 Regular ADF

	Transitioned ADF (n = 24,932)			2015 Regular ADF (n = 52,500)		
Condition	**n**	**Weighted n**	**% (95% CI)**	**n**	**Weighted n**	**% (95% CI)**
Chronic low back pain	799	4604	18.5 (17.1, 19.9)	963	6153	11.7 (9.3, 14.7)
Hearing loss	714	3922	15.7 (14.5, 17.0)	839	4799	9.1 (7.1, 11.7)
High blood pressure	592	2985	12.0 (11.0, 13.1)	826	4123	7.9 (6.4, 9.6)
High cholesterol	666	3194	12.8 (11.8, 13.9)	1136	5784	11.0 (9.1, 13.2)
Other musculoskeletal condition	506	3031	12.2 (11.0, 13.4)	750	5839	11.1 (8.4, 14.6)
Sinus problems	326	1877	7.5 (6.6, 8.5)	619	4308	8.2 (6.0, 11.1)

7.3 Respiratory health

The respiratory health questionnaire was based on the questionnaire used in the Australian Gulf War Follow up Health Study (Ikin et al., 2017; Sim et al., 2015) and baseline study (Kelsall et al., 2004b) and included items derived from the European Community Respiratory Health Survey (Burney et al., 1994) and the American Thoracic Society questionnaire (Ferris, 1978). In Transitioned ADF members and 2015 Regular ADF members, asthma ever and whether this had been diagnosed by a doctor were measured using self-report items based on the items from the European Community Respiratory Health Survey (Burney et al., 1994).

Transitioned ADF were significantly more likely to report several individual respiratory symptoms in the preceding 12 months compared with 2015 Regular ADF (see Table 4). Although there was no difference between Transitioned ADF and 2015 Regular ADF in the proportions who reported asthma ever, among those who reported asthma ever Transitioned ADF were more likely to have had asthma in the preceding 12 months (11.5% vs 5.8%; OR 2.5, 95% CI 1.7, 3.5) and to have taken asthma medication in the preceding month when compared with 2015 Regular ADF (21.4% vs 13.4%; OR 1.9, 95% CI 1.2, 3.0).

Table 4 Estimated prevalence of respiratory symptoms and conditions in the preceding 12 months in Transitioned ADF and 2015 Regular ADF

	Transitioned ADF (n = 24,932)			2015 Regular ADF (n = 52,500)		
Respiratory symptoms	**n**	**Weighted n**	**% (95% CI)**	**n**	**Weighted n**	**% (95%CI)**
Wheeze[a]	722	5073	20.4 (18.7, 22.1)	1145	8173	15.6 (12.6, 19.1)
Wheeze with breathlessness	392	2748	54.2 (49.5, 58.8)	590	3476	42.5 (32.0, 53.8)
Wheeze when cold not present	462	3208	63.2 (58.6, 67.6)	603	3808	46.6 (35.6, 57.9)
Woken with tightness in chest	574	3812	15.3 (13.9, 16.8)	729	5794	11.0 (8.4, 14.4)
Attack of shortness of breath during the day whilst at rest[b]	422	2858	11.5 (10.2, 12.8)	432	3623	6.9 (4.9, 9.6)
Attack of shortness of breath following strenuous activity	549	3626	14.5 (13.2, 16.0)	826	6281	12.0 (9.3, 15.3)
Woken by attack of shortness of breath[b]	318	2111	8.5 (7.4, 9.6)	321	1966	3.8 (2.5, 5.6)
Woken by attack of coughing	772	4921	19.7 (18.2, 21.4)	1430	8262	15.7 (13.4, 18.4)
Cough first thing in the morning	389	2688	10.8 (9.6, 12.1)	560	4274	8.1 (5.8, 11.2)
Cough during the day or at night	524	3479	14.0 (12.6, 15.4)	782	6714	12.8 (9.8, 16.5)
Phlegm from chest in morning during winter[b]	600	4580	18.4 (16.8, 20.1)	994	7082	13.5 (11.1, 16.3)
Phlegm from chest during day or at night during winter	550	4118	16.5 (15.0, 18.2)	805	5884	11.2 (8.9, 14.1)
Phlegm on most days for as much as 3 months of a year for at least 2 years?	296	2280	55.2 (50.1, 60.6)	370	2055	34.9 (26.3, 44.7)
Trouble breathing[a]	624	3871	15.5 (14.2, 17.0)	940	6472	12.3 (9.7, 15.6)
Continuous trouble breathing	81	444	11.5 (9.0, 14.5)	80	837	12.9 (5.3, 28.3)
Repeated trouble breathing, but always gets better	117	842	21.7 (17.9, 26.2)	160	1691	26.1 (15.1, 41.3)
Rare trouble breathing	423	2549	65.9 (61.1, 70.3)	697	3930	60.7 (46.7, 73.2)
Disabled from walking by condition other than heart/lung disease[b]	276	1641	6.6 (5.8, 7.5)	200	1271	2.4 (1.4, 4.2)
Shortness of breath[b]	403	2427	9.7 (8.7, 10.9)	401	2656	5.1 (3.4, 7.5)
Nasal allergies	1135	7520	30.2 (28.3, 32.1)	2417	16,281	31.0 (27.3, 35.0)
Asthma (ever)[a]	553	4247	17.0 (15.5, 18.7)	1045	7359	14.0 (11.4, 17.2)
Asthma confirmed by doctor	502	3815	89.8 (86.0, 92.7)	951	6605	89.8 (77.4, 95.7)
Asthma in last 12 months	80	490	11.5 (8.9, 14.8)	107	423	5.8 (4.3, 7.7)
Asthma medication currently	146	911	21.4 (17.8, 25.6)	203	989	13.4 (10.1, 17.7)

a. Subcategories are calculated among those who answer 'yes' to the category.
b. Estimated prevalence significantly greater in Transitioned ADF compared with 2015 Regular ADF.

7.4 Service-related injuries

Service-related injuries were measured using items developed by the researchers for the current Programme. They asked about injuries sustained during an individual's military career that required time off work.

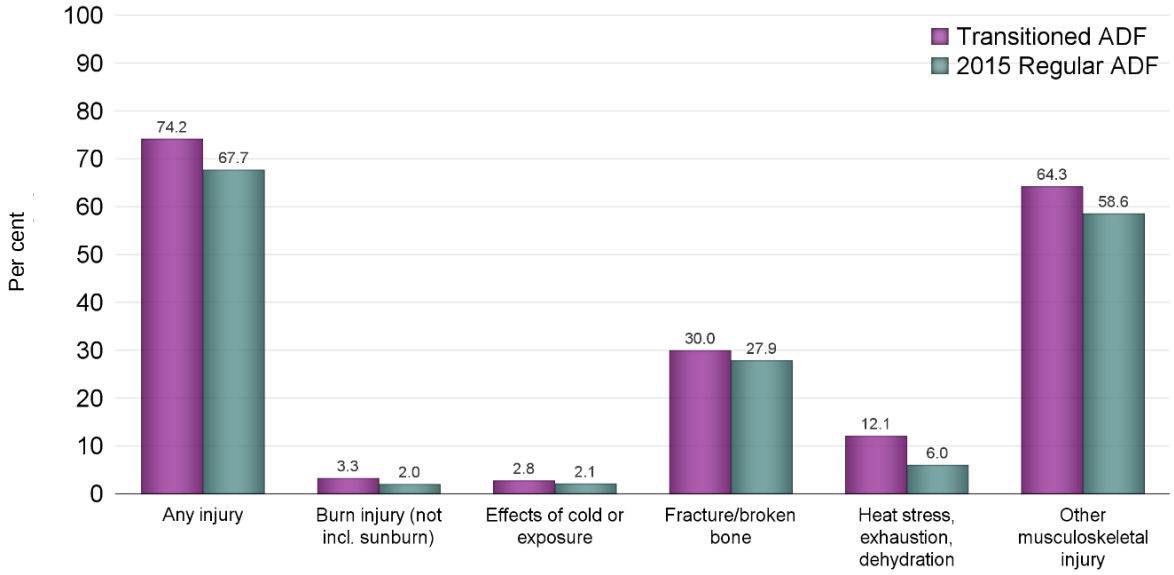
Transitioned ADF members were slightly more likely to have reported a service-related injury and reported slightly more service-related injury types compared with 2015 Regular ADF members (see Figure 3). The two most common injury types reported by both groups were other musculoskeletal injury and fracture/broken bone.

Overall, the pattern of service-related injury types in Transitioned ADF and 2015 Regular ADF was similar. Transitioned ADF were, however, significantly more likely to have reported heat stress, exhaustion or dehydration (12.1% vs 6.1%; OR 2.2, 95% CI 1.5, 3.1) compared with 2015 Regular ADF and were significantly more likely to have reported a burn injury (3.3% vs 2.0%; OR 1.8, 95% CI 1.4, 2.4) (see Figure 3).

The most common fracture site reported (>20%) in Transitioned ADF was the knee: 25.6% reported a fractured knee; this was followed by ankle (23.3%), foot (22.9%), shoulder (16.0%) and spine (12.4%). The most common fracture sites for 2015 Regular ADF were the ankle (22.2%), followed by the foot (21.4%), knee (18.2%), shoulder (16.2%) and spine (13.6%). The most common musculoskeletal injury location for both groups was the knee.

