

**Australian peacekeepers:
Long-term mental health status,
health service use, and quality of life**

Technical report

Authors: Graeme Hawthorne, Sam Korn, Mark Creamer*

**Australian peacekeepers:
Long-term mental health status, health service use, and quality of life**

Technical Report

Graeme Hawthorne†

Sam Korn

Mark Creamer*

Mental Health Evaluation Unit & the Australian Centre for Posttraumatic Mental Health
Department of Psychiatry, The University of Melbourne

August 2013 (Revised August 2014)

* Due to the unforeseen unavailability of the first author to complete this report, the Australian Centre for Posttraumatic Mental Health, Department of Psychiatry, University of Melbourne, assumed responsibility for the report in May 2013. The final version of the report was revised and edited by Professor Mark Creamer, in consultation with Professor McFarlane, Professor Sim, members of the original research team, and Professor David Forbes and Associate Professor Meaghan O'Donnell.

†We would like to acknowledge the passing of Associate Professor Graeme Hawthorne and pay tribute to his outstanding leadership of this research project.

Recommended citation:

Hawthorne, G., Korn, S., & Creamer, M. (2014) *Australian peacekeepers: Long-term mental health status, health service use, and quality of life – Technical Report*. Unpublished manuscript, Department of Psychiatry, University of Melbourne, Australia.

For further information about this report please contact:
Associate Professor Meaghan O'Donnell
Director of Research
Australian Centre for Posttraumatic Mental Health
Phone: +61 3 9035 5599
Email: mod@unimelb.edu.au

Chief investigators

A/Prof Graeme Hawthorne

Principal Research Fellow, Mental Health Evaluation Unit
Department of Psychiatry, The University of Melbourne

Professor Malcolm Sim

Director, Monash Centre for Occupational & Environmental Health
Department of Epidemiology & Preventive Medicine, Faculty of Medicine, Nursing & Health
Sciences
Monash University

Professor Alexander McFarlane

Director, Centre for Traumatic Stress Studies
University of Adelaide

**Research team: Mental Health Evaluation Unit,
Department of Psychiatry, The University of Melbourne**

Dr Sam Korn

Research Fellow

Mr Andrew Rodsted

Research Assistant

Ms Suzanne Pollard

Research Assistant

Mr David Fallon

Research Assistant

Ms Bianca Anjara

Research Assistant

Professor Mark Creamer

Honorary Professorial Fellow
Department of Psychiatry and the Australian Centre for Posttraumatic Mental Health

ADVISORY COMMITTEE

A/Prof Graeme Hawthorne

Principal Research Fellow, Mental Health Evaluation Unit
Department of Psychiatry, The University of Melbourne

Professor Malcolm Sim

Director, Monash Centre for Occupational & Environmental Health
Department of Epidemiology & Preventive Medicine, Faculty of Medicine, Nursing & Health Sciences
Monash University

Professor Alexander McFarlane

Director, Centre for Traumatic Stress Studies
University of Adelaide

Dr Sam Korn

Research Fellow, Mental Health Evaluation Unit
Department of Psychiatry, The University of Melbourne

Ms Sandy Bell

Assistant Secretary
Transport, Research and Development Branch, Department of Veterans' Affairs

Ms Kyleigh Heggie

Director
Research, Development and Coordination Section
Transport, Research and Development Branch, Department of Veterans' Affairs

Ms Tracey Chant

Assistant Director
Research, Development and Coordination Section
Transport, Research and Development Branch, Department of Veterans' Affairs

Mr Tim Cummins

Senior Project Officer
Research, Development and Coordination Section
Transport, Research and Development Branch, Department of Veterans' Affairs

Dr Eileen Wilson, Ms Megan McDonald and Ms Kerrie Martain

Former Department of Veterans' Affairs members of the Advisory Committee

Mr Paul Copeland

Immediate Past President
Australian Peacekeeper & Peacemaker Veterans' Association

Mr Michael Annett

Chief Executive Officer, Victorian Branch
Returned and Services League of Australia

ACKNOWLEDGEMENTS

We would like to thank the Australian Department of Veterans' Affairs for funding this project, with particular acknowledgement to Dr Eileen Wilson, Director Research, Development and Coordination Section, Transport, Research and Development Branch as well as Ms Megan McDonald and Kerrie Martain, Senior Research Officers, Research, Development and Coordination Section, Transport, Research and Development Branch, Department of Veterans' Affairs, Commonwealth of Australia.

Our thanks are extended to Mr Paul Copeland, Immediate National President, Australian Peacekeeper & Peacemaker Veterans' Association, and Mr Michael Annett, Chief Executive Officer, RSL Victorian Branch.

We would like to thank the research assistants who interviewed peacekeepers and maintained the study database: Mr Andrew Rodsted, Ms Suzanne Pollard, Mr David Fallon and Ms Bianca Anjara.

Our thanks are also extended to all the peacekeepers who participated in this study. Without their generosity in giving up their time this study would not have been possible.

TABLE OF CONTENTS

| | |
|----------------------------------------------------------------------------------------------|------------|
| Research team | iii |
| Advisory committee | iv |
| Acknowledgements | vi |
| List of tables | x |
| List of figures | xi |
| Abbreviations | xii |
| Glossary of terms | xiv |
| Executive summary | 1 |
| 1. Background | 1 |
| 2. Study aims | 1 |
| 3. Study design, data collection, and analysis | 1 |
| 4. Study findings | 2 |
| 5. Study strengths and limitations | 4 |
| 6. Implications | 4 |
| 1.0 Background and study aims | 7 |
| 1.1 The nature of peacekeeping | 7 |
| 1.2 Australia's involvement | 7 |
| 1.3 The nature of mental health problems | 9 |
| 1.3.1 <i>Psychiatric diagnoses</i> | 9 |
| 1.3.2 <i>Other mental health and related constructs</i> | 10 |
| 1.4 The mental health sequelae of peacekeeping operations | 11 |
| 1.5 Rationale for the current study | 12 |
| 1.6 Appropriate comparisons for the current study | 12 |
| 1.7 Aims of the current study | 14 |
| 2.0 Method | 17 |
| 2.1 Study design | 17 |
| 2.1.1 <i>Study deployments</i> | 17 |
| 2.1.2 <i>High versus low stress deployments</i> | 18 |
| 2.2 Participants: Sample and selection | 18 |
| 2.2.1 <i>Sample size</i> | 18 |
| 2.2.2 <i>Participant selection</i> | 19 |
| 2.3 Procedures for data collection | 20 |
| 2.3.1 <i>Initial recruitment into the study</i> | 20 |
| 2.3.2 <i>Data collection</i> | 23 |
| 2.4 Comparator samples | 24 |
| 2.4.1 <i>National Survey of Mental Health and Wellbeing (NSMHWB)</i> | 25 |
| 2.4.2 <i>CMVH East Timor and Bougainville samples</i> | 26 |
| 2.4.3 <i>Australian Gulf War Veterans Health Study (AGWVHS)</i> | 27 |
| 2.4.4 <i>(ADF) Mental Health Prevalence and Wellbeing Study sample</i> | 27 |
| 2.5 Measures | 28 |
| 2.5.1 <i>Composite International Diagnostic Interview (CIDI)</i> | 29 |
| 2.5.2 <i>Background information</i> | 30 |
| 2.5.3 <i>Standardised self-report measures – mental and physical health</i> | 31 |
| 2.5.4 <i>Standardised self-report measures – associated problems</i> | 33 |
| 2.5.5 <i>Standardised self-report measures – potential risk and protective factors</i> | 36 |

| | | |
|------------|-----------------------------------------------------------------------|-----------|
| 2.6 | Data analysis..... | 37 |
| 2.6.1 | <i>Data verification and missing data</i> | 37 |
| 2.6.2 | <i>Participation bias</i> | 38 |
| 2.6.3 | <i>Response bias</i> | 39 |
| 2.6.4 | <i>Significance levels and statistical analyses</i> | 39 |
| 2.6.5 | <i>Predictor variables</i> | 41 |
| 2.7 | Ethics..... | 42 |
| 2.7.1 | <i>Adverse events</i> | 42 |
| 3.0 | Participants | 43 |
| 3.1 | Participation rate..... | 43 |
| 3.2 | Study generalisability..... | 44 |
| 3.2.1 | <i>Non-response and partial completion</i> | 44 |
| 3.2.2 | <i>Bias response by questionnaire length</i> | 45 |
| 3.2.3 | <i>Questionnaire response bias</i> | 46 |
| 3.2.4 | <i>Missing data</i> | 48 |
| 3.3 | Demographic details of participants..... | 48 |
| 3.3.1 | <i>General demographic profile of study participants</i> | 48 |
| 3.4 | Service and deployment history..... | 51 |
| 3.5 | Trauma exposure..... | 52 |
| 3.5.1 | <i>Traumatic life events exposure</i> | 52 |
| 3.5.2 | <i>Trauma exposure on deployment: TSES-R2 findings</i> | 54 |
| 3.6 | Summary..... | 56 |
| 4.0 | Mental health | 58 |
| 4.1 | Pre-deployment mental health..... | 58 |
| 4.2 | The prevalence of mental health conditions..... | 60 |
| 4.2.1 | <i>Posttraumatic stress disorder (PTSD)</i> | 64 |
| 4.2.2 | <i>Generalised Anxiety Disorder (GAD)</i> | 65 |
| 4.2.3 | <i>Major Depressive Episode (MDE)</i> | 66 |
| 4.2.4 | <i>Alcohol and other drug abuse and dependence</i> | 66 |
| 4.3 | Predictors and correlates of mental health conditions..... | 67 |
| 4.3.1 | <i>Univariate associations</i> | 67 |
| 4.3.2 | <i>Multivariate analyses</i> | 70 |
| 4.4 | Associated constructs of mental health and wellbeing..... | 73 |
| 4.4.1 | <i>PCL</i> | 74 |
| 4.4.2 | <i>General Health Questionnaire (GHQ-12 bimodal)</i> | 75 |
| 4.4.3 | <i>K10</i> | 76 |
| 4.4.4 | <i>Suicidal ideation and self-harm</i> | 78 |
| 4.4.5 | <i>Anger</i> | 80 |
| 4.4.6 | <i>Demoralisation</i> | 81 |
| 4.4.7 | <i>Social isolation</i> | 82 |
| 4.4.8 | <i>Posttraumatic growth</i> | 83 |
| 4.5 | Summary..... | 88 |
| 5.0 | General health, service use, and quality of life | 91 |
| 5.1 | General health..... | 91 |
| 5.1.1 | <i>Current medical conditions</i> | 91 |
| 5.1.2 | <i>Overall health status</i> | 94 |
| 5.1.3 | <i>Health function as assessed by the SF-36</i> | 96 |
| 5.2 | Health service use and satisfaction..... | 98 |
| 5.2.1 | <i>Health care service use</i> | 98 |
| 5.2.2 | <i>Satisfaction with health care services</i> | 102 |
| 5.2.3 | <i>Use of prescribed and over the counter (OTC) medications</i> | 103 |
| 5.3 | Quality of life..... | 105 |
| 5.4 | The value of life lost – a utility perspective..... | 109 |

| | | |
|------------|------------------------------------------------------------------------------------|------------|
| 5.4.1 | <i>The impact of mental health conditions on quality of life</i> | 111 |
| 5.4.2 | <i>The cost implications</i> | 114 |
| 5.5 | Summary | 117 |
| 6.0 | Discussion | 119 |
| 6.1 | Overview of study findings: Mental health | 119 |
| 6.1.1 | <i>Pre-deployment mental health</i> | 120 |
| 6.1.2 | <i>Current mental health disorders</i> | 121 |
| 6.1.3 | <i>Associated constructs of psychological health and wellbeing</i> | 122 |
| 6.1.4 | <i>Risk and protective factors: Possible explanations for mental health status</i> | 125 |
| 6.1.5 | <i>Mental health and wellbeing: Summary</i> | 128 |
| 6.2 | Overview of study findings: Physical health, service use, and satisfaction | 128 |
| 6.3 | Overview of study findings: Quality of life and cost burden | 130 |
| 6.4 | Implications for policy and programs | 132 |
| 6.5 | Implications for future research | 133 |
| 6.6 | Strengths and limitations | 135 |
| 6.7 | Summary and conclusions | 137 |
| 7.0 | References | 139 |

LIST OF TABLES

| | |
|------------|--------------------------------------------------------------------------------------------------------------|
| Table 1.1 | UN-authorized peacekeeping deployments to which Australia has contributed (1946-2011) |
| Table 2.1 | Summary of study measures |
| Table 3.1 | Analysis of representativeness of study participants |
| Table 3.2 | Response completion by deployment, percentages |
| Table 3.3 | Response style: an analysis of online versus telephone data |
| Table 3.4 | Response style: an analysis of peacekeepers with the matched NSMHWB cohort |
| Table 3.5 | Demographic characteristics of study participants |
| Table 3.6 | Summary of deployment history |
| Table 3.7 | Summary of lifetime trauma exposure by deployment (Life Events Checklist) |
| Table 3.8 | Traumatic stress exposure assessed by the Traumatic Stress Exposure Scale – R2, on deployment, by deployment |
| Table 4.1 | Pre-deployment mental health of participants by mental health condition, percentages |
| Table 4.2 | 12-month CIDI mental health status of participants, percentages |
| Table 4.3 | 12-month CIDI mental health status comparisons, percentages |
| Table 4.4 | Criterion A events for peacekeepers and comparators with PTSD, percentages |
| Table 4.5 | Predictors of 12-month mental health conditions: Univariate analyses |
| Table 4.6 | Predicting 12-month CIDI PTSD |
| Table 4.7 | Predicting 12-month CIDI GAD |
| Table 4.8 | Predicting 12-month CIDI Depression |
| Table 4.9 | Predicting 12-month CIDI Alcohol abuse |
| Table 4.10 | Predicting 12-month CIDI Alcohol dependence |
| Table 4.11 | PTSD Checklist (PCL) mean scores and percentages scoring above the cut-off for probable PTSD |
| Table 4.12 | Psychological ‘caseness’ (distress) on the GHQ-12 |
| Table 4.13 | K10 status of participants, and mean K10 scores, by deployment, percentages |
| Table 4.14 | K10 status of participants, NSMHWB, and military comparators, percentages |
| Table 4.15 | 12 month suicidal ideation, plan or attempt as assessed by the CIDI, percentages |
| Table 4.16 | Mental health conditions and social isolation, percentages |
| Table 4.17 | Posttraumatic growth by deployment, PGI scores, percentages |
| Table 4.18 | Univariate predictors of posttraumatic growth |
| Table 4.19 | Predicting peacekeepers with posttraumatic growth |
| Table 5.1 | Reported current medical conditions, percentages |
| Table 5.2 | Overall health status of participants, percentages |
| Table 5.3 | Health service providers used in the past 3 months, percentages |
| Table 5.4 | The impact of mental health syndromes on peacekeepers’ quality of life, AQL utilities |
| Table 5.5 | Loss of life-value (utility) due to peacekeeping, for the number of CIDI mental health syndromes |
| Table 5.6 | Estimated excess annual burden of peacekeeping associated with peacekeeping and mental health disorders |

LIST OF FIGURES

- Figure 2.1: Flowchart of study recruitment and participation
- Figure 3.1: Lifetime exposure to traumatic events, percentages
- Figure 3.2: Exposure on deployment to PTEs, TSES-R2 percentages
- Figure 4.1: Mental health delineations and anger (DAR5)
- Figure 4.2: Demoralisation in peacekeepers; distribution of DS scores
- Figure 5.1: Number of health conditions
- Figure 5.2: Median number of health conditions by deployment
- Figure 5.3: Mental component summary (MCS) and physical component summary (PCS) scores
- Figure 5.4: Number of health services used, by health care provider type
- Figure 5.5: Satisfaction with health services; SAPS scores
- Figure 5.6: Number of prescribed medications and OTCs used
- Figure 5.7: Peacekeepers vs comparators QoL, AQoL utility deciles
- Figure 5.8: QoL (AQoL) by mental health conditions
- Figure 5.9: Peacekeepers' quality of life in context

ABBREVIATIONS

| | |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ABS | Australian Bureau of Statistics. |
| ADF | Australian Defence Force. |
| AGWVHS | Australian Gulf War Veterans' Health Study |
| AHP | Allied health practitioners, including psychologists, physiotherapists, nurses, chiropractors, acupuncturists, herbalists and other alternative health care providers. |
| ALT | Alternative therapists (acupuncturists, herbalists, naturopaths etc.). |
| ANOVA | Analysis of variance. Statistical test for assessing mean scores across groups. |
| APPVA | Australian Peacekeeper and Peacemaker Veterans Association. |
| AQoL | Assessment of quality-of-life instrument. A multi-attribute utility instrument for measuring health-related quality of life (HRQoL). |
| CAPS | Clinician Administered PTSD Scale. |
| CID / MCID | Clinically important difference / Minimum clinically important difference. |
| CIDI | Composite International Diagnostic Interview. World Health Organization instrument for the delineation of mental health conditions. |
| CMVH | Centre for Military and Veterans' Health. |
| CURF | Confidentialised Unit Record Files. Survey data files prepared by the ABS. |
| DAR5 | Dimensions of Anger Reactions. Scale for assessing anger. |
| DS | Demoralization Scale. Scale for assessing demoralisation. |
| DSM-IV | Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition. Published by the American Psychiatric Association. |
| DVA | Australian Government Department of Veterans' Affairs. |
| FS | Friendship Scale. Scale for assessing social isolation. |
| GAD | Generalised anxiety disorder. |
| GHQ12 | General Health Questionnaire. Scale for assessing general psychological distress. |
| GP | General Practitioner. |
| HRQoL | Health-related quality of life. |
| ICD10 | International Classification of Disease – Tenth Edition. Published by the World Health Organization. |
| IQR | Inter quartile range. |
| IRT | Item Response Theory. |
| K10 | Kessler 10. Scale for assessing psychological health. |
| LEC | Life Events Checklist. Scale for assessing exposure to potentially traumatic events. See PTEs. |
| LOT-R | Life Orientation Test – Revised. Scale for assessing a person's outlook on life. |
| MAU | Multi Attribute Utility. |
| MBS | Medical Benefits Scheme. Australian Commonwealth Government scheme for the registration and subsidisation of medical costs. |
| MCS | Mental Component Summary. Summary scale from the SF-36V2 for assessing mental health. |
| MDE | Major depressive episode. |
| MHWS | Mental Health and Well Being Study. |
| MilHOP | Military Health Outcomes Program conducted under the auspices of the ADF. |
| NSMHWB | National Survey of Mental Health and Wellbeing. Conducted by the ABS. |
| OR | Odds ratio. |

| | |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OTC | Over-the-counter therapy. Pharmaceuticals or other drug therapies that can be purchased without the need for a prescription. |
| PBAC | Australian Pharmaceutical Benefits Advisory Committee |
| PBS | Pharmaceutical Benefits Scheme. Australian Commonwealth Government scheme for the registration and subsidisation of pharmaceuticals. |
| PCL-C | Posttraumatic stress disorder checklist. Scale for the delineation of posttraumatic stress disorder. Refers to the civilian version of the PCL. |
| PCS | Physical Component Summary. Summary scale from the SF-36V2 for assessing physical health. |
| PTGI | Posttraumatic Growth Inventory. Scale assessing posttraumatic growth. |
| PTE | Potentially traumatic event. Common PTEs include exposure to natural disasters (e.g., fire, flood), serious life-threatening accidents, assault (including rape or sexual assault), serious harm or injury, being held hostage or captive, and war-zone or combat experience. |
| PTSD | Posttraumatic stress disorder. For a definition see Glossary of Terms. |
| RSL | Returned and Services League of Australia. |
| RR | Relative Risk. |
| SAHOS | South Australian Health Omnibus Survey. |
| SAPS | Short Assessment of Patient Satisfaction Scale. |
| SEIFA | Socio-Economic Indexes for Areas. ABS measure of socioeconomic advantage or disadvantage. See Glossary of Terms for a fuller explanation. |
| SES | Socio-economic status |
| SF-36V2 | Short Form Health Survey, Version 2. Scale for assessing a person's health. |
| SR | Self-report measures. |
| TPI | Totally and permanently incapacitated. DVA classification of disablement. |
| TSES-R2 | Traumatic Stress Exposure Scale – Revision 2. Scale for assessing exposure on deployment to PTEs. |
| TTI | Temporary totally incapacitated. DVA classification of disablement. |
| TTO | Time-trade off. |
| Tukey HSD | Tukey Honestly Significant Difference Test. Statistical test to identify which groups are significantly different to each other after an omnibus test shows statistically significant differences between groups. |
| UN | United Nations. The UN was founded in 1945. In 2011 there were 192 member countries. The purposes of the UN are to maintain international peace and security, develop friendly relations among nations and promote social progress, better living standards and human rights. ¹ |
| UN Charter | The Charter of the UN, signed in San Francisco on 26 June 1945, is the foundation document for all UN peace operations consistent with its purpose of saving “succeeding generations from the scourge of war” (18, page 13). Peace operations are authorised under Chapters 6, 7 and 8 of the UN Charter. |
| VVCS | Originally the Vietnam War Veterans' Counselling Service, now the Veterans and Veterans Families Counselling Service. Part of DVA, the VVCS was set up to assist Vietnam War veterans who needed counselling or other therapies for mental and social health problems. VVCS services are available to any veteran. |
| WHMS / WHMSI | World Mental Health Survey Initiative. World Health Organization study of international mental health prevalences. |
| WHO | World Health Organization. |
| WHO DIS | World Health Organization Diagnostic Interview Schedule for the delineation of mental health conditions. |
| WHOQoL | World Health Organization Quality of Life Group. |

¹ Taken from <http://www.un.org/en/aboutun/index.shtml> (Accessed 27 November 2011)

GLOSSARY OF TERMS

| | |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Allotment Lists | Australian Defence Force lists of deployed personnel. Used to create study list of veterans who participated in the peacekeeping deployments sampled for this study. |
| Bonferroni | Method of adjustment of the test value where multiple comparisons are carried out. |
| χ^2 | Chi square test. Statistical test for assessing categorical data in a classification table. |
| Cronbach α | Statistical test for assessing the reliability of an instrument. |
| Cohen's d | Measure of effect size. See effect size. |
| Disability | Refers to the 'accepted disabilities' reported by a veteran, where these were defined as the disabilities accepted by DVA for the purposes of the award of a disability pension. This definition does not imply that the reported disabilities are those that DVA recognised. Because veterans were asked to nominate their DVA-accepted disability, those reported will reflect veterans' beliefs about their DVA-accepted disabilities. |
| Disability pension | Disability pension awards paid to a veteran are based on clinical review where the criteria are compensation for injuries or diseases caused or aggravated by deployment or Defence service. In general, higher levels of disability pension are a function of assessed disability level (19). Readers should be aware that although participants in this study may have had accepted disabilities and held DVA cards (either White or Gold), their use of health services may not be for their accepted disability; indeed their most significant health condition may not be related to their accepted disability at all. However, all health services provided under a DVA card would be paid for by DVA. |
| Dispositional optimism | Being optimistic about life. |
| Era veterans | A comparator group of veterans from the same era. |
| Fisher Exact Test | Statistical test for assessing categorical data in a classification table where the numbers are too small for a χ^2 test. |
| Kruskal–Wallis χ^2 | Statistical test for use with non-normally distributed data. |
| Mokken analysis | Item response theory analysis for non-normally distributed data. |
| Mokken ρ | Statistical test for assessing the reliability of an instrument where the items are non-normally distributed. |
| Gold Card | The <i>Repatriation Health Card — For All Conditions</i> , issued by DVA, enables veterans to access all health services, including medical, dental and other optional care. Veterans are entitled to a Gold Card under the <i>Veterans' Entitlements Act 1986</i> . |
| kappa (κ) | Statistical test of the level of agreement between two categorical estimates of the same thing. |
| Orange Card | <i>Repatriation Pharmaceutical Benefits Card</i> , first issued by DVA in 2002. This card provides pharmaceutical benefits under the Repatriation Pharmaceutical Benefits Scheme. |
| Peace building | See Peacekeeper. |
| Peace enforcer | Including its derivatives, such as peace enforcing, refers to all personnel who have been deployed on a UN-authorized peace enforcement deployment, including peacemaker and peacemaking. 'Peace enforcer' is preferred to 'peacemaker' because it more closely aligns with the UN powers located under Chapter VII of the UN Charter than the term 'peacemaker', since these deployments may be concerned with maintaining the peace as well as |

| | |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | restoring peace. In general, the term ‘peace enforcer’ is only used in this study where it refers to deployments made under Chapter VII. For all other deployments, the term ‘peacekeeper’ is used. |
| Peacekeeper | Including its derivatives, such as peacekeeping, refers to all personnel who have been deployed on a UN-authorized peacekeeping (including peace monitoring or humanitarian deployment) or peace enforcing (including peacemaking) mission, or other peacemaking deployment, i.e., this is the umbrella term used throughout the study. |
| Peacekeeping SEIFA | See Peacekeeper. Socio-Economic Indexes for Areas. The Australian Bureau of Statistics (ABS) publishes five SEIFA indices describing different aspects of socioeconomic advantage or disadvantage for geographic areas (20). This study used the SEIFA for socioeconomic disadvantage. This is a composite measure primarily comprising weighted values for education, employment and income at the ABS collector district level. These values are aggregated up to various levels. For this study, the aggregate level used was at the level of the veteran’s postcode. For the SEIFA, the Australian population norm is 1000.00; values above this represent increasing levels of socioeconomic advantage, and values below this represent increasing level of socioeconomic disadvantage. |
| UN Charter | Foundation document for the United Nations (UN), signed in San Francisco on 26 June 1945. This specifies that one of the key functions of the UN is the authorisation of peace operations consistent with saving “succeeding generations from the scourge of war” (1, page 13). A copy of the Charter can be found at: http://www.un.org/en/documents/charter/ . |
| Variable | An indicator of a construct that can vary. For example, a variable, V1, may describe the gender of people. Gender, and the variable V1, will vary by whether a person is a male or female. V1 may be coded 1 = Male, 2 = Female, or in some other way. |
| Veteran | Defined in this study as a person who served in the ADF (i.e., an ex-serviceperson) or in Australia’s Merchant Navy during World War II. |
| White Card | <i>Repatriation Health Card — For Specific Conditions</i> , issued by DVA enabling veterans to access all health services related specifically to a veteran’s disability classification. |

1. Background

Since the end of World War II, Australia has contributed to 23 major peacekeeping operations worldwide under the auspices of the United Nations (UN), involving over 34,000 peacekeepers. One consequence of this participation is the potential for long-term mental health sequelae arising from the deployment. This study reports on the mental and physical health of a sample of Australia's peacekeepers who were deployed on seven UN-sanctioned peacekeeping missions between 1989 and 2002. The deployments were: Namibia (1989-1990; UNTAG; N = 613 Australian peacekeepers), Western Sahara (1991-1994; MINURSO; N = 225), Cambodia (1991-1993; UNAMIC/UNTAC; N = 1,215), Rwanda (1994-1995; UNAMIR II; N = 638), Somalia (1992-1996; UNOSOM I/UNITAF/ UNOSOM II; N = 1,480), East Timor (1999; INTERFET; N = 7,970) and East Timor (1999-2002; UNTAET; N = 2,090). The main study findings are in relation to mental health outcomes, including the prevalence of formal psychiatric diagnoses and associated features such as anger, demoralisation and social isolation. Veterans' reported use of health services is also presented, as well as an examination of the impact of peacekeeping and its sequelae on peacekeepers' quality of life.

2. Study aims

This study was designed to examine the mental health sequelae of peacekeeping. The primary aim was to provide a profile of the long-term mental health adjustment of Australia's former peacekeepers. Secondary aims were to: (a) Provide a preliminary indication of the physical health of Australia's former peacekeepers; (b) Examine the relationships between pre-deployment, deployment, and post-deployment stressors and current mental health; and (c) Explore health service utilisation and provide a preliminary estimate of the economic burden of mental health conditions in former peacekeepers.

3. Study design, data collection, and analysis

This cross-sectional study involved administering a structured clinical interview (CIDI) and a self-report questionnaire to a random sample of Australian peacekeepers. The participation rate, based on the

names of those who were initially drawn from deployment lists, was 72% of those who could be contacted (1,484 of the initially drawn 2,247 names). The final sample comprised 1,067 full or partial completers (48% participation rate). Participants were predominantly male, with an average age of 47 years. The majority (92%) were Army, with only 4% each from Navy and Air Force. Nearly half the sample (48%) reported receiving some form of DVA benefit.

The CIDI was used to arrive at categorical psychiatric diagnoses for posttraumatic stress disorder (PTSD), generalised anxiety disorder (GAD), major depression (MDE), and alcohol use/dependence. Several well validated questionnaires were used to assess related constructs such as general psychological health and wellbeing, anger, and social isolation. Information on demographics, service history, and trauma exposure was collected also. The findings were compared with one civilian and three military Australian comparator groups: (a) the civilian comparator from the 2007 National Survey of Mental Health and Wellbeing (NSMHWB); (b) Centre for Military and Veterans' Health (CMVH) Deployed Health Studies on the East Timor and Bougainville deployments; (c) the Australian Gulf War Veterans' Health Study (AGWVHS); and (d) the 'ever deployed' group from the ADF Mental Health Prevalence and Wellbeing Study.

4. Study findings

Three quarters of the sample had only ever been deployed on one mission, and only 7% had served on three or more missions. Participants reported high levels of exposure to potentially traumatic events (PTEs) both on deployment, and in terms of overall life experiences. Not unexpectedly, the prevalence of PTSD, anxiety, and depression prior to their first deployment was very low – around one quarter to one third of the rates found in the civilian comparators. Alcohol use disorders, however, were higher among peacekeepers – possibly a reflection of the military sub-culture of the time.

The prevalence of current (in the past 12 months) disorder in the peacekeeper sample, however, was considerably higher than that of the comparator groups. A total of 30% met criteria for at least one CIDI-diagnosed mental health condition, compared with 12% in the civilian NSMHWB sample, 22% in the Gulf War veteran sample, and 21% in the currently serving ADF sample. PTSD (17%) was diagnosed at rates two to three times higher than that found in the comparator military samples. Prevalence of anxiety (GAD) and alcohol abuse/dependence was also substantially higher

than in the comparator samples, albeit occurring at lower rates than PTSD. Depression, however, was not so clear cut, occurring at rates slightly higher than the serving ADF sample, but lower than that reported in the Gulf War (AGWVHS) sample. Psychological health assessed by the self-report measures was comparable with, or worse than, the various comparator groups. On the K10, for example (a general measure of psychological health), 30% scored in the “high” or “very high” range consistent with the diagnostic figures from the CIDI. A further 25%, however, reported moderate levels of distress on the K10. Suicidal ideation was relatively common, along with high levels of anger, demoralisation, and social isolation.

Although it is not possible to comment definitively on causation in a cross-sectional design, there was evidence of a strong association between high levels of exposure to PTEs (both deployment-related and across the lifespan) and current mental health. Number of deployments was a predictor only for depression, with peacekeepers deployed more than once having twice the risk of current depression. Although there was a tendency for participants from the Rwanda and Somalia deployments to report the highest rates of PTSD and GAD, those differences were not significant and there was no significant difference between deployments classified as ‘high’ or ‘low’ stress for any disorder. Mental health problems were, however, strongly associated with history of trauma exposure. Thus, it is not the number or type of deployments *per se* that are pathogenic, it is the actual experiences on those deployments that increases risk for subsequent disorder.

In summary, while nearly half of the participants appear to be coping well with little evidence of psychological dysfunction, around one quarter report moderate levels of mental ill health, with just over one quarter (around 30% of the whole sample) reporting more severe diagnosable problems. This level of psychiatric morbidity is only slightly below that of Australia’s Vietnam era veterans. The pattern of symptoms in this peacekeeper population is characterised by high levels of PTSD and substance abuse, with moderate levels of generalised anxiety and depression.

In terms of general health, although most peacekeepers reported that they were in good, very good, or excellent health, a substantial minority – nearly 35% – reported their general health to be fair or poor, and over half the sample reported specific physical health problems. As expected, the physical health findings varied with age: younger participants reported better physical health than older participants.