Finally, in general, service-related injuries were more likely to have been sustained during training than on deployment.

Figure 3 **Estimated proportions of service-related injury types sustained during military career in Transitioned ADF and 2015 Regular ADF**



7.5 Pain intensity and disability

Chronic pain intensity, disability and functional impairment were measured using a seven-item scale and algorithm (Von Korff et al., 1992) categorised into grades (Grades 0 and I–IV) of pain intensity and disability, as used in the Australian Gulf War Follow up Health Study (Sim et al., 2015).

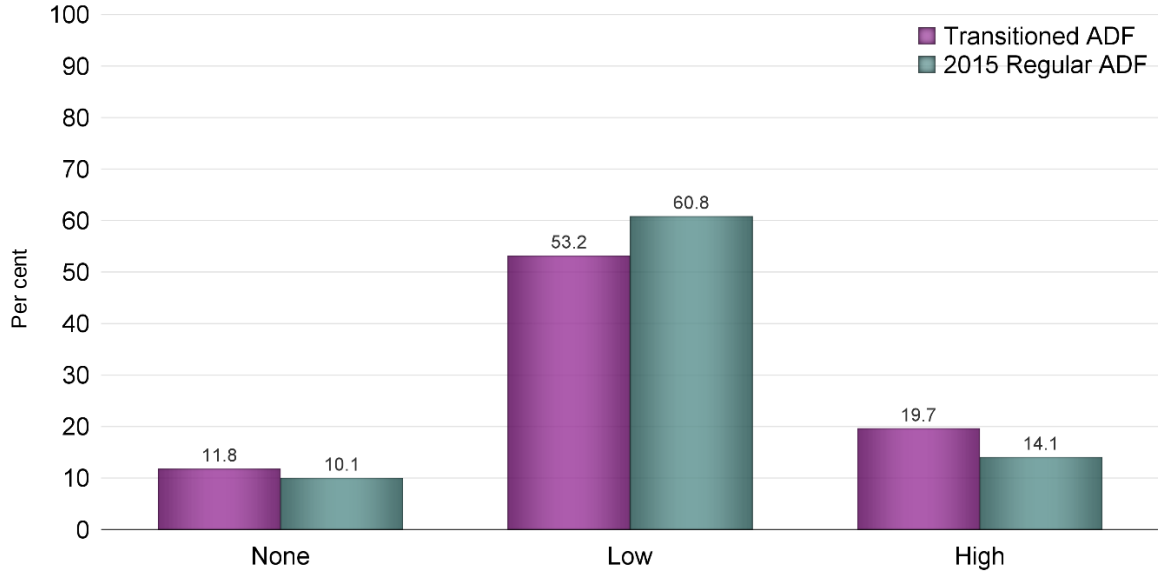
There were no significant differences between Transitioned ADF members and 2015 Regular ADF members in the proportions reporting no pain, low pain intensity and high pain intensity in the preceding six months (see Figure 4).

The majority of both Transitioned ADF and 2015 Regular ADF reported having Grade I low disability – low intensity pain, demonstrating the widespread occurrence of pain. The majority of Transitioned ADF and 2015 Regular ADF reported experiencing some pain intensity and disability: only 11.8% of Transitioned ADF and 10.1% of 2015 Regular ADF reported being free of pain. Low pain intensity was reported by 53.2% of Transitioned ADF and 60.9% of 2015 Regular ADF; high pain intensity was reported by 19.7% of Transitioned ADF and 14.1% of 2015 Regular ADF.

The reasons for increased pain intensity and disability were not canvassed in the Mental Health and Wellbeing Transition Study – for example, whether those who reported injuries, an increased number of injuries or injuries of specific types, who reported doctor-diagnosed musculoskeletal disorders or other types of physical health conditions, especially chronic physical health conditions, or those with comorbid psychological health conditions also reported increased pain intensity and disability. It also needs to be recognised that the causes of pain can be multifactorial and complex.

Pain has been shown to be very prevalent in other military populations. In comparison with the 41.3% of Transitioned ADF in the current study who reported experiencing low-grade pain intensity and disability, a similar proportion (41.0%) of transitioned Canadian veterans experienced constant pain or discomfort and 23% experienced recurrent pain (VanDenKerkhof et al., 2015; Van Til et al., 2017).

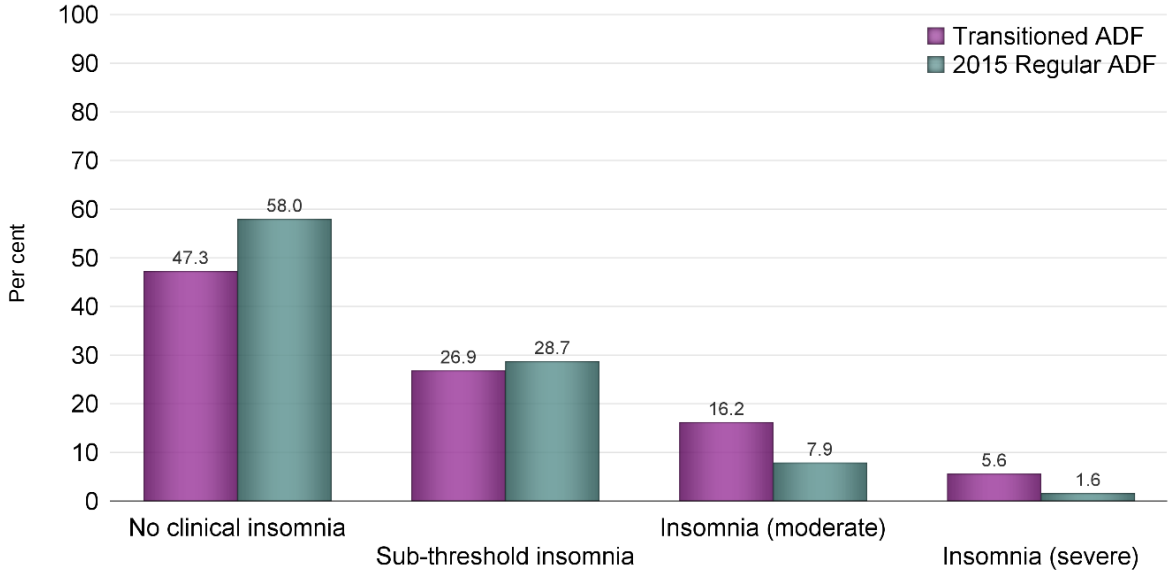
Figure 4 **Estimated proportions of grades of pain intensity and disability in the preceding six months in Transitioned ADF and 2015 Regular ADF**



7.6 Insomnia severity

Self-reported insomnia in the preceding two weeks was assessed using the Insomnia Severity Index (Bastien et al., 2001). Overall, logistic regressions examining the dichotomised insomnia severity variable showed that Transitioned ADF members were significantly more likely to report having experienced moderate or severe insomnia in the preceding two weeks (21.8% vs 9.5%; OR 2.5, 95% CI 1.8, 3.5) than 2015 Regular ADF members. Approximately half of Transitioned ADF (47.3%) and nearly 60% of 2015 Regular ADF (58.0%) reported no clinically significant insomnia in the preceding two weeks. Transitioned ADF were more likely than 2015 Regular ADF to report moderate (16.2% vs 7.9%) and severe (5.6% vs 1.6%) insomnia (see Figure 5).

Figure 5 **Estimated proportions of insomnia severity in the preceding two weeks in Transitioned ADF and 2015 Regular ADF**



Although the analyses were adjusted for factors including age, it could be important to examine whether reported insomnia is greater in different age groups and the relationship with psychological health and risk taking. Sleep disorders have been associated with risk in performance, fatigue and the ability to concentrate, and it is important to consider them in a clinical and organisational context (Filip et al., 2017; Kucharczyk et al., 2012).

7.7 Lifestyle risk factors

In the case of lifestyle risk factors, a greater proportion of Transitioned ADF members reported increased physical inactivity compared with 2015 Regular ADF members. The two groups did not differ in other risk factors – having a body mass index in the pre-obese or obese range and current, former or ever smoking status.

7.7.1 Body mass index and physical activity

BMI was calculated as a function of respondents' self-reported weight and height – that is, weight (kg) / height $(m)^2$. The scores were categorised according to guidelines from the Australian Government Department of Health (Department of Health, 2017) and collapsed into normal/underweight, pre-obese or obese (obese classes 1, 2 and 3) categories. Some caution is required in relation to interpretation of BMI in the pre-obese range in particular since BMI does not discriminate between higher muscle mass and fat (Nuttall, 2015).

About one-quarter of Transitioned ADF (26.1%)) and 2015 Regular ADF (27.4%) had a BMI within the normal range. Nearly half of Transitioned ADF (45.5%) and 2015 Regular ADF (49.1%) had a BMI in the pre-obese range and about one-quarter of Transitioned ADF (26.2%) and 2015 Regular ADF (21.8%) had a BMI in the obese range. Logistic regression showed that there were no significant differences between Transitioned ADF and 2015 Regular ADF in BMI overall.