Reported health service use by the peacekeeper sample was high, with those reporting poor mental health especially likely to have used health services – over 80% had consulted a GP, 32% a psychiatrist, and 20% a psychologist. Only 17% of peacekeepers with a mental health condition had not seen any clinician or therapist in the previous three months. This level of service use is substantially higher than the general population; the NSMHWB revealed that only 28% of men with mental health problems had sought help. One explanation for this is the greater accessibility to healthcare provided to veterans through the Repatriation system, as well as recent efforts to raise awareness of mental health issues amongst veterans. It is also possible that the severity of the mental health problem is greater in peacekeepers compared with those in the general population. Satisfaction with health care was only moderate, with 41% indicating that they were dissatisfied. Those in poor health and those with a CIDI diagnosed mental health condition were more likely to be dissatisfied with their health care.

Consistent with the findings regarding mental and physical health, quality of life in the peacekeeper sample was generally inferior to that of the comparable civilian (NSMHWB) sample. Using a standard health economics approach, the estimated excess costs per case per annum are considerable at \$20,000 for those with one mental health condition, and \$37,000 for those with two or more mental health conditions. Based on the entire population of peacekeepers in Australia, the estimated excess cost of the health impact of peacekeeping was \$582 million per annum.

5. Study strengths and limitations

The design and implementation of this study is characterised by many strengths, including extensive consultation with key stakeholders (e.g., members of the Advisory Committee, the Department of Veterans' Affairs, the veteran community, and key researchers in the field from around Australia), careful subject sampling, a large sample size, best practice data collection strategies, and rigorous data cleaning and analysis procedures. Limitations included the fact that a substantial number of those who could have participated did not, the cross-sectional design, the need for retrospective reporting (especially of trauma exposure), the self-reporting nature of data, and the fact that it is not possible to determine the extent to which any outcomes are attributable to the peacekeeping deployment *per se* rather than to military service more generally.

6. Implications

The implications of the study findings are largely consistent with initiatives adopted by the ADF and DVA over the last decade in the area of post-deployment health. The fact that the rates of PTSD were high highlights the importance of assertively addressing this issue in combination with general mental health prevention and intervention strategies such as effective screening, early recognition, and easy early access to evidence-based care. While health care use is high, the exact nature of mental health services being provided to this population is unclear and a clinical audit to ensure that services are in line with best practice treatment guidelines may be warranted. The level of suicidality is of particular concern, and existing mental health and suicide prevention programs should be targeted at this group. Budgetary and service development projections should take the current findings into consideration.

1.0 BACKGROUND AND STUDY AIMS

1.1 The nature of peacekeeping

The United Nations (UN) Charter² signed in 1945 authorises peace operations under Chapters 6, 7 and 8. Chapter 6 authorises the UN to take action where a peace agreement is in place, with a focus on observation, prevention of hostilities, policing, and supporting peaceful interactions between disputing parties. This is a traditional peacekeeping role. Chapter 7 authorises the UN to take whatever action is needed in cases of threats to, or breaches of, the peace, as well as acts of aggression. This is often referred to as peace enforcement or peacemaking. Chapter 8 covers regional arrangements for settling disputes. Where settlements cannot be reached, the UN is authorised to take whatever enforcement action is necessary. Although these UN authorisations imply different kinds of interventions, there is no standard nomenclature to describe them. For the purposes of this report, 'peacekeeping' is the umbrella term used throughout to describe any such deployment. 'Peace-enforcement' is used to specifically describe a UN-authorised peace enforcement or peacemaking deployment as defined in Chapter 7 of the UN Charter.

1.2 Australia's involvement

Australia has made a substantial contribution to UN-authorised peacekeeping deployments. Since the end of World War II, Australia has contributed to 23 major UN peacekeeping operations worldwide, involving over 34,000 peacekeepers. These deployments are detailed in Table 1.1. Although Australia has contributed to non-UN deployments, such as Bougainville, the Solomon Islands, and Zimbabwe, those deployments are not a focus of this study. Table 1.1 shows that, of the 23 UN deployments to which Australia has contributed, 16 occurred post-1990, including Australian participation in six peace enforcement deployments. Thus, the last two decades have seen a substantial increase in the number and intensity of peacekeeping deployments.

² <http://www.un.org/en/documents/charter/> (Accessed 13 June 2013)

Table 1.1: UN-authorized peacekeeping deployments to which Australia has contributed (1946-2011) (b)

| Deployment | Type | Years | | Full name | UN/ Other code | Australian involvement | |
|--------------------|---------------------------------|-------|------|-------------------------------------------------------------------------------|-------------------|------------------------|--------|
| | | Start | End | | | Deployed | Killed |
| Israel/Palestine | Peacekeeping | 1948 | - | UN Truce Supervision Organization | UNTSO | 342 | 22 |
| Yemen | Peacekeeping | 1963 | 1964 | UN Yemen Observation Mission | UNYOM | 2 | 0 |
| Cyprus | Peacekeeping | 1964 | - | UN Peacekeeping Force in Cyprus | UNFICYP | 50 | 3 |
| India/Pakistan | Peacekeeping | 1965 | 1966 | UN India-Pakistan Observation Mission | UNIPOM | 4 | 0 |
| Israel/Egypt/Sinai | Peacekeeping | 1973 | 1979 | Second UN Emergency Force | UNEF II | 280 | 0 |
| Iran/Iraq | Peacekeeping | 1988 | 1991 | UN Iran-Iraq Military Observer Group | UNIIMOG | 96 | 0 |
| *Namibia | Peacekeeping | 1989 | 1990 | UN Transition Assistance Group | UNTAG | 613 | 0 |
| *Cambodia | Peace enforcement | 1991 | 1992 | UN Advance Mission in Cambodia | UNAMIC | 65 | 0 |
| *Cambodia | Peace enforcement/ Peacekeeping | 1992 | 1993 | UN Transitional Authority in Cambodia | UNTAC | 592 | 0 |
| *Somalia | Peace enforcement | 1992 | 1993 | UN Operation in Somalia I | UNSOM I/UNITAF | 1230 | 0 |
| Mozambique | Peacekeeping | 1992 | 1994 | UN Operation in Mozambique | ONUMOZ | 31 | 0 |
| *Somalia | Peacekeeping/ Peace enforcement | 1993 | 1995 | UN Operation in Somalia II | UNOSOM II | 250 | 0 |
| *Rwanda | Peacekeeping/ Peace enforcement | 1993 | 1996 | UN Assistance Mission for Rwanda | UNAMIR II | 600 | 0 |
| *Western Sahara | Peacekeeping | 1993 | - | UN Mission for the Reform in Western Sahara | MINURSO | 219 | 1 |
| Guatemala | Peacekeeping | 1997 | 1997 | UN Verification Mission in Guatemala | MINUGUA | 1 | 0 |
| Sierra Leone | Peacekeeping/ Peace enforcement | 1999 | 2005 | UN Mission in Sierra Leone | UNAMSIL | 20 | 0 |
| *East Timor | Peace enforcement | 1999 | 2000 | International Force in East Timor | INTERFET | 7,970 | 1 |
| *East Timor | Peacekeeping | 1999 | 2002 | UN Transitional Administration in East Timor | UNTAET | 2,090 | 0 |
| Ethiopia & Eritrea | Peace enforcement | 2000 | 2008 | UN Mission in Ethiopia and Eritrea | UNMEE | 16 | 0 |
| Afghanistan | Peace enforcement | 2002 | - | UN Assistance Mission in Afghanistan/ International Security Assistance Force | UNAMA (a) /ISAF | 1,550 | 29 |
| East Timor | Peacekeeping | 2002 | 2005 | UN Mission of Support in East Timor | UNMISSET | -13,000 | 0 |
| Iraq | Peace enforcement | 2004 | - | UN Assistance Mission for Iraq/ Multinational Force - Iraq | UNAMI (a) / MNF-I | >20,000 | 1 |
| Sudan | Peace enforcement | 2005 | - | UN Mission in the Sudan | UNMIS | 18 | |
| Timor-Leste | Peacekeeping | 2006 | - | UN Integrated Mission in Timor-Leste | UNMIT | | 1 |
| Darfur | Peace enforcement | 2007 | - | AU/UN Hybrid Operations in Darfur | UNAMID | 8 | 0 |
| South Sudan | Peace enforcement | 2011 | - | United Nations Mission in the Republic of South Sudan | UNMISS | | |

Notes

Sources: <http://www.un.org/> . Date accessed: 30/6/2010; <http://www.defence.gov.au/op> Date accessed: 3/10/2011; <http://www.peacekeepers.asn.au/> Date accessed: 3/10/2011

* = Study deployment.

(a) = Humanitarian deployment.

(b) = Current deployment figures accurate only to 2011

1.3 The nature of mental health problems

It is not the intention of this section to provide a detailed description of all mental health problems; the interested reader is referred to specialised texts for more information. Rather, the purpose is to provide a brief overview of key mental health concepts that were assessed as part of this study and that will be discussed in later chapters. An important distinction can be made between specific mental health disorders or conditions and more general mental health problems or 'constructs'. For example, the word 'depression' describes a construct characterised by negative mood and loss of pleasure. It can be considered as dimensional – from none or mild depression through to severe depression – and is often assessed using some kind of self-report symptom checklist. It is not a specific condition or disorder. Major depression and dysthymic disorder, on the other hand, are categorical diagnoses defined in the diagnostic manuals (such as DSM or ICD) and requiring a specific constellation of symptoms. This study examined both categorical diagnoses and dimensional constructs, allowing comparisons with studies that have used one or other of these approaches. The use of dimensional constructs in addition to categorical diagnoses also provides a broader picture of psychological health and wellbeing.

1.3.1 *Psychiatric diagnoses*

In terms of formal categorical diagnoses, the current study assessed the presence of four high prevalence conditions: major depression, posttraumatic stress disorder (PTSD), generalised anxiety disorder (GAD), and alcohol abuse/dependence. All of these were assessed using a structured interview. Detailed descriptions are available from the DSM-IV diagnostic manual and a brief description of each follows.

Major depression: Major depression is characterised by depressed mood and/or loss of interest in normal activities. To meet a diagnosis, the person also requires four or more of the following symptoms: appetite disturbance, sleep disturbance, psychomotor agitation or retardation, low energy, feelings of worthlessness or guilt, poor concentration, recurrent thoughts of death or suicide.

Posttraumatic stress disorder: In order to meet criteria for PTSD, the person must have experienced a powerful emotional reaction following a threat to the life or physical integrity of themselves or others. Symptoms are then required from each of three clusters: re-experiencing the trauma (e.g.,

intrusive memories, nightmares, flashbacks), avoidance and emotional numbing (e.g., active avoidance of reminders, withdrawal from significant others, flattened affect), and persistent hyperarousal (e.g., sleep disturbance, exaggerated startle, hypervigilance).

Generalised anxiety disorder: GAD is characterised by worry and apprehension about everyday events and problems, combined with persistent physical symptoms of anxiety (e.g., pounding heart, sweating, muscle tension, nausea).

Alcohol/substance abuse/dependence: Alcohol and other drug abuse is characterised by a pattern of use leading to significant impairment such as failure to fulfil major role obligations (e.g., work), repeated use in dangerous situations (e.g., driving), alcohol-related legal problems, or persistent interpersonal problems. Dependence requires additional indicators such as tolerance (the need for increasing amounts) and withdrawal (appearance of physical and/or psychological symptoms on cessation). In the current study, the primary focus in this area was use of alcohol, but marijuana, stimulants, and opioids were also assessed.

1.3.2 Other mental health and related constructs

Other (dimensional) mental health constructs were also assessed as part of the current study using self-report measures. (Further details of these constructs, including references, appear in the following chapter, and the measures are provided in Appendix 2.) These included:

General psychological wellbeing: A general construct of mental health and wellbeing covering symptoms such as worry, nervousness and restlessness, as well as feelings of hopelessness, sadness and worthlessness.

Anger: A common response to stress, especially in males, tapping into areas such as frequency, severity, and duration of anger.

Demoralisation: A construct related to depression, characterised by areas such as loss of a sense of purpose, feelings of guilt and regret, and discouragement.

Social isolation: Issues such as loneliness, relationships with others, and availability of emotional support.

Health-related quality of life: An indication of the extent to which health issues impact on the person's quality of life.

Posttraumatic growth: This construct taps into positive changes following trauma exposure in five core domains: relating to others, new possibilities, personal strength, spiritual change, and appreciation for life.

Full details of the structured interview and self-report measures used in this study are provided in the following chapter, with the complete questionnaire included at Appendix 2.

1.4 The mental health sequelae of peacekeeping operations

The increased operational tempo described in Section 1.2 above raises the question of potential mental health sequelae for Australian peacekeepers. It is worth noting at the outset that post-deployment studies suggest psychological adjustment following peacekeeping is generally good (21-27). For many of those deployed, the rewarding aspects of peacekeeping (e.g., being involved in humanitarian work) may lead to positive outcomes; indeed, research suggests that up to 75% of peacekeepers report some form of personal growth (28-32).

At the same time, however, peacekeeping can be a highly stressful experience. Some stressors can apply to any military deployment, such as separation from family and exposure to high physical threat to oneself or one's colleagues. Other stressors may be more specific to peacekeeping, such as role confusion, mission ambiguity, and moral complexity (e.g., being forbidden by 'rules of engagement' to intervene in the prevention of harm to civilians). Exposure to certain types of potentially traumatic events (PTEs), such as witnessing attacks and atrocities against civilians, or handling dead bodies of civilians, are likely to be more common in peacekeeping missions (33, 34).

A substantial body of overseas research suggests that mental health problems can develop following peacekeeping missions at rates comparable to those seen in combat deployments. Those studies have often reported a high incidence of mental health problems in returned peacekeepers, including alcohol and/or substance abuse in around 20% of participants (30, 35-38), significant anxiety symptoms in around 25% (22, 24, 26, 34, 39-41), depression symptoms in around 35% (20, 24, 29, 40-43), and probable PTSD in around 5% of participants (20, 28, 30, 35, 37, 38, 42-61).

Only a few Australian studies have explored the mental health sequelae of peacekeeping deployments. Ward (59), for example, in a small study of ADF personnel deployed to Somalia, reported that 28% suffered general psychological distress and 20% met criteria for probable PTSD at

15-months post-deployment. Hodson et al (62) tracked Australian peacekeepers deployed to Rwanda and reported that probable PTSD rose from 8% at the end of deployment to 15% at 36-month follow-up.

Regrettably, however, much of the research on peacekeeper veterans is methodologically poor, rendering the findings hard to interpret. Most studies, for example, collected data from convenience, rather than representative, samples. Participation rates were often low and many studies did not include any comparison group. Of those studies that did include a comparator group, many used inappropriate samples. In most studies, the data were collected shortly after deployment completion, with few conducting any long-term follow up of participants. In short, much previous research is hard to interpret, highlighting the need for a methodologically rigorous study to investigate mental health outcomes in this population (63).

1.5 Rationale for the current study

The mental health sequelae of military combat deployments are now widely accepted, with large reliable studies reporting significant psychiatric morbidity among various veteran groups including those deployed to the Korean War (64), Vietnam War (65, 66), the first Gulf War (67, 68), and the current Middle East conflicts (69). The economic costs of this disability are considerable in terms of health care, compensation, the criminal justice system, and lost productivity. The human costs are not limited to the veterans themselves, but extend to family members and, indeed, the broader community (70). It is clear that a better understanding of the psychiatric impact of military deployment is crucial to improve prevention, early recognition, and effective management of these cases.

As noted above, however, a comparable body of high quality research does not exist for military deployments of a peacekeeping nature. The little research that does exist is characterised by poor methodology, inadequate sampling, and an over-emphasis on anecdotal reports. The current study aimed to address the deficiencies in previous research by using a large, carefully selected sample with appropriate comparator groups.

1.6 Appropriate comparisons for the current study

It is clear from the above summary that previous research on peacekeeper mental health has produced widely varying results and has been of mixed quality, with few studies being of sufficient

quality to provide appropriate comparisons for the current research. In choosing studies against which to compare the current findings, therefore, a decision was taken to focus primarily on recent Australian studies since several strong datasets are available. (Comparisons with individual studies from overseas research, where appropriate, are made later in the Discussion chapter). Details of these studies, including appropriate references, appear in Chapter 2 and only a brief overview will be provided here.

First, a comparison with the general population is available from the National Survey of Mental Health and Wellbeing (NSMHWB) conducted by the Australian Bureau of Statistics (ABS) in 2007. As discussed in Chapter 2, a sub-sample of that population approximately matched to the current peacekeeper cohorts was selected. The NSMHWB provides a direct comparison for the interview data collected in the current study, as well as for one of the key dimensional measures of psychological distress. The prevalence rates of key conditions from the matched NSMHWB sample are reported where appropriate in later chapters.

Second, comparisons with deployed peacekeepers are available from the Deployed Health Studies Program conducted by the Centre for Military and Veterans' Health (CMVH). Two of those studies examined the East Timor (1999-2005) and Bougainville (1997-2003) deployments, with data collection for both occurring in 2008. Those studies used only self-report questionnaires and, unlike the other comparator groups reported here, did not use a structured diagnostic interview. Interestingly, both studies reported no significant differences in mental health (either PTSD or general psychological wellbeing) between deployed and comparison groups. There was a slightly higher rate of hazardous alcohol use among East Timor veterans compared to controls, but no difference in the Bougainville study. Those studies provide a direct comparison for some of the key self-report measures used in the current study.

A third study with which to compare the current findings is the Australian Gulf War Veterans Health Study (AGWVHS). That study of 1,456 predominantly Royal Australian Navy veterans of the 1991 Gulf War used a similar methodological approach to the current research, adopting both structured interview and self-report measures to collect data. That study found a prevalence of 5.1% for CIDI-diagnosed PTSD, 0.4% for GAD, 9% for major depression, and 4.3% for alcohol dependence and/or abuse.

The fourth, and potentially most valuable, body of data against which to compare the current results is the Australian Defence Force (ADF) Mental Health Prevalence and Wellbeing study published in 2010. That study, which used a similar methodology to the current research, provides a cross-sectional picture of mental health and wellbeing among currently serving personnel. While the average age of those participants is younger than the peacekeeper samples, the comparable methodology and shared ADF background of participants renders it a very useful comparator. That study reported rates of mental health problems comparable to those found in the general Australian population (22% had experienced a mental health disorder in the previous 12 months). The ADF study provides disorder rates for those who had ever deployed versus those who had never deployed; the former was used as the most appropriate comparison for the current study. PTSD was the most common disorder (8%), closely followed by depression (6%). Interestingly, there was no difference in mental health between personnel who had and had not deployed, although the nature of the deployment (i.e., severity of exposure) was a significant risk factor. The ADF Mental Health Prevalence and Wellbeing study provides a direct comparison for the interview and some of the self-report measures used in the current study.

Further details of the results of these comparator studies are reported in later chapters of this report. A final comparison in the current study was internal: results from those deployments defined as high stress (or 'warlike') were compared with those deployments defined as low stress (or 'non-warlike') – see Section 2.1.2 for details. Although, as discussed in the following chapter, this comparison needs to be interpreted cautiously, it does have the potential to provide some indication of the impact of traumatic exposure on mental health over and above any effects of a peacekeeping deployment in itself.

1.7 Aims of the current study

This study was designed to examine the mental health sequelae of peacekeeping in a sample of Australian peacekeepers 10-15 years after deployment completion. The primary aim of the study was to provide a profile of the long-term mental health adjustment of Australia's former peacekeepers. Secondary aims were to:

- (a) Provide a preliminary indication of the physical health of Australia's former peacekeepers

- (b) Examine the relationships between pre-deployment, deployment, and post-deployment stressors and current mental health
- (c) Explore health service utilisation and provide a preliminary estimate of the economic burden of mental health conditions in former peacekeepers.

The next chapter will describe the methodology employed to address the above study aims.

2.1 Study design

The study involved administering a questionnaire and interview, cross-sectionally, to randomly sampled Australian peacekeepers who had participated in one or more of seven UN-sanctioned deployments during the 1990s and early 2000s. The seven chosen deployments were those to which Australia had contributed relatively large contingents of peacekeepers and represented a range from low to high stress exposure.

2.1.1 Study deployments

The selected deployments were Namibia (1989-1990; UNTAG; N = 613 Australian peacekeepers), Western Sahara (1991-1994; MINURSO; N = 225), Cambodia (1991-1993; UNAMIC/UNTAC; N = 1,215), Rwanda (1994-1995; UNAMIR II; N = 638), Somalia (1992-1996; UNOSOM I/UNITAF/ UNOSOM II; N = 1,480), East Timor (1999; INTERFET; N = 7,970) and East Timor (1999-2002; UNTAET; N = 2,090). Basic details of these deployments are provided in Table 1.1.

There was a significant difference in current age between the samples due to the 13 year range across dates of the study deployments. Participants from the two East Timor missions were significantly younger than those deployed to Somalia, Western Sahara, Rwanda, and Cambodia. Participants deployed to Namibia were the oldest group overall (ANOVA, $F = 80.8$, $df = 6$, $p < 0.01$). There was also a significant difference between the deployments for gender, with fewer females deployed to Cambodia (3%), Namibia ($n = 0$), and Somalia (3%) than to the other deployments ($\chi^2 = 42.5$, $df = 6$, $p < 0.01$).

The ABS SEIFA (Socioeconomic Indicators for Australia) for socioeconomic disadvantage was calculated using participants' postcodes. Based on this criterion, a significant difference was observed between the deployments (ANOVA, $F = 6.7$, $df = 6$, $p < 0.01$). Participants deployed to Cambodia (SEIFA mean = 1,014; SD = 62.4) had a higher socio-economic status than those deployed to Somalia and Namibia (SEIFA mean = 994.1; SD = 59.7 and 995.7; SD = 3.2 respectively). The majority of participants lived in Queensland (41%), New South Wales (17%), and Victoria (16%).

2.1.2 High versus low stress deployments

All military deployments – both combat and peacekeeping – vary in the extent to which personnel are exposed to potentially traumatic events. As a means of exploring these differences on subsequent adjustment, the seven deployments selected for this study were divided into two groups: those which were most likely to have exposed personnel to high levels of stress and those in which exposure to PTEs was likely to have been low. This allocation was made on the basis of interviews with former senior ADF peacekeeper personnel, as well as a review of the available descriptive literature. It is recognised that the allocation to high and low stress deployments is somewhat arbitrary, and any comparisons should be interpreted with caution. Nevertheless, as noted later in Chapter 3, this allocation is supported by data demonstrating a significant difference in traumatic exposure between the two groups.

Four deployments were allocated to the high stress sample. It is widely accepted that the Rwanda and Somalia deployments were characterised by high levels of life threat and exposure to the death and suffering of others. The first of the East Timor deployments (INTERFET), defined as a peace enforcement mission, was reportedly considerably more stressful than the later UNTAET deployment, with frequent militia contacts and exposure to dead and severely injured civilians. Cambodia was a more variable deployment with both peace enforcement and standard peacekeeping roles, but was considered best allocated to the high stress group. Namibia, Western Sahara, and the second part of the East Timor deployment (UNTAET) were all classed as peacekeeping (not peacemaking or peace enforcement), and were considered best allocated to the low stress group. Deployments to Cambodia, East Timor (INTERFET), Rwanda, and Somalia comprised just under 70% of the current sample.

2.2 Participants: Sample and selection

Full details of the participants are provided in Chapter 3. This section describes the process of sampling and selection.

2.2.1 Sample size

To ensure sufficient power for comparisons of mental health syndromes between severe and less-severe deployments, the initial sample size calculation was based on the detection of relative risk

between cohorts (71) where the criterion was PTSD. From the literature it was assumed that 4% of low-stress deployment veterans (as defined above) would exhibit symptoms of PTSD, and that a relative risk (RR) of 2.00 for those on severe deployments was to be detected, assuming a test size of 0.05 and power of 0.80.

Based on previous experience, a participation rate of between 45-70% of those within scope was expected. The low estimate was based on participation rates reported in the CMVH East Timor study (37) and the high estimate from participation rates in two recent Australian veteran studies: the Gulf War Veterans' Health Study and the Pathways to Care Study (13, 72). To compensate for the possibility of participation at the low end of the response estimate, a conservative participation rate of 50% was predicted. Oversampling by 50% was therefore undertaken to ensure reaching the calculated sample size.

Under these assumptions, the rounded up sample size was 885 veterans from the severe deployments and 885 from the less-severe deployments, providing a base total of 1,770 participants. Given that veterans were deployed by cluster and often maintain lifelong friendships, to avoid reduced statistical power due to any possible clustering (73), the base sample was increased by 25% giving an initial sample to be contacted of 2,247 possible participants. These calculations revealed that, other than for East Timor, the only way to achieve the required sample size was to take censuses (i.e., all those deployed rather than a random sample) of the other deployments (see Table 1.1 for details of numbers on each deployment).

2.2.2 Participant selection

Eligible participants were peacekeepers deployed on any of the seven UN deployments described above. In order to avoid an excessive burden on participants, peacekeepers who were involved in other health studies at the time of data collection were excluded. That included those still serving in the ADF, since the Military Health Outcomes Program (MilHOP) was underway at the time (74, 75), as well as those who were sampled as part of the CMVH East Timor Health Study (37).

Deployment lists were drawn up by the Department of Veterans' Affairs (DVA) using data from the Allotment Lists (lists of deployed personnel) and other ADF records. These lists were then checked against ADF records for still-serving members and with the CMVH for participants who

participated in the East Timor Health Study. Any peacekeeper who had served on more than one of the selected deployments was classed as being part of their first recorded deployment. Since this process was carried out by DVA prior to participant lists being provided to the research team, it is not possible to comment on the numbers excluded because of participation in other studies. DVA then supplied the researchers with a de-identified list of potential participants. The researchers selected veterans within deployments to be approached (either random within strata selection or census) and returned the selected list back to DVA. Contact details were obtained by DVA from their records and from the Australian Electoral Commission for last known address. Since these records are updated regularly, this process also excluded those who had died. DVA then mailed potential participants who survived the entry and exclusion criteria to invite them to participate.

2.3 Procedures for data collection

2.3.1 Initial recruitment into the study

Once the sample had been selected as described above, the initial study package was sent out by DVA to all potential participants. The package, a copy of which is provided in Appendix 1, included:

- An introductory letter
- A \$5 voucher incentive
- The plain language statement
- A consent form
- Hotline contact details to the researchers for enquiries about the study
- Letters of endorsement from DVA and ex-service organisations (the Returned and Services' League of Australia (RSL), and the Australian Peacekeeper and Peacemaker Veterans' Association (APPVA))
- Contact details for a counselling service (should any respondent feel upset by completing the questionnaire)
- Contact details for the ethics committees of DVA, the University of Melbourne, and the ADF
- A pre-paid return envelope addressed to the research team at the University of Melbourne.

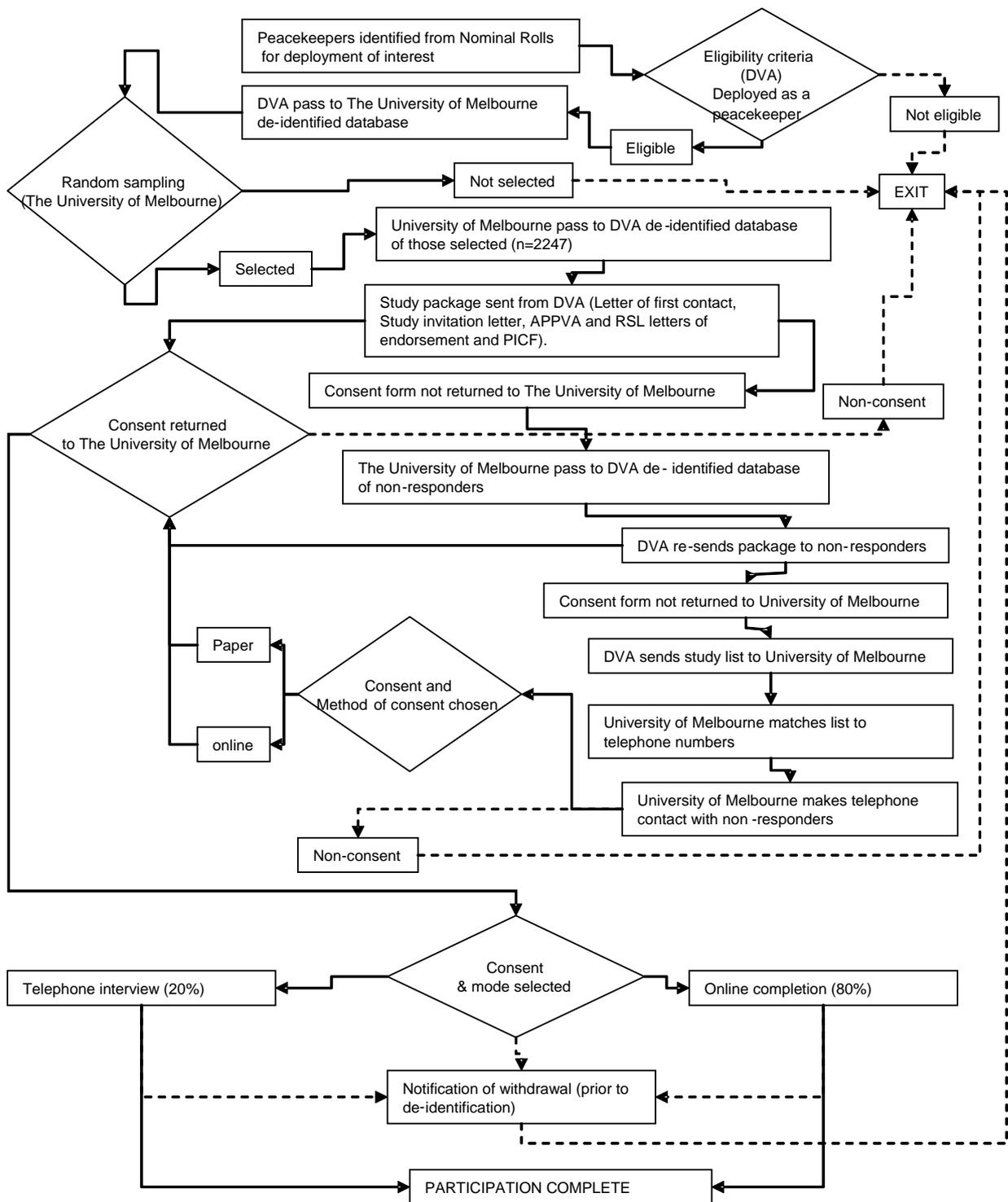
In view of the potential for compensation and confidentiality concerns, participants were reassured in the introductory letter that study participation would not affect entitlements in any way

and that personal details would not be released to DVA. The package included a return slip for those who chose not to participate.

If there was no response from the initial contact after one month, a first follow-up was undertaken. This involved re-sending the study invitation package, minus the \$5 voucher. For peacekeepers who did not respond to the first two mail outs, a third and final contact attempt was made by telephone and the veteran was invited into the study using a script developed by the study team. Any peacekeeper on the study list that did not have an identified telephone number received a third letter of invitation only. As part of the third contact, the option of completing consent online was offered.

Figure 2.1 shows a flowchart of these recruitment procedures. Details of the numbers of participants at each stage of recruitment appear in Chapter 3.

Figure 2.1: Flowchart of study recruitment and participation



2.3.2 Data collection

Participants were offered the choice of completing the study questionnaire either by telephone interview or online. Participants indicated their choice either by filling out the appropriate section on their returned consent form or when they filled out their online survey.

The online option was developed following the experience of the CMVH East Timor Defence Health Study (37), where around 80% of participants elected online completion (personal communication). The online survey was developed by insight4 (<http://www.insight4.com/>). Each peacekeeper who chose online completion was sent a unique ID (identification number) and password. The online survey was designed so that participants could log out during the survey if it became too tiring or stressful, logging back on later to resume the questionnaire from where they left it. Once each group of survey questions was completed, they were 'locked down' and the respondent could not go back to change a response.

Participants who chose a telephone interview were contacted by a research assistant to organise a time. During the interview, the research assistant read the questions and possible responses from the online computer screen and entered the participant's answers directly into the online version of the survey. If at any point the participant displayed signs of distress, the interview was suspended until the participant was able to continue or they elected to complete the remainder of the interview at a later time. Participants were reminded of contact details for counselling services.

Every effort was made to ensure that the completion rate for this study was optimised. The progress of responding participants was monitored via the administration screen of the online survey. Consenting participants who had not started the survey, or who had failed to progress over a two week period, were contacted by email or telephone. If a participant indicated that they were having trouble with a particular section they were offered the opportunity to complete that section with an interviewer.