In order to assess physical activity, participants were asked to complete the Short Last 7 Days Self-Administered version of the International Physical Activity Questionnaire (IPAQ, 2002).

Transitioned ADF (47.5%) were significantly less likely to be physically active at a health-enhancing level (that is, HEPA active) compared with 2015 Regular ADF (56.4%) (OR 1.6, 95% CI 1.2, 2.3). A greater proportion of Transitioned ADF (19.7%) were inactive than 2015 Regular ADF (15.1%). Similar proportions of Transitioned ADF members (20.9%) and 2015 Regular ADF members (21.6%) were minimally active.

Lifestyle factors such as BMI and physical activity are complex risk factors for many non-communicable diseases (Australian Institute of Health and Welfare, 2012), so some considerations need to be taken into account when interpreting the findings. For example, in relation to physical inactivity and the proportion overweight (BMIs in the pre-obese and obese range) in Transitioned ADF, the reporting of physical conditions that could contribute to greater difficulty for the transitioned group to exercise and maintain body weight is a consideration. Further, a consideration for the finding of reduced physical activity after separation from the Australian Defence Force is that passing a fitness test is no longer a necessity.

7.7.2 Smoking status

Items used for assessing tobacco use were taken from the 2013 National Drug Strategy Survey (Australian Institute of Health and Welfare, 2014) and the 2010 Mental Health Prevalence and Wellbeing Study (McFarlane et al., 2011).

Similar proportions of Transitioned ADF members (15.2%) and 2015 Regular ADF members (14.1%) were current smokers or had tried smoking (23.1% and 24.4%, respectively). A slightly higher proportion of Transitioned ADF compared with 2015 Regular ADF (30.8% vs 27.1%) were former smokers, and 2015 Regular ADF (33.9%) were more likely to be non-smokers than Transitioned ADF (29.5%).

Although smoking rates might be lower than or comparable to those for the US and Canadian military, the association between smoking and military service, particularly in this cohort, and the recognised importance of smoking as a risk factor and predictor for many adverse health outcomes, suggest that during service and before discharge provision of information on smoking cessation is important. National and state campaigns in Australia address smoking cessation and tobacco control – for example, through the Cancer Council Australia (Cancer Council Australia, 2017) and Quit (Quit Victoria, 2018). The influence of these programs on Transitioned ADF and 2015 Regular ADF might differ from that among the general community, however, and smoking cessation knowledge and behaviour were not specifically explored in this study.

7.8 Self-perceived health and quality of life

7.8.1 Self-perceived health

Self-perceived health was assessed with a single survey question taken from the SF-12 (Ware et al., 1996) – 'In general, how would you say your health is?' – which was scored on a five-point scale (excellent to poor). More than one-third of Transitioned ADF members (35.0%) and almost one-quarter of 2015 Regular ADF members (23.7%) perceived their health to be fair–poor. Transitioned ADF were significantly more likely to rate their health as fair–poor compared with 2015 Regular ADF.

7.8.2 Self-perceived satisfaction with health

Self-perceived satisfaction with health was assessed by a single item – 'How satisfied are you with your health?' – which was scored on a five-point scale ranging from 'very dissatisfied' to 'very satisfied'. Transitioned ADF (40.1%) were significantly more likely to report dissatisfaction with their health (compared with satisfaction) than 2015 Regular ADF (30.1%) (OR 1.4, 95% CI 1.2, 1.8).

7.8.3 Self-perceived quality of life

Self-perceived quality of life was assessed using a single survey item selected from the WHOQOL-Bref (World Health Organization, 1996) – 'How would you rate your quality of life?' – which was scored on a five-point scale ranging from 'very poor' to 'very good'. Approximately two-thirds of Transitioned ADF rated their quality of life as good – very good (62.8%) compared with 72.0% of 2015 Regular ADF. Transitioned ADF (16.2%) were significantly more likely to perceive their quality of life as poor – very poor compared with 2015 Regular ADF (6.4%) (OR 2.6, 95% CI 1.7, 3.9).

7.8.4 Self-perceived satisfaction with life in the preceding year

Self-perceived satisfaction with life in the preceding year was assessed by using a single item on a seven-point scale – the 'Delighted–Terrible Scale' (Andrews & Crandall, 1976). Respondents were asked 'How do you feel about your life as a whole, taking into account what has happened last year and what you expect to happen in the future?' Scaled responses ranged from 'delighted' to 'terrible'. For the purpose of analysis, the seven-point scale was also collapsed into dissatisfied (mixed–terrible) and satisfied (mostly satisfied – delighted). Transitioned ADF members and 2015 Regular ADF members showed no significant differences in self-perceived satisfaction with life: 55.6% of Transitioned ADF and 63.0% of 2015 Regular ADF reported they felt delighted, pleased or mostly satisfied with their life as a whole. About a quarter of both groups reported they felt mixed.

7.8.5 Self-perceived physical health in the preceding year

Self-perceived physical health was assessed by using a single item on a five-point scale. Respondents were asked 'how their physical health has been over the past year' and responses ranged from 'very poor' to 'excellent'. For the purpose of logistic regression analysis the five-point scale was also dichotomised into 'poor–fair' and 'good–excellent'. Nearly half of Transitioned ADF (48.7%) and 58.2% of 2015 Regular ADF reported their physical health as good–excellent. The likelihood of reporting poor–fair physical health compared with good–excellent was significantly greater among Transitioned ADF (poor–fair, 51.1%) compared with 2015 Regular ADF (poor–fair, 41.7%) (OR 1.3, 95% CI 1.1, 1.7).

7.9 Use of health services

Items assessing health service use were based on the questionnaire used in the Australian Gulf War Follow up Health Study (Ikin et al., 2016; Sim et al., 2015). Respondents were asked whether they had visited any of a list of 18 different types of health professionals in the preceding 12 months, excluding any time spent in hospital. They were also asked whether they had consulted a GP or specialist doctor in the preceding two weeks and how many times they had done so.

Although similar proportions of Transitioned ADF members (87.1%) and 2015 Regular ADF members (90.1%) reported having consulted a health service in the preceding 12 months, the odds were significantly lower in Transitioned ADF (OR 0.6, 95% CI 0.4, 0.8). The most commonly consulted health professionals or services for both Transitioned ADF and 2015 Regular ADF in the preceding 12 months were GPs (78.9% and 72.4% respectively), dentists or dental professionals (41.6% and 70.2%) and specialist doctors (38% and 47.4%). Dentists or dental professionals (OR 0.3, 95% CI 0.2, 0.3), dieticians/nutritionists (OR 0.5, 95% CI 0.4, 0.8) and specialist doctors (OR 0.6, 95% CI 0.5, 0.8) were significantly less likely to have been consulted by Transitioned ADF, whereas chiropractors (13.0% vs 5.7%; OR 2.5, 95% CI 1.7, 3.6), diabetes educators (1.3% vs 0.5%; OR 2.3, 95% CI 1.5, 3.4) and osteopaths (2.9% vs 1.0%; OR 3.1, 95% CI 2.3, 4.3) were significantly more likely to have been consulted by Transitioned ADF compared with 2015 Regular ADF. Transitioned ADF members were significantly less likely to have seen a GP (OR 0.7, 95% CI 0.5, 0.9) or specialist doctor (OR 0.7, 95% CI 0.6, 1.0) in the preceding two weeks compared with 2015 Regular ADF.

The findings relating to lower use of health services among Transitioned ADF members compared with 2015 Regular ADF members need to be viewed in context. The patterns of health service use for 2015 Regular ADF are likely to have, in part, reflected attendance for routine health assessments for administrative reasons, such as pre- and post-deployment health checks. A proportion of health service contacts of 2015 Regular ADF would thus be more likely to be related to regular general health checks or mandated medical examinations, rather than to specific treatment-seeking consultations, and this makes interpretation difficult. Further, Regular ADF have ready access to medical services when serving, whereas Transitioned ADF have access to medical services through the Australian national health care system more broadly, in the public or private health systems, but also need to seek out these services. These factors might well contribute to the finding of a lower proportion of the Transitioned ADF cohort who used any health service as compared with 2015 Regular ADF in this study.

8 Physical health in Transitioned ADF by DVA client status, transition status and medical discharge status

8.1 DVA client status

Department of Veterans' Affairs officers work with transitioned members who contact them and require assistance and/or are seeking compensation for a condition/injury linked to their service with the military. For 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 being related to military service. Because the DVA clients were more likely to have physical and/or psychological health condition(s) that met the eligibility requirements according to the criteria just listed, it was anticipated that these clients might 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 with DVA clients being more likely to have poorer physical health and engage in greater use of health services compared with non-DVA clients.

This study found that Transitioned ADF members who were DVA clients were more likely to report poorer health for the majority of physical health outcomes compared with those who were not DVA clients. Specifically, when compared with non-DVA clients 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 and 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.

Transitioned ADF members who were DVA clients were also more likely to report poorer self-perceived health compared with non-DVA clients, which might be a reflection of their poorer physical health overall. In terms of health professionals sought, DVA clients were significantly more likely to report seeing a GP, psychologist, specialist doctor, alcohol/drug worker, audiologist or dietician/nutritionist in the preceding 12 months compared with non-DVA clients. DVA clients were also significantly more likely to report seeing a GP or specialist doctor in the preceding two weeks compared with non-DVA clients. In the case of lifestyle risk factors, DVA clients were more likely to be categorised as obese, yet there were no statistically significant differences in physical activity except for a borderline increase in being inactive (as opposed to being HEPA active) compared with non-DVA clients.

8.2 Transition status

Transitioned ADF members were categorised into three groups – Ex-Serving, Active Reservist and Inactive Reservist – which broadly represented their level of continued association with Defence as well as their potential access to support services provided by Defence. Ex-Serving personnel consisted of individuals who had completely discharged from the ADF; Inactive Reservists were individuals who were classified as a reservists but had no ongoing, regular engagement with the ADF; and Active Reservists were individuals who were still actively engaged with the ADF and thus still performed reserve work and regularly participated in parades.

Poorer health outcomes were consistently observed for Ex-Serving ADF compared with both the other groups. Specifically, Ex-Serving ADF reported the majority of health symptoms more commonly than Active and Inactive Reservists. Similar reporting patterns were observed for Inactive and Active Reservists. In terms of doctor-diagnosed conditions, Ex-Serving ADF were more likely to report circulatory, musculoskeletal and nervous system condition types compared with Active Reservists and were more likely to report digestive, musculoskeletal and nervous system condition types compared with Inactive Reservists.

Compared with Active Reservists, Ex-Serving ADF were more likely to report any service-related injury; compared with Inactive Reservists, they were more likely to report a greater number of injury types. Furthermore, the prevalence of injuries sustained during training was greater than that for injuries sustained on deployment. The comparison of injury types experienced during training or on deployment was based on a comparison of weighted prevalence and their associated confidence intervals, rather than odds ratios, and needs to be interpreted with some caution.

Ex-Serving ADF members were more likely to report the majority of respiratory symptoms (but not 'asthma ever'), high pain intensity and disability and clinical insomnia compared with Active and Inactive Reservists. Both pain and insomnia can be sequelae of musculoskeletal disorders and have also been associated with mental health symptoms and disorders; it is therefore important to consider any increased reporting of mental disorders in the groups in question in the context of the increased reporting of high-intensity pain and insomnia.

In the case of lifestyle risk factors, Ex-Serving ADF were more likely to be physically inactive and obese compared with Active Reservists. Furthermore, Ex-Serving ADF were more likely than Active Reservists to be current smokers. These findings highlight the importance of ensuring that before discharge the Ex-Serving group receives information and education, as well as opportunities to maintain their fitness and a healthy lifestyle.

Ex-Serving ADF were also more likely to report poorer self-perceived health, satisfaction and quality of life on all the indicators compared with both Active Reservists and Inactive Reservists.

In relation to use of health services, the proportions of Ex-Serving ADF members, 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 Reservists and Inactive Reservists to have visited most types of health professionals or services in the preceding 12 months and to have visited GPs or specialists in the preceding two weeks. This pattern of increased health service use is consistent with the increased self-reporting of most of the medical conditions and other physical health outcomes examined in this study and has important implications for health service planning for transitioned personnel.

It was hypothesised that the Transitioned ADF members who were most disengaged from Defence – in particular, those who had fully discharged at the time of completing this study (that is, Ex-Serving members) – would be in poorer physical health. The reasons for discharge and the health status of ADF personnel on transition are assessed on the basis of an individual's application to the Reserves. It was therefore possible that the Ex-Serving group would include a greater proportion who were medically discharged or had physical or psychological health conditions that would render them ineligible for the Reserves.

8.3 Medical discharge status

As a summary measure for the current study, discharge status was collapsed into two categories – medical discharge or other (non-medical discharge). 'Medical discharge' refers to the involuntary termination of a client's employment by the ADF on the grounds of a permanent or long-term inability (unfitness) to serve or unfitness for deployment to operational (warlike) service.

Transitioned ADF members who had been medically discharged were more likely to report poorer health compared with those who had not been medically discharged. The magnitude of these differences was greater than that for the comparisons of Transitioned ADF in terms of DVA client status and transition status, although this was not tested statistically. Given that the reason for leaving the ADF was medical discharge, such a finding was not unexpected.

Specifically, with the exception of skin ulcers, Transitioned ADF who had been medically discharged were significantly more likely than those non-medically discharged to report all health symptoms and were more

likely to report the majority of doctor-diagnosed condition categories, all respiratory symptoms or conditions with the exception of nasal allergies and asthma ever, every injury type except burn injuries, higher pain levels and insomnia.

In the case of lifestyle risk factors, Transitioned ADF who had been medically discharged were more likely to be inactive or minimally active (as opposed to HEPA active), were more likely to be categorised as obese and were more likely to currently smoke than personnel who were discharged on other grounds. This finding highlights the importance of ensuring that before discharge such individuals receive sufficient information and education and an opportunity to maintain their fitness and lifestyle.

Transitioned ADF who had been 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. The odds were of a greater magnitude than those for comparisons in the other Transitioned ADF subgroups, although the differences were not tested statistically.

In relation to use of health services, Transitioned ADF who had been medically discharged were significantly more likely to consult a range of health professionals and services in the preceding 12 months compared with personnel who had been discharged on other grounds. These professionals and services included alcohol and drug workers, diabetes educators, dieticians/nutritionists, general practitioners, physiotherapists/hydrotherapists, psychologists, social workers/welfare officers and specialist doctors. Transitioned ADF who had been medically discharged were also significantly more likely to have consulted a GP or specialist doctor in the preceding two weeks compared with Transitioned ADF who had not been medically discharged. This pattern of increased health service use is consistent with the increased self-reporting of the majority of medical conditions and other physical health outcomes examined in the current study. This has implications for health service planning specific to transitioned personnel.

Consistent with the definition of ‘medical discharge’, it was expected that personnel who had been medically discharged would be more likely to exhibit poorer physical health compared with personnel who had been discharged on other grounds. The relationship between the reason(s) for an individual’s medical discharge and reported physical health was not, however, explored, and this is an important area of research to be considered in the future, including through data linkage.

9 Smoking, quality of life and doctor-diagnosed asthma in Transitioned ADF compared with the Australian Community

In order to assess the physical health of the Transitioned ADF members in comparison with that of the broader Australian community, contemporaneous data obtained from the 2014–15 ABS National Health Survey (Australian Bureau of Statistics, 2015) were used. Comparisons were, however, limited to variables for which comparable data were available – namely, smoking status, self-perceived health status and doctor-diagnosed asthma. Questions taken from the National Health Survey were used.

To enable comparison of estimates for Transitioned ADF and the Australian Community sample, direct standardisation was applied to the estimates derived from the National Health Survey. The NHS is the most recent in a series of Australia-wide Australian Bureau of Statistics health surveys assessing various aspects of the health of Australians, among them long-term health conditions, health risk factors and health service use. The NHS data were restricted to people aged 18–71 years (consistent with the Transitioned ADF data) and were standardised by sex, employment status (employed or not) and age category (18–27, 28–37, 38–47, 48–57 and 58+ years) and estimates were generated on the outcomes of interest. Standard errors for the NHS data were estimated using the replication weights provided in the NHS data file.

9.1 Summary of findings

Transitioned ADF members were less likely than the Australian Community to be current smokers and less likely to have doctor-diagnosed asthma but more likely to report poorer self-perceived health.

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 among Transitioned ADF compared with the Australian Community was similar in males and females and by age group. The implications of an increased proportion of Transitioned ADF reporting their health as fair or poor are not clear. For instance, comparisons between Transitioned ADF and the Australian Community sample on the number of comorbidities were not made, and this was a single-item question that is not specifically directed towards physical health but instead towards self-perceived health in general.

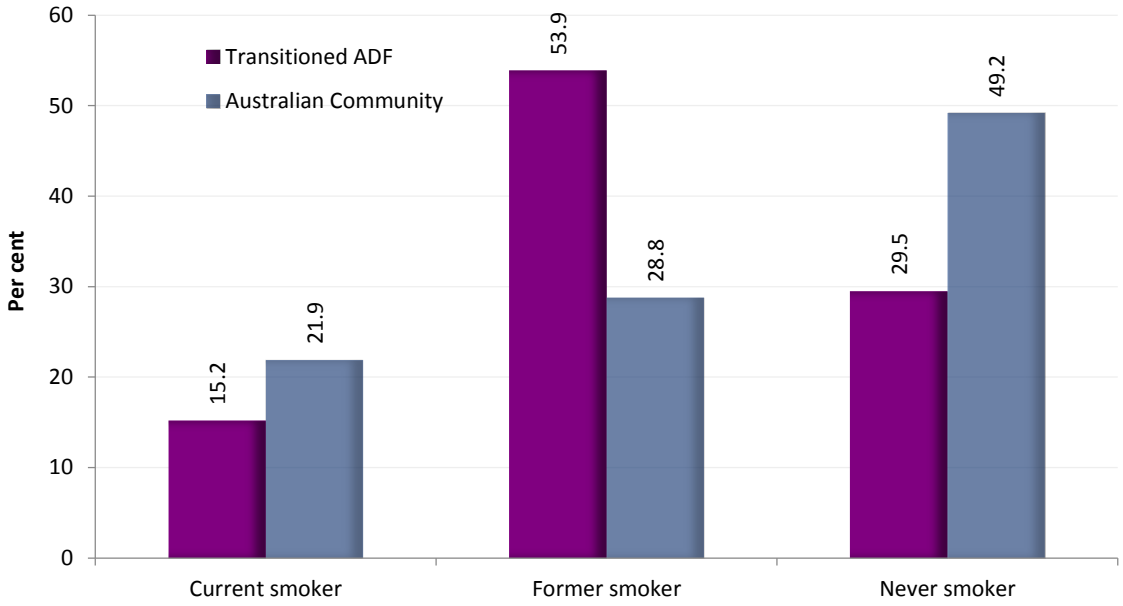
Self-reported doctor-diagnosed asthma in Transitioned ADF and doctor-diagnosed asthma in the Australian Community sample were used to define asthma for comparative purposes. In Transitioned ADF, doctor-diagnosed asthma prevalence was significantly lower (15.3% vs 21.9%) than in the Australian Community. 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; it is likely to reflect expected medical standards in the Australian Defence Force.