To control for response set bias (76), the order in which the instruments were administered within the study questionnaire was systematically varied. Six 'data pack sorts' (i.e., the order in which instruments were administered) were created, and each sort was randomly allocated to participants.

All data were stored on a password protected server at The University of Melbourne and the data were accessible only by the principal researchers.

2.4 Comparator samples

It is tempting to assume that an appropriate comparison (or control) group is essential in a study of this kind in order to interpret the findings. If rates of illness in a non-exposed population are known, it is possible to determine the effect of exposure on the exposed population. It is, however, important to emphasise the caveat that it is almost impossible to find a meaningful matched sample with which to compare this study population. One possible comparator – at least in theory – is era veterans who were not deployed. In Australia's case, however, most members of the ADF were deployed in the 1990s or 2000s; the few who were not deployed would not be a comparable representative sample – these people were unusual in that they, unlike most of their colleagues, were not deployed. Thus, an era cohort for comparison is not only virtually impossible but would create a meaningless contrast.

In the current study, the basic prevalence rates are the most important outcome: how many of Australia's peacekeeping veterans are suffering significant mental health problems? It is these figures that will be used to drive strategic planning and service developments, rather than any estimate of whether they are higher or lower than some arbitrary comparison group. It is interesting, however, to compare rates with other samples if only to determine whether the current findings are 'out of range' from expected values. In order to do this, the four comparator samples introduced in Chapter 1 are reported in subsequent chapters whenever the same measure has been used. All of these samples have limitations as comparison groups (which is why the term 'comparator' rather than 'comparison' has been chosen). The samples are: (a) a non-military comparator from the general (non-military) population; (b) two peacekeeper samples from other studies (East Timor and Bougainville); (c) a sample of Australian Gulf War veterans; and (d) a sample of currently serving ADF personnel. Since the civilian sample is the only one that is matched to the peacekeeper sample, that is the only one with which external statistical comparisons will be made. The other comparison samples, like other deployment research from Australia and overseas, will be compared by observation only. Each of the three comparator samples will now be described.

2.4.1 National Survey of Mental Health and Wellbeing (NSMHWB)

In 1997 and 2007, the ABS, under the auspice of the Australian Government Department of Health and Ageing (DoHA), conducted large surveys to determine the prevalence of mental health conditions in the Australian population. In order to ensure comparability of results, these studies were designed in collaboration with the international group of researchers conducting the World Mental Health Surveys in many countries across the world. The primary source of data was a structured clinical interview administered by trained lay interviewers. In Australia, locally adapted versions of the Composite International Diagnostic Interview (CIDI) were used in the NSMHWB (77, 78). The 2007 NSMHWB involved a nationally representative, cross-sectional household survey carried out between August and December 2007, conducted by the ABS using the English language CIDI version 3.0 with men and women aged 18-85 years inclusive. The overall response rate was 60% (N = 8,841). A full description of the 2007 NSMHWB can be found at:

<http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/4326.0Explanatory%20Notes12007?opendocument&tabname=Notes&prodno=4326.0&issue=2007&num=&view> (Accessed 31 August 2011).

Rather than use the whole Australian population for comparison, a subsample of the national dataset was extracted to more closely resemble the study population. First, since the 2007 NSMHWB asked about participants' veteran status, these questions were used to exclude veterans from the proposed comparison group. Second, although the best way of selecting a comparison sample would be to match each person according to certain variables, confidentiality restrictions prohibited any attempt to match NSMHWB data with any list of specific individuals. Matching, therefore, was carried out at the aggregate level: aggregate variables of interest from the peacekeepers' data were matched with variables from the NSMHWB where these variables were collapsed to form suitable aggregates. The variables used were gender (male/female), age (5-year cohorts), relationship status (single/partnered/separated or divorced or widowed) and education attainment (primary/high/trade or TAFE/college or university degree). The NSMHWB database (excluding veterans) was searched for matching logical aggregate groups and group membership adjusted to achieve a 1:1 relationship with study peacekeepers through randomly sampling the necessary proportion to achieve similar sized

groups. This resulted in a comparison group matched for gender, age, education, and relationship status against which to compare study peacekeeper participants.

In interpreting comparisons between the study peacekeeper sample and this general population sample from the NSMHWB, it is important to bear in mind two additional caveats beyond the aggregate matching process described above. First, any differences between the samples may reflect not only peacekeeper deployments but also the military experience more broadly, since those who participated in the NSMHWB had not seen military service. The second caveat is the 'healthy soldier effect': members of the military are presumed to be healthier than their civilian counterparts due to medical screening at selection, greater access to and availability of health care whilst in the military, and the physical fitness required for service (79).

2.4.2 CMVH East Timor and Bougainville samples

Data from the CMVH Deployed Health Studies Program studies of East Timor (37) and Bougainville (80) veterans were used as a second comparison sample. These studies were retrospective, cross-sectional designs, and used some of the self-report measures adopted in the current research. Study participants were randomly selected from the nominal role for each deployment. In terms of those who completed the key measures of interest to the current study, the East Timor sample comprised 1,833 veterans (46% response rate), of whom most (89%) were male. Most were in the 30-39 (50%) or 40+ (36%) age groups, and 77% were Army (13% RAN, 10% RAAF). For just over half the sample, East Timor was their only deployment, 29% had been on one other deployment, and 16% had been on two or more other deployments. The Bougainville sample comprised 2,342 veterans (49% response rate), of whom most (87%) were male. Most were in the 30-39 (46%) or 40+ (47%) age groups, and 70% were Army (25% RAN, 5% RAAF). For just over one third of the sample, Bougainville was their only deployment, 37% had been on one other deployment, and 28% had been on two or more other deployments. Thus, these two samples comprised highly comparable groups of participants on key demographic and service variables. As discussed in subsequent chapters, they are also comparable to the current sample. Further details of these samples are available from the full reports at: <http://www.cmvh.org.au/index.html?page=120661>.

2.4.3 Australian Gulf War Veterans Health Study (AGWVHS)

The AGWVHS was designed to investigate whether ADF personnel who served in the Gulf War have a higher than expected rate of adverse physical and psychological health effects and, if so, whether these effects are associated with exposures and experiences that occurred in the Gulf War. The comparison group was randomly selected from members of the ADF who were eligible to be deployed to the Gulf War, but who were not deployed. Measures included several standardised questionnaires (some of which were the same as those used in the current research), as well as the CIDI and a physical health assessment. The final sample comprised 1,456 Gulf War veterans (81% of those eligible) and 1,588 (57%) comparison group members. More than 85% of Gulf War veterans and 70% of comparison group subjects were from the Navy, and approximately two thirds of participants were no longer serving members of the ADF. There were very few women in either participating group, representing less than 2.5% of all participants. (Further details are available from the main study report at

http://www.dva.gov.au/aboutDVA/publications/health_research/aus_gulf_war_vets/Pages/pdf%20table%20of%20contents.aspx).

2.4.4 (ADF) Mental Health Prevalence and Wellbeing Study sample

The primary goal of the ADF Mental Health Prevalence and Wellbeing Study (74) was to establish the baseline prevalence of mental disorder in the ADF. A two-phase design was used. In the first phase, ADF personnel (N=26,281) were surveyed using a self-report questionnaire. In the second phase, a subset of respondents (N=1,798) was interviewed, with priority given to those identified in Phase 1 as being more likely to have a mental health problem. The data were then weighted on the basis of gender, service, medical classification status, and deployment history to provide estimates of prevalence for the entire serving regular ADF. The questionnaire contained several measures used in the current study and the interview component used the CIDI (also used in the current study). Consistent with the broader ADF population, the Phase 1 sample was predominantly male (84%). Further details are available from the main study report (75) at: http://www.defence.gov.au/health/DMH/docs/MHPWS_report-Full_Report.pdf. That report quotes figures separately for ADF personnel who had ever been deployed and those who had never been deployed. After due consideration, it was decided to use the deployed sample for comparison with the

current data, since that group more closely resembles the peacekeeper sample, and there may be something atypical about those who had never deployed.

Table 2.1: Summary of study measures

| <i>Instrument</i> | <i>Abbreviation</i> | <i>Measures</i> | <i>Reference</i> |
|---------------------------------------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------|------------------|
| General questions | | | |
| Demographic questions | | Gender, age, education attainment, marital and employment status and family background | |
| Service history | | Details of all military deployments | |
| Health care service use | | Estimates of health service use | (1, 2) |
| Checklist of health conditions | | Self-report of diagnosed health conditions | (1, 2) |
| Standard SR measures | | | |
| <i>a) Mental health and physical health measures:</i> | | | |
| General Health Questionnaire-12 | GHQ-12 | General psychological health and wellbeing | (3) |
| Kessler-10 | K10 | General psychological health and wellbeing | (4) |
| Posttraumatic Check List - Civilian | PCL-C | Posttraumatic stress disorder symptoms based on the DSM-IV. | (5) |
| Short Form Health Survey Version 2 | SF-36V2 | Summary scores of physical and mental health | (6) |
| <i>b) Associated problems / issues:</i> | | | |
| Demoralization Scale | DS | Demoralization | (7) |
| Dimensions of Anger Reactions | DAR5 | Anger | (8) |
| Friendship Scale | FS | Social isolation | (9) |
| Post-Traumatic Growth Inventory | PGI | Personal growth as a result of deployment | (10, 11) |
| Assessment of Quality of Life | AQoL | Assesses health-related quality of life | (12) |
| Short Assessment of Patient Satisfaction Scale | SAPS | Satisfaction with health care | (13) |
| <i>c) Risk and protective factors</i> | | | |
| Life Events Checklist | LEC | Major life events experienced, witnessed or heard about. Where an event was endorsed, the event year was recorded | (14) |
| Traumatic Stress Exposure Scale – Revised Version 2 | TSES-R2 | Deployment stress exposure. Developed for use by Australian peacekeepers in East Timor | (10, 11) |
| Life Orientation Test - Revised | LOT-R | Measure of dispositional optimism | (15) |
| Composite International Diagnostic Interview (CIDI) Sections | | | |
| Posttraumatic stress disorder (PTSD) | | | |
| Major depressive episode (MDE) | | | |
| Generalised anxiety disorder (GAD) | | | |
| Alcohol and substance use | | | |
| Suicidality | | | (16, 17). |

2.5 Measures

Two types of measure were used: (a) a structured clinical interview, the Composite International Diagnostic Interview (CIDI) (17) was used to determine the prevalence of diagnosable mental conditions, as well as suicidal ideation and behaviour; and (b) self-report measures. A summary of the

study measures is provided in Table 2.1 and a complete copy of the study questionnaire can be found in Appendix 2.

2.5.1 Composite International Diagnostic Interview (CIDI)

The CIDI was developed from the WHO's Diagnostic Interview Schedule (DIS). The CIDI version current at the time of data collection was the third version (CIDI 3.0) (16). A modified Australian version was used in the 2007 NSMHWB (78) and, in the interests of compatibility, this version was used in the study. This enabled direct comparison with the aggregate matched sample from the 2007 NSMHWB described above. The CIDI provides diagnoses based on the criteria of both the WHO International Classifications of Disease (ICD) (81) and the American Psychiatric Association's (APA) Diagnostic and Statistical Manual (DSM) (82). In order to enable comparison with the NSMHWB, as well as with the ADF Mental Health Prevalence Study, ICD-10 diagnostic criteria were adopted for the current study. The CIDI provides prevalence rates for disorders present in the past 12 months. It also elicits the age of first symptom onset which was used in combination with the age of first deployment to calculate pre-deployment prevalence.

The CIDI is a very lengthy interview containing modules for the full spectrum of non-psychotic psychiatric disorders. In order to minimise the burden on respondents, only four diagnostic modules were administered: PTSD, GAD, MDE, and alcohol/substance abuse/dependence. (In addition to alcohol, the use of marijuana, stimulants, and opioids was explored briefly). Those modules were chosen because previous research with Australian veterans (66, 67) has identified these conditions as being likely to show elevated rates. The questions regarding suicidal ideation, planning, and attempt that appear in the CIDI were included also.

Although the ABS had developed a scoring algorithm for the 2007 NSMHWB CIDI, it has not been released. The scoring algorithms for the CIDI used in this study were therefore developed by adapting the algorithms developed for the World Mental Health Survey (see <http://www.hcp.med.harvard.edu/wmhcdi/about.php> (accessed 31 August 2011)) to the Australian CIDI version used in the NSMHWB.

2.5.2 Background information

In addition to the CIDI, participants were administered a questionnaire comprising several self-report measures. These measures fall into two groups, the first of which was background information on demographics, ADF service, health service use, and reported health problems.

2.5.2.1 Socio-demographic questions

Items comprised:

- a) Gender: male/female
- b) Age: both as a continuous variable in years and as a categorical variable with four levels: 20-39/40-49/50-59/≥60 years
- c) Country of birth: Since 91% of participants were born in Australia, for most analyses country of birth was coded into the three categories reported in the NSMHWB dataset:
 - i) Australia; ii) other English-speaking countries; iii) rest of the world
- d) Relationship status: single/partnered/separated or divorced/widowed
- e) Highest education level: primary/high school/trade or TAFE certificate/college or university
- f) Annual household income after taxation: classified to reflect Australian household incomes for 2009-10 (83): \$0-24,000/\$25-44,000/\$45-69,000/\$70-99,000/\$100,000-149,000/≥\$150,000
- g) Additional data were collected relating to social security or pension benefits, current labour force participation, and type of work performed. Current health status was probed with questions assessing any current illness, medication consumption, and whether the participant had a DVA health card (awarded for an accepted service-related disability).

2.5.2.2 Service history

The service history section of the questionnaire probed service branch (Army, Navy, Air Force), dates of military service, regular/reservist status, deployment history, physical and mental injuries during deployment, medical treatment for injuries, and current health consequent upon any injuries suffered during deployment.

2.5.2.3 Health care service use checklist

Based on the checklist used in the Pathways to Care study of Australian veterans (13), this checklist covered use of:

- a) Medical specialists (other than psychiatrists), psychiatrists, and general practitioners
- b) Allied health professionals (AHP) including community health centres, district or other community nurses, social worker, psychologist, other counsellor (e.g., marriage guidance counsellor), chiropractor, physiotherapist, occupational therapist, speech therapist, acupuncturist, and 'other'
- c) Alternative therapists (ALT), including acupuncturist, herbalist, naturopath, other therapist
- d) Prescribed and over-the-counter medications.

2.5.2.4 Health conditions

Twenty-seven health conditions were probed, based on the health conditions checklist used by the World Health Organization Quality of Life Group (84, 85). Derived from the ICD, this list represents the most commonly experienced health conditions. The conditions probed were allergies, amputation, arthritis, asthma, back pain, cancer, cardiovascular disease (angina, coronary, myocardial infarction, use of a cardiac pacemaker), depression, diabetes/high blood sugar, fatigue, headache/migraine, hypertension/high blood pressure, inflamed bowel or colitis, kidney disease, musculoskeletal problems, nervousness, neurological conditions (stroke, multiple sclerosis, muscular dystrophy), physical senses (hearing, smelling, tasting, vision), sleep disorder, thyroid, and ulcer. In addition, participants were asked if they had any other major health conditions.

2.5.3 Standardised self-report measures – mental and physical health

This part of the questionnaire comprised several established measures assessing a variety of psychological health and wellbeing constructs.

2.5.3.1 General Health Questionnaire (GHQ-12)

General psychological health and wellbeing was assessed with the 12-item version of the General Health Questionnaire (GHQ-12) (8). This measure assesses 12 areas of psychological functioning such as concentration, sleep, feeling unhappy, loss of confidence, and feeling worthless. Each item has four response levels (0,1,2,3) representing increasing levels of psychological distress. Although three different scoring methods are possible, the 'standard' scoring method which dichotomises items (0,0,1,1) and then computes a total (86), was used to provide comparability with other studies. In the present study, the Australian cut-points of 2/3 reported for general psychological distress were used (72,87,88). Test-retest reliability of the GHQ-12 has been reported as being 0.52 - 0.75 (89). In this study the internal reliability was Cronbach $\alpha = 0.92$.

2.5.3.2 K10

Given the uncertainties of the GHQ-12, and to be consistent with all three comparator samples chosen for the current study, the Kessler-10 (K10) was also administered. Like the GHQ, the K10 is a brief measure of general psychological health and wellbeing, developed initially as a screening measure (3,90). It consists of 10 items, each rated on a 1-5 scale, assessing symptoms such as feeling tired, hopeless, depressed, and worthless. Items are summed to provide a score range of 10-50. To provide comparability with other studies, scores were classified as low level of psychological distress (10-15), moderate distress (16-21), high distress (22-29), and very high distress (30-50). The internal reliability of the K10 has been reported to be between Cronbach $\alpha = 0.80-0.93$ (90-92). In this study Cronbach $\alpha = 0.95$.

2.5.3.3 PTSD Checklist (PCL)

Since PTSD is a core area of interest in this population, a self-report measure was included in addition to the categorical diagnosis provided by the CIDI. PTSD symptoms were assessed with the PTSD Checklist (PCL) (93, 94). The 17 items correspond to the DSM-IV criteria, with each rated on a five-point scale (1-5) to give a score range of 17 to 85. A score of 50 or more is widely accepted as a cut-off for probable PTSD and was used in the current study. (It is worth emphasising that the optimal cut-off will vary depending on the purpose for which the measure is to be used. The recent ADF MHPWBS reported that 29 on the PCL was the best for operational screening to identify possible PTSD with a low risk of missing positive cases, while 53 provided the most accurate estimate of the number of ADF personnel with diagnosable PTSD (74, 75). The reliability of the PCL has been previously reported to be in the range Cronbach $\alpha = 0.72-0.97$, with test-retest reliability = 0.43-0.96 (94, 95). In this study the internal reliability was Cronbach $\alpha = 0.97$.

2.5.3.4 SF-36 Version 2 health functioning

Health function status was assessed using the SF-36 Version 2 (SF-36V2 (9)). Although the SF-36V2 provides scores on eight subscales, only the two primary scales are reported here: the Physical Component Summary (PCS) and the Mental Component Summary (MCS). Lower scores indicate worse health, with each scale providing an indication of the degree to which physical or mental health issues interfere with functioning. The scoring of these two scales is complex, requiring differential weights for each item (Australian weights were used (96)) and the interested reader is referred to the

original text for more details (9). Scale scores are presented as T-scores, which are based on a population mean of 50 and a standard deviation (SD) of 10. The internal reliability of the SF-36V2 has been reported as Cronbach $\alpha = 0.84-0.94$ (97, 98); in this study $\alpha = 0.97$. Although the PCS and MCS provide an opportunity for comparisons with other populations, they are most valuable in answering questions relating to health economics.

Both the MCS and PCS were significantly skewed such that transformation to achieve normality was not possible. For multivariate analyses investigating the predictors of health both the MCS and PCS were dichotomised based on the literature reporting minimum and clinically important differences (99). Based on SF-36V2 T-scores (mean = 50, SD = 10), the MCS and PCS were dichotomised at 5 points below the population mean (i.e., at 45). Cases at or above this were deemed to be in normal health and cases below this were deemed to be in poor health.

2.5.4 Standardised self-report measures – associated problems

2.5.4.1 Demoralization Scale (DS)

Demoralisation is related to, but not the same as, depression (6). Although not a widely used concept in mental health research, it was included here to explore its particular relevance to the psychological impact of peacekeeping. The Demoralization Scale (DS) (6) comprises 24 items assessing purpose in life, losing one's role in life, feelings of guilt and regret, distress, discouragement and a loss of being able to cope. Items use a 5-point response scale. After reversal of five items, scoring is through simple summation giving a range of 0-96 where high scores represent high levels of demoralisation. Cut-points for the DS are 29/30, with scores of 30 or more indicating high levels of demoralisation. The internal reliability of the DS and its sub-scales has been reported to be between Cronbach $\alpha = 0.71-0.94$ (6). In the current study, Cronbach $\alpha = 0.97$.

2.5.4.2 Dimensions of Anger Reactions – 5 (DAR-5)

Problematic anger is common in military veterans, both in isolation and as an associated feature of PTSD or depression (100). Anger was assessed in this study with the short form of the Dimensions of Anger Reactions measure, the DAR-5 (1,2). Developed from the original DAR (101), the DAR-5 comprises five items assessing anger at people, anger intensity, anger duration, the desire for anger violence, and the impact of anger on relationships. Each item is scored from 0 to 5, so summative

scoring provides a range of 0 to 20, with higher scores indicating greater anger. No formal cut-points for the DAR-5 have been published. However, Hawthorne et al (2) validated DAR-5 scores against anger items from the CAPS (Clinician Administered PTSD Scale), STAXI (State Trait Anger Inventory) and PCL (PTSD Checklist) and arrived at the following classification: scores between 0 and 5 on the DAR-5 indicate no or very slight anger, 6-10 mild anger, 10-15 severe anger and ≥ 16 extreme anger. The internal reliability of the DAR-5 has been previously reported at Cronbach $\alpha = 0.88$ (2). In this study the reliability was Cronbach $\alpha = 0.91$.

2.5.4.3 *Friendship Scale (FS)*

Social isolation is a common associated feature of depression, PTSD, and some anxiety disorders. It was assessed in this study with the Friendship Scale (FS) (5). Developed from a systematic literature review this 6-item measure assesses the ease of relating to others, feeling isolated, having someone to share feelings with, finding it easy to get in touch with others, feeling separate from other people, and being alone and friendless. The timeframe is the past four weeks. There are two sub-scales assessing perceived social isolation and loneliness, each of three items (5). The FS classifies cases into five levels of social isolation: the very socially isolated (scores: 0-11), isolated (12-15), those with some social isolation (16-18), the socially connected (19-21), and the very socially connected (22-24). Australian population norms have been published and show 59% are very socially connected, 25% are socially connected, 9% experience some social isolation, 5% are socially isolated and 2% are very socially isolated (102). To identify the socially isolated, in this study FS scores are reported both as a scale scores (range 0-24) and using the classification system. The internal reliability in this study was Cronbach $\alpha = 0.90$.

2.5.4.4 *Posttraumatic Growth Inventory (PTGI)*

Although research in the trauma field has traditionally focussed on adverse psychological impact, there has been increasing interest in recent years on the potential for personal growth following adversity (103). In this study, personal growth following deployment was assessed with the Posttraumatic Growth Inventory (PTGI) (14). This 21-item scale comprises five scales assessing relating to others, new possibilities in life, personal strength, spiritual change, and greater appreciation of life. Scoring is by summation; high scores are indicative of personal growth. PTGI scores are presented in the literature as mean scores (14, 104, 105) and no cut-points to identify those with

posttraumatic growth have been identified. To identify the percentage of peacekeepers that had experienced posttraumatic growth in this study, the PTGI was dichotomised at 44.10. This cut-point was the mean score reported by Powell et al (105) for trauma survivors of the war in former Yugoslavia (1991-5). Scores below this were deemed to represent little posttraumatic growth and scores above this posttraumatic growth. The internal reliability of the PTGI has been reported as Cronbach α = 0.90-0.91 for the full scale, and 0.67-0.85 for the subscales (14, 106). Test-retest at 2-month follow-up was 0.71-0.78 (14, 106) and 0.37-0.74 for the subscales (14). In the present study the internal reliability was Cronbach α = 0.95.

2.5.4.5 Assessment of Quality of Life (AQoL)

Mental and physical ill-health can have a profound impact on social and occupational functioning, as well as on quality of life. Health-related quality of life (HRQoL) was assessed in this study by the Assessment of Quality of Life (AQoL) measure (12). This short multi-attribute utility (MAU) instrument was based on the World Health Organization's definition of health; it describes 'handicap' as distinct from impairment and disability (12).

The AQoL comprises 15 questions each with four response levels. The items are organised into five dimensions (illness, independent living, social relationships, physical senses and psychological wellbeing). The preference (utility) weights, which are used in health economics, were obtained using the time-trade off (TTO) method from a representative sample of the Australian population (107-109). The score range covers the health utility spectrum from 1.00 (best HRQoL state) to -0.04 (worst HRQoL state) where 0.00 is a death-equivalent state. The Australian population norm is 0.83 (SD=0.20) and the minimum important difference is 0.06 (110). The reliability of the AQoL was Cronbach α = 0.88.

2.5.4.6 Short Assessment of Patient Satisfaction Scale (SAPS)

Satisfaction with health care was assessed with the Short Assessment of Patient Satisfaction Scale (SAPS) (7). This 7-item scale assesses health care service access, health information, the clinician-patient relationship, participation in decision-making, satisfaction with health care, treatment outcomes, and overall satisfaction. Scoring is through summation, with higher scores indicating

greater levels of patient satisfaction. Internal reliability has been reported to be Cronbach $\alpha = 0.86$ (7). In the current study the reliability was Cronbach $\alpha = 0.81$.

2.5.5 Standardised self-report measures – potential risk and protective factors

2.5.5.1 Life Events Checklist (LEC)

Cumulative trauma is a significant contributing factor in the development of psychopathology and has been shown to powerfully interfere with recovery following traumatic exposure (111, 112). The experience of significant traumatic events was assessed in the current study by the Life Events Checklist (LEC; 17 items) (4). This was designed to elicit exposure to Criterion A events of PTSD (the 'stressor criterion') under DSM-IV. Since the interest here was in the cumulative effect of trauma exposure across the whole life span, the questions did not differentiate timing of the events. (Unfortunately, this approach precludes examination of whether these events occurred before, during, or after the index peacekeeping deployment). The items probe experience (happened to me, witnessed, or learned about it) of 16 Criterion A events; the final question asked about "any other stressful event or experience". Test-retest at one and four week follow-up provided kappa (κ) agreement levels between 0.32 and 1.00 (4, 113). Although internal reliability is sometimes reported, it is not a helpful concept in checklists of possible life event experiences.

2.5.5.2 Traumatic Stress Exposure Scale - Revision 2 (TSES-R2)

Since the stress of peacekeeping was a particular focus of this study, an additional measure of trauma exposure that related specifically to deployment was included. The TSES-R2 was developed for use by Australian peacekeepers in East Timor to assess deployment stress exposure (10, 11). The scale comprises three sub-scales: trauma to self, trauma to others not caused by self, and trauma to others caused by self. The 12 items inquire about events such as being in danger, exposure to dead bodies, and death or injury to a colleague or loved one. There are three ratings for each item: frequency of exposure, severity of response, and current response. Scoring is by simple summation, giving ranges from 0 (no exposure) to 26 for frequency of exposure, and 0 (no severe response/no enduring feelings) to 39 for response. As for the LEC, although internal reliability of the TSES-R2 scales has been reported, it is not a useful concept for life event checklists. The test-retest correlation at 1 month has been reported as 0.70-0.82 (11). No cut-points for the TSES-R2 frequency scale

appear to have been published. Therefore, TSES-R2 scores were quartiled such that ~25% of participants were in each quarter. The quartiled scores were 0-5/6-9/10-13/≥14 exposures. Participants completed the TSES-R2 with reference to their most recent deployment. (Unfortunately, this wording precludes definitive comment on whether this was the index peacekeeping deployment. However, since 75% of the sample had completed only one deployment, it would apply to the index deployment in most cases.)

2.5.5.3 Life Orientation Test – Revised (LOT-R)

Dispositional optimism is thought to be one predictor of resilience and posttraumatic growth following trauma exposure (114). The LOT-R (15) is a measure of dispositional optimism. It was included in this study as a possible predictor of current mental health. The LOT-R comprises 10 items, of which four are fillers and are not used in scoring. The six scoring items probe areas such as expecting the best, expecting things to not go my way, and expecting more good than bad things. Items are rated on a 5-point (0-4) scale, providing a score range from 0 to 24 with higher scores representing greater optimism. Scheier et al (15) reported that the mean LOT-R score among US college students was 14.3 (SD=4.28), while a traumatic brain injury sample provided a mean score of 12.6 (SD=5.2) (115). It has been proposed that suitable cut-points for delineating optimism and pessimism could be based on those forming the top and bottom 33% of respondents respectively (116); these cut-points were used in this study. The internal reliability of the LOT-R has been reported as Cronbach $\alpha = 0.78$ (15). In this study Cronbach $\alpha = 0.86$.

2.6 Data analysis

2.6.1 Data verification and missing data

Data verification was undertaken, including checks for keyboard errors, keyboard shift, and out of range responses.

There were three forms of missing data in this study: missing data due to non-response; missing data due to incomplete data collection; and missing data within completed questionnaires. Missing data due to non-response can bias a study's findings. For this reason, sampling bias was investigated through examining respondents/non-respondents as described in Chapter 3.

Missing data due to incomplete data collection was a function of participants' partial completion of the study questionnaire at the time of data collection closure (i.e., they had started the questionnaire but had not completed it – often after several reminders). The effect of partial completion is that the sample size available for any particular data analysis varied. For this reason, the numbers available for data analysis are always reported in the tables. The effect of partial completion on bias was investigated through examining completers/partial-completers as described in Chapter 3.

Missing data within completed questionnaires was assumed to be missing at random. Since most participants completed the questionnaire online, the rate of missing data was extremely low – the computer algorithm was designed to re-present any questions which had not been responded to. For all of the psychometric scales (described above), item-level missing data were imputed using horizontal mean imputation where the proportion of missing data was less than 30% of items within the scale. Missing demographic, health status, health service use, and CIDI data were not imputed and listwise deletion was used.

2.6.2 Participation bias

To investigate participation bias, all eligible and sampled peacekeepers were categorised into three groups: (i) completers (those who completed the study questionnaire); (ii) partial-completers (those who completed some of the study questionnaire); and (iii) non-responders (those who could not be contacted, those who never responded to the invitation to participate in the study, those who refused to participate, and those who provided consent but either did not start the questionnaire or who did not complete the CIDI component).

The ratio of completers to non-responders overall and between deployments, as well as between completers and non-completers by deployment, was examined using χ^2 . Both models were run twice, first with deployment as seven categories (to represent the seven deployments), and then as two categories to represent high and low stress deployments. Analysis of variance (ANOVA) was used to compare mean ages and socio-economic status of completers and non-participants. Age was also grouped dichotomously at less than 40 versus greater than 40 and analysed using χ^2 . The results of these analyses are reported in Chapter 3.

2.6.3 Response bias

Two tests of response bias were conducted. The first was to identify possible 'yea/nay-saying' or random response within each study instrument. The second was to investigate the response style of participants in online versus telephone interview.

To investigate response bias within instruments, the standard deviation of the first group of consecutive items was compared with that of the last group of consecutive items. A paired t-test was used from which Cohen's d effect size was calculated. The number of consecutive items depended on the length of the instrument. For the longer instruments a maximum of four items from the beginning and four items from the end were used. To investigate the reliability of instruments by mode of data collection (online versus telephone) and study cohort (peacekeepers versus comparators), the Hakstian-Whalen method of comparison was used where evidence of higher Cronbach α s is deemed indicative of response style bias (117,118).

Results of these analyses are reported in Chapter 3.

2.6.4 Significance levels and statistical analyses

The test size probability level was set at $\alpha \leq 0.05$ for a finding to be accepted as statistically significant. Although it is sometimes appropriate to adjust this level of significance (e.g., through applying a Bonferroni correction), an a priori decision was made not to do this in the current study. This was based on the recognition that rejecting findings deemed to be possible Type II errors risks missing important associations that may inform our ability to provide the best possible care to those who require it. Nevertheless, findings with significance levels less than 0.01 (i.e., those shown as 0.05 in this report) should be interpreted with caution.

Descriptive statistics were used to describe results and proportions are described as percentages. Categorical variables were examined using χ^2 ; where the assumptions were violated, the Fisher Exact Test was used instead. Kappa (κ) was used to assess the level of agreement between variables. After Landis and Koch (119), the following interpretations of κ were used: 0.00-0.20 was interpreted as slight agreement, 0.21-0.40 as fair, 0.41-0.60 moderate, 0.61-0.80 substantial, and 0.81-1.00 almost perfect agreement.

For scale scores, the data were checked for normality prior to data analysis. Normally distributed data were analysed using parametric tests (e.g., t-tests, ANOVA). Non-normally distributed data were transformed to approximate normality and parametric tests used for data analysis. In the interests of readability, however, the original untransformed scores are presented. This is indicated in the text. Where non-normally distributed scores were not amenable to transformation, they were analysed using non-parametric procedures which examine the ranks of participants' scores (e.g., the Kruskal-Wallis χ^2 test). These data are presented as medians and inter-quartile ranges (IQRs). The exception is the SF-36V2 scores which are presented as T-scores (120) as discussed above. Due to the fact that scores were highly skewed, statistical analyses of SF-36V2 data were carried out using non-parametric procedures, but means and SDs are presented in the interests of readability.

Potential predictors of mental health were explored for the CIDI-diagnosed conditions. For reasons of parsimony, these analyses were not conducted for the related constructs of psychological distress since these are largely a function of the primary mental health conditions. Predictive analyses were, however, conducted for posttraumatic growth, since this is a somewhat different construct. In order to explore potential predictors, univariate tests (chi-square, t-tests) were performed to explore the relationship between each of the possible predictors (see next section) and the relevant dependent variable. Significant predictors were then included in multivariable models utilising logistic regression. Stable logistic regression models require sample sizes based on the number of covariates in the model, the number of possible response options used by study participants, and the distribution of endorsements. We set the minimum expected cell size at 10 cases and all models were constructed using a forward stepwise procedure. Variables were then iteratively selected from each of the groups identified below and entered into or withdrawn from the logistic regression model until the most parsimonious model was reached consistent with the sample size requirements. Where these procedures led to models with fewer predictors than required by the sample size constraint, a second variable was selected from a group and entered into the model.

Statistics are reported to two decimal places. All analyses were carried out using SPSS Statistics Version 18 (121).

2.6.5 Predictor variables

In the above analyses, potential predictors comprised the following:

- a) **Demographic variables:** Marital status, age, employment, education, income, age at deployment, gender
- b) **Trauma exposure:** High versus low stress deployment, number of deployments, deployment-related exposure to PTEs, fear/horror at the time, lifetime PTEs
- c) **Physical health:** self-rated health, physical (PCS) scale of the SF-36
- d) **Disposition:** optimism/pessimism
- e) For alcohol use disorders and posttraumatic growth only, the presence of other CIDI-diagnosed mental health conditions (PTSD, GAD, depression) were included also.

It is important also to note what was not included. Some comparable research has investigated rank as a predictor of mental health outcome; although findings are variable, most research suggests that officers report lower rates of disorder than other ranks (e.g., (75)). This question, however, was not asked in the current study and it was therefore not possible to include rank as a predictor in this study. A related issue is that of service (Army, Navy, Air Force) which, again, is often included as a predictor in comparable studies. Like rank, the findings are often conflicting. We did not include service as a predictor in this study for two related reasons. First, as noted later in Section 3.4, service and deployment are highly related. Among our participants, the Namibia, Western Sahara, and UNTAET samples comprised only Army personnel, and there was only one non-Army participant in the INTERFET sample. The other two deployments included small but variable numbers of Navy and Air Force participants. Second, as noted in Section 3.4, the overall numbers of participants in each service were highly disparate, creating significant problems for the reliability of statistical analyses – 92% were Army, 4% Navy and 4% Air Force. Given these proportions, it would be meaningless to include service as a predictor of outcome.

As will be noted further at various points in subsequent chapters, these potential predictors of current mental health must be interpreted with great caution. Many (such as prior trauma exposure) rely on retrospective recall and, as such, have the potential to be influenced by current mental state. It is possible, for example, that people with current mental health problems will be more likely to report greater trauma histories; the extent to which this reflects reality rather than being a function of recall bias must remain a matter for speculation. Current demographic differences (e.g., marital status,

education) could be interpreted either as predictors of, or as a result of, mental health problems. They may also be influenced by deployment date, with the older participants from earlier deployments having more opportunity to marry or gain further education. In short, the cross sectional nature of this research – while common to many comparable studies – creates problems for teasing out cause and effect.

2.7 Ethics

This study was approved by the Australian Department of Veterans' Affairs Human Research Ethics Committee, the Australian Defence Force Human Research Ethics Committee and was registered with The University of Melbourne Human Research Ethics Committee. Copies of the ethics clearances from all three Committees are presented in Appendix 3.

2.7.1 Adverse events

During the data collection phase of the study there were two adverse events. The first adverse event involved a participant who was admitted to hospital with exacerbated PTSD symptoms some eight ten days after completing the study interview over the telephone. He was discharged a week later and no further issues were reported in the following six months. The second adverse event concerned an inappropriate email sent to 190 study participants by a research assistant. Two participants lodged complaints and reply emails were received from 25% of those who received the email. Letters of apology from the university were immediately forwarded to all recipients of the email. Both adverse events were notified to all three ethics committees.

3.0 PARTICIPANTS

This chapter reports on participation rates and explores issues relating to the generalisability of the study findings. It then goes on to describe the sample in terms of socio-demographic characteristics, deployment history, and exposure to potentially traumatic events. As discussed in Section 2.6.5, in interpreting data from this (and subsequent) chapters, it needs to be remembered that some apparent differences may not be a function of the peacekeeping deployment *per se*. For example, the simple fact that participants from the UNTAET deployment are younger than those from, say, Namibia or Cambodia, may explain some variance. The nature of the deployment – and, therefore, the type of personnel deployed – may explain some differences. For example, the profile of personnel on a primarily medical deployment (such as Rwanda) may be quite different to those on a primarily peace enforcement deployment (such as Somalia). In short, interpretation of differences across deployments requires caution.

3.1 Participation rate

Selection of participants is described in Chapter 2 (Section 2.2.2). A total of 2,247 peacekeepers were mailed the invitation package. One hundred and sixty-three were returned because the veteran was not known at the address, leaving 2,084 letters delivered to veterans. After three mail-outs/telephone calls, 600 peacekeepers were non-contactable, leaving 1,484 veterans in scope (66% of drawn names). Of those, 173 veterans refused participation (12% of those in scope) and consent to participate was received from 1,311 veterans (88% of those in scope). Of those who gave consent, 217 (15% of those in scope) did not proceed any further in the study and 27 (2%) withdrew from the study. The remainder (N=1,067) were full or partial completers: 1,004 completed the entire questionnaire (68% of those in scope); 42 (3%) cases partially completed the questionnaire but did not complete the CIDI component (i.e., questionnaire data exists for 1,046 cases, although the number is lower for some measures due to partial completion); 21 (1%) completed the CIDI but not all other parts of the questionnaire (i.e., CIDI data exists for 1,025 cases). The participation rate, based on those who were initially drawn, was calculated after Lynn et al (122) at 47.49%. The participation rate of those in scope was 71.90%.

3.2 Study generalisability

3.2.1 Non-response and partial completion

A summary of the representativeness of study participants can be found in Table 3.1. Study participants were significantly older than non-responders and were from a higher socio-economic status (SES) background. Somalia and East Timor deployments had significantly lower response rates than expected, whereas higher response rates were obtained from the deployments to Cambodia, Namibia and Western Sahara. Interestingly, the three deployments with the highest participation rates – Cambodia, Namibia and Western Sahara – were the three that had not been previously studied.

In addition to the data presented in Table 3.1, representativeness was examined by looking at participation status by deployment, comparing those who were non-contactable (including where study invitations were returned to either DVA or the researchers), those who refused to participate (including those who gave consent but never participated), those who partially completed the study questionnaire, and those who fully completed the study questionnaire.

Table 3.1: Analysis of representativeness of study participants (CIDI completers)

| | | <i>Status (a)</i> | | <i>Statistics</i> |
|-----------------------|---------------------|------------------------------------------|--------------------------------------|------------------------------------|
| | | <i>Study participant (N = 1,025)</i> | <i>Non-responder (N = 1,228)</i> | |
| Age | Mean (SD) in years | 46.5 ± 8.4 | 43.8 ± 6.8 | t = 8.43, df = 2,251, p < 0.01 (b) |
| Socio-economic status | SEIFA mean (SD) (c) | 1,006.4 ± 61.1 | 1,000.6 ± 60.4 | t = 2.24, df = 2,186, p = 0.03 (b) |
| Deployment | Cambodia | 295 | 267 | |
| | Namibia | 197 | 156 | |
| | Western Sahara | 39 | 38 | |
| | Somalia | 215 | 291 | |
| | Rwanda | 111 | 135 | |
| | ET INTERFET | 66 | 148 | |
| | ET UNTAET | 102 | 193 | $\chi^2 = 61.63, df = 6, p < 0.01$ |

Notes:

Based on examination of standardised residuals, cells in bold italic are the statistically significant cells.

a = Study participants refers to veterans who completed the study questionnaire; Non-responders refers to veterans who were either out of scope or who failed to complete the study questionnaire

b = independent t-test

c = Socio-economic Indicators for Australia, Index of Disadvantage

There was a significant difference between these four groups across deployments ($\chi^2 = 99.4, df = 18, p < 0.01$). The largest number of non-contactable peacekeepers was from deployments to Somalia and both East Timor deployments. There were more than expected completers from the deployments to Cambodia, Namibia and Western Sahara, although Cambodia and Namibia, along

with Somalia and East Timor (INTERFET), also had more than expected number of refusals. There were more than expected partial completers from Rwanda and East Timor (UNTAET). There was no significant difference between the high stress (Rwanda, Somalia, Cambodia and INTERFET) and low stress (Namibia, Western Sahara, and UNTAET) deployments for these four groups ($\chi^2 = 3.21$, $df = 3$, $p = 0.36$). The details are shown in Table 3.2.

Table 3.2: Response completion by deployment, percentages

| <i>N</i> | <i>Deployment status</i> | | | | | | |
|------------------------|--------------------------|----------------|---------------|------------------|----------------|-----------------|---------------|
| | <i>Cambodia</i> | <i>Namibia</i> | <i>Rwanda</i> | <i>W. Sahara</i> | <i>Somalia</i> | <i>INTERFET</i> | <i>UNTAET</i> |
| | <i>562</i> | <i>352</i> | <i>244</i> | <i>77</i> | <i>505</i> | <i>209</i> | <i>289</i> |
| Non-responders/RTS (a) | 26.3 | 23.3 | 33.6 | 28.3 | 36.6 | 46.4 | 49.5 |
| Refusals | 18.9 | 19.9 | 18 | 16.9 | 18.8 | 20.6 | 11.1 |
| Partial completers | 3.0 | 2.6 | 4.5 | 5.2 | 2.8 | 2.9 | 2.9 |
| Completers | 51.8 | 54.3 | 43.9 | 49.4 | 41.8 | 30.1 | 34.6 |

Notes:

Statistics: $\chi^2 = 99.4$, $df = 18$, $p < 0.01$. Based on examination of residuals, statistically significant cells marked in bold italic

a = RTS: Study invitation letter returned; address unknown

There was no significant difference between the four groups for gender ($\chi^2 = 1.93$, $df = 3$, $p = 0.59$) or for SES as measured by geographical location (SEIFA, ANOVA, $F = 2.15$, $df = 3$, $p = 0.09$). There was, however, an association between age and participation (ANOVA, $F = 59.6$, $df = 3$, $p < 0.01$). Non-contactable peacekeepers were the youngest group (mean age = 42.8 years, $SD = 6.6$), the non-starters and partial completers slightly older (45.4 years, $SD = 6.7$, and 45.5 years, $SD = 7.6$ respectively), and the full completers the oldest (47.7, $SD = 8.3$ years).

3.2.2 Bias response by questionnaire length

Response bias could occur where participants became fatigued by the end of the survey and responded differently than at the beginning (e.g., through giving the same response to each question or randomly answering questions) (123). To prevent this form of response bias, the study measures were prepared in six different sort orders (Study Pack A through F). The sort orders were randomly assigned to participants. Thus, response bias by questionnaire length was eliminated.

3.2.3 Questionnaire response bias

Two tests of response bias were conducted. The first test (response bias test) was to identify possible yea/nay-saying or random response within each study instrument. The second was to investigate the response style of participants.

Response bias within questionnaire measures was assessed by examination of changes in the standard deviation between the first and last four items of measures with similar response scales. Seven instruments with eight or more items with similar response scales for these items were included. The results were computed as Cohen's *d* effect sizes (124). Based on the standard classification of effect sizes, the instruments were grouped into those with little evidence of response bias ($d \sim 0.25$) and those with evidence of substantial response bias ($d \sim 0.80$). Instruments with small changes in the SD were the AQoL ($d = 0.29$; 95%CI = 0.27-0.32), GHQ-12 ($d = 0.39$; 95%CI = 0.37-0.41), LOT-R ($d = 0.09$; 95%CI = 0.05-0.12) and PCL ($d = 0.26$; 95%CI = 0.24-0.29). The two instruments with evidence of substantial response bias were the DS ($d = 1.74$; 95%CI = 1.72-1.77) and the PTGI ($d = 0.89$; 95%CI = 0.84-0.94). For the DS the bias was due to inconsistent responses in the second half of the measure; precisely why these should have occurred is unknown. For the PTGI there was a substantial increase in the standard deviation among the last four questions; these questions probed issues around life value. The change in standard deviations may, therefore, have reflected greater disagreement among veterans regarding their beliefs about life values rather than being evidence of response bias *per se*.

The second test investigated response style (i.e., whether there was a consistent orientation towards supplying endorsements (125)). Where such response styles exist they artificially increase the reliability of the measures (through reduction in the observed variance) which may have the effect of inflating mean scores or categories. To assess response style we calculated Cronbach α for all scale measures by administration mode (online completion versus telephone interview). We also examined Cronbach α for the two scales that were present in both the study dataset and the NSMHWB dataset. Our first hypothesis was that online completion would result in higher Cronbach α s than would be observed in the telephone interviews. This was based on research into computer-based data collection which shows that where several items are displayed on-screen simultaneously, respondents may use earlier endorsements as a guide for answering later questions (118). Table 3.3 shows that on

four of the 13 tests there was some evidence of response style bias. The instruments were the K10, PCL-C, PTGI, and TSES-R2. Overall, however, there was insufficient evidence to conclude that response style confounded the results due to different administration modes (online and telephone data collection).

Table 3.3: Response style: an analysis of online versus telephone data

| <i>Instrument</i> | <i>N. items</i> | <i>Mode of administration</i> | | | | <i>Statistics (a)</i> | |
|------------------------------------------|-----------------|-------------------------------|----------|------------------|----------|-----------------------|-------------------------|
| | | <i>Online</i> | | <i>Telephone</i> | | <i>M-statistic</i> | <i>1-tailed p-value</i> |
| | | <i>n</i> | <i>α</i> | <i>n</i> | <i>α</i> | | |
| AQoL | 12 | 924 | 0.88 | 84 | 0.86 | 0.79 | 0.37 |
| DAR-5 | 5 | 927 | 0.93 | 84 | 0.91 | <0.01 | 0.95 |
| Demoralization scale | 24 | 928 | 0.97 | 84 | 0.97 | 0.45 | 0.50 |
| Friendship scale | 6 | 945 | 0.90 | 84 | 0.90 | 0.03 | 0.86 |
| General health questionnaire-12 | 12 | 932 | 0.92 | 84 | 0.92 | 0.01 | 0.94 |
| K10 | 10 | 909 | 0.96 | 84 | 0.94 | 5.00 | 0.03 |
| Life events checklist | 15 | 925 | 0.74 | 84 | 0.71 | 0.43 | 0.51 |
| Life orientation test-R2 | 6 | 926 | 0.87 | 84 | 0.83 | 2.11 | 0.15 |
| Posttraumatic checklist-C | 17 | 923 | 0.97 | 84 | 0.95 | 8.06 | <0.01 |
| Posttraumatic growth inventory | 21 | 927 | 0.95 | 84 | 0.92 | 6.98 | 0.01 |
| SF36-V2 | 35 | 925 | 0.97 | 84 | 0.96 | 2.81 | 0.09 |
| Short assessment of patient satisfaction | 7 | 937 | 0.80 | 84 | 0.82 | 0.37 | 0.54 |
| Traumatic stress exposure scale | 12 | 930 | 0.82 | 84 | 0.72 | 5.99 | 0.01 |

Notes:

a = Hakstian-Whalen test

Our second hypothesis was that there would be higher Cronbach α s among the peacekeepers when compared with the matched NSMHWB cohort on the two questionnaire measures that were common to both. This hypothesis was developed from the observation that, for most of the study instruments, the Cronbach α s were higher than those reported in the literature (see Section 2.4.3). Cronbach α 's were compared using the Hakstian-Whalen test with 1-tailed p-values (117). Table 3.4 compares study peacekeepers with the matched NSMHWB cohort. There were significant differences on both measures, the K10 and AQoL, with the peacekeeper sample obtaining inflated Cronbach α s. These findings suggest the presence of response style bias among peacekeepers. The most likely explanation for these findings was that most participants were healthy and, therefore, they disproportionately endorsed responses at the healthy end of scales. Again, therefore, there was insufficient evidence to conclude that response style confounded the results.

Table 3.4: Response style: an analysis of peacekeepers with the matched NSMHWB cohort

| Instrument | Number of items | Study cohort | | | | M-statistic | 1-tailed p-value |
|------------|-----------------|--------------|----------|-------------|----------|-------------|------------------|
| | | Peacekeepers | | Comparators | | | |
| | | n | α | n | α | | |
| K10 | 10 | 993 | 0.95 | 1025 | 0.87 | 199.50 | <0.01 |
| AQoL | 12 | 1008 | 0.87 | 1025 | 0.77 | 74.71 | <0.01 |

Notes:

a = Hakstian-Whalen test

3.2.4 Missing data

Due to the construction of the online survey there was almost no missing data. The online survey was constructed to only allow participants to continue if they had completed the current section. Throughout the beta-testing phase of the survey this was checked to confirm that this part of the design had been successful. The only part of the survey open to misclassification of data was the open-ended text responses. Prior to analysis each one of these text boxes was examined, and if there was unusual data it was corrected or eliminated.

3.3 Demographic details of participants

The demographic details of participants are given in Table 3.5.

3.3.1 General demographic profile of study participants

The mean age of participants varied by deployment. Those deployed to Namibia were the oldest participants and those deployed to East Timor (INTERFET) the youngest (ANOVA, $F = 21.92$, $df = 6, 1060$, $p < 0.01$). This was to be expected as the deployments selected for this study covered a 13-year period. There was no difference in age between the high stress (Rwanda, Somalia, Cambodia and INTERFET) and low stress (Namibia, Western Sahara, UNTAET) deployments (t-test, $t = 1.12$, $df = 1,065$, $p = 0.25$). Study participants were overwhelmingly male (95%); excluding the missions to East Timor, there were very few deployed females. Even on the missions to East Timor, there were few females (6% for INTERFET and 8.4% for UNTAET). There was no significant differences in the proportion of females by high and low stress deployments ($\chi^2 = 1.54$, $df = 1$, $p < 0.01$).

Table 3.5: Demographic characteristics of study participants (b)

| Categories | | Deployment (a) | | | | | | | Total |
|--------------------------------|---------------------------|-----------------------------------|----------------|---------------|-----------------|----------------|----------------|---------------|-------|
| | | Cambodia 307 | Namibia 199 | Rwanda 118 | W. Sahara 41 | Somalia 224 | INTERFET 66 | UNTAET 107 | |
| N | | | | | | | | | |
| Age in years | Mean years | 46.8 | 50.1 | 48.1 | 47.6 | 46.1 | 40.7 | 40.3 | 46.5 |
| | SD | 6.9 | 7.3 | 9.5 | 7.0 | 7.4 | 8.1 | 8.4 | 8.4 |
| | Statistics | ANOVA, F=25.1, p<0.05 | | | | | | | |
| Age group (n (%)) | 0-39 | 10.1 | 1.1 | 18.6 | 15.0 | 20.7 | 49.3 | 57.9 | 19.5 |
| | 40-44 | 35.4 | 25.1 | 22.3 | 22.5 | 32.7 | 23.9 | 9.3 | 27.6 |
| | 45-49 | 23.6 | 28.8 | 24.6 | 27.5 | 15.2 | 14.9 | 12.1 | 21.2 |
| | 50-54 | 16.1 | 16.6 | 12.7 | 12.5 | 18.0 | 7.5 | 10.2 | 14.8 |
| | 55-59 | 8.8 | 15.5 | 7.6 | 17.5 | 7.4 | 0 | 4.7 | 9.0 |
| | 60+ | 5.2 | 12.8 | 13.6 | 5.0 | 6.0 | 4.5 | 5.6 | 7.8 |
| | Statistics | $\chi^2=241.27$, df=30, p < 0.01 | | | | | | | |
| Gender (n (%)) | Male | 95.8 | 100 | 89.0 | 92.7 | 97.7 | 94.0 | 91.6 | 95.5 |
| | Female | 4.2 | 0 | 11.0 | 7.3 | 2.3 | 6.0 | 8.4 | 4.5 |
| | Statistics | $\chi^2=28.29$, df=6, p < 0.01 | | | | | | | |
| Educational attainment (n (%)) | Primary school | 9.7 | 19.5 | 6.7 | 7.3 | 12 | 7.5 | 17.8 | 1.3 |
| | Trade certificate | 32.8 | 38 | 24.4 | 34.1 | 24.4 | 29.8 | 29.9 | 42.0 |
| | High school | 33.1 | 25.5 | 34.5 | 36.6 | 48.4 | 44.8 | 33.6 | 35.6 |
| | University/College degree | 24.4 | 17 | 34.5 | 22 | 15.1 | 17.9 | 18.7 | 21.1 |
| | Statistics | $\chi^2=62.80$, df=24, p < 0.01 | | | | | | | |
| Relationship | Single | 7.1 | 3 | 5 | 2.4 | 8.9 | 7.5 | 13.1 | 7.0 |
| | Married/de facto | 79.9 | 82.5 | 80.7 | 75.6 | 84.0 | 79.1 | 78.5 | 81.3 |
| | Divorced/separated | 13 | 14.5 | 14.3 | 22 | 7.1 | 13.4 | 8.4 | 11.7 |
| | Statistics | $\chi^2=24.9$, df=12, p =0.02 | | | | | | | |

Table 3.5: Demographic characteristics of study participants (b)

| Categories | | Deployment (a) | | | | | | Total | |
|-----------------------|----------------------------------|---------------------------------|----------------|---------------|-----------------|----------------|----------------|-------|---------------|
| | | Cambodia 307 | Namibia 199 | Rwanda 118 | W. Sahara 41 | Somalia 224 | INTERFET 66 | | UNTAET 107 |
| N | | | | | | | | | |
| Work status (Current) | Working full or part time | 76.9 | 78.9 | 63.6 | 78 | 68.3 | 84.8 | 80.4 | 74.9 |
| | Out of workforce | 1.6 | 2.5 | 7.6 | 7.3 | 4.9 | 1.5 | 6.5 | 4.9 |
| | Retired or on benefits | 18.2 | 18.6 | 28.8 | 14.6 | 26.8 | 13.6 | 13.1 | 20.2 |
| | Statistics | $\chi^2=26.7$, df=12, p < 0.01 | | | | | | | |
| Household income | \$0-\$24,999 | 3.0 | 4.3 | 4.3 | 7.7 | 4.7 | 7.8 | 1 | 4.0 |
| | \$25,000-49,999 | 12.1 | 13.4 | 10.4 | 2.6 | 14.9 | 6.3 | 14.4 | 12.2 |
| | \$50,000-\$74,999 | 24.3 | 24.7 | 24.3 | 25.6 | 22.8 | 21.9 | 31.7 | 24.7 |
| | \$75,000-\$99,999 | 18.0 | 23.1 | 17.4 | 30.8 | 21.9 | 26.6 | 15.4 | 20.4 |
| | \$100,000+ | 42.6 | 34.4 | 43.5 | 33.4 | 35.2 | 37.5 | 37.5 | 38.5 |
| Statistics | $\chi^2=27.24$, df=24, p = 0.29 | | | | | | | | |
| Pension status | Receiving benefits | 45.5 | 39.3 | 50.8 | 39.0 | 45.7 | 44.8 | 38.3 | 43.4 |
| | Not receiving benefits | 54.5 | 60.7 | 48.1 | 61.0 | 54.3 | 55.2 | 16.7 | 56.6 |
| | Statistics | $\chi^2=6.32$, df=6, p = 0.39 | | | | | | | |

Notes:

(a) = Percentages represent percentage of that deployment.

(b) = Includes only those peacekeepers who had completed the CIDJ

Most (78%) of the sample had completed either high school (35.6%) or a Trade/TAFE degree (42%) as their highest educational level. Participants from the low stress deployments were less likely to have a high school or university education as their highest level of education ($\chi^2 = 19.8$ df = 2, $p < 0.01$). The majority of participants were partnered (81%), with slightly more divorced/separated/widowed participants in the Namibia (15%) and Western Sahara (22%) samples and more single participants from Somalia (9%) and East Timor UNTAET (13%) ($\chi^2 = 24.9$, df = 12, $p = 0.02$). There was no difference in relationship status between the high and low stress deployments ($\chi^2 = 1.48$, df = 2, $p = 0.48$). The Rwanda and Somalia samples had the lowest employment levels (64% and 68% respectively) and the highest proportion of retirement/sickness benefits (29% and 27% respectively) ($\chi^2 = 26.7$, df = 12, $p < 0.01$). Despite both these deployments being in the high stress group, there was no difference in employment rates between the high and low stress samples ($\chi^2 = 5.5$, df = 2, $p = 0.07$). The most common household income bracket was \$70,000 to \$99,000 (27%) followed by the \$100,000 to \$149,000 bracket (21%) and there was no difference between deployments ($\chi^2 = 27.24$, df = 24, $p = 0.29$). There were differences in socio-economic location (SEIFA) between deployments (Kruskal-Wallis, $\chi^2 = 38.40$, df = 6, $p < 0.01$). The Namibia and Somalia samples were from lower SES backgrounds, while the Cambodia sample came from the highest SES background. The high stress deployment group had higher SEIFA scores than the low stress group (Kruskal-Wallis $\chi^2 = 4.33$, df = 1, $p = 0.04$).

Even though 75% of study peacekeepers were employed, 51.8% indicated that they were receiving some form of benefit. There was no difference for benefit status by deployments ($\chi^2 = 7.35$, df = 1, $p = 0.29$) or by stress group level ($\chi^2 = 2.31$, df = 1, $p = 0.13$).

3.4 Service and deployment history

The vast majority of participants (92%) were Army, with only 4% each from Navy and Air Force. In our sample, the Namibia, Western Sahara, and UNTAET deployments contained only Army, while all participants except one from the INTERFET deployment were Army. The Somalia sample comprised 13% Navy and 5% Air Force, and the Cambodia sample included 5% Navy and 6% Air Force.

The majority of respondents in this study had only been on one mission, although 7% of peacekeepers had been deployed on three or more missions (Table 3.6). The peacekeepers deployed

to Rwanda, Western Sahara, Somalia and East Timor were significantly more likely to have been deployed on two or more missions ($\chi^2 = 18.58$, $df = 6$, $p = 0.01$). Overall, participants who were deployed to the high stress missions were more likely to have been deployed multiple times ($\chi^2 = 5.66$, $df = 1$, $p = 0.02$). Participants who were deployed on more than one mission were more likely to be on a DVA pension ($\chi^2 = 8.27$, $df = 2$, $p = 0.02$).

Table 3.6: Summary of deployment history

| | | <i>Cambodia</i> | <i>Namibia</i> | <i>Rwanda</i> | <i>W. Sahara</i> | <i>Somalia</i> | <i>INTERFET</i> | <i>UNTAET</i> | <i>Total</i> |
|---------------------------------------|----|-----------------|----------------|---------------|------------------|----------------|-----------------|---------------|--------------|
| | | <i>306</i> | <i>198</i> | <i>117</i> | <i>41</i> | <i>224</i> | <i>66</i> | <i>106</i> | <i>1,058</i> |
| Number of times deployed | 1 | 75.8 | 83.3 | 65.8 | 68.3 | 70.1 | 65.2 | 72.6 | 73.6 |
| | 2 | 16.3 | 11.6 | 20.5 | 29.3 | 21.0 | 31.8 | 23.6 | 19.1 |
| | 3+ | 7.8 | 5.1 | 13.7 | 2.4 | 8.9 | 3.0 | 3.8 | 7.3 |
| $\chi^2=35.04$, $df=12$, $p < 0.01$ | | | | | | | | | |
| Number of study deployments | 1 | 86.6 | 94.4 | 77.8 | 82.5 | 80.8 | 96.9 | 94.0 | 87.0 |
| | 2+ | 13.4 | 5.6 | 22.2 | 17.5 | 19.2 | 3.1 | 6.0 | 13.0 |
| $\chi^2=36.80$, $df=6$, $p < 0.01$ | | | | | | | | | |

Notes:

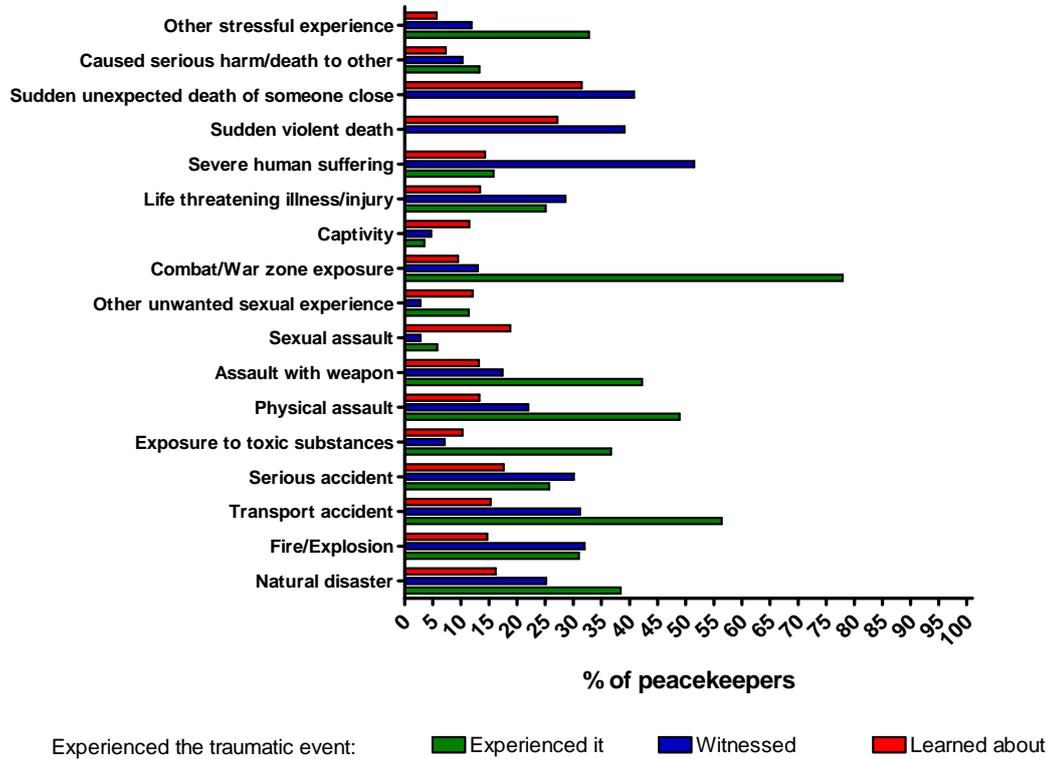
Based on examination of residuals, statistically significant cells marked in *bold*

3.5 Trauma exposure

3.5.1 Traumatic life events exposure

Lifetime traumatic events exposure was assessed with the Life Events Checklist (LEC). Figure 3.1 shows the range of events and the proportion of peacekeepers that experienced, witnessed, or heard about each event. As might be expected, the most commonly experienced event in the current sample was being involved in combat or having a war zone experience (77.9%), followed by a transport accident (56.4%), a physical assault (48.9%), assault with a weapon (42.2%), and exposure to a toxic substance (36.7%). The most commonly witnessed events were exposure to severe human suffering (51.5%), the sudden unexpected death of someone close (40.8%), and witnessing sudden violent death (39.1%). Commonly reported potentially traumatic events which were learned about were the sudden unexpected death of someone close (31.5%) and sudden violent death (27.2%).

Figure 3.1: Lifetime exposure to traumatic events, percentages



Of the comparator groups, the ADF Mental Health Prevalence and Wellbeing Study was the only one to ask a similar question (i.e., not specifically deployment events) and that study did not break responses down into the three exposure options. Nevertheless, some cautious comparisons are possible, bearing in mind that the current sample is older and has therefore had more time to be exposed. The ADF most commonly reported events (apart from deployment itself) were similar to the current sample, albeit at lower rates: exposure to injury/death of others (44%), unexpected death of someone close (36%), life threatening automobile accident (27%), and assault with a weapon (26%).