9.2 Smoking status

Smoking status was assessed using four items that asked whether the respondent currently smoked, had ever tried smoking cigarettes or other forms of tobacco, had ever smoked a full cigarette, cigar or pipe, or had smoked the equivalent of 100 cigarettes (or the equivalent amount of tobacco) in their lifetime.

The proportion of Transitioned ADF compared with the Australian Community reporting ‘current smoking’ was significantly lower (15.2% vs 21.9%), reporting being ‘former smokers’ was significantly higher (53.9% vs 28.8%) and reporting having ‘never smoked’ was significantly lower (29.5% vs 49.2%) (see Figure 6). The overall smoking patterns observed in the Transitioned ADF and the Australian Community were consistent in males and females and by age groups.

Figure 6 Estimated prevalence of smoking in Transitioned ADF compared with the Australian Community



9.3 Self-perceived health

Self-perceived health was assessed using a single item taken from the Short Form 12 Health Survey (SF-12) – 'In general would you say your health is?' – which was scored on a five-point Likert scale with five response options – excellent, very good, good, fair or poor.

Compared with the Australian Community, the proportion of Transitioned ADF who rated their health as excellent (19.2% vs 8.9%) or very good (37.5% vs 26.4%) was significantly lower; the proportions who rated their health as fair (10.1% vs 23.9%) or poor (3.1% vs 11.1%) were significantly higher (see Figure 7). The overall patterns observed for Transitioned ADF and the Australian Community in relation to self-perceived health were consistent in males and females and by age groups.

9.4 Doctor-diagnosed asthma

Doctor-diagnosed asthma was assessed in Transitioned ADF using self-reported 'asthma ever' that had been confirmed by a doctor; the assessment was based on questions from the European Community Respiratory Health Survey (Burney et al., 1994). In the Australian Community sample self-reported asthma was assessed using a single item in the 2014–15 ABS National Health Survey data – 'Have you ever been told by a doctor or nurse that you have asthma?' (Australian Bureau of Statistics, 2015).

The proportion of Transitioned ADF who reported doctor-diagnosed asthma was significantly lower than that for the Australian Community (15.3% vs 21.9%) (see Figure 8). The overall patterns observed in the Transitioned ADF and the Australian Community in relation to doctor-diagnosed asthma were consistent between males and females and by age group.

Figure 7 **Estimated prevalence of self-perceived health in Transitioned ADF compared with the Australian Community**

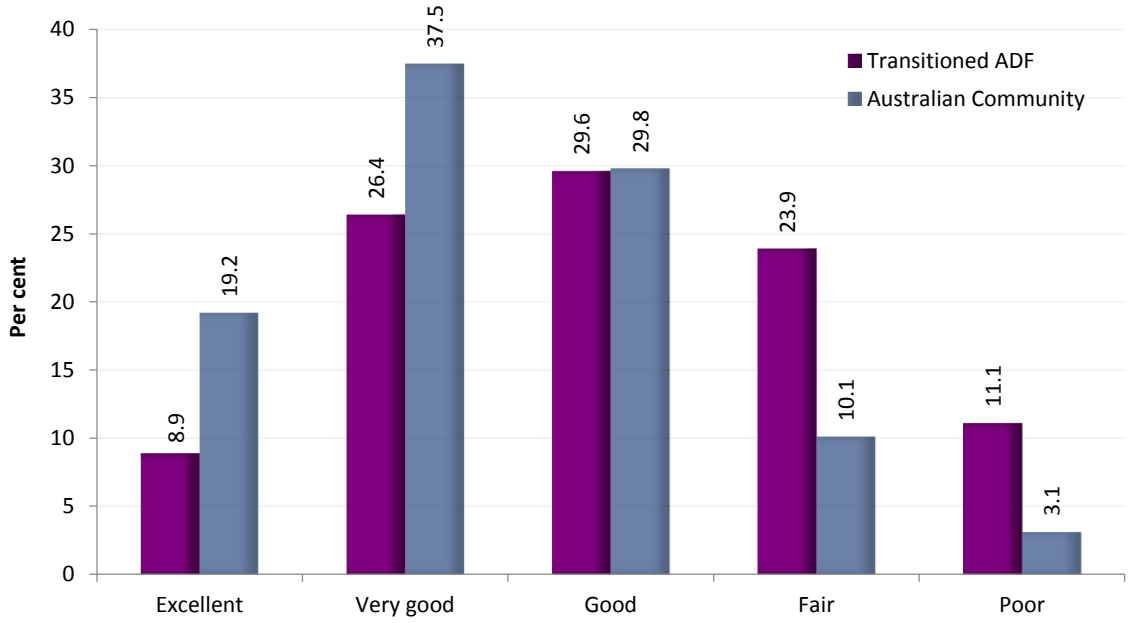
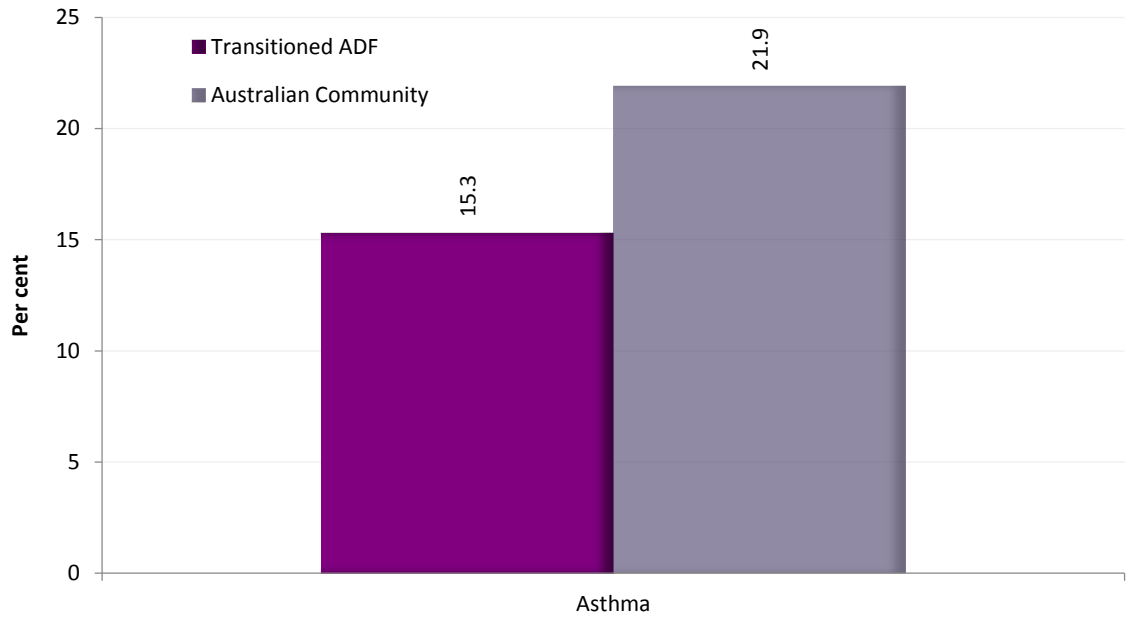


Figure 8 **Estimated prevalence of doctor-diagnosed asthma in Transitioned ADF compared with the Australian Community**



10 Implications and future directions

This study provided a comprehensive assessment of physical health among Transitioned ADF members compared with 2015 Regular ADF members based on a range of indicators and among Transitioned ADF members by DVA client status, transition status and discharge status. The study identified groups in which physical health is poorer: Transitioned ADF in comparison with 2015 Regular ADF and, among Transitioned ADF members, the DVA client group, the medically discharged group and the Ex-Serving group.