The mean number of lifetime events by deployment is shown in Table 3.7. Overall, there was a difference between the high stress and low stress groups (Kruskal-Wallis $\chi^2 = 7.66$, $df = 1$, $p < 0.01$), although this difference was explained by the two deployments at the extremes: Western Sahara (4.3 events) and Somalia (5.7 events; Kruskal-Wallis $\chi^2 = 16.21$, $df = 6$, $p = 0.01$). There was also a difference between the high and low stress deployment groups on number of events witnessed (3.88 versus 3.35 respectively; Kruskal-Wallis $\chi^2 = 8.84$, $df = 1$, $p < 0.01$), but no difference between the individual deployments (Kruskal-Wallis $\chi^2 = 12.86$, $df = 6$, $p = 0.05$). For events that were “heard

about”, there was no difference between the deployments (Kruskal-Wallis $\chi^2 = 0.02$, $df = 1$, $p = 0.89$) or between high/low stress deployment groups (Kruskal-Wallis $\chi^2 = 9.75$, $df = 6$, $p = 0.14$).

Table 3.7: Summary of lifetime trauma exposure by deployment (Life Events Checklist)

| <i>LEC</i> | | <i>Cambodia</i> | <i>Namibia</i> | <i>Rwanda</i> | <i>W. Sahara</i> | <i>Somalia</i> | <i>INTERFET</i> | <i>UNTAET</i> | | <i>Total</i> |
|----------------|------|-----------------|----------------|---------------|------------------|----------------|-----------------|---------------|-----|--------------|
| | | <i>292</i> | <i>191</i> | <i>109</i> | <i>38</i> | <i>213</i> | <i>64</i> | <i>102</i> | | <i>1009</i> |
| Happened to me | Mean | 5.11 | 4.75 | 5.54 | 4.39 | 5.69 | 4.64 | 4.75 | (a) | 5.12 |
| | SD | 2.95 | 3.13 | 3.53 | 3.31 | 2.88 | 3.24 | 2.74 | | 3.07 |
| Witnessed it | Mean | 3.86 | 3.41 | 3.70 | 2.97 | 4.13 | 3.42 | 3.38 | (b) | 3.71 |
| | SD | 3.14 | 3.16 | 2.91 | 2.33 | 3.08 | 3.00 | 3.02 | | 3.07 |
| Heard about it | Mean | 2.80 | 2.71 | 2.12 | 2.50 | 2.31 | 2.38 | 2.30 | (c) | 2.52 |
| | SD | 3.28 | 3.15 | 3.06 | 2.75 | 2.99 | 2.59 | 2.92 | | 3.08 |

Notes:

(a) Statistics: Kruskal-Wallis $\chi^2 = 16.21$, $df = 6$, $p = 0.03$

(b) Statistics: Kruskal-Wallis $\chi^2 = 12.86$, $df = 6$, $p = 0.05$

(c) Statistics: Kruskal-Wallis $\chi^2 = 9.75$, $df = 6$, $p = 0.14$

The number of events experienced significantly increased by number of deployments (1, 2 or 3-6 deployments, Kruskal-Wallis $\chi^2 = 16.40$, $df = 2$, $p < 0.01$), although this finding was explained by a significant difference between one and more than one deployment. The number of deployments a peacekeeper had been on was not significantly associated with the number of events witnessed (Kruskal-Wallis $\chi^2 = 5.97$, $df = 2$, $p = 0.05$) or heard about (Kruskal-Wallis $\chi^2 = 0.22$, $df = 2$, $p = 0.90$).

3.5.2 Trauma exposure on deployment: TSES-R2 findings

Endorsements of the 12 defined potentially traumatic events (PTEs) probed by the Traumatic Stress Exposure Scale – Revision 2 (TSES-R2) are shown in Figure 4.2. The most commonly endorsed events were danger of being injured (reported by 82.9% of participants), danger of being killed (76.6%), seeing dead bodies (77.9%), witnessing degradation and misery (71.8%) and hearing of a friend or co-worker being injured or killed (64.1%). The least reported events were being present when a loved one was killed or injured (8.7%), causing the death of another person (16.5%), and causing injuring to another person (19.7%).

Most participants reported being exposed either to particular events multiple times or to multiple PTEs. The summed scores of the TSES-R2 provide a measure of cumulative exposure to

PTEs, as well as the associated fear and/or horror at the time of the event and currently. Details of this cumulative exposure are provided in Table 3.8.

Table 3.8: Traumatic stress exposure assessed by the Traumatic Stress Exposure Scale – R2, on deployment, by deployment

| <i>TSES-R2</i> | | <i>Cambodia</i> | <i>Namibia</i> | <i>Rwanda</i> | <i>W. Sahara</i> | <i>Somalia</i> | <i>INTERFET</i> | <i>UNTAET</i> | <i>Total</i> |
|--------------------------------|------|-----------------|----------------|---------------|------------------|----------------|-----------------|---------------|--------------|
| | | <i>293</i> | <i>193</i> | <i>110</i> | <i>38</i> | <i>214</i> | <i>65</i> | <i>101</i> | <i>1,009</i> |
| Frequency | Mean | 9.43 | 8.03 | 11.51 | 6.55 | 11.44 | 8.14 | 7.37 | (a) 9.42 |
| | SD | 4.83 | 4.91 | 5.09 | 5.16 | 4.81 | 5.49 | 4.81 | 5.16 |
| Fear and/or horror at the time | Mean | 9.00 | 7.81 | 10.92 | 7.61 | 10.84 | 7.58 | 6.09 | (b) 8.97 |
| | SD | 6.38 | 5.67 | 6.78 | 7.35 | 6.85 | 6.04 | 5.09 | 6.48 |
| Fear and/or horror now | Mean | 5.56 | 4.70 | 8.54 | 5.21 | 8.21 | 3.68 | 4.43 | (c) 6.07 |
| | SD | 6.54 | 5.54 | 8.09 | 8.11 | 8.29 | 4.87 | 5.44 | 7.03 |

Notes:

(a) Statistics: Kruskal-Wallis $\chi^2 = 95.28$, $df = 6$, $p < 0.01$

(b) Statistics: Kruskal-Wallis $\chi^2 = 59.89$, $df = 6$, $p < 0.01$

(c) Statistics: Kruskal-Wallis $\chi^2 = 47.17$, $df = 6$, $p < 0.01$

Participants who were deployed to the high stress missions were more likely to endorse a greater frequency of deployment-related PTEs overall (10.27, SD = 5.1 versus 7.66, SD = 4.92; Kruskal-Wallis $\chi^2 = 57.46$, $df = 1$, $p < 0.01$). There were also significant differences by deployment, with those deployed to Somalia (11.4 events) and Rwanda (11.5) endorsing the highest number (Kruskal-Wallis $\chi^2 = 95.28$, $df = 6$, $p < 0.01$). The same pattern was observed for the measures of fear and/or horror associated with the exposures at the time (by deployment, Kruskal-Wallis $\chi^2 = 59.89$, $df = 6$, $p < 0.01$) and currently (by deployment, Kruskal-Wallis $\chi^2 = 47.17$, $df = 6$, $p < 0.01$). As expected, the frequency of PTE endorsement significantly increased with the number of missions. Participants deployed on one mission reported a mean of 9.11 (SD = 5.02) PTEs compared to 10.27 (SD = 5.45) for peacekeepers deployed on two or more missions (Kruskal-Wallis $\chi^2 = 9.99$, $df = 2$, $p = 0.01$). Interestingly, this was not observed with fear and/or horror experienced at the time (Kruskal-Wallis $\chi^2 = 4.35$, $df = 2$, $p = 0.11$), but was observed with current fear and/or horror associated with the events (Kruskal-Wallis $\chi^2 = 7.20$, $df = 2$, $p = 0.03$).

The event that most caused fear and/or horror at the time was hearing of a loved one who had been injured or killed (97% of those who endorsed the item) or being present when a loved one had been injured or killed (98%) – but it should be noted that these events were rarely endorsed (22% and

9% respectively). Of the more common exposures, fear/horror at the time was commonly associated with being witness to human degradation and misery on a large scale (93%), being present when a close friend or co-worker had been injured or killed (92%), believing that your actions or inaction resulted in someone being seriously injured (92%), hearing of a close friend or co-worker who had been injured or killed (91%), and believing your actions or inaction resulted in someone being killed (91%). Current feelings of fear/horror associated with the event were less frequent, but nevertheless still relatively common: believing that your actions or inaction resulted in someone being seriously injured or killed (88%) and being present when a loved one had been injured or killed (83%). Finally, of those who reported being in danger of being injured – one of the most commonly endorsed PTEs – 53% reported having current reactions of fear/horror associated with that experience.

3.6 Summary

The participation rate of those in scope for the current study was very respectable at 72% (i.e., of those who could be contacted); this compares favourably with the other research on military populations (combat and peacekeepers) discussed in Chapter 1. Those who participated were likely to be older, and more likely to be from deployments to Cambodia, Namibia and Western Sahara, than non-participants. The sample was predominantly male (95%), with an average age of 46 years, and 78% had completed either high school or a trade/TAFE qualification. Most (81%) were partnered, and 75% were working at the time of the study. Three quarters (74%) had only ever been deployed on one mission and just 7% had served on three or more missions. Nearly half (48%) reported receiving some form of DVA benefit, with 22% holding a DVA Gold Card and 28% holding a DVA White Card, while 4% were receiving a benefit from another agency. Participants reported high rates of exposure to PTEs, both deployment-related events and more broadly in terms of lifetime exposure. For many, these events were still associated with feelings of fear and/or horror.

The next chapter goes on to discuss the primary focus of the current study – the mental health status of Australia's peacekeepers.

This chapter reports the prevalence of pre-deployment and current (12-month) mental health conditions assessed using the CIDI. It also reports on current levels of several associated constructs of mental health and wellbeing.

4.1 Pre-deployment mental health

Pre-deployment mental health status is important in understanding the impact of peacekeeping deployments, facilitating the interpretation of current mental health status. An estimate of pre-deployment mental health was established by comparing the reported ages of first onset for the various mental health conditions to the age at first deployment. (Age of symptom onset was only available for the CIDI sections of the questionnaire). Since age of military enlistment was not available, it is not possible to comment on whether these pre-deployment mental health problems occurred pre-enlistment or during the period of military service prior to the peacekeeping deployment in question. The NSMHWB was used as a comparator by specifying age of onset in that sample as 26 years, which was the median age of the peacekeepers' first deployment (26.0 years). The retrospective nature of these symptom onset data (both peacekeeper and civilian), as well as the imprecision regarding onset dates relative to military service, suggest that they should be interpreted cautiously. Nevertheless, they inform our understanding of pre-deployment vulnerability. Table 4.1 shows the pre-deployment prevalence of mental health disorders in the various peacekeeping samples, along with the NSMHWB comparator sample.

As shown in Table 4.1, the prevalence of mental health disorders pre-deployment was very low – significantly lower in PTSD, major depression, and GAD than an age-matched civilian cohort (NSMHWB). Notwithstanding the caveats to interpretation described above, this is not surprising. The peacekeeper sample had undergone fitness for duty checks both at recruitment and at regular intervals during their service – they would be expected to have low rates of both physical and mental health conditions at that point in their careers. Of interest, however, is the finding that alcohol abuse and dependence levels were somewhat higher among peacekeepers than in the civilian sample.

Table 4.1: Pre-deployment mental health of participants by mental health condition, percentages

| | <i>Deployment</i> | | | | | | | <i>Total, civilian comparison</i> | | | |
|--------------------|-------------------|----------------|---------------|------------------|----------------|-----------------|---------------|-----------------------------------|---------------|------|-----|
| | <i>Cambodia</i> | <i>Namibia</i> | <i>Rwanda</i> | <i>W. Sahara</i> | <i>Somalia</i> | <i>INTERFET</i> | <i>UNTAET</i> | <i>Peacekeepers</i> | <i>NSMHWB</i> | | |
| <i>N</i> | 295 | 197 | 111 | 39 | 215 | 66 | 102 | 1,025 | 1,025 | | |
| PTSD | 1.7 | 3.6 | 6.3 | 2.6 | 1.4 | 3.0 | 2.9 | (a) | 2.7 | 6.1 | (f) |
| GAD | 1.0 | 0.5 | 1.8 | 0.0 | 1.4 | 0.0 | 2.0 | (b) | 1.1 | 3.9 | (g) |
| Depression | 1.0 | 1.0 | 1.8 | 2.6 | 0.5 | 3.0 | 2.0 | (c) | 1.3 | 5.6 | (h) |
| Alcohol Abuse | 30.2 | 42.6 | 28.8 | 30.8 | 35.8 | 30.3 | 41.1 | (d) | 34.6 | 29.5 | (i) |
| Alcohol dependence | 7.1 | 12.6 | 8.1 | 7.8 | 8.4 | 7.6 | 7.8 | (e) | 8.7 | 3.5 | (j) |

Notes:

Based on median age of the peacekeeper deployment age (26)

Based on examination of residuals, statistically significant cells marked in *bold*

Statistics

| | | | |
|-----|------------------------------------|-----|-------------------------------|
| (a) | Fisher Exact Test = 2.83, p = 0.81 | (f) | $\chi^2=16.91$, df=1, p<0.01 |
| (b) | Fisher Exact test=5.45, p=0.39 | (g) | $\chi^2=28.64$, df=1, p<0.01 |
| (c) | Fisher Exact test = 8.03, p=0.19 | (h) | $\chi^2=14.09$, df=1, p<0.01 |
| (d) | $\chi^2=12.16$, df=6, p=0.06 | (i) | $\chi^2=6.29$, df=1, p=0.01 |
| (e) | $\chi^2=5.21$, df=6, p=0.52 | (j) | $\chi^2=23.93$, df=1, p<0.01 |

The mean age among peacekeepers of first drinking 12 or more standard drinks per year was 17.3 (SD = 2.5) years, which was the same for the comparators (17.4 years, SD = 4.6, $t = -0.63$, $df = 1,915$, $p = 0.53$). Thus, it appears that problem drinking developed between the age of 17 and the age of first deployment, possibly a reflection of the military sub-culture of the time.

4.2 The prevalence of mental health conditions

The prevalence of CIDI-diagnosed mental health conditions in the last 12 months for each peacekeeper deployment (and the whole sample) is shown in Table 4.2. The following sections discuss each disorder in detail.

Table 4.2: 12-month CIDI mental health status of participants, percentages

| <i>N</i> | <i>Deployment</i> | | | | | | | <i>Statistics</i> | <i>Total</i> 1,025 |
|--------------------|------------------------|-----------------------|----------------------|------------------------|-----------------------|-----------------------|----------------------|--------------------------------------|-----------------------|
| | <i>Cambodia</i> 295 | <i>Namibia</i> 197 | <i>Rwanda</i> 111 | <i>W. Sahara</i> 39 | <i>Somalia</i> 215 | <i>INTERFET</i> 66 | <i>UNTAET</i> 102 | | |
| PTSD | 15.6 | 15.2 | 22.5 | 17.9 | 18.6 | 9.1 | 17.6 | $\chi^2=6.66, df=6, p=0.35$ | 16.8 |
| GAD | 4.4 | 3.6 | 8.1 | 2.6 | 5.6 | 3.0 | 3.9 | $\chi^2=4.85, df=6, p=0.56$ | 4.7 |
| Depression | 6.4 | 5.6 | 7.2 | 15.4 | 8.4 | 4.5 | 6.9 | $\chi^2=6.18, df=6, p=0.40$ | 7.0 |
| Alcohol Abuse | 12.9 | 10.2 | 11.7 | 12.8 | 13.5 | 9.1 | 11.8 | $\chi^2=1.87, df=6, p=0.93$ | 12.0 |
| Alcohol dependence | 12.2 | 10.2 | 10.8 | 7.7 | 13.5 | 7.6 | 10.8 | $\chi^2=3.00, df=6, p=0.81$ | 11.3 |
| Drug dependence | 4.1 | 1.5 | 0.0 | 5.1 | 2.8 | 4.5 | 1.0 | Fisher Exact test=9.68, df=6, p=0.10 | 2.6 |

Table 4.3 shows comparisons in the prevalence of disorders assessed by the CIDI. First, those deployments categorised as 'high stress' and those categorised as 'low stress' are compared. Interestingly, there was no significant difference between these groups on the prevalence of any CIDI diagnosis, and observation of the percentages suggests that the two groups have very similar rates of current mental health disorder. Second, the current sample is compared with the matched NSMHWB civilian sample. Rates for the peacekeeper sample are significantly higher than their civilian counterparts for all disorders except drug dependence. Finally, comparison figures for the ADF deployed sample (see Section 2.4.3) are provided. Formal statistical comparison was not undertaken with that group, since these samples were neither directly comparable nor matched. Nevertheless, observation of the mean rates of disorder suggests substantially higher rates for all disorders (with the possible exception of depression) in the peacekeeper sample. This is, of course, not surprising – the ADF sample are currently serving and regular health checks attest to their 'fitness to deploy'.

Although not included in Table 4.3, the AGWVHS also reported on rates of these conditions. Gulf War veterans reported a prevalence of 5.1% for CIDI-diagnosed PTSD, 0.4% for GAD, 9% for major depression, and 4.3% for alcohol dependence and/or abuse. It is interesting to note that, while rates among AGWVHS participants for most disorders were lower than that found for the peacekeeper sample, depression was somewhat higher.

Table 4.3: 12-month CIDI mental health status comparisons, percentages

| <i>N</i> | <i>Comparators</i> | | | <i>Statistics</i> <i>High vs low</i> | <i>NSMHWB</i> <i>1,025</i> | <i>Statistics</i> <i>PK vs NSMHWB</i> | <i>ADF</i> <i>31,056</i> |
|---------------------------|---------------------------------|-------------------------------------|------------------------------------|-----------------------------------------|-------------------------------|------------------------------------------|-----------------------------|
| | <i>PK total</i> <i>1,025</i> | <i>PK high stress</i> <i>687</i> | <i>PK low stress</i> <i>338</i> | | | | |
| PTSD | 16.8 | 17.0 | 16.3 | $\chi^2 = 0.09, df = 1, p = 0.76$ | 6.0 | $\chi^2 = 59.66, df = 1, p < 0.01$ | 8.0 |
| GAD | 4.7 | 5.2 | 3.6 | $\chi^2 = 1.45, df = 1, p = 0.23$ | 2.9 | $\chi^2 = 4.32, df = 1, p = 0.04$ | 0.8 |
| Depression | 7.0 | 7.0 | 7.1 | $\chi^2 = 0.004, df = 1, p = 0.94$ | 2.8 | $\chi^2 = 19.26, df = 1, p < 0.01$ | 5.5 |
| Alcohol abuse | 12.0 | 12.5 | 12.9 | $\chi^2 = 0.49, df = 1, p = 0.48$ | 3.5 | $\chi^2 = 51.61, df = 1, p < 0.01$ | 2.0 |
| Alcohol dependence | 11.3 | 11.9 | 10.1 | $\chi^2 = 0.80, df = 1, p = 0.37$ | 3.6 | $\chi^2 = 44.08, df = 1, p < 0.01$ | 2.4 |
| Drug dependence | 2.6 | 3.1 | 1.8 | $\chi^2 = 1.45, df = 1, p = 0.23$ | 0.7 | $\chi^2 = 0.78, df = 1, p = 0.38$ | |
| <i>No. CIDI diagnoses</i> | | | | | | | |
| 0 | 70.1 | 55.5 | 60.4 | | 87.9 | | |
| 1 | 21.6 | 21.7 | 20.4 | | 9.7 | | |
| 2 | 6.8 | 10.8 | 11.5 | | 1.7 | | |
| 3+ | 1.5 | 12.1 | 7.7 | $\chi^2 = 5.35, df = 3, p = 0.15$ | 0.8 | $\chi^2 = 167.05, df = 3, p < 0.01$ | |

Note: Number of CIDI diagnoses is restricted to PTSD, GAD, major depression, and alcohol use disorders; drug dependence was not included because these data were not available for most of the comparator samples and because of the unreliability of asking about illicit drug use.

It is also clear from Table 4.3 that comorbidity is common in the peacekeeper sample. A total of 30% met criteria for at least one of the CIDI-diagnosed mental health conditions that were assessed in this study (i.e., PTSD, GAD, major depression, or alcohol use disorder), with 22% having only one diagnosis, 7% having two, and 2% having three or more. This compares with the civilian NSMHWB sample in which only 12% met criteria for one of these diagnoses. In the AGWVHS, 22% had at least one CIDI diagnosis and in the currently serving ADF sample 21% had at least one diagnosis. In interpreting these latter two comparisons, it is worth remembering that many more conditions were covered in the AGWVHS and ADF studies, increasing the chances of “any disorder” or “multiple disorders” in those samples. In that context, the higher rates in the current sample are even more unexpected.

4.2.1 Posttraumatic stress disorder (PTSD)

Table 4.4 provides the list of Criterion A events associated with a diagnosis of PTSD in the peacekeeper sample, as well as in the matched civilian sample (NSMHWB). Peacekeepers with PTSD were significantly more likely than their civilian counterparts to nominate peacekeeping, combat, and witnessing atrocities as the Criterion A event, while the civilian sample was more likely to nominate unexpected death of a loved one. Although not surprising, this finding highlights the potentially pathogenic nature of military deployment; despite the fact that participants in the current study reported multiple traumatic events across their lives (see Section 3.5), it was their military experiences that were most likely to result in the development of PTSD.

Table 4.4: Criterion A events for peacekeepers and comparators with PTSD, percentages

| <i>Event</i> | <i>Peacekeeper N=181</i> | <i>NSMHWB N=117</i> |
|------------------------------------------------------------|------------------------------|-------------------------|
| Peacekeeping (not defined further) | 27.1% | 0.0% |
| Combat experience | 16.0% | 6.0% |
| Saw atrocities | 12.2% | 0.0% |
| Unexpected death of a loved one | 7.7% | 24.8% |
| Witnessed death or dead body or saw someone seriously hurt | 7.7% | 9.4% |
| Other PTE (a) | 29.3% | 59.8% |

Notes:

Criterion A event is described as: exposure to a stressful event or situation (either short- or long-lasting) of exceptionally threatening or catastrophic nature, which would be likely to cause pervasive distress in almost everyone.

Statistics: $X^2 = 82.44$, $df = 5$, $p < 0.01$.

Statistically significant cells are in *bold italic*.

(a) = Other includes:

| | | |
|-------------------------------------------------|-------|-------|
| Motor vehicle accident | 2.8% | 7.7% |
| Mugged or threatened with a weapon | 2.2% | 2.6% |
| Purposely injured, tortured or killed someone | 2.2% | 0.9% |
| Life threatening accident | 1.7% | 3.4% |
| Life threatening illness | 1.7% | 5.1% |
| Witnessing physical fights at home (as a child) | 1.1% | 0.0% |
| Civilian in a war zone | 0.6% | 0.0% |
| Natural disaster | 0.6% | 0.9% |
| Manmade disaster | 0.6% | 0.9% |
| Raped | 0.6% | 4.3% |
| Child's serious injury | 0.6% | 1.7% |
| Traumatic event to a loved one | 0.6% | 2.6% |
| Accidentally caused serious injury or death | 0.6% | 1.7% |
| Other non-specified event | 13.8% | 28.0% |

As shown in Table 4.2, 16.8% of the peacekeeper sample met criteria for a CIDI diagnosis of PTSD in the past 12 months and there was no significant difference between deployments. As shown in Table 4.3, however, the PTSD rate in the peacekeeper sample was significantly higher than the 6% seen in the civilian (NSMHWB) sample. Although not compared statistically (see Section 2.4), it also appears substantially higher than the 8% in the currently serving deployed ADF sample and the 5.1% found in the Gulf War (AGWVHS) sample.

4.2.2 Generalised Anxiety Disorder (GAD)

As shown in Table 4.2, 4.7% of the peacekeeper sample met criteria for a CIDI diagnosis of GAD in the past 12 months and there was no significant difference between deployments. As shown in Table 4.3, the prevalence of GAD in the peacekeeper sample was significantly higher than 2.9% seen in the NSMHWB comparator sample. Although not compared statistically, it also appears to be

substantially higher than the 0.8% reported in the currently serving ADF sample and the 0.4% reported in the AGWVHS sample.

4.2.3 Major Depressive Episode (MDE)

As shown in Table 4.2, 7% of the peacekeeper sample met criteria for a CIDI diagnosis of major depression in the past 12 months and there was no significant difference between deployments. As shown in Table 4.3, the prevalence of depression in the peacekeeper sample was significantly higher than the 2.8% seen in the NSMHWB civilian comparator sample. Although not compared statistically, MDE in the current sample appears to be only slightly higher than the 5.5% reported for the currently serving ADF sample and slightly lower than the 9% reported in the AGWVHS.

4.2.4 Alcohol and other drug abuse and dependence

As shown in Table 4.2, 12% of the peacekeeper sample met criteria for a CIDI diagnosis of alcohol abuse in the past 12 months and there was no significant difference between deployments. As shown in Table 4.3, and in contrast to the pre-deployment comparison, the prevalence of alcohol abuse in the peacekeeper sample was significantly higher than the 3.5% seen in the NSMHWB civilian comparator sample. Although not compared statistically, it also appears to be substantially higher than the 2% reported for the currently serving deployed ADF sample and the 4.3% reported in the AGWVHS.

With regard to dependence, 11.3% of the peacekeeper sample met criteria for a CIDI diagnosis of alcohol dependence in the past 12 months and there was no significant difference between deployments. As for alcohol abuse, the prevalence of alcohol dependence in the peacekeeper sample was significantly higher than the 3.6% seen in the NSMHWB civilian comparator sample and, although not compared statistically, appears to be substantially higher than the 2.4% reported for the currently serving ADF sample also.

Although participants were asked about use of other drugs, a detailed analysis of these data will not be reported here since responses to survey questions about illicit drug use are notoriously unreliable. Briefly, however, Table 4.2 shows that the current prevalence for CIDI-diagnosed drug dependence was 2.6% and did not differ across deployments. This figure was, however, significantly higher than the prevalence of drug dependence among the civilian NSMHWB sample (0.7%). Of those

peacekeepers classed as dependent, 29.3% reported first having problems pre-deployment; it is not possible to determine whether these problems started pre- or post-enlistment.

The most commonly endorsed drug among the peacekeepers was marijuana, with 27.9% reporting that they had used it more than five times in their lives, followed by stimulants (7.9%) and opioids (1.4%). The mean age of first using marijuana was 19.5 years, stimulants 21.1 years, and opioids 26.4 years. Of those who used marijuana, 81.7% first used it pre-deployment, compared with 63.7% for stimulants. (Numbers for opioids were too small to comment on this issue).

4.3 Predictors and correlates of mental health conditions

It is important to emphasise that in a cross-sectional design of this nature, it is not possible to comment definitively on causation or directionality of any observed relationships and the data should be interpreted cautiously. The process for exploring predictors and correlates of mental health outcomes was described in Sections 2.6.4 and 2.6.5. The first step involved exploring the relationships between putative predictor variables and the key mental health outcomes in a series of univariate analyses, before combining the significant variables in multivariate analyses.

4.3.1 Univariate associations

The results of the univariate analyses are shown in Table 4.5. It is clear that several variables were associated with mental health outcomes, and that a variable that was associated with one CIDI-diagnosed condition was likely to be associated with other conditions also. Given the high comorbidity and symptom overlap routinely seen in these high prevalence conditions, this is not surprising.

Few demographic variables were strongly associated with mental health outcomes. Marital status, age, and education, for example, were either not associated or were only significant at the .05 level. Income level was significantly related to PTSD and depression (and less so to alcohol use disorders), with those on lower incomes being at greater risk. Employment status (working versus retired/benefit) was strongly associated with all conditions, but income and employment are more likely to be a result of, not a predictor of, mental health state.

Table 4.5: Predictors of 12-month mental health conditions: Univariate analyses (see text for details)

| Variable | Test | Test statistic, (degrees of freedom), and significance (*= $p<.05$; **= $p<.01$, ***= $p<0.001$) | | | | |
|-----------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------|-----------------|-----------------|----------------|---------------|
| | | PTSD | GAD | Depression | Alc abuse | Alc dep |
| Demographics | | | | | | |
| Marital status: Unpartnered | Chi-square | 7.37 (2) * | 2.94 (2) ns | 2.99 (2) ns | 5.32 (1) ns | 6.03 (1) * |
| Age: Older | Chi-square | 0.86 (3) * | 0.73 (3) ns | 1.46 (3) ns | 2.03 (3) ns | 2.71 (3) ns |
| Employment: Retired/sickness benefit | Chi-square | 40.03 (2) *** | 37.37 (2)*** | 52.13 (2) *** | 13.74 (2) ** | 10.94 (2) ** |
| Education | Chi-square | 7.26 (3) ns | 2.35 (3) ns | 2.06 (3) ns | 3.96 (3) ns | 2.60 (3) ns |
| Income | Chi-square | 19.72 (5) ** | 6.88 (5) ns | 17.97 (5) ** | 13.08 (5) * | 11.58 (5) * |
| Trauma exposure / deployments | | | | | | |
| Age of deployment: Older | Kruskal-Wallis χ^2 | 7.50 (1)** | 0.45 (1)ns | 0.20 (1) ns | 0.24 (1) ns | 0.11 (1) ns |
| High stress vs. Low stress | Chi-square | 0.09 (1) ns | 1.92 (1) ns | 0.02 (1) ns | 0.49 (1) ns | 0.76 (1) ns |
| No. of deployments: >1 | Chi-square | 5.23 (1) * | 0.24 (1) ns | 17.81 (1) *** | 1.44 (2) ns | 1.34 (1) ns |
| Deployment related PTEs | t-test | 9.35 (289) *** | 5.83 (1012) *** | 5.33 (1012) *** | 2.99 (1012) ** | 9.59 (1) ** |
| Fear/horror at time | Kruskal-Wallis χ^2 | 93.69 (1)*** | 25.12 (1) *** | 23.62 (1) *** | 17.59 (1) *** | 17.50 (1) *** |
| Lifetime PTEs | Kruskal-Wallis χ^2 | 58.13 (1)*** | 29.67 (1) *** | 10.37 (1) *** | 11.51 (1) ** | 6.85 (1) ** |
| Physical health | | | | | | |
| Fair/poor self-rated physical health | Chi-square | 37.25 (1)*** | 36.08 (1) *** | 61.57 (1) *** | 28.14 (1) *** | 26.18 (1) *** |
| Poor health on SF-36 PCS scale | Chi-square | 19.61 (1)*** | 4.78 (1) * | 92.92 (1) ** | 5.67 (1) * | 4.95 (1) * |
| Disposition | | | | | | |
| Pessimistic outlook | Chi-square | 26.65 (1)*** | 13.1 (1) *** | 37.31 (1) *** | 27.51 (1) *** | 35.15 (1) *** |
| Mental health (Alcohol disorders only) | | | | | | |
| CIDI diagnosed PTSD | Chi-square | | | | 8.54 (1) ** | 9.26 (1)* |
| CIDI diagnosed GAD | Chi-square | | | | 36.28 (1) *** | 29.14 (1) *** |
| CIDI-diagnosed depression | Chi-square | | | | 5.72 (1)* | 6.99 (1)** |

Interestingly, those participants who had deployed more than once were no more likely than those with single deployment histories to meet criteria for alcohol use disorders or GAD. The relationship with PTSD was significant only at .05, but there was a highly significant relationship with depression – those with multiple deployments were much more likely to be currently depressed. Age at the time of deployment was related to PTSD only, with the counterintuitive finding that those participants who were older at the time of deployment were more likely to have current PTSD (mean age was 28 years for those with PTSD and 26 years for those without). In an attempt to understand this finding, however, further analysis revealed a relationship between age of first deployment and number of deployments: those who first deployed at a younger age were more likely to have more subsequent deployments. This may explain the increased PTSD risk. As already seen from Table 4.3, high versus low stress deployment was not a predictor of disorder in itself, but trauma exposure on deployment was strongly associated with PTSD, GAD and MDE, and moderately so with alcohol use disorders. This finding is consistent with the 2010 ADF mental health prevalence and wellbeing study – it is not the deployment *per se*, it is what the person experiences on deployment that influences risk for adverse mental health outcomes. The same relationships were found for reported fear/horror at the time of the deployment trauma exposure, as well as for number of lifetime exposures to potentially traumatic events. In short, notwithstanding the risk of recall bias, it does appear that trauma history is strongly associated with current mental health.