Among Transitioned ADF the proportions that reported an increased number of doctor-diagnosed conditions decreased, and only a small proportion reported seven to eight conditions or more. This suggests a minority of Transitioned ADF reporting a high level of physical comorbidity. Among Transitioned ADF who were DVA clients, a greater proportion reported an increased number of conditions than did non-DVA clients. Transitioned ADF members who are DVA clients have accepted medical conditions, so these findings are consistent with the pattern of increased reporting of doctor-diagnosed conditions. Reported doctor-diagnosed medical conditions were not analysed on the basis of the year of diagnosis in relation to individuals' transition, or otherwise, from the ADF. It is therefore possible that the onset of reported doctor-diagnosed conditions among Transitioned ADF might have occurred while these people were serving in the ADF or emerged after discharge.

It is also important to acknowledge that in the non–DVA client group there is a significant range of morbidity. This group might not have come into contact with DVA since their discharge from the ADF or might not be entitled to DVA benefits such as health services (for a DVA client as defined in this study). They do, however, have access to the national health care system through Medicare and/or private health insurance.

The study did not examine the point at which Transitioned ADF access DVA or whether the health services provided through DVA or through the national health care system are optimally meeting their needs. The survey questionnaire asked participants about the year of diagnosis for each medical condition they reported, and this could be assessed further in relation to discharge from the ADF and in relation to presentation to DVA currently and in the future.

Physical health outcomes should not be seen in isolation: they can interact with each other (for example, high BMI and diabetes) and with mental health. Although this was not analysed specifically in the study, it is important to recognise the interrelationships and comorbidity of physical health and mental health, and the data collected provide a basis for further analysis. For example, musculoskeletal disorders can predispose or lead to psychological disorders such as depression or an adjustment disorder. As a result, improving physical health for those living with mental illness can lead to improvements in both types of disorder.

Another important aspect of the pattern of reported doctor-diagnosed conditions among Transitioned ADF members – particularly musculoskeletal conditions and risk factors for cardiovascular disease such as high cholesterol and high blood pressure – is that these conditions have known patterns of comorbidity with depression (Kelsall et al., 2014) and with PTSD (Abouzeid et al., 2012; Andersen et al., 2010; Kibler et al., 2014; Rosenbaum et al., 2015; Sareen et al., 2007; Sumner et al., 2016). It was beyond the scope of this report to explore these and other important relationships between physical conditions and mental health. The comorbidities between physical and mental disorders that are most prevalent in military populations – particularly depression and alcohol use disorders (Ikin et al., 2004; Ikin et al., 2016; Sim et al., 2015) – as well as the extensive known physical comorbidities of PTSD, make further investigation of the interrelationship between physical and mental health in transitioned populations an important topic (Sareen et al., 2007).

Increased symptom reporting among Transitioned ADF and in subgroups was a finding of the current study. The symptom questionnaire included a range of general health symptoms across multiple body systems. One

challenge in interpreting the significance of these general health physical and psychological symptoms in a symptom questionnaire is that there can be a high level of comorbidity between these symptoms and psychiatric disorders (McFarlane et al., 2008). For example, some general health symptoms are associated with low-grade inflammation (Tak et al., 2009), a factor that recent research has found to be part of the underpinnings of PTSD (Spitzer et al., 2010).

Health indicators such as sleep, pain and quality of life are also related to both physical health and mental health and their impacts. The higher levels of pain reported by Transitioned ADF need to be interpreted in the context of both the physical and the mental health of this group. Depression and PTSD can contribute to pain symptoms and have shared neurobiological dysregulations (Baune et al., 2008; Moeller-Bertram et al., 2014). The comprehensive physical and psychological health data collected for the Transition and Wellbeing Research Programme provide a basis for further examination to better understand these relationships and inform health promotion and disease prevention strategies.

The Mental Health and Wellbeing Transition Study examined the differences in physical health outcomes among Transitioned ADF members compared with 2015 Regular ADF members. Associations between mental health, traumatic events, demographic factors (such as age) and service-related factors (such as rank or Service) that have previously been shown to be linked to poorer physical health (Kelsall et al., 2004a; Sim et al., 2015) were not investigated further as part of the study. Further examination of such factors or associations with exposures or with other predictors might help explain observed differences between Transitioned ADF and 2015 Regular ADF or between Transitioned ADF subgroups. For example, examination of predictive factors could help explain the observed findings of differences in the reporting of circulatory conditions, digestive conditions and musculoskeletal and connective tissue conditions between groups.

Chronic conditions tend to increase with age (Australian Institute of Health and Welfare, 2016), although previous research in veteran populations has found an increased likelihood of reporting some adverse health outcomes, including increased symptom reporting and some psychological disorders, among younger veterans (Ikin et al., 2004; Kelsall et al., 2009; Sim et al., 2015). The present study adjusted for age in comparisons between groups, but insights could be gained by further examination of the effects of age in relation to health outcomes.

Musculoskeletal injuries were the most common type of injury reported by study participants, and these injuries were more likely to be reported as being sustained in training (as opposed to deployment). There could be a number of reasons for this, but in this study it was not possible to fully explore whether training is riskier than deployment. The findings of this study provide a base for further investigation of associations between injury patterns and military service roles – for example, the number of deployments and differing roles in active ADF service.

Use of health services and reported consultations were treated in this study as a health indicator. In collecting self-reported data on health service use, it is possible to collect information on the use of various allied health services that might not be included in the Medicare databases as well as information from participants who have not agreed to Medicare linkage. Linkage with and collection of recorded Medicare data do, however, allow the assessment of health service and pharmaceutical use across a period back in time without being fully reliant on participants' recall. Combined, the self-reported data and the linked health databases can provide a more complete description of health service and pharmaceutical use and how physical health conditions are being managed compared with what would be achievable with either data source alone. This – as well as linkage with DVA databases – is something that should be built on in further research.

The present study investigated the initial stages of transition (the first five years) and establishes a very important baseline assessment of health in this cohort, rather than relying on efforts to capture health impacts retrospectively when carrying out research into physical health in the future. This is very relevant as some physical disorders with a longer lead time for development – such as cancer, diabetes, chronic obstructive pulmonary disease, musculoskeletal conditions, including joint disease, or chronic physical disorders that could

be related to military service – might not yet have become evident. Equally, delayed-onset PTSD, which has been well documented in veteran populations (Horesh et al., 2011; Marmar et al., 2015) presents a probability of increasing risk of the related physical comorbidities in the future. Furthermore, although this study did not investigate the role of combat exposure itself as a determinant of the premature onset of chronic disease and death that was found in a longitudinal cohort of Second World War veterans (Lee et al., 1996) and in veterans of more recent conflicts, it does provide a baseline for this type of longitudinal research in the future. The previous research findings suggest that the physical health burden described in this report for Transitioned ADF members could be an underestimate of the total health burden that is likely to be experienced by this group over time and in the longer term.

When assessing the physical health of Transitioned ADF members, one important aspect of the study design is the inclusion of a relevant military comparison group. Transitioned ADF members (who had transitioned during the period 2010 to 2014) were compared with Regular ADF members who were in the Services in 2015, the year directly after this period, the data for both populations being collected in 2015. Some comparisons used Australian community data, but this could be done only for a small number of measures and using data obtained from a largely comparable year. It also needs to be acknowledged that comparison with a civilian population has its limitations, among them selection into the military and maintenance of fitness, possible environmental and chemical exposures, and stressful experiences, which can differ from the experience of the general community and affect physical and/or mental health.

The physical health of Transitioned ADF members has not been studied as consistently or comprehensively as has their mental health in epidemiological health studies of military, veteran or transitioning military populations in Australia or internationally in the past two decades, and there are limited data with which to compare physical health status findings. The US Institute of Medicine conducted a two-phase literature review of the physical, psychological, social and economic effects of deployment to Iraq and Afghanistan and of gaps in care, but it concentrated on the deployment-related outcomes of traumatic brain injury, posttraumatic stress disorder, depression, substance use, and suicidal ideation in the comprehensive review phase, while recognising that many other psychiatric and physical conditions could have been included (Institute of Medicine of the National Academies, 2013)

The present study will help build an evidence base in this field. A consideration is whether the population-based models that have been adopted to promote and manage mental health in military, veteran and transitioning personnel, building on the research done in the past two decades, have similar counterparts in relation to physical health.

In the past 20 years mental health in the ADF and DVA has received increased attention. Findings from the Australian Gulf War Veterans' Health Study 2011–12 of increased psychological disorders among Gulf War veterans compared with the military comparison group (Ikin et al., 2004; Ikin et al., 2016; McKenzie et al., 2004) were followed by the development and implementation of the 2011 Australian Defence Force Mental Health and Wellbeing Strategy (Department of Defence, 2011). Since then there have been further reviews and inquiries into mental health and suicide prevention, and the Defence Mental Health and Wellbeing Strategy 2018–2023 (Department of Defence, 2017) has been developed.

Defence also has a number of other programs in relation to mental health – for example, the Suicide Prevention Program, the Periodic Mental Health Screen, the Operational Mental Health Screen, the ADF Rehabilitation Program for traumatic stress (and for physical health), and the mental health and wellbeing RESET program. These incorporate population- and individual-based approaches to mental health promotion and treatment. There are, however, fewer programs aimed at physical health, although Defence does provide operationally focused physical health promotion, prevention and early treatment services for deployed forces (Department of Defence, 2017).