Participants who rated their health as fair or poor were more likely than those who reported better health to meet criteria for all the CIDI-diagnosed conditions. The physical (PCS) scale of the SF-36, however, showed weaker relationships with all disorders except PTSD. Not surprisingly, a pessimistic outlook was associated with all disorders.

Finally, the relationship between alcohol use disorders and other CIDI-diagnosed conditions was explored. GAD was strongly associated with both abuse and dependence, while PTSD and depression showed slightly less strong associations.

4.3.2 Multivariate analyses

Logistic regression models were constructed using the procedures outlined in Section 2.6.4 to examine the predictors of 12-month mental health diagnoses assessed using the CIDI. As noted previously, although the term 'predictors' is used in these analyses the cross sectional nature of this study, and the risk of recall bias, highlights the importance of interpreting these results with caution. These variables are better conceptualised as being 'associated with' rather than 'predictors of' the diagnosis under consideration.

The first model explored predictors of PTSD; results are shown in Table 4.6. When all significant variables from the univariate analyses were explored together, the model showed that 12-month PTSD was a function of deployment exposure, fear/horror experienced at the time of deployment exposures, endorsing five or more life events, and being out of the workforce.

| <i>Predictor</i> | <i>Base</i> | <i>Comparator</i> | <i>OR</i> | <i>95%CI</i> |
|----------------------------------------------------------|-------------------------------|----------------------------------------|-----------|--------------|
| Life Events Checklist | 0-4 events | 5+ events | 2.98 | 1.85-4.82 |
| Number of exposures from the TSES | 0-9 Events | 10+ events | 1.60 | 1.00-2.54 |
| Fear and/or horror from deployment exposures at the time | No feelings of fear or horror | Feelings of fear or horror at the time | 2.73 | 1.70-4.40 |
| Employment | In the labour force | Retired/Sickness benefits | 1.94 | 1.32-2.84 |

Notes

Logistic regression model statistics: Hosmer & Lemeshow $\chi^2 = 4.12$, $df = 6$, $p = 0.66$. -2LL = 777.80. Model correctly classified 82.4% of study participants.

See the text for an explanation of model construction and variables dropped from the model.

Trauma history, both military and other, was strongly associated with meeting criteria for a diagnosis of PTSD in the last 12 months. Having endorsed five or more events on the LEC was associated with three times the odds of having 12-month PTSD, endorsing more than 10 events on the TSES was associated with 1.6 times the odds, and experiencing feelings of fear/horror at the time of deployment exposures was associated with a 2.7 times the odds of 12-month PTSD. Finally, being out of the workforce was associated with 1.9 times the odds of having PTSD.

The logistic regression predicting GAD is shown in Table 4.7. Meeting criteria for a diagnosis of GAD in the past 12 months was a function of deployment exposure, endorsing five or more life events, self-reported general health and being out of the workforce.

Table 4.7: Predicting 12-month CIDI GAD

| <i>Predictor</i> | <i>Base</i> | <i>Comparator</i> | <i>OR</i> | <i>95%CI</i> |
|-----------------------------------|--------------------------|---------------------------|-----------|--------------|
| Life Events Checklist | 0-4 events | 5+ events | 3.13 | 1.18-8.26 |
| Number of exposures from the TSES | 0-9 Events | 10+ events | 2.30 | 1.06-4.97 |
| General Health | Excellent/Very good/Good | Fair/Poor | 3.18 | 1.55-6.53 |
| Employment | In the labour force | Retired/Sickness benefits | 2.63 | 1.39-4.97 |

Notes

Logistic regression model statistics: Hosmer & Lemeshow $\chi^2 = 3.85$, $df = 6$, $p = 0.70$. $-2LL = 324.17$. Model correctly classified 95.2% of study participants.

See the text for an explanation of model construction and variables dropped from the model.

Again, trauma history was powerfully associated with a diagnosis of GAD. Having endorsed five or more events on the LEC was associated with 3.1 times the odds of having 12-month GAD and endorsing more than 10 events on the TSES was associated with 2.3 times the odds. Both a self-report of fair or poor health (3.2 times the odds), and being out of the workforce (2.6 times the odds of 12-month GAD) were also associated, although it is hard to know whether these are predictors of, or a result of, having the diagnosis.

The logistic regression model for depression in the last 12 months is shown in Table 4.8. Meeting criteria for major depression was a function of number of deployments, fear and/or horror experienced from deployment exposures, self-reported general health and life orientation.

Table 4.8: Predicting 12-month CIDI Depression

| <i>Predictor</i> | <i>Base</i> | <i>Comparator</i> | <i>OR</i> | <i>95%CI</i> |
|----------------------------------------------------------|-------------------------------|----------------------------------------|-----------|--------------|
| Number of deployments | Deployed once | 2 or more deployments | 2.11 | 1.26-3.54 |
| Fear and/or horror from deployment exposures at the time | No feelings of fear or horror | Feelings of fear or horror at the time | 1.90 | 1.05-3.43 |
| General Health | Excellent/Very good/Good | Fair/Poor | 4.30 | 2.30-8.07 |
| Life orientation | Neutral/optimistic | Pessimistic | 0.50 | 0.28-0.87 |

Notes

Logistic regression model statistics: Hosmer & Lemeshow $\chi^2 = 1.6$, $df = 6$, $p = 0.97$. -2LL = 427.96. Model correctly classified 92.7% of study participants.

See the text for an explanation of model construction and variables dropped from the model.

Having been on more than one deployment was associated with a two-fold increase in risk for depression, and reporting fear/horror at the time of deployment exposures was associated with 1.9 times the odds of having 12-month depression. Self-reporting fair or poor health was associated with a 4.3 times the odds of 12-month depression, although again it is not possible to comment on whether this is a predictor or a consequence. Finally, being pessimistic was associated with 0.5 times the odds of 12-month depression.

The logistic regression model for alcohol abuse is shown in Table 4.9. The model showed that 12-month alcohol abuse was a function of 12-month GAD, self-reported general health and life orientation.

Table 4.9: Predicting 12-month CIDI Alcohol abuse

| <i>Predictor</i> | <i>Base</i> | <i>Comparator</i> | <i>OR</i> | <i>95%CI</i> |
|------------------|--------------------------|-------------------|-----------|--------------|
| 12-month GAD | No 12-month GAD | 12-month GAD | 3.83 | 2.01-7.27 |
| General health | Excellent/Very good/Good | Fair/Poor | 1.78 | 1.34-2.78 |
| Life orientation | Neutral/optimistic | Pessimistic | 2.0 | 1.29-3.10 |

Notes

Logistic regression model statistics: Hosmer & Lemeshow $\chi^2 = 0.30$, $df = 2$, $p = 0.86$. -2LL = 669.10. Model correctly classified 87.7% of study participants.

See the text for an explanation of model construction and variables dropped from the model.

Having a concurrent diagnosis of GAD was associated with 3.8 times the odds of having 12-month alcohol abuse. Like depression, self-reported fair or poor health was associated with 1.8 times the odds of 12-month alcohol abuse and a pessimistic outlook was associated with 2.0 times the odds.

The logistic regression model for alcohol dependence is shown in Table 4.10. The model showed that 12-month alcohol dependence was a function of 12-month GAD, self-reported general health, life orientation, and marital status.

Table 4.10: Predicting 12-month CIDI Alcohol dependence

| <i>Predictor</i> | <i>Base</i> | <i>Comparator</i> | <i>OR</i> | <i>95%CI</i> |
|------------------|--------------------------|-------------------|-----------|--------------|
| 12-month GAD | No 12-month GAD | 12-month GAD | 3.27 | 1.69-6.32 |
| General health | Excellent/Very good/Good | Fair/Poor | 1.64 | 1.04-2.60 |
| Life orientation | Neutral/optimistic | Pessimistic | 2.23 | 1.49-3.51 |
| Marital status | Not partnered | Partnered | 0.61 | 0.38-0.97 |

Notes

Logistic regression model statistics: Hosmer & Lemeshow $\chi^2 = 6.69$, $df = 4$, $p = 0.15$. -2LL = 643.80. Model correctly classified 88.1% of study participants.

See the text for an explanation of model construction and variables dropped from the model.

Having a concurrent diagnosis of GAD was associated with 3.3 times the odds of having 12-month alcohol dependence. Like alcohol abuse and depression, self-reported fair or poor health was associated with a 1.6 times the odds of 12-month alcohol dependence and being pessimistic was associated with 2.3 times the odds. Finally, being partnered was associated with 0.6 times the odds of 12-month alcohol dependence.

4.4 Associated constructs of mental health and wellbeing

The sections above described the prevalence and predictors of categorical mental health diagnoses as assessed using a structured clinical interview (CIDI). This section presents data on a range of constructs around mental health and wellbeing, most of which were assessed using self-report instruments. The first measures to be presented will be those most closely aligned to the mental health diagnoses discussed above (PCL, K10, GHQ-12, suicidal ideation). This is followed by discussion of the associated constructs of anger, demoralisation, and social isolation, before addressing the area of posttraumatic growth. Physical health outcomes and other associated constructs such as health service use, satisfaction, and quality of life will be discussed in the next chapter.

4.4.1 PCL

The PCL is a self-report measure covering the PTSD symptoms as described in the DSM-IV. As such, it provides a useful adjunct to the CIDI PTSD diagnosis. The most common method of scoring the PCL is to compute a total score by summing the individual items, with scores of 50 or more indicating a high probability that the person has PTSD (see Section 2.5.3.3). Table 4.11 shows both the total PCL score and the proportion scoring above the cut-off for all deployments and for the total sample. Participants from the Rwanda and Somalia deployments were significantly more likely to score above the cut-off (29.7% and 27.8% respectively), while those from the INTERFET deployment were less likely. Those findings are in line with the CIDI PTSD prevalence shown in Table 4.2, although those differences did not reach significance with a formal diagnosis. Using the PCL, the prevalence of likely PTSD for the total sample was 19.9%, compared with the 16.8% obtained using the CIDI PTSD diagnosis.

Table 4.11: PTSD Checklist (PCL) mean scores and percentages scoring above the cut-off for probable PTSD

| Categories | Deployment status | | | | | | | Overall status |
|----------------------------------------------|-------------------|------------|-------------|-----------|-------------|-------------|------------|----------------|
| | Cambodia | Namibia | Rwanda | W. Sahara | Somalia | INTERFET | UNTAET | Peacekeepers |
| | 292 | 194 | 108 | 37 | 212 | 64 | 100 | 1,007 |
| PCL-C sum | | | | | | | | |
| Mean | 33.2 | 30.5 | 37.3 | 31.5 | 38.0 | 29.2 | 32.2 | 33.7 |
| SD | 16.3 | 13.8 | 17.9 | 16.6 | 17.8 | 13.7 | 18.1 | 16.6 |
| Kruskal-Wallis $\chi^2=32.53$, df=6, p<0.01 | | | | | | | | |
| PCL -C sum (cut-point 50) | | | | | | | | |
| No | 81.5 | 88.7 | 70.3 | 81.1 | 72.2 | 90.6 | 80 | 80.1 |
| Yes | 18.5 | 11.3 | 29.7 | 19.9 | 27.8 | 9.4 | 20 | 19.9 |
| $\chi^2=28.57$, df=6, p<0.01 | | | | | | | | |

Notes:

Based on examination of residuals, statistically significant cells marked in **bold**

The proportion of participants scoring above the cut-off on the PCL can be compared with several of the comparator samples described in Section 2.4. The prevalence of 19.9% observed in the current sample is substantially higher than that reported for the Bougainville (6%) and East Timor (7%) comparator groups, as well as that reported for the currently serving ADF sample (3%). Another comparator of interest for the PCL is the AGWVHS, which reported that 7.9% of those deployed to the

Gulf scored above the cut-off on the PCL. Finally, the 'internal' comparison revealed that those participants from high stress deployments were more likely to meet the PCL cut-off than those from low stress deployments (22.3% vs. 14.8%; $\chi^2 = 7.92$ df = 1, $p < 0.05$).

4.4.2 General Health Questionnaire (GHQ-12 bimodal)

As discussed in Section 2.5.3.1, the GHQ is a general measure of psychological health and wellbeing. Using the bimodal GHQ-12 scale cut-points at the level of 2/3, 26.7% of the sample scored positively for generalised psychological distress. As shown in Table 4.12, there was no significant difference between deployments on those reaching the cut-off for 'caseness' (general psychological distress) on the GHQ. Observation of the means indicates that participants from the Somalia and INTERFET deployments had the highest proportion above the cut-off, followed by Rwanda.

Table 4.12: Psychological 'caseness' (distress) on the GHQ-12

| <i>N</i> | <i>Deployment status</i> | | | | | | | <i>Total</i> |
|----------|----------------------------------|----------------|---------------|------------------|----------------|-----------------|---------------|---------------------|
| | <i>Cambodia</i> | <i>Namibia</i> | <i>Rwanda</i> | <i>W. Sahara</i> | <i>Somalia</i> | <i>INTERFET</i> | <i>UNTAET</i> | <i>Peacekeepers</i> |
| | 293 | 194 | 109 | 38 | 214 | 64 | 104 | 1,016 |
| < = 2 | 73.0% | 77.3% | 72.5% | 76.3% | 70.6% | 70.3% | 74.0% | 73.3% |
| > = 3 | 26.7% | 22.7% | 27.5% | 23.7% | 29.4% | 29.7% | 26.0% | 26.7% |
| | $\chi^2=2.97$, df=6, $p = 0.81$ | | | | | | | |

Only one of the comparator samples chosen for the current study used the GHQ-12. The AGWVHS used a lower cut-off of 2 or more to establish caseness. Re-analysis of the current data showed that 33.9% of participants scored above this lower cut-off point. This figure is marginally lower than the 39.6% reported for the Gulf War sample scoring 2 or more on the GHQ-12. A second highly relevant comparison, however, is also available. The large UK study of troops returning from the Iraq war (126) used a higher cut-off to identify caseness on the GHQ-12 (a score of 4 or more, compared to ours of 3 or more). Re-analysis of the current data, however, showed that 21.8% of participants scored above this higher cut-off point. This is remarkably close to the 20% reported for the UK Iraq sample. Of interest also in the UK study was the finding that 26% of reservists who deployed to Iraq scored above the cut-off, compared with 19% among regulars.

4.4.3 K10

As discussed in Section 2.5.3.2, the K10, like the GHQ, is a general measure of psychological health and wellbeing. Mean scores on the K10 for each deployment, as well as percentages in the various severity classifications, are shown in Table 4.13 for each deployment.

Although differences across deployments by the four distress levels did not achieve significance, there was a significant difference in mean scores – participants from the Rwanda and Somalia deployments scored highest on the K10. Nearly one-fifth of Rwanda and Somalia veterans scored in the very high category; people who score at this level have a three out of four chance (ten times the population risk) of meeting criteria for an anxiety or depressive disorder and a 6% chance (20 times the population risk) of ever having made a suicide attempt (127). Despite the higher rates for Rwanda and Somalia, there were no significant differences between high and low stress deployments when the K10 was analysed by severity groups, but a small significant difference in mean scores.

Scores on the K10 (severity groups and means) are shown alongside various comparator groups in Table 4.14. K10 scores among peacekeepers were significantly higher than their civilian counterparts. Although formal statistical comparisons were not possible, observation of the percentages in each severity group reveals that the peacekeepers also scored higher than the ADF deployed sample, as well as the East Timor and Bougainville samples. (Note that the Timor and Bougainville studies combined the moderate and high groups into a single percentage figure). In the peacekeeper sample, 14% scored in the very high range, compared with 3% in the ADF deployed sample, 7% in the East Timor sample, and 5% in the Bougainville sample.

Table 4.13: K10 status of participants, and mean K10 scores, by deployment, percentages

| | | Deployment | | | | | | | Statistics | PK total 993 | PK high stress 667 | PK low stress 326 | Statistics High vs low |
|----------------|-------------------|------------|------------|-------------|--------------------|------------|------------|------------|------------|-----------------|--------------------------|-------------------------|------------------------------|
| | | Cambodia | Namibia | Rwanda | W. Sahara 37 | Somalia | INTERFET | UNTAET | | | | | |
| <i>N</i> | | 286 | 190 | 107 | | 211 | 63 | 99 | | | | | |
| Distress level | Low (10-15) | 45.5 | 48.4 | 44.9 | 51.4 | 37.4 | 58.7 | 47.5 | | 45.5 | 44.1 | 48.5 | |
| | Moderate (16-21) | 25.2 | 27.4 | 19.6 | 27.0 | 25.1 | 19.0 | 25.3 | | 24.7 | 23.7 | 26.7 | |
| | High (22-29) | 14.7 | 15.3 | 16.8 | 10.8 | 19 | 15.9 | 10.1 | | 15.4 | 16.5 | 13.2 | |
| | Very high (30-50) | 14.7 | 8.9 | 18.7 | 10.8 | 18.5 | 6.3 | 17.2 | (a) | 14.4 | 15.7 | 11.7 | (c) |
| | Mean (SD) | 18.8 (8.5) | 17.6 (7.5) | 20.4 (10.0) | 17.7 (8.0) | 20.4 (9.4) | 16.6 (6.7) | 19.0 (9.3) | (b) | 18.9 (8.7) | 19.4 (8.9) | 18.0 (8.1) | (d) |

(a) $\chi^2 = 24.51$ df = 18, p=0.14

(b) Kruskal-Wallis $\chi^2=13.22$, df=6, p=0.04

(c) $\chi^2 = 5.81$ df = 3, p=0.12

(d) Kruskal-Wallis $\chi^2 = 4.10$, df = 1, p = 0.04

Table 4.14: K10 status of participants, NSMHWB, and military comparators, percentages

| | | Deployment | | | ADF deployed 29,878 | East Timor study 1,732 | Bougainville ADF Study |
|----------------|-----------------------|-----------------|-----------------|-------------------------------------------------|------------------------|---------------------------|------------------------|
| | | PK total 993 | NSMHWB 1,025 | Statistics PK vs NSMHWB | | | |
| Distress level | Low (10-15) | 45.5 | 74.3 | | 68.5 | 53.0 | 56.0 |
| | Moderate (16-21) | 24.7 | 16.3 | | 20.1 | | |
| | Moderate-High (16-29) | | | | | 39.0 | 39.0 |
| | High (22-29) | 15.4 | 6.3 | | 8.3 | | |
| | Very high (30-50) | 14.4 | 3.0 | $\chi^2 = 201.09$ df = 3, p<0.001 | 3.1 | 7.0 | 5.0 |
| | Mean (SD) | 18.9 (8.7) | 14.3 (5.4) | Kruskall-Wallis $\chi^2=175.51$, df=1, p<0.001 | | | |

4.4.4 Suicidal ideation and self-harm

Unlike other measures in Section 4.4, suicidal ideation was assessed not through a self-report measure but as part of the CIDI interview. It is included in this section, however, since it is not a psychiatric diagnosis (like PTSD, GAD, and MDE); rather, it is an associated construct. Suicidal ideation and self-harm may occur in the absence of any diagnosable psychiatric disorder, or in the context of PTSD, depression, or any other condition. The CIDI explores three levels of suicidality in the last 12 months: whether the person has thought about suicide (suicidal ideation), whether the person has decided how they would do it (suicide plan), and whether the person has tried to kill him/herself (suicide attempt). Frequencies for each of these constructs, along with NSMHWB and ADF deployed comparator groups, appear in Table 4.15.

Across deployments, there were no differences in suicidal ideation or suicide attempts, but participants from Cambodia, Rwanda, Somalia, and INTERFET were more likely to have made a suicide plan than those from other deployments. Overall, the level of suicidality in this sample was high – significantly higher than their civilian counterparts from the NSMHWB. Observation of the means suggests that the ADF deployed sample, while higher in each category than the NSMHWB sample, nevertheless reported much lower suicidality than the peacekeeper sample.

Table 4.15 : 12 month suicidal ideation, plan or attempt as assessed by the CIDI, percentages

| | <i>Deployment</i> | | | | | | | <i>Statistics</i> | <i>Total</i> | | | |
|-------------------|-------------------|----------------|---------------|------------------|----------------|-----------------|---------------|--------------------------------------|---------------------|---------------|------------------------------|---------------|
| | <i>Cambodia</i> | <i>Namibia</i> | <i>Rwanda</i> | <i>W. Sahara</i> | <i>Somalia</i> | <i>INTERFET</i> | <i>UNTAET</i> | | <i>Peacekeepers</i> | <i>NSMHWB</i> | <i>Statistics</i> | <i>ADF</i> |
| <i>N</i> | 293 | 194 | 110 | 39 | 215 | 63 | 101 | | 1,014 | 1,025 | PK vs NSMHWB | 24,481 |
| Suicidal ideation | 10.6 | 6.2 | 13.6 | 12.8 | 12.6 | 9.5 | 9.9 | $\chi^2=6.32, df=6, p=0.39$ | 10.7 | 2.7 | $\chi^2=51.35, df=1, p<0.01$ | 3.8 |
| Suicide plan | 6.8 | 1.5 | 9.9 | 0.0 | 7.0 | 7.6 | 4.9 | $\chi^2=14.12, df=6, p=0.03$ | 5.8 | 0.7 | $\chi^2=42.33, df=1, p<0.01$ | 1.1 |
| Suicide attempt | 1.7 | 0.0 | 1.8 | 0.0 | 0.9 | 1.5 | 0.0 | Fisher Exact test=5.44, df=6, p=0.37 | 1.0 | 0.2 | $\chi^2=5.37, df=1, p=0.02$ | 0.4 |

Note

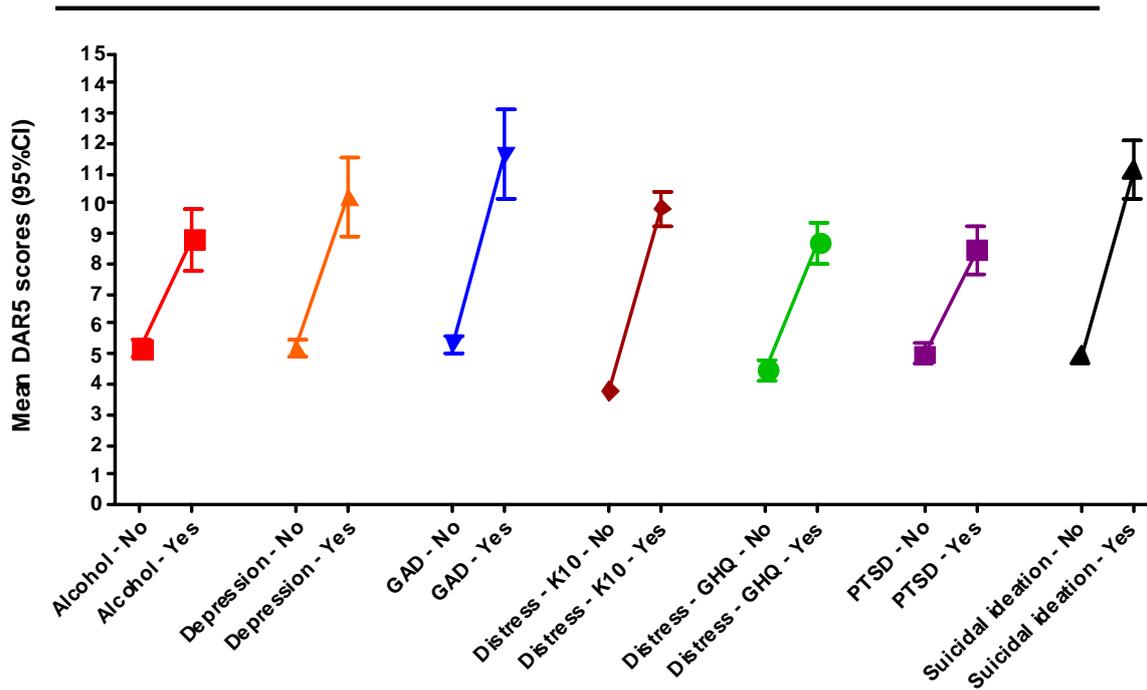
Based on examination of residuals, statistically significant cells marked in *bold*.

4.4.5 Anger

The construct of anger, commonly associated with disorders such as PTSD and depression, was assessed using the DAR-5 (see Section 2.5.4.2). The mean score was 5.59 (SD = 4.87). Percentages falling in each category described in Section 2.5.4.2 were: no or very slight anger (scores of 0-5): 59.1%; mild anger (6-10): 24.6%; severe anger (10-15): 10.4%; and extreme anger (≥ 16): 5.8%. The mean score seems relatively low, suggesting that anger is not a substantial problem for the group as a whole. It is worth emphasising, however, that 10% of the sample reported severe anger (in the 10-15 score range) and a further 6% reported extreme anger. Thus, for a substantial minority, anger was indeed a problem. Unfortunately, comparative data with other military samples on this measure are not available.

There was no difference in the level of anger between deployments (ANOVA, $F_{\text{transformed}} = 1.91$, $df = 6,1004$), $p = 0.08$). Although participants from the high stress deployments reported higher levels of anger than those from the low stress deployments (t-test, $t_{\text{transformed}} = -2.01$, $df = 1,009$, $p = 0.05$), the difference was less than one point on the DAR-5, suggesting it is unlikely to be a clinically significant difference. There was, however, a strong association between anger and the presence of a mental health condition. As shown in Figure 4.1, for those without a mental health condition, the DAR-5 mean score ranged from 2.95 to 5.29, whereas for those with a mental health condition, scores ranged from 6.95 to 11.63.

Figure 4.1: Mental health delineations and anger (DAR5)



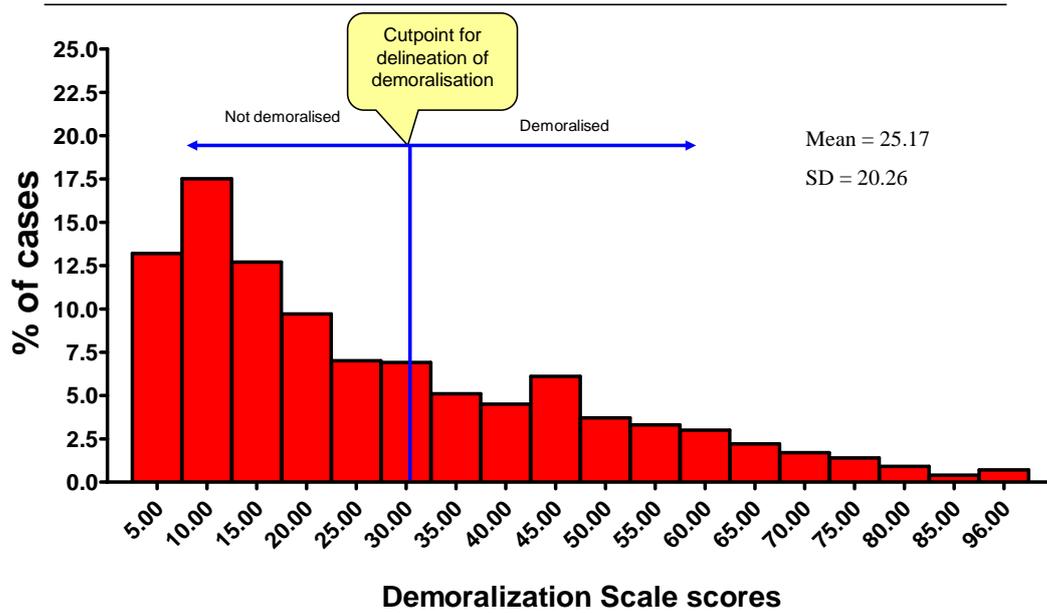
Statistics: T-test, $T_{\text{Transformed}}$, $p < 0.01$ for all

4.4.6 Demoralisation

As discussed in Section 2.5.4.1, demoralisation is characterised by themes such as loss of purpose, discouragement, and feelings of being unable to cope. It was assessed using the 24-item Demoralization Scale (DS). The mean DS score among the study peacekeepers was 25.17 (SD = 20.26), with 34.1% of the sample scoring above the recommended cut-off of 30. The only deployment with more than expected cases of demoralisation was Somalia (42.5%) ($\chi^2 = 14.2$, $df = 6$, $p = 0.03$). When deployments were grouped by high/low stress, there was no significant difference. Similarly, there was no significant difference in the proportion of cases classified as being demoralised by the number of deployments. Unfortunately, comparative data with other military samples on this measure are not available.

Unsurprisingly, demoralisation was associated with the presence of CIDI-diagnosed mental health conditions, as well as high scores on the associated measures of GHQ, K10, and suicidal ideation. For those without mental health problems, the DS mean score ranged from 9.45 to 24.00, while mean scores ranged from 33.33 to 53.58 for those with the mental health conditions (i.e., all above the recommended cut-off of 30).

Figure 4.2: Demoralisation in peacekeepers; distribution of DS scores



4.4.7 Social isolation

As discussed in Section 2.5.4.3, social isolation was assessed using the Friendship Scale (FS), which classifies people into five levels of social connectedness. Compared with Australian population norms (5), the peacekeeper sample was considerably more isolated. In the peacekeeper sample, 23.8% were very socially isolated compared with only 2% in the general Australian community; 17.3% were socially isolated compared with 5% in the general community; 14.7% reported some isolation compared with 9%; 19.1% were socially connected compared with 25%; and 25.1% were very socially connected compared with 59% in the general community. There were no significant differences in social isolation between deployments ($\chi^2 = 27.21$, $df = 24$, $p = 0.30$), by deployment stress classification ($\chi^2 = 8.40$, $df = 4$, $p = 0.08$), nor by the number of deployments ($\chi^2 = 13.20$, $df = 8$, $p = 0.11$). Unfortunately, comparative data with other military samples on this measure are not available.

There was a clear relationship between CIDI-diagnosed mental health conditions and social isolation (Table 4.16). For each diagnosis, a significantly higher percentage of peacekeepers without the condition were classified as being very socially connected or socially connected. In contrast, a

significantly higher percentage of participants meeting diagnostic criteria were classified as being either very socially isolated or socially isolated. A high proportion of those with mental health conditions were also socially isolated: 63% of those with GAD and 60% of those with depression were very socially isolated.

Table 4.16: Mental health conditions and social isolation, percentages

| | | N | Friendship scale classification (a) | | | | |
|-----------------------|----------------------|-----|-------------------------------------|--------------|--------------|--------------|---------------------------------|
| | | | 1 | 2 | 3 | 4 | 5 |
| Alcohol dependence | No | 912 | 20.5% | 17.3% | 14.8% | 20.1% | 27.3% |
| | Yes | 117 | 49.6% | 17.1% | 13.7% | 12.0% | 7.7% |
| | | | | | | | $\chi^2 = 56.35, df=4, p<0.01$ |
| Depression (12-month) | No | 946 | 20.9% | 17.3% | 14.9% | 19.9% | 27.0% |
| | Yes | 72 | 59.7% | 18.1% | 11.1% | 11.1% | 0.0% |
| | | | | | | | $\chi^2 = 65.28, df=4, p<0.01$ |
| GAD (12-month) | No | 981 | 21.9% | 16.9% | 15.4% | 19.8% | 26.0% |
| | Yes | 48 | 62.5% | 25.0% | 0.0% | 6.3% | 6.3% |
| | | | | | | | $\chi^2 = 52.26, df=4, p<0.01$ |
| PTSD (12-month) | No | 857 | 19.7% | 15.2% | 15.3% | 21.1% | 28.7% |
| | Yes | 172 | 44.2% | 27.9% | 11.6% | 9.3% | 7.0% |
| | | | | | | | $\chi^2 = 88.18, df=4, p<0.01$ |
| K10 distress level | Low-moderate (10-22) | 724 | 25.4% | 62.1% | 93.4 | 97.9% | 98.4% |
| | Severe (23-50) | 269 | 74.6% | 37.9% | 16.6 | 2.1% | 1.6% |
| | | | | | | | $\chi^2 = 427.76, df=4, p<0.01$ |
| GHQ-12 | No distress | 743 | 12.0% | 17.0% | 16.4% | 22.9% | 31.9% |
| | Chronic distress | 266 | 55.6% | 18.4% | 10.2% | 9.4% | 6.4% |
| | | | | | | | $\chi^2 = 233.28, df=4, p<0.01$ |

Notes

(a) 1 = very socially isolated; 2 = socially isolated; 3 = some isolation, some connection; 4 = socially connected; 5 = very socially connected.

Bold cells show where there were statistically significantly more cases than expected.

4.4.8 Posttraumatic growth

As noted in Section 1.4, research suggests that many peacekeepers report some form of personal growth. In this study, post-peacekeeping personal growth was assessed with the Posttraumatic Growth Inventory (PTGI; see Section 2.5.4.4 for details). Although the name suggests otherwise, the PTGI does not necessarily require a trauma (as in a ‘psychic wound’) to have occurred

– rather, it is about changes to life views following a potentially stressful experience. In the current study, the stem wording was “..the degree to which this change occurred in your life as a result of your deployment(s)...”. The PTGI score range is 0-105, with higher scores indicating greater personal growth. The PTGI mean score for the whole sample was 38.5 (SD = 24.9), somewhat lower than the PTGI mean score of 41.1 (SD = 25.8) found in a US Army deployed sample (128), and the mean of 59.1 (SD = 23) reported in a sample of US veteran amputees from the recent Iraq deployments (129).

Expressed as percentages (since the scales have different numbers of items), the highest growth was reported on the appreciation of life subscale (mean = 48% of possible maximum score; SD = 34%), with items such as “my priorities about what is important in life” and “an appreciation for the value of my own life”. Compared to other scales, high scores were also obtained on the personal strength subscale (mean = 46.5% of maximum score; SD = 32.5%), with items such as “a feeling of self-reliance” and “knowing I can handle difficulties”. Mean scores on other scales were in the range 15% to 36.8%. Thus, although some personal growth was reported, the majority of study participants experienced this to a small degree.

There was no difference in PTGI mean scores by deployment (Kruskal-Wallis $\chi^2 = 8.81$, df = 6, p = 0.19) or between the stress level deployment classification (high stress/low stress) (Kruskal-Wallis $\chi^2 = 2.13$, df = 1, p = 0.14). The details, including percentage scale scores, are shown in Table 4.17.

Table 4.17: Posttraumatic growth by deployment, PGI scores, percentages

| | | Deployment status | | | | | | Statistics | Overall | |
|----------------------|------|-------------------|---------|--------|----------------|---------|-------------|------------|---------|-----------|
| | | Cambodia | Namibia | Rwanda | Western Sahara | Somalia | ET INTERFET | | | ET UNTAET |
| Total score | Mean | 37.6 | 35.4 | 37.7 | 32.0 | 38.9 | 31.1 | 35.7 | (a) | 36.8 |
| | SD | 23.2 | 23.2 | 24.1 | 24.3 | 23.9 | 22.3 | 25.9 | | 23.2 |
| <i>Scales</i> | | | | | | | | | | |
| Relating to others | Mean | 32.9 | 31.4 | 33.4 | 25.7 | 35.1 | 29.1 | 31.4 | (b) | 32.6 |
| | SD | 24.0 | 22.9 | 21.4 | 23.1 | 24.0 | 20.6 | 24.3 | | 23.1 |
| New possibilities | Mean | 30.8 | 29.6 | 30.0 | 30.8 | 32.0 | 25.2 | 30.8 | (c) | 30.4 |
| | SD | 28.8 | 26.8 | 29.6 | 30.0 | 29.2 | 28.4 | 31.2 | | 28.8 |
| Personal strength | Mean | 49.0 | 45.5 | 46.0 | 39.5 | 48.5 | 41.0 | 44.5 | (d) | 46.5 |
| | SD | 32.0 | 31.0 | 32.0 | 33.5 | 33.0 | 32.5 | 33.5 | | 32.5 |
| Spiritual change | Mean | 27.0 | 24.0 | 32.0 | 15.0 | 15.0 | 10.0 | 15.0 | (e) | 15.0 |
| | SD | 27.0 | 24.0 | 32.0 | 27.0 | 26.0 | 19.0 | 23.0 | | 26.0 |
| Appreciation of life | Mean | 49.3 | 45.3 | 52.0 | 41.3 | 52.0 | 38.0 | 44.7 | (f) | 48.0 |
| | SD | 33.3 | 33.3 | 35.3 | 32.0 | 34.0 | 30.0 | 36.7 | | 34.0 |

Notes:

Scores are presented as percentage of total possible score since the individual scales are of different lengths.

(a) Kruskal-Wallis $\chi^2=8.81$, $df = 6$, $p =0.19$

(b) Kruskal-Wallis $\chi^2=8.35$, $df = 6$, $p =0.21$

(c) Kruskal-Wallis $\chi^2=3.56$, $df = 6$, $p =0.74$

(d) Kruskal-Wallis $\chi^2=6.67$, $df = 6$, $p =0.35$

(e) Kruskal-Wallis $\chi^2= 4.68$, $df = 6$, $p =0.59$

(f) Kruskal-Wallis $\chi^2=14.80$, $df = 6$, $p =0.02$

As further indication of where personal growth occurred, the two items with the largest raw score mean response (out of 5), were item 14 ("*Knowing I can handle difficulties*"; mean = 2.60, SD = 1.80) and item 19 ("*My priorities about what is important in life*"; mean = 2.56, SD = 1.81).

Interestingly, these two items were also two of the three most highly endorsed in a recent study of US Iraq veterans (130). The two items with the lowest mean score, suggesting least personal growth, were item 17 ("*A better understanding of spiritual matters*"; mean = 0.93, SD = 1.52) and item 18 ("*I have a stronger religious faith*"; mean = 0.62, SD = 1.29).

As noted in Section 2.6.4, unlike the CIDI-diagnosed conditions, potential predictors of the related constructs of psychological distress were not explored since these are largely a function of the primary mental health conditions. Predictive analyses were, however, conducted for posttraumatic growth, since this is a somewhat different construct. The univariate analyses are shown in Table 4.18. Interestingly, trauma exposure (deployment-related PTEs, fear/horror at the time, and lifetime PTEs), and the presence of CIDI-diagnosed PTSD, were strong predictors of posttraumatic growth. Although initially counterintuitive, this finding is consistent with much previous research (e.g., Pietrzak et al., 2010) (130). One probable explanation is that posttraumatic growth occurs when the trauma has been upsetting enough to promote engagement in positive meaning-making of the event (14) (103). Thus, trauma survivors with lower levels of exposure (131) and/or PTSD symptoms (132) may be less likely to report posttraumatic growth.

Table 4.18: Univariate predictors of posttraumatic growth

| Variable | Test | Test statistic, (degrees of freedom), and significance (*= $p < .05$; **= $p < .01$, ***= $p < 0.001$) |
|-----------------------------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------|
| Demographics | | |
| Marital status: Unpartnered | Chi-square | 0.05 (1) NS |
| Age: Older | Chi-square | 1.11 (3) NS |
| Employment: Retired/sickness benefit | Chi-square | 9.14 (1) ** |
| Education | Chi-square | 10.13 (3) * |
| Income | Chi-square | 1.19 (5) NS |
| Trauma exposure / deployments | | |
| Age of deployment: Older | Kruskal-Wallis χ^2 | 0.73 (1) NS |
| High stress vs. Low stress | Chi-square | 0.50 (1) NS |
| No. of deployments: >1 | Chi-square | 6.44 (1) * |
| Deployment-related PTEs | t-test | 6.57 (1006) *** |
| Fear/horror at time | Kruskal-Wallis χ^2 | 62.33 (1) *** |
| Lifetime PTEs | Kruskal-Wallis χ^2 | 27.94 (1) *** |
| Physical health | | |
| Fair/poor self-rated physical health | Chi-square | 0.05 (1) NS |
| Poor health on SF-36 PCS scale | Chi-square | 1.74 (1) NS |
| Disposition | | |
| Pessimistic outlook | Kruskal-Wallis χ^2 | 4.45 (1) * |
| Mental health (Alcohol disorders only) | | |
| CIDI diagnosed PTSD | Chi-square | 15.55 (1) *** |
| CIDI diagnosed GAD | Chi-square | 0.05 (1) NS |
| CIDI-diagnosed depression | Chi-square | 1.85 (1) NS |

These relationships were largely confirmed in the subsequent multivariate logistic regression. Being deployed two or more times was associated with 1.4 times the odds of having posttraumatic growth, fear/horror from deployment exposures at the time was associated with a 2.6 times the odds of posttraumatic growth, and endorsing five or more events on the life event checklist was associated with 1.4 times the odds of posttraumatic growth. Finally, being optimistic (or neutral, rather than pessimistic) in outlook was associated with a 1.8 times the odds of posttraumatic growth. This

association is to be expected – the dispositional ability to see the positive side of things is likely to facilitate positive meaning-making of the experience.

Table 4.19: Predicting peacekeepers with posttraumatic growth

| <i>Predictor</i> | <i>Base</i> | <i>Comparator</i> | <i>OR</i> | <i>95%CI</i> |
|----------------------------------------------------------|-------------------------------|----------------------------------------|-----------|--------------|
| Number of deployments | Deployed once | 2 or more deployments | 1.43 | 1.06-1.92 |
| Life orientation | Pessimistic | Neither/Optimistic | 1.76 | 1.31-1.89 |
| Life event checklist | 0-4 events | 5+ events | 1.41 | 1.05-1.89 |
| Fear and/or horror from deployment exposures at the time | No feelings of fear or horror | Feelings of fear or horror at the time | 2.64 | 1.98-3.51 |

Notes

Logistic regression model statistics: Hosmer & Lemeshow $\chi^2 = 3.86$, $df = 7$, $p = 0.80$. -2LL = 1230.28. Model correctly classified 62.7% of study participants.

See the text for an explanation of model construction and variables dropped from the model.

4.5 Summary

This chapter has presented results on the prevalence of mental health disorders and related constructs among Australian peacekeepers. In terms of formal diagnoses, the prevalence of mental health disorders pre-deployment was very low – significantly lower in PTSD, major depression, and GAD than an age-matched civilian cohort. Although this suggests an absence of significant psychiatric vulnerability prior to deployment, the fact that alcohol use disorders were much higher than the civilian sample should be seen as an important caveat.

Currently, however, the prevalence of disorder in this sample was disturbingly high. Rates of current (12-month) PTSD, for example, were double that of a currently serving ADF deployed sample and nearly three times that of the civilian sample. Several other psychiatric disorders, although interestingly not depression, were also present at substantially higher rates than the comparison groups, including the AGWVHS, as were rates of comorbidity. Although there was little to suggest higher rates of disorder in those participants who had been on ‘high stress’ rather than ‘low stress’ deployments, prior trauma exposure (both deployment and non-deployment related) consistently emerged as a strong predictor.

Self-report measures of psychological health and wellbeing (e.g., the PCL, GHQ-12, K10) supported the diagnostic findings, with high rates of psychological distress reported by the

peacekeeper sample. Related constructs such as anger, demoralisation, and social isolation were also reported at high levels. Of particular concern are the high reported rates of suicidal ideation and behaviour among the peacekeepers. Although some posttraumatic growth was reported, the levels were generally lower than those found in other military samples.

Taken together, the findings reported in this chapter present a bleak picture of the mental health of Australia's peacekeepers. Rates of disorder and psychological distress – particularly PTSD and alcohol abuse – are higher than expected and compare unfavourably with other military populations. Although the explanation for this must remain largely a matter of speculation, potential reasons will be explored in the discussion.

5.0 GENERAL HEALTH, SERVICE USE, AND QUALITY OF LIFE

Although the primary focus of this study was mental health, the research also looked at physical health, health service use and satisfaction, and health-related quality of life. This is important, since mental and physical health are closely related. This chapter reports key findings in those areas, with a focus on descriptive analyses. The relationships between health and the potential predictors shown in Table 4.5 were explored and are described where appropriate, but more detailed analyses of predictors was not undertaken due to the cross-sectional nature of the study and the difficulty of interpreting the direction of any putative relationships. Finally, the chapter presents some preliminary data on the potential costs associated with the mental health sequelae of peacekeeping.

5.1 General health

5.1.1 *Current medical conditions*

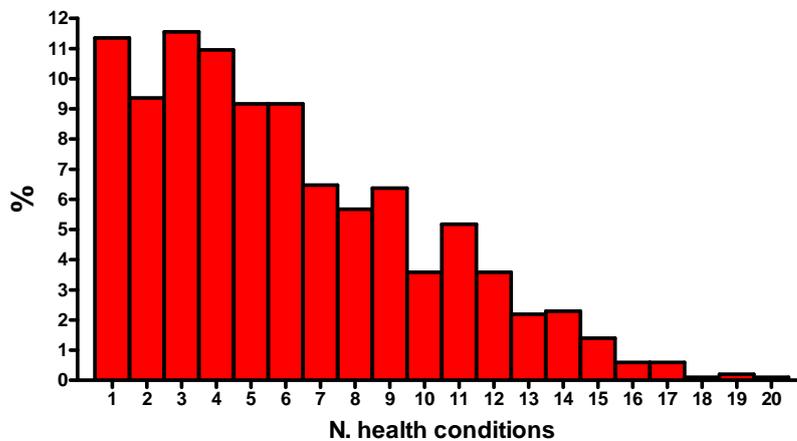
Participants were presented with a list of 28 medical conditions (see Section 2.5.2.4) and asked which, if any, they had currently or in the past. Table 5.1 shows the proportion of the sample reporting each medical condition. Over half the sample reported back problems, and over one third reported sleep problems, movement difficulties, allergies, fatigue or depression. Unfortunately, due to the manner in which these questions were asked, it is not known when these medical conditions first occurred or whether they are still current.

To obtain an estimate of overall health, endorsements across all conditions were summed. The median number of medical conditions reported was 4.00 (IQR = 6.00). The distribution of these is shown in Figure 5.1; as expected the data were skewed, with most participants reporting no (11.7%), one (8.8%), two (11.6%) or three (11%) conditions. There was, however, a small number of peacekeepers who reported 10 or more health conditions (11.2%).

Table 5.1: Reported current medical conditions, percentages

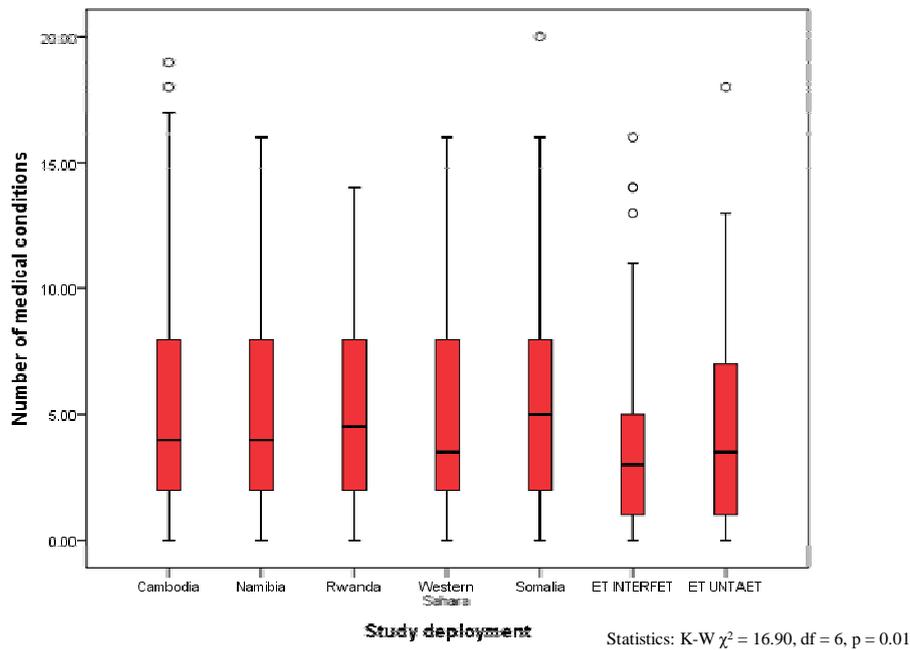
| <i>Medical condition</i> | <i>Percent endorsed N=1004</i> |
|------------------------------------------------------|------------------------------------|
| Back problems (including disc or spine) | 55.4% |
| Fatigue | 43.7% |
| Depression | 42.2% |
| Allergies | 36.7% |
| Movement problems | 36.2% |
| Sleeping disorder | 33.5% |
| Headache or migraine | 32.7% |
| Nervousness | 31.2% |
| Arthritis | 27.9% |
| Trouble hearing | 25.8% |
| High blood pressure or hypertension | 24.3% |
| Muscular weakness | 21.9% |
| Vision problems | 14.8% |
| Asthma or other severe lung problems | 13.6% |
| Smelling or tasting problems | 10.5% |
| High blood sugar or diabetes | 9.6% |
| Ulcer (duodenal, stomach, or peptic) | 6.9% |
| Chronic inflamed bowel, colitis | 4.5% |
| Cancer diagnosed within the last three years | 3.9% |
| Paralysis or neurological problem | 3.3% |
| Thyroid problems | 3.3% |
| Angina | 2.4% |
| Heart attack, myocardial infarction (MI) or coronary | 2.3% |
| Heart failure or enlarged heart | 1.7% |
| Kidney disease | 1.4% |
| Using a cardiac pacemaker | 0.3% |
| Amputation of an arm or leg | 0.1% |
| Some other major problem | 14.3% |

Figure 5.1: Number of health conditions



As shown in Figure 5.2, there were significant differences between deployments (Kruskall-Wallis $\chi^2 = 16.90$, $df = 6$, $p = 0.01$). Fewer current medical conditions were reported by peacekeepers from the two East Timor deployments (INTERFET and UNTAET) when compared with those from the other five deployments (Kruskall-Wallis $\chi^2 = 12.72$, $df = 1$, $p < 0.01$). This may, of course, be explained by the fact that the Timor deployments were more recent, as noted in Section 3.3.1, participants from the Timor deployments were among the youngest in the sample. Indeed, there were significant associations between the number of medical conditions and age (with younger participants reporting fewer conditions: $r_s = 0.22$, $p < 0.01$). Number of medical conditions was also associated with education attainment (with higher education associated with fewer conditions: Kruskal-Wallis $\chi^2 = 11.47$, $df = 3$, $p < 0.01$) and, not surprisingly, labour force participation (with those still in the workforce reporting fewer conditions: Kruskal-Wallis $\chi^2 = 161.71$, $df = 2$, $p < 0.01$).

Figure 5.2: Median number of health conditions by deployment



5.1.2 Overall health status

As part of the SF-36V2, participants were asked to rate their general health on a 5-point scale ranging from “excellent” to “poor”. The self-reported overall health of study participants is shown in Table 5.2, broken down by deployment. Most peacekeepers reported that they were in good, very good, or excellent health but a substantial minority – nearly 35% – reported their general health to be fair or poor. The significant differences by deployment were explained by more than expected INTERFET cases, and fewer than expected Rwanda cases, reporting that they were in excellent health.

Table 5.2: Overall health status of participants, percentages

| <i>General health</i> | <i>Deployment status</i> | | | | | | <i>Overall status</i> | | |
|-----------------------|--------------------------|----------------|---------------|------------------|----------------|-----------------|-----------------------------------|-----------------------------------|------------------|
| | <i>Cambodia</i> | <i>Namibia</i> | <i>Rwanda</i> | <i>W. Sahara</i> | <i>Somalia</i> | <i>INTERFET</i> | <i>UNTAET</i> | <i>Peacekeepers</i> | <i>SAHOS (a)</i> |
| <i>N</i> | <i>292</i> | <i>193</i> | <i>109</i> | <i>38</i> | <i>213</i> | <i>64</i> | <i>104</i> | <i>1,013</i> | <i>1,479</i> |
| Excellent | 6.8% | 9.3% | 2.8% | 13.2% | 6.1% | 20.3% | 9.6% | 8.1% | 19.5% |
| Very good | 24.7% | 28.0% | 23.9% | 31.6% | 21.6% | 17.2% | 27.9% | 24.7% | 31.4% |
| Good | 30.8% | 33.7% | 33.9% | 28.9% | 35.2% | 34.4% | 27.9% | 32.5% | 31.9% |
| Fair | 28.1% | 24.4% | 33.9% | 21.1% | 28.6% | 17.2% | 26.0% | 26.9% | 11.9% |
| Poor | 9.6% | 4.7% | 5.5% | 5.3% | 8.5% | 10.9% | 8.7% | 7.8% | 5.3% |
| Statistics | | | | | | | $\chi^2=36.54, df = 24, p > 0.01$ | $\chi^2=149.83, df = 4, p < 0.01$ | |

Notes:

Based on examination of residuals, statistically significant cells marked in **bold**

(a) = Data from the South Australian Health Omnibus Survey, 2008. Males only.

Since this question was not asked in the NSMHWB, data from male participants in the South Australian Health Omnibus Survey (SAHOS) were used for comparison. These estimates represent male population norms for this question and were unmatched, requiring caution in interpretation. A full description of the SAHOS methodology can be found elsewhere (133-135). Briefly, the SAHOS is a population-based survey administered to metropolitan and country residents of South Australia aged 15 years or more via a face-to-face interview. The sample size was approximately 3,000 for the 2008 survey which was used for this comparison (133). When compared with males from the 2008 SAHOS (right hand panel of Table 5.2), participants were significantly more likely to report being in fair or poor health. After collapsing the categories (excellent/very good/good versus fair/poor) peacekeepers were 2.8 times more likely to report being in fair or poor health than were the SAHOS males (OR: 2.78, 95%CI: 2.26 – 3.30).

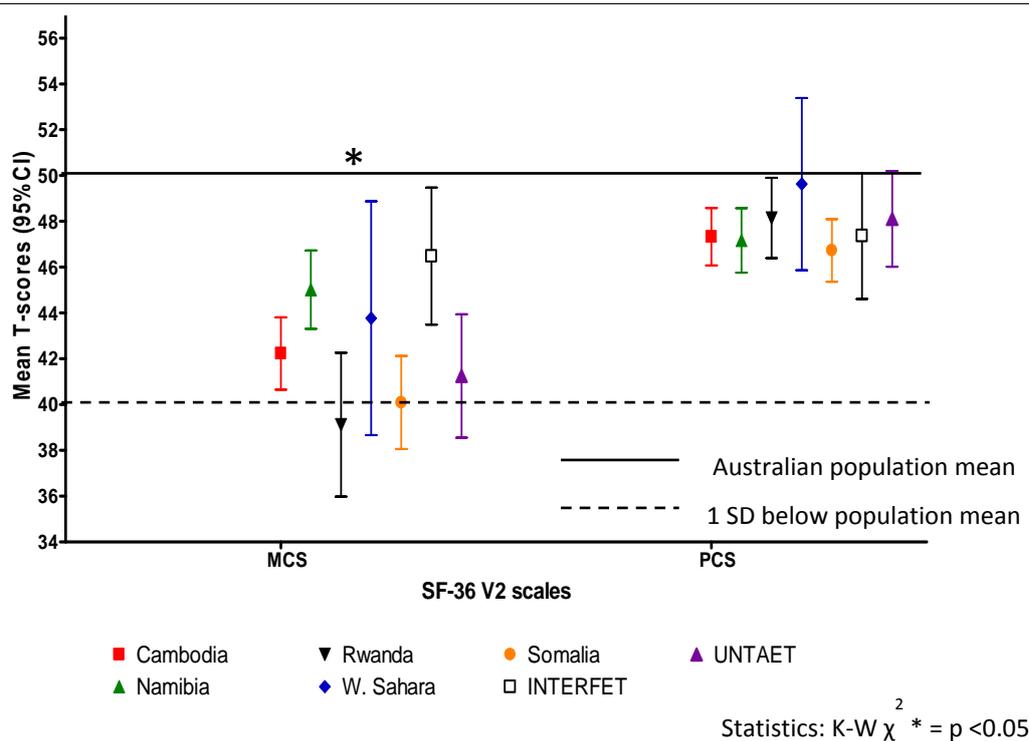
Consistent with the findings regarding number of medical conditions, there was a significant relationship with age; those aged 20 to 39 years were more likely to report being in excellent health, whereas those aged 50 to 59 years were more likely to report being in fair health ($\chi^2 = 34.92$, $df = 12$, $p < 0.01$). Also in line with number of medical conditions, those who had completed high school were less likely to report being in excellent health and more likely to report being in poor health, while those with a degree were less likely to report being in fair health ($\chi^2 = 23.67$, $df = 12$, $p = 0.02$). There was no difference in general health status by gender (Fisher Exact Test = 4.12, $p = 0.38$) or relationship status ($\chi^2 = 2.66$, $df = 8$, $p = 0.95$). In terms of deployment and trauma history, those who had served on three or more deployments were more likely to report being in poor health, whereas those who had served on only one deployment were less likely to report being in fair health ($\chi^2 = 19.75$, $df = 8$, $p = 0.01$). There was also a monotonic relationship with deployment-related trauma exposure: as the number of exposures (TSES-R2) increased, general health declined ($\chi^2 = 91.53$, $df = 12$, $p < 0.01$). Consistent with this, participants from high stress deployments were slightly more likely to report fair or poor health than those from low stress deployments ($\chi^2 = 4.08$, $df=1$, $p=0.04$).

5.1.3 Health function as assessed by the SF-36

As discussed in Section 2.5.3.4, the SF-36V2 is a general measure of health functioning. Only the two summary scales – mental component summary (MCS) and physical component summary (PCS) –

will be reported here. The mean scores (95% CIs) for the MCS and PCS for each deployment are shown in Figure 5.3. The solid horizontal line at 50 T-score points represents the Australian population norm and the dotted horizontal line at 40 T-score points represents one standard deviation below the mean (96). Mean score for the MCS was 42.21 (SD = 14.18) and for the PCS 47.43 (SD = 10.42). The MCS T-scores were statistically below the population norm and varied between deployments (Kruskall-Wallis $\chi^2 = 19.90$, $df = 6$, $p < 0.01$), with Rwanda and Somalia the lowest. Peacekeepers deployed to the high stress deployments obtained MCS rank scores indicating worse mental health than those deployed on the low stress deployments, although the differences were marginal and were below the thresholds for clinically important differences (the mean MCS scores were $MCS_{\text{Hiestress}} = 41.46$, $SD = 14.61$ and $MCS_{\text{Lowstress}} = 43.73$, $SD = 13.15$; Kruskal-Wallis $\chi^2 = 4.24$, $df = 1$, $p = 0.04$). Although the PCS scores were marginally below population norms, this was not statistically significant nor did it vary between deployments (Kruskall-Wallis $\chi^2 = 5.41$, $df = 6$, $p = 0.49$).

Figure 5.3: Mental component summary (MCS) and physical component summary (PCS) scores



Consistent with the other health indices discussed above, MCS scores varied monotonically with educational attainment: the higher the education level, the higher the MCS score (indicating better mental health; Kruskal-Wallis $\chi^2 = 8.40$, $df = 3$, $p = 0.04$). Females were 3.7 times more likely

to be classified with poor mental health than were males (95%CI = 1.75-7.81), while those with high numbers of lifetime PTEs were 2.01 times more likely to report poor mental health on the MCS (95%CI = 1.44-2.80). There were no significant differences in MCS scores by age group or relationship status.

PCS scores varied age, with the younger peacekeepers reporting better physical health on the PCS than older participants (Kruskall-Wallis $\chi^2 = 51.95$, $df = 3$, $p < 0.01$). A similar pattern was evident for education attainment, with highest PCS mean scores (i.e., better health) obtained by those with higher education levels (Kruskall-Wallis $\chi^2 = 15.24$, $df = 3$, $p < 0.01$).

5.2 Health service use and satisfaction

5.2.1 Health care service use

Health service providers were grouped into medical practitioners (general practitioners, psychiatrists, and other medical specialists), allied health professionals (AHPs: chiropractor, nurse, occupational therapist, physiotherapist, psychologist, social worker and other counsellors, speech therapist), and alternative therapists (ALT: acupuncturist, herbalist, naturopath, other therapist). The total number of health services used by provider type in the past three months is shown in Figure 5.4. The total numbers of services consumed was truncated for graphical reasons at 10; there were a few cases, however, which had used between 11 and 30 health care services.

Figure 5.4: Number of health services used, by health care provider type

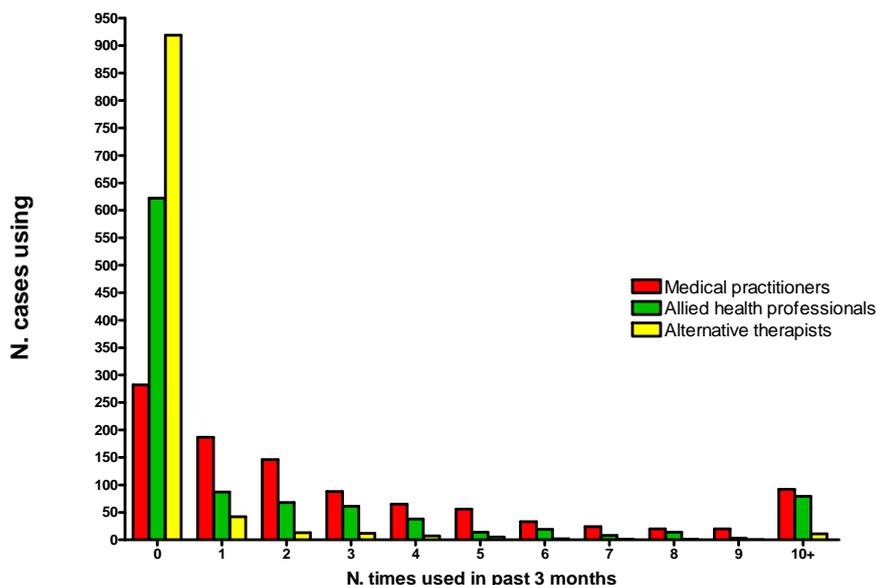


Table 5.3 shows provider type by deployment. Overall, 68.1% of peacekeepers had seen a GP in the previous three months; there was no significant difference by deployment. Medical specialists (excluding psychiatrists) had been seen by 35%; again there was no significant difference by deployment. However, 16.1% of participants had seen a psychiatrist; those from Rwanda and Somalia were more likely to report seeing a psychiatrist. There was no difference across deployments in use of AHPs, but ALTs were significantly more likely to be used by peacekeepers from Rwanda and INTERFET.

Participants with diagnosed mental health conditions were more likely to consult a medical practitioner of some kind. Over 80% of veterans with a mental health diagnosis had consulted with a general practitioner, 32% had consulted a psychiatrist, 20% a psychologist, and 8% had seen a counsellor. There was, however, considerable overlap between these figures – most people who were seeing a psychologist were also seeing a psychiatrist – such that only just over one third of peacekeepers with a mental health condition had seen a specialist mental health provider. Nevertheless, only 17% of peacekeepers with a mental health condition had not seen any clinician or therapist. Those with major depression were 2.9 times more likely to have consulted a medical practitioner in the last three months than those without depression (OR: 2.95, 95%CI: 1.24-6.99). Those with GAD were 2.7 times more likely (OR: 2.73, 95%CI: 1.15-6.51); those with alcohol

dependence were 2.6 times more likely (OR: 2.59, 95%CI: 1.52-4.40); and those with PTSD were 2.5 times more likely (OR: 2.46, 95%CI: 1.58-3.83). Participants who reported suicidal ideation were three times more likely to have consulted a medical practitioner (OR: 3.09, 95%CI: 1.70-5.62). Females were more than twice as likely as males to have seen a medical practitioner (OR = 2.27, 95%CI: 1.10-5.14), and older participants were more likely to report seeing a medical practitioner when compared with younger study participants (91% of those aged 60+ years reported having seen a medical practitioner compared with 63% of those aged 20-39 years, $\chi^2 = 32.10$, $df = 3$, $p < 0.01$). There was no statistically significant association between education attainment or relationship status and having seen a medical practitioner.

AHPs were seen by 36.8% of peacekeepers in the previous three months. As for medical practitioners, use of AHP services in the past three months was related to participants' current mental health status. Those with depression were twice as likely to have seen an AHP as the non-depressed (OR: 2.09; 95%CI: 1.18-3.71); those with PTSD were 1.9 times more likely than those without PTSD (OR: 1.88; 95%CI: 1.35-2.61); and those with harmful alcohol use were 1.8 times more likely (OR: 1.82; 95%CI: 1.24-2.67). Participants who reported suicidal ideation were over twice as likely to have seen an AHP as those without suicidal thoughts (OR: 2.08; 95%CI: 1.39-3.11). Interestingly, there was no association between GAD and having seen an AHP. Finally, there was no statistically significant association between seeing an AHP and gender, participant age, education attainment or relationship status.