In the context of physical health, assessment and management are generally provided in the primary healthcare setting, in medical assessments of fitness for duty, and in connection with occupational health and

safety. Individuals are referred to healthcare or health promotion programs, including general public programs such as smoking cessation programs, as required.

DVA has programs relating to social health and wellbeing as well as physical health, as is referred to in the DVA Social Health Strategy 2015–2023 for the Veteran and Ex-Service Community. 'Veteran and ex-service community' refers broadly to veterans and former serving personnel, as well as their families, carers and organisations that support them (Department of Veterans' Affairs, 2015). This expanded focus on veterans and the ex-service community is broader than the Transition and Wellbeing Transition Study definition for these groups and recognises the supports that are important for improving the community's quality of life and identifying ways this might be achieved – through preventing illness where possible, fostering social connectedness and enhancing health and wellbeing (Department of Veterans' Affairs, 2015).

Several health and wellbeing areas of particular concern to the veteran and ex-service community have been identified previously such as risk of social isolation, employment opportunities post-separation, the risk of weight gain following transition, the high prevalence of mental conditions (including depression and PTSD and alcohol use disorder) and comorbidity with other mental illnesses, and the prevalence of smoking while serving. These issues remain relevant to the current physical health of transitioned personnel (Department of Veterans' Affairs, 2015). DVA's strategy for dealing with veterans' mental health needs is set out in the Veteran Mental Health Strategy 2013–2023 (Department of Veterans' Affairs, 2013); other matters that are more closely related to physical health are responded to through population-wide measures such as the Australian Government's smoking reduction initiatives.

Under the DVA Social Health Strategy 2015–2023, the Department invests in a range of programs and initiatives designed to support health and wellbeing in the veteran and ex-serving community, including population-level programs and programs aimed at individuals. The findings in relation to physical health and wellbeing outcomes from this Mental Health and Wellbeing Transition Study could help inform planning and practice in such programs.

Population level programs include:

- *Veterans' Health Week.* This is an annual event with changing themes that centre on aspects of health and wellbeing that are relevant to the veteran community. It offers an opportunity for veterans to participate, connect and influence their own and their friends' health and wellbeing.
- *The Men's Health Peer Education Program.* This aims to improve the health of male veterans, using trained volunteers to encourage them to understand their health and wellbeing and working in partnership with professional service providers in managing any identified concerns.

Programs for individuals include:

- *The Coordinated Veterans' Care Program.* This is a targeted voluntary program for DVA Gold Card holders with health problems that increase their risk of unplanned hospitalisations. Eligibility for the program is determined by a GP and, once enrolled, a veteran's ongoing and planned care is based on a personalised care plan developed by the GP and the nurse coordinator. The program is offered in addition to any existing DVA services and entitlements for eligible persons with one or more of the following chronic conditions – congestive heart failure, coronary artery disease, chronic obstructive pulmonary disease, diabetes and pneumonia.
- *The Veterans Heart Health Program, 'Improving Veterans' Health'.* This DVA-funded program aims to help improve returned service personnel's overall physical health, physical fitness and wellbeing through physical exercise, nutrition and healthy lifestyle education. It is a 52-week program that focusses on increasing physical activity and healthy lifestyle choices.

- *The DVA Rehabilitation Appliance Program.* This initiative is designed to help eligible members of the veteran community be independent and self-reliant in their own homes. It offers health care assessments and provides aids and appliances to help to minimise the impact of disabilities, enhance quality of life and maximise independence. In 2017 a prosthetic recreational sports aid category was added.

An analysis of DVA or ADF policies or programs in relation to physical health and socio-demographic factors was beyond the scope of this study. The extent to which programs such as those just mentioned respond to the physical health needs of Transitioned ADF members and the poorer health, and thus probably the increased needs, of Transitioned ADF subgroups (such as the Ex-Serving and the medically discharged) could be considered in the context of the physical health findings detailed in this report.

The purpose of the Physical health Status study was to examine the prevalence and significance of physical health outcomes in Transitioned and Regular ADF members. The study is one of the first internationally to investigate a comprehensive range of physical health indicators in recently transitioned military personnel. It provides a comprehensive dataset and framework for further detailed analyses of the physical health of ADF members both now and in the future and has several important implications for practice and future research.

Overall, the Transitioned ADF members were more likely to report poorer physical health in all domains and to have increased lifestyle risk factors coupled with poorer self-perceived health, satisfaction and quality of life when compared with 2015 Regular ADF members. Within the Transitioned ADF group, those who were further removed from the ADF (that is, Ex-Serving members) and those who were already DVA clients or had received a medical discharge appeared to be particularly at risk. In the context of findings from the *Mental Health Prevalence Report*, physical comorbidities and their relationship with psychological health are important considerations. Furthermore, physical health status during the transitioning phase can have other implications – for example, for general health and wellbeing, for re-integration and employment post-transition and, in the longer term, for the onset of chronic health conditions.

In the process of discharge from the ADF and transition to civilian life, a more formal procedure for discharging members to a primary healthcare provider for physical as well as mental health care if required could be a consideration since it might assist with the early identification of problems and comorbidities.

The finding of poorer physical health among Transitioned ADF members compared with 2015 Regular ADF members and among the Transitioned ADF subgroups might have implications for the services these individuals are eligible to receive or for health service planning. These implications need, however, to be considered in the context of Defence's and DVA's existing programs, something that was beyond the scope of this study.

Further consideration of patterns of injury and risk factors might offer opportunities for building an evidence base around the implications of injuries for performance of duties and for medical discharge, as well as offering greater opportunities for prevention and injury reduction through design of equipment and other strategies. Further analysis should be used to identify subgroups at greater risk of injury and the associated risk factors, injuries during training being of particular interest since such musculoskeletal problems can be risk factors for later chronic conditions such as osteoarthritis.

At present in the ADF women have increasing and changing roles. There is the potential for this to have consequences for their physical health – particularly in terms of musculoskeletal disorders and injuries. Further analyses could look at health outcomes for female members of the ADF, in particular post-transition.

Sleep disorders and fatigue are important factors associated with work performance, especially in safety-critical jobs. The finding of an increased prevalence of sleep disturbance and other lifestyle risk factors among Transitioned ADF members (in particular, DVA clients and those who were medically discharged) highlights the importance of ensuring that this group is given information, education and opportunities to maintain their

fitness and a healthy lifestyle before discharge. Inclusion of sleep measures in regular health or psychological screening might also be of value.

Smoking is an important risk factor, and smoking cessation is a public health measure as relevant to ADF and transitioned ADF personnel as it is to the general population, even though current smoking levels are lower in ADF personnel than in the Australian community. Overweight or obesity and inadequate physical activity are well-documented risk factors for many chronic diseases. These risk factors and their implications need to be considered in the context of existing health programs, in the ADF and DVA and in the general community.

There are implications for monitoring the health of this cohort of Transitioned ADF and 2015 Regular ADF into the future to integrate the findings in relation to physical health with mental health and pathways to care and to monitor changes in physical and mental health status over time. This could be achieved through repeated health surveys or through data linkage with the existing Medicare and PBS databases. Monitoring the health and healthcare needs and use of the non–DVA client group, including whether they subsequently apply for benefits and become clients of DVA, is also important.

Despite its size and breadth, the *Physical Health Status Report* was not able to investigate the causal pathways and correlates of physical health symptoms and disorders among Transitioned ADF members. Nevertheless, the data collected through the study (for example, on demographic and service-related factors), together with other Programme findings (for example, on mental health and pathways to care), have important implications for both transitioned and regular ADF members, for their families, for members' clinical and allied health service providers, and for DVA and Defence in terms of health care and employment.

Taken together, the results from this program of research provide a unique platform for identifying specific subgroups at risk of poor physical, mental and social health outcomes into the future. In particular, they provide the foundation for gaining a more complete understanding of the physical health of transitioned ADF members through the consideration of comorbidities and interrelationships with mental health – for example, the relationship between musculoskeletal disorders, mental disorders, insomnia, pain, disability, and self-perceived health and quality of life. Such knowledge is required for prevention, early intervention and improved integration of the treatment of physical and mental comorbidities in military and transitioned personnel both in Australia and worldwide.

The study cohorts used, as well as the 'nested' groups within each cohort, and the comprehensive database the study provides can be used in further research into priority areas as they emerge in national or international military and veteran communities and the scientific literature. Examples include increasing comorbidity of conditions, physical and psychological, and the challenges this presents for the individual, their families and coordinated multidisciplinary care; service-related exposures and risk factors for poorer physical health outcomes in transitioned personnel; development of data systems to monitor physical health and assess treatment outcomes and barriers to care; and use of evidence-based treatment.

In conclusion, this study compares the physical health status of Transitioned ADF members with that of 2015 Regular ADF members using general health indicators as well as indicators relevant to several body systems. Despite some limitations, such as low participation rates, the study represents the first comprehensive Australian study of the physical health of transitioned personnel and one the few international studies in this field. It is a very important baseline study of health in this cohort and provides a solid evidence base for the future.

Overall, Transitioned ADF members were more likely to report poorer physical health, to have increased lifestyle risk factors, and to report poorer self-perceived health, satisfaction and quality of life compared with 2015 Regular ADF members. Among the Transitioned ADF, poorer physical health outcomes overall were reported by DVA clients compared with those who were not DVA clients, by Ex-Serving members compared with Active Reservists and Inactive Reservists, and by those who had been medically discharged compared with those who had been discharged for another reason.

Physical comorbidities and the relationship with psychological health are an important element. Physical health status during the transitioning phase is likely to have important implications – for example, for general health and wellbeing, for re-integration and employment post-transition and, in the longer term, for later onset of chronic health conditions. The study findings can help in the development and refining of preventive health programs and in health management relating to chronic diseases. This is a relatively young cohort, and longitudinal follow-up to assess and monitor chronic conditions that emerge will be important.

10.1 Areas for future research

There is considerably less research and data available on the physical health of transitioning ADF members or transitioning personnel internationally than there is on the mental health of these personnel. This study provides a comprehensive data set from which more important findings can be extracted. The data are, however, yet to be fully analysed in order to answer further questions of interest and relevance to DVA and Defence practice and programs.

It is important that the value of existing data and their potential as an evidence–base for further analyses to answer questions of interest are understood and appreciated and that strategies are developed for further analyses in the light of further discussion of the findings and their implications and the relationship with other findings from the Transition and Wellbeing Research Programme overall.

A number of areas for further examination of the data that emerge from the findings of this report are suggested below. These could be informed further by discussion with Defence and DVA on particular questions of interest:

- Examine the effects of risk factors for physical symptoms or conditions that are increased in Transitioned ADF members or subgroups thereof (for example, for age, Service, rank, sex, deployment history and combat exposure). Additionally, examine predictors for particular conditions such as injuries and musculoskeletal disorders (for example, in relation to training and deployment).
- Examine the timing of the reported onset of doctor-diagnosed medical conditions in relation to discharge and presentation to DVA.
- Examine the impact of physical health on help seeking and treatment in relation to DVA.
- Examine the interrelationships and comorbidity of physical health outcomes and the comorbidity of physical health and mental health conditions.
- Examine the impact of physical health on presentation in relation to psychological health and engagement with mental health services and treatment effectiveness for mental disorders.
- Complete linkages with Medicare and PBS health data and develop health service use indicators in order to analyse and report on Medicare and PBS data. Use of such data will complement self-reported health service use data and so provide a more complete picture of health service use.
- Investigate the relationships between outcomes such as insomnia, pain, musculoskeletal disorders, disability, psychological and physical disorders and self-perceived health and quality of life and between socio-demographic and socio-economic factors such as employment and social wellbeing.
- Further examine health outcomes and risk factors among female 2015 Regular ADF members and female transitioned ADF members.
- Monitor changes in the present cohort's physical and mental health status over time. This could be done through repeated health surveys or through data linkage with existing Medicare and PBS databases. Monitoring the health and healthcare needs and use of the non–DVA client group, including whether they subsequently apply for benefits and become clients of DVA, is also important.

Glossary of terms

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 for Transitioned ADF members with an Australian Community population, direct standardisation was applied to estimates in the 2014–15 ABS National Health Survey data. The NHS 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, or Defence, is constituted under the *Defence Act 1903* (Cth). Its 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 Commonwealth Parliament, which represents the Australian people to efficiently and effectively carry out the government's defence policy. The current Programme 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 support 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 factors 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. For this Programme it developed a Study Roll by integrating contact information from various sources and databases.

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

Comorbidity. The occurrence of more than one disorder at the same time.

Composite International Diagnostic Interview (CIDI). The World Mental Health Survey Initiative version of the World Health Organization's Composite International Diagnostic Interview, version 3 (WMH-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) and the World Health Organization International Classification of Diseases, 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). The department 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.

DVA client. A term used when referring to clients of the Department of Veterans' Affairs for the purpose of analysis. In the construction of the DVA dataset for the Military and Veteran Research Study Roll, DVA created

an indicator of confidence against each veteran with respect to the level of interaction DVA had with them for assessing how confident DVA was about the accuracy of their address. Members of each of the following groups were considered DVA clients:

- *High.* Where a veteran is in receipt of a fortnightly payment (such as income support or a 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 their address would be up to date and correct.

- *Medium.* Where a veteran only holds a treatment card (that is, does not also receive 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, yet they would still be considered DVA clients. For the purposes of this report, any individual in the study population who met these criteria was flagged as a 'DVA client'. Those with this flag were compared against those without it.

Ex-service organisation (ESO). An organisation that provides assistance to current and former ADF members. Services can include welfare support, help with DVA claims, and employment programs and social support.

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 can be a veteran or the widow/widower or dependant of a veteran. Only the person named on the card is covered.

Medical Employment Classification (MEC). An administrative process designed to monitor physical fitness and medical standards in the ADF. MEC was 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 but who remain medically fit for duty in their occupation in a deployed or seagoing environment. In allocating the sub classification 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. A member so classified should be medically managed towards recovery and should be receiving active medical management with the intention of regaining MEC 1 or MEC 2 within 12 months of allocation of MEC 3. After a maximum of 12 months their MEC is reviewed. If still medically unfit for military duties in any operational environment, they are downgraded to MEC 4 or, if appropriate, referred to a MEC Review Board for consideration of an extension to remain MEC 3.

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

Medical fitness. A status defined as follows:

- *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 just described, or are assigned a perturbed MEC value of 'fit'.

- *Unfit.* Those not fit for deployment in 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 were classified as 'unfit' if they fell into MEC 3 or 4, as just described, or were assigned a perturbed MEC value of unfit.

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

Mental Health Prevalence and Wellbeing Study (MHPWS). The 2010 MHPWS is 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, or MEAO. Thousands of members have deployed to the MEAO since 2001, many of them completing multiple tours of duty. The Transition and Wellbeing Research Programme will seek to build on the Military Health Outcomes Program

Military Health Outcomes Program (MilHOP). MilHOP detailed the prevalence of mental disorders among serving ADF members in 2010 as well as deployment-related health factors for those deployed to the Middle East Area of Operations. The Transition and Wellbeing Research Programme aims to redress a number of gaps identified following MilHOP, including the mental health of Reservists, Ex-Serving members and ADF members in high-risk roles, along with the trajectory of disorder and pathways to care for individuals identified with a mental disorder in 2010.

National Death Index (NDI). A Commonwealth database that contains records of deaths registered in Australia since 1980. Data come from the Registry of Births, Deaths and Marriages in each jurisdiction, the National Coronial Information System and the Australian Bureau of Statistics. Before participants were contacted, the Study Roll was cross-checked against the NDI to ensure that no approaches to deceased members were made.

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

National Health Survey (NHS). The 2014–15 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.

Pharmaceutical Benefits Scheme (PBS). The 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 many Australians. The PBS is part of the Australian Government's broader National Medicines Policy. Data on healthcare use and costs, as well as Pharmaceutical Benefit Scheme and Repatriation Pharmaceutical Benefits Scheme data, were obtained for consenting Serving and Ex-Serving ADF members as part of the current program of research.

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

- *Commissioned Officer (OFFR).* Senior Commissioned Officers (Commander (CMDR), Lieutenant Colonel (LTCOL), Wing Commander (WGCDR) and above) and Commissioned Officers (Lieutenant Commander (LCDR), Major (MAJ), Squadron Leader (SQNLDR) and more junior ranks).

- *Non-Commissioned Officer (NCO).* Senior Non-Commissioned Officers (Petty Officer (PO), Sergeant (SGT) and more senior ranks), and Junior Non- Commissioned Officers (Leading Seaman (LS), Corporal (CPL) and more junior ranks).

- *Other Ranks.* Able Seaman (AB), Seaman (SMN), Private (PTE), Leading Aircraftman (LAC), Aircraftman (AC) or equivalent.

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

- *Medical discharge.* Involuntary termination of the client's employment by the ADF 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 be prescribed only for Department of Veterans' Affairs beneficiaries who hold a Gold, White or Orange Card. Data on healthcare use and costs, as well as Pharmaceutical Benefit Scheme and Repatriation Pharmaceutical Benefits Scheme data, were obtained for consenting Serving and Ex-Serving ADF members as part of the current program of research.

Service status. The ADF consists of three forces:

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

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

- *Royal Australian Air Force.* An air force that 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 in deployment overseas. It 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.

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

- Defence Personnel Management Key Solution database
- DVA client databases
- National Death Index
- ComSuper member database
- Military Health Outcomes Program dataset.

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

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 to an Active Reservist role.

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 and their eligible dependants to gain access to 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 health cards.

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

- correct for differential non-response
- adjust for any systematic biases in the respondents – for example, oversampling of high scorers for the CIDI.

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

- injuries or conditions that are accepted as being caused by war or as service related
- malignant cancer, pulmonary tuberculosis, posttraumatic stress disorder, anxiety and/or depression, whether or not 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 covered by a Gold Card but must be for treatment of conditions that are accepted as being caused by war or as service related.

World Mental Health Survey Initiative Version of the World Health Organization Composite International Diagnostic Interview – version 3 (CIDI). The CIDI (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) and the 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 Programme.

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.

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 – 3.9 years, 4–7.9 years, 8–11.9 years, 12–15.9 years, 16–19.9 years and 20+ years.

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