Table 5.3: Health service providers used in the past 3 months, percentages

| <i>Health service provider type</i> | <i>Deployment</i> | | | | | | <i>Statistics</i> | <i>Total</i> | |
|-------------------------------------|-------------------|----------------|---------------|------------------|----------------|-----------------|-------------------|------------------------------------|---------------|
| | <i>Cambodia</i> | <i>Namibia</i> | <i>Rwanda</i> | <i>W. Sahara</i> | <i>Somalia</i> | <i>INTERFET</i> | | | <i>UNTAET</i> |
| | 292 | 194 | 108 | 38 | 215 | 65 | 101 | 1013 | |
| <i>Medical practitioner</i> | | | | | | | | | |
| General practitioner | 66.40% | 71.60% | 70.40% | 63.20% | 67.00% | 67.70% | 68.30% | $\chi^2 = 2.31, df = 6, p = 0.89$ | 68.10% |
| Psychiatrist | 15.40% | 10.30% | 25.00% | 10.50% | 20.50% | 10.80% | 15.80% | $\chi^2 = 16.54, df = 6, p = 0.01$ | 16.10% |
| Other specialist | 32.50% | 31.40% | 44.40% | 28.90% | 38.10% | 32.30% | 36.60% | $\chi^2 = 7.96, df = 6, p = 0.24$ | 35.00% |
| <i>Other health professional</i> | | | | | | | | | |
| AHP (a) | 32.50% | 35.10% | 39.80% | 36.80% | 40.90% | 41.50% | 37.60% | $\chi^2 = 5.19, df = 6, p = 0.52$ | 36.80% |
| ALT (b) | 8.20% | 6.70% | 15.70% | 7.90% | 7.40% | 16.90% | 9.90% | $\chi^2 = 12.74, df = 6, p = 0.05$ | 9.30% |

Notes:

(a) = Allied health professional: chiropractor, nurse, occupational therapist, physiotherapist, psychologist, social worker and other counsellors, speech therapist

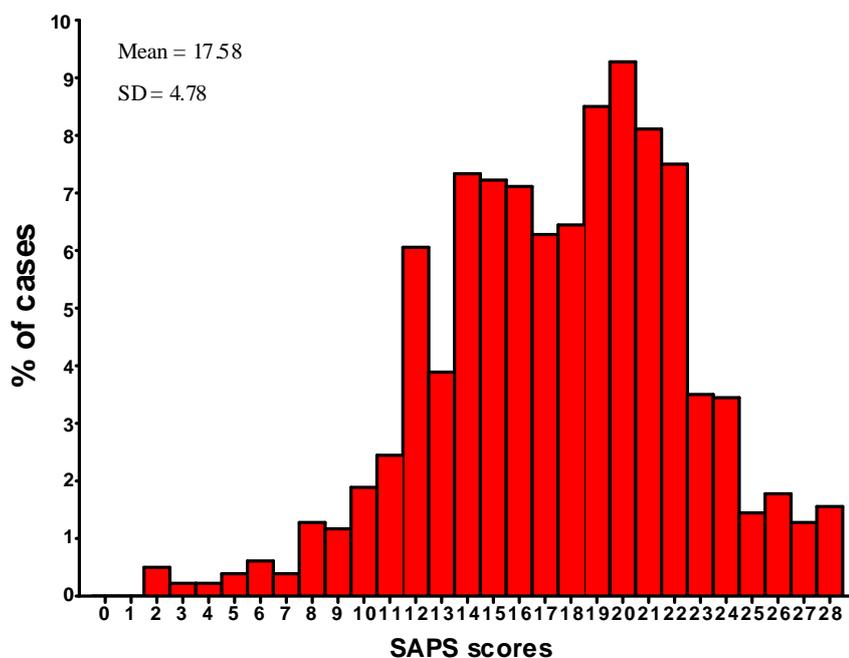
(b) = Alternative therapist: acupuncturist and other therapists (herbalist, naturopath, etc.)

5.2.2 Satisfaction with health care services

As discussed in Section 2.5.4.6, satisfaction with health care services was assessed by the Short Assessment of Patient Satisfaction Scale (SAPS) (7, 136). The distribution of SAPS scores is shown in Figure 5.5. The mean score of 17.58 (SD = 4.78) is very close to the suggested cut-point of 17 for differentiating those who are satisfied with their health care and those who are dissatisfied; 40.7% were below this cut-off score indicating that they were dissatisfied with their health care.

SAPS scores varied by the general health of study participants. Those who were in excellent, very good, or good health reported higher satisfaction with health services than those who reported that they were in fair or poor health (t-test, $t_{\text{transformed}} = -5.17$, $df = 1004$, $p < 0.01$). Similarly, the more CIDI-diagnosed mental health conditions, the lower the satisfaction with health services (ANOVA, $F_{\text{transformed}} = 5.78$, $df = 2,1018$, $p < 0.01$). Interestingly, however, while there were significant differences in SAPS scores for those with and without depression (t-test, $t_{\text{transformed}} = -2.35$, $df = 1013$, $p = 0.02$) and suicidal ideation (t-test, $t_{\text{transformed}} = -3.35$, $df = 1009$, $p < 0.01$), there were no differences in satisfaction for those with or without alcohol dependence, GAD, or PTSD.

Figure 5.5: Satisfaction with health services; SAPS scores



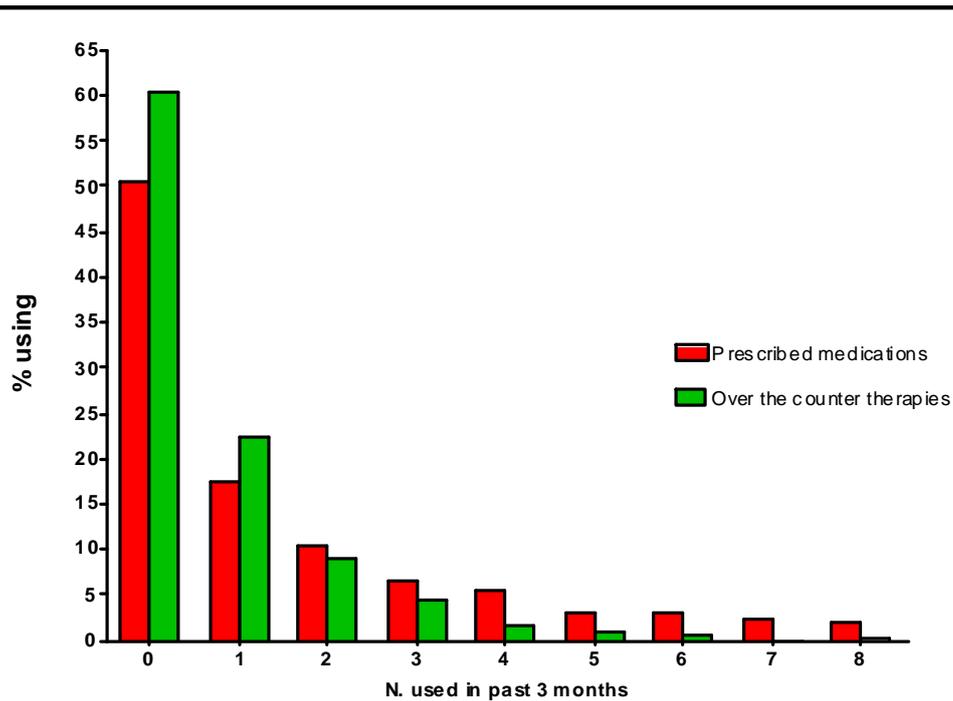
Notwithstanding the general finding that worse health was associated with lower satisfaction, access to services appeared to be a factor also: those holding a DVA Gold Card (presumably those with worse health) reported higher satisfaction scores than those with a White Card or no DVA health card (ANOVA, $F_{\text{transformed}} = 7.97$, $df = 2,1018$, $p < 0.01$). This finding, however, may also be influenced by age: older participants (aged over 50 and presumably more likely to have a Gold Card) reported higher levels of satisfaction than younger participants (ANOVA, $F_{\text{transformed}} = 16.97$, $df = 3,1017$, $p < 0.01$).

Finally, trauma history influenced satisfaction with health care. Those who had experienced five or more PTEs on the Life Events Checklist reported lower patient satisfaction than those who had experienced fewer life events (t-test, $t_{\text{transformed}} = -2.55$, $df = 1004$, $p < 0.01$). There was no significant difference in SAPS scores by deployment, nor by the number of deployments served on.

5.2.3 Use of prescribed and over the counter (OTC) medications

Participants were asked to report the number of prescribed medications and over-the-counter (OTCs) therapies used. As shown in Figure 5.6, over half the sample (51%) did not report using any prescribed medications and 60% did not report the use of any OTCs. Very small numbers reported the use of three or more medications or OTCs.

Figure 5.6: Number of prescribed medications and OTCs used



For data analysis, the number of medications and OTCs was collapsed into those reporting no use, some use (1 or 2 medications or OTCs) and multiple use (3+). Of those who did not use any prescribed medication, 34% reported use of OTCs; of those using some prescribed medication, 43% were also using OTCs; and of those using multiple prescribed medications, 47% also used OTCs ($\chi^2 = 26.65$, $df = 4$, $p < 0.01$). Thus, as veterans' consumption of prescribed medications increased, so did their consumption of OTCs.

Prescribed medication use increased with age. Of younger peacekeepers (those aged 20-49 years) 57.5% reported they did not use any medications compared with just 35.6% of those 50 years or older. Just over a quarter (26%) of younger participants reported using one to two medications compared with 31.5% among older veterans, and 16.5% of younger participants reported using three or more medications compared with 32.9% of older participants ($\chi^2 = 53.29$, $df = 2$, $p < 0.01$). As expected, those reporting poor physical health on the SF-36V2 PCS were almost eight times more likely than those with higher PCS scores to be consuming three or more medications (OR: 7.87, 95%CI: 5.67-10.91), and those with poor mental health on the MCS were 4.5 times more likely to be using three or more medications than those with good mental health (OR: 4.49, 95%CI: 3.24-6.22).

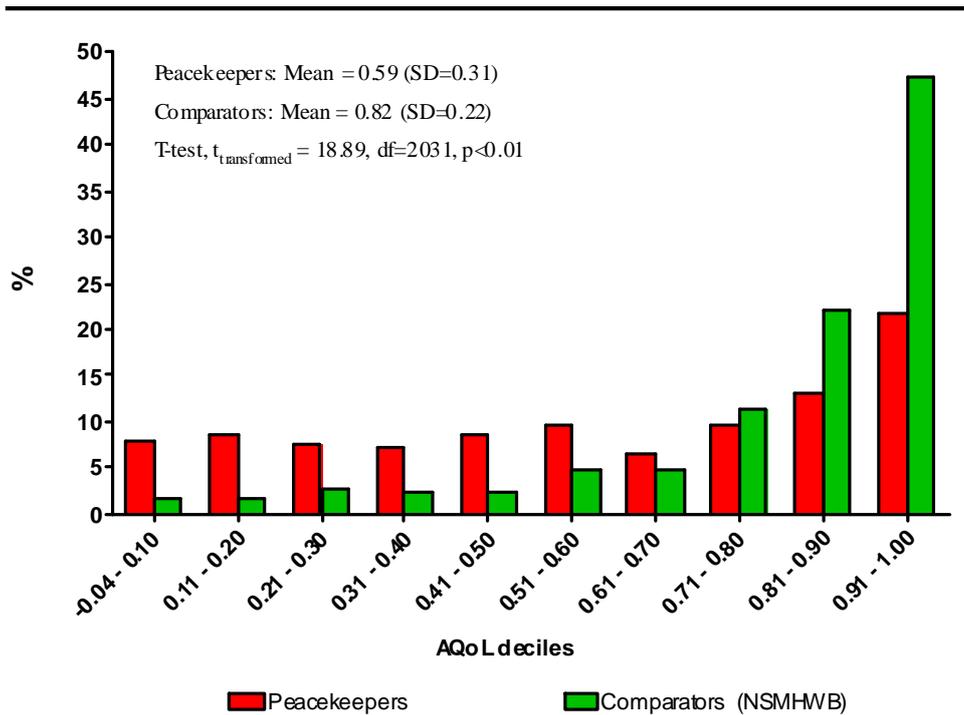
Those with current GAD (but not other diagnoses) were 2.4 times more likely to have used three or more medications compared to those without GAD. There was no relationship between prescribed medication use and deployment, and no differences by gender, education attainment, or relationship status.

Consumption of OTCs showed a slightly different pattern. Females were nearly four times more likely to report using three or more OTCs when compared with males (OR: 3.69, 95%CI: 1.81-7.52), and participants who were divorced/widowed or separated were more likely to report using three or more OTCs than were those who were single or partnered ($\chi^2 = 13.01$, $df = 4$, $p = 0.01$). Those with poor mental health on the MCS were 1.6 times more likely to report using three or more OTCs than were those in good health (OR: 1.60, 95%CI: 1.02-2.52). There was no significant difference in the consumption of OTCs by deployment, physical health status (PCS), or age group.

5.3 Quality of life

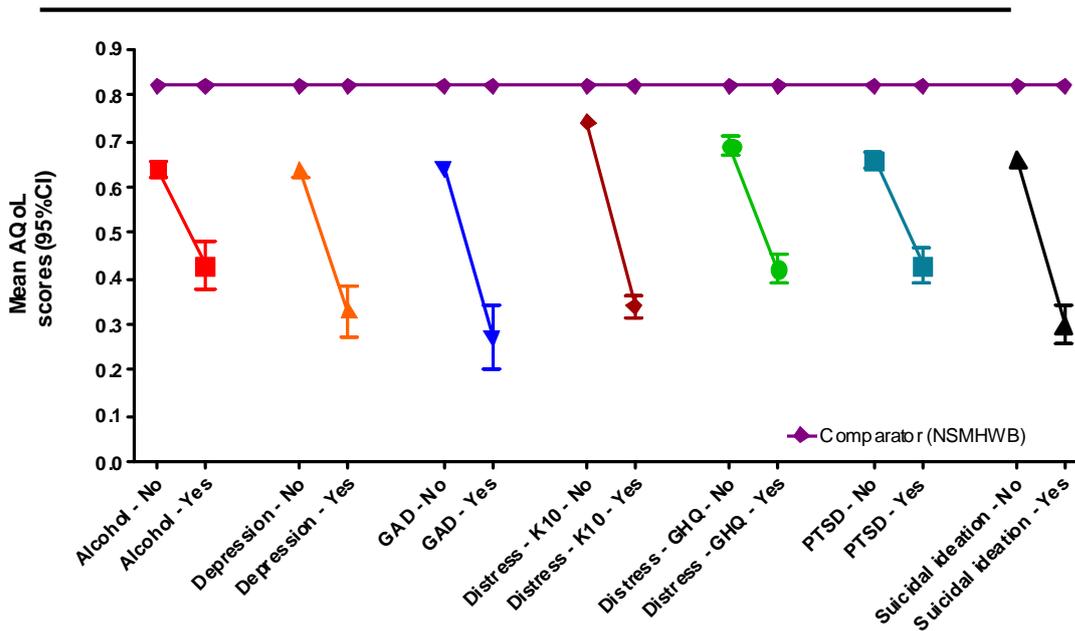
As noted in Section 2.5.4.5, health-related quality of life (HRQoL) was assessed using the AQoL. Scores on the AQoL cover the full health utility spectrum from 1.00 (best HRQoL state) to -0.04 (worst HRQoL state) where 0.00 is a death-equivalent state. The Australian population norm is 0.81 (SD = 0.22) (137). The distribution of AQoL scores is shown in Figure 5.7 for both peacekeepers and the matched NSMHWB cohort (comparators). As expected in a general population sample, 47.2% of the civilian comparators' scores fell within the ceiling decile. This can be compared with just 21.7% of peacekeepers. At the death-equivalent utility endpoint of the AQoL scale (0.00) the situation was reversed: 16.4% of all peacekeepers obtained utility scores within the lowest two deciles compared with just 3.2% of the comparator cohort. The mean scores reflect this discrepancy between the peacekeepers and the NSMHWB comparators. For peacekeepers, the AQoL mean score was 0.59 (SD = 0.31) and for the comparators it was 0.82 (SD = 0.22). These differences were statistically significant (t-test, $t_{\text{transformed}} = -19.16$, $df = 2013$, $p < 0.01$) and suggest that peacekeepers, when compared with their matched civilian peers, have a quality of life that is approximately 30% worse.

Figure 5.7: Peacekeepers vs comparators QoL, AQoL utility deciles



As expected, mental health demonstrated a substantial impact on quality of life. AQoL scores were significantly lower for those with alcohol dependence, depression, GAD, and PTSD, as well as suicidal ideation and those scoring highly on the GHQ and K10 (t-test, $t_{transformed}$, $p < 0.01$ for all). The details are summarised in Figure 5.8. For all mental health conditions, there were very substantial reductions in quality of life. Consistent with this, those reporting poor mental health on the SF-36V2 MCS had significantly worse quality of life ($AQoL_{Mean\ normal\ mental\ health} = 0.78$, $SD = 0.19$ versus $AQoL_{Mean\ poor\ mental\ health} = 0.44$, $SD = 0.25$; t-test, $t_{transformed} = -24.06$, $df = 1,002$, $p < 0.01$). Similar findings were obtained for physical health status on the SF-36V2 PCS ($AQoL_{Mean\ normal\ physical\ health} = 0.72$, $SD = 0.23$ versus $AQoL_{Mean\ poor\ physical\ health} = 0.42$, $SD = 0.25$; t-test, $t_{transformed} = -17.92$, $df = 1,002$, $p < 0.01$).

Figure 5.8: QoL (AQoL) by mental health conditions



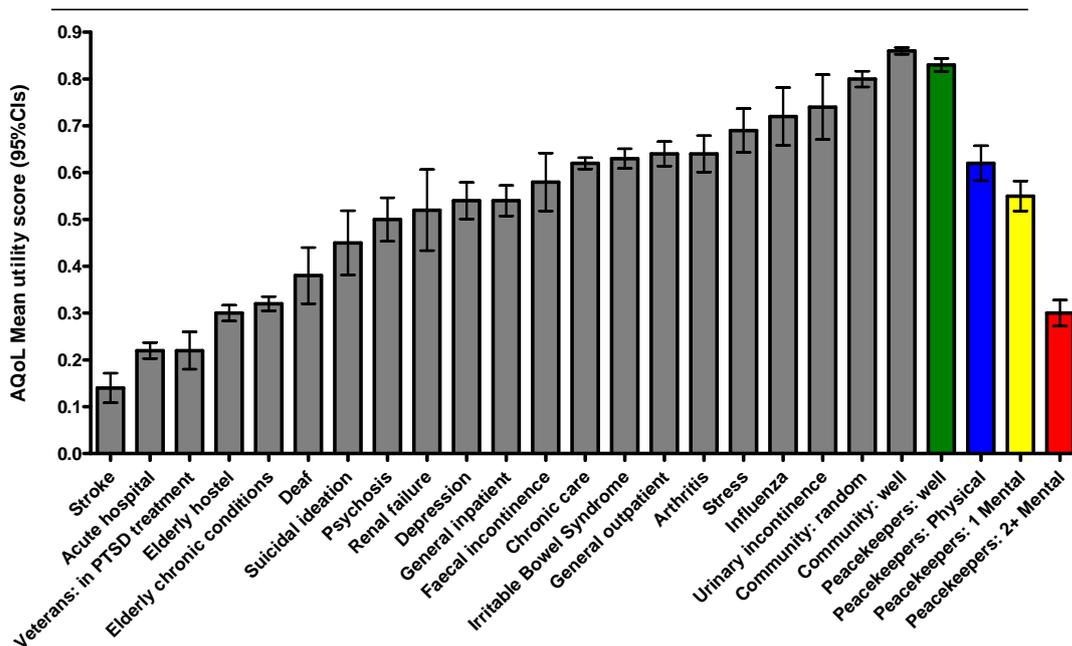
Statistics: t-test, $t_{\text{Transformed}}$, $p < 0.01$ for all

For the peacekeepers, current AQoL scores did not differ by deployment (ANOVA, $F_{\text{Transformed}} = 1.15$, $df = 6,1001$, $p = 0.33$) or across high and low stress deployments (ANOVA, $F_{\text{Transformed}} = 0.75$, $df = 1,1006$, $p = 0.39$). There were, however, significant differences by the number of deployments – as the number of the deployments increased, QoL deteriorated. For those who had participated in one deployment the AQoL mean = 0.65 (SD = 0.27), for two deployments it was 0.56 (SD = 0.28) and for three or more deployments it was 0.53 (SD = 0.27) (ANOVA, $F_{\text{Transformed}} = 11.49$, $df = 2,1005$, $p < 0.01$). Consistent with this, QoL in peacekeepers was associated with the number of lifetime PTEs reported on the LEC and deployment-related PTEs on the TSES-R2. For the LEC, those with 0 to 4 PTEs obtained a mean AQoL score of 0.72 (SD = 0.23) compared with 0.54 (SD = 0.29) for those with five or more PTEs (t-test, $t_{\text{transformed}} = -10.61$, $df = 1001$, $p < 0.01$). Similarly, for PTEs whilst on deployment as assessed by the TSES-R2, the mean AQoL score was 0.71 (SD = 0.24) for those who reported 0 to 9 PTEs, and 0.53 (SD = 0.29) for those who reported 10 or more PTEs (t-test, $t_{\text{transformed}} = -11.05$, $df = 1006$, $p < 0.01$).

There was a small deterioration in quality of life with age: the AQoL mean score for those aged 20-29 years was 0.69 (SD = 0.26), for those aged 40-59 years it was 0.61 (SD = 0.28), and for those

aged 60 years or more it was 0.56 (SD = 0.29; ANOVA, $F_{\text{transformed}} = 9.92$, $df = 2,1005$, $p < 0.01$). Those who were partnered obtained the highest mean AQoL score (0.63, SD = 0.27), significantly higher than those who were divorced, separated, or widowed (0.55, SD = 0.29), and those who were single (0.56, SD = 0.28; ANOVA, $F_{\text{transformed}} = 6.21$, $df = 2,1005$, $p < 0.01$). Finally, there were small but significant differences in mean AQoL scores by education attainment, with higher education being associated with better quality of life: those who had completed high school (mean AQoL = 0.56, SD = 0.29) had significantly worse quality of life than those with TAFE (0.66, SD = 0.25) or University (0.67, SD = 0.27) education (ANOVA, $F_{\text{transformed}} = 7.83$, $df = 3,1004$, $p < 0.01$). There were significant differences in quality of life scores by life orientation; those who were optimistic obtained a mean AQoL score of 0.79 (SD = 0.19), those with a neutral life outlook obtained a mean score of 0.66 (SD = 0.24), and those who were pessimistic obtained a mean score of 0.41 (SD = 0.25; ANOVA, $F_{\text{transformed}} = 247.35$, $df = 2,1005$, $p < 0.01$). There was no significant difference in AQoL mean scores by gender.

Figure 5.9: Peacekeepers' quality of life in context



Source: Hu et al (2005); peacekeeper data from this study

Figure 5.9 places the study findings in the context of other health conditions in the Australian community (138). The healthy peacekeepers (green column) shown in the figure were those

peacekeepers from this study who had no reported mental or physical health conditions. As shown, when compared with (unmatched) civilian comparators, also with no known health conditions, those peacekeepers reported a slightly lower quality of life. This difference, however, while statistically significant (Welch's approximate t , $t = 3.81$, $df = 642$, $p < 0.01$), is not clinically meaningful. The mean AQoL score for peacekeepers with a physical disability only was 0.62 (SD = 0.21), roughly the equivalent of those in the general community with irritable bowel syndrome, chronic health care needs, or general hospital outpatients. The AQoL score for peacekeepers with one mental health condition was 0.55 (SD = 0.24). Lending weight to the validity of the measure, this score is similar to those in the general community with depression. It is also comparable to hospital inpatients, as well as those in the general community with renal failure. The situation of those with two or more mental health conditions was considerably worse. The AQoL utility score was 0.30 (SD = 0.21), comparable to the elderly living in residential care or those in the general community with chronic conditions. Interestingly, however, these scores are still slightly above those of veterans undergoing treatment for PTSD. In summary, these data suggest that peacekeepers' quality of life is generally comparable to that of civilians suffering from the same or similar conditions.

5.4 The value of life lost – a utility perspective

Although there are many viewpoints from which evaluations can be undertaken, in economic evaluation the societal perspective is preferred because it represents the public interest particularly where there may be high patient, family or other sector costs (139-141). This perspective is taken here. Utility (loss of quality of life) can be represented by a global estimate from the AQoL (12, 109). This estimate provides the broadest perspective since it is assumed to reflect all losses associated with ill health, including health service costs, costs borne by other sectors (e.g., legal costs) and costs borne by the individual (e.g., loss of wages, marital breakdown). Although this approach is consistent with that taken in the health economics literature, it must be recognised that the costs are simply extrapolated from AQoL scores; no attempt is made to compute the actual costs in each domain individually.

Table 5.4: The impact of mental health syndromes on peacekeepers' quality of life, AQoL utilities

| <i>Condition</i> | | <i>AQoL utilities</i> | | | | | | | | | | |
|--------------------------|--------------|-----------------------|-------------|--------------|------|---------------------------|-------------|--------------|-----------|-------------------------------|--------------|------|
| | | <i>Peacekeepers</i> | | | | <i>NSMHWB comparators</i> | | | | <i>Loss in life value (a)</i> | | |
| | | <i>N</i> | <i>Mean</i> | <i>95%CI</i> | | <i>N</i> | <i>Mean</i> | <i>95%CI</i> | | <i>Mean</i> | <i>95%CI</i> | |
| | | <i>Lo</i> | <i>Hi</i> | | | <i>Lo</i> | <i>Hi</i> | | <i>Lo</i> | <i>Hi</i> | | |
| K10 (Cut-point:21/22) | No | 694 | 0.74 | 0.73 | 0.75 | 929 | 0.85 | 0.84 | 0.86 | 0.11 | 0.10 | 0.12 |
| | Yes | 294 | 0.34 | 0.31 | 0.37 | 96 | 0.46 | 0.40 | 0.52 | 0.12 | 0.10 | 0.14 |
| | Utility loss | | 0.40 | 0.36 | 0.44 | | 0.39 | 0.32 | 0.46 | | | |
| Alcohol dependence | No | 893 | 0.64 | 0.62 | 0.66 | 988 | 0.82 | 0.81 | 0.83 | 0.18 | 0.17 | 0.19 |
| | Yes | 115 | 0.43 | 0.38 | 0.48 | 37 | 0.72 | 0.63 | 0.81 | 0.29 | 0.25 | 0.33 |
| | Utility loss | | 0.21 | 0.14 | 0.28 | | 0.10 | 0.00 | 0.20 | | | |
| Depression | No | 937 | 0.64 | 0.62 | 0.66 | 996 | 0.83 | 0.82 | 0.84 | 0.19 | 0.18 | 0.20 |
| | Yes | 71 | 0.33 | 0.28 | 0.38 | 29 | 0.53 | 0.42 | 0.64 | 0.20 | 0.15 | 0.25 |
| | Utility loss | | 0.31 | 0.24 | 0.38 | | 0.30 | 0.18 | 0.42 | | | |
| Generalised anxiety | No | 960 | 0.64 | 0.62 | 0.66 | 995 | 0.82 | 0.81 | 0.83 | 0.18 | 0.17 | 0.19 |
| | Yes | 48 | 0.27 | 0.20 | 0.34 | 30 | 0.56 | 0.46 | 0.66 | 0.29 | 0.23 | 0.35 |
| | Utility loss | | 0.37 | 0.29 | 0.45 | | 0.26 | 0.14 | 0.38 | | | |
| PTSD | No | 836 | 0.66 | 0.64 | 0.68 | 964 | 0.83 | 0.82 | 0.84 | 0.17 | 0.16 | 0.18 |
| | Yes | 172 | 0.43 | 0.39 | 0.47 | 61 | 0.61 | 0.54 | 0.68 | 0.18 | 0.15 | 0.21 |
| | Utility loss | | 0.23 | 0.17 | 0.29 | | 0.22 | 0.14 | 0.30 | | | |
| Suicidal ideation | No | 900 | 0.66 | 0.64 | 0.68 | 997 | 0.83 | 0.82 | 0.84 | 0.17 | 0.16 | 0.18 |
| | Yes | 108 | 0.30 | 0.26 | 0.34 | 28 | 0.47 | 0.34 | 0.60 | 0.17 | 0.12 | 0.22 |
| | Utility loss | | 0.36 | 0.30 | 0.42 | | 0.36 | 0.22 | 0.50 | | | |

Notes:

(a) = Loss of quality of life attributed to both military service and the impact of peacekeeping.

5.4.1 The impact of mental health conditions on quality of life

It is clear from Section 5.3 above that the quality of life for peacekeepers in this study is compromised, particularly where they suffer from mental health conditions. Table 5.4 attempts to quantify this reduction in quality of life associated with the CIDI-diagnosed mental health conditions, as well as with suicidal ideation and the broad indicator of psychological distress, the K10.

The left hand panel of the table reports peacekeepers' AQoL utility loss due to each of the mental health syndromes. These losses in quality of life range from 0.21 for alcohol dependence to 0.40 for those scoring highly on the K10. The centre panel reports the same data for the comparator cohort. Importantly, there was no significant difference between peacekeepers and comparators in terms of the impact of specific mental health indices on participants' lives. For example, there was no significant difference between the impact of general psychological distress (K10) for peacekeepers and comparators (losses of 0.40, 95%CI: 0.36-0.44 compared with 0.39, 95%CI: 0.32-0.46). That is, experiencing a mental health condition has the same degree of impact on quality of life for both peacekeepers and civilians.

In contrast, the right-hand column of the table reports the differences in AQoL utility scores between peacekeepers and comparators. There are two important observations. First, peacekeepers without the condition of interest obtained utility scores that were 0.11 to 0.19 AQoL utility score points worse than the civilian comparators. In every case this difference was statistically significant and exceeded the published minimum important difference for AQoL scores (0.06) – in some cases two to three times over (110). Thus, there must be other factors that adversely affect the quality of life of the peacekeepers. This could, for example, be the presence of other conditions (e.g., physical health problems, or mental health conditions other than those assessed in this study). It could also, for example, be a function of the general experience of peacekeeping (or military deployment), or simply of being a member of the ADF.

The second observation is that, across all the mental health conditions assessed, peacekeepers with the condition of interest experienced a QoL that was significantly worse than that of age and gender matched civilians with the same condition. Quantified, this difference ranged from 0.17 for suicidal ideation to 0.29 for alcohol dependence and GAD. That is, although the impact of

each condition within the same population is comparable, peacekeepers with the condition have a poorer quality of life than their civilian counterparts.

Having established that individual mental health conditions are associated with compromised quality of life, the next question is the impact of multiple conditions occurring comorbidly. Table 5.5 quantifies the effect of this by examining losses in quality of life by the number of mental health conditions suffered. Consistent with Table 5.4 above, peacekeepers have a lower quality of life than their civilian counterparts with the same number of conditions. As shown, for peacekeepers with one mental health syndrome when compared with the comparators without any mental health syndromes, the utility loss was 0.32 and for those with two or more syndromes it was 0.57. These decrements, then, are an estimate of the total value of quality of life lost carried by peacekeepers with mental health syndromes when compared with healthy comparators.

Table 5.5: Loss of life-value (utility) due to peacekeeping, for the number of CIDI mental health syndromes

| <i>N. (a)</i> | | <i>Total N.</i> | <i>N. with condition</i> | <i>P (b)</i> | <i>AQoL utility</i> | | | <i>Utility loss</i> | | |
|---------------|-------------|-----------------|--------------------------|--------------|---------------------|--------------|-----------|---------------------|--------------|-----------|
| | | | | | <i>Mean</i> | <i>95%CI</i> | | <i>Mean</i> | <i>95%CI</i> | |
| | | | | | | <i>Lo</i> | <i>Hi</i> | | <i>Lo</i> | <i>Hi</i> |
| 0 | Comparator | 1,025 | 847 | 0.83 | 0.87 | 0.85 | 0.88 | 0.10 | 0.07 | 0.13 |
| | Peacekeeper | 1,008 | 570 | 0.57 | 0.77 | 0.75 | 0.78 | | | |
| 1 | Comparator | 1,025 | 110 | 0.11 | 0.67 | 0.62 | 0.72 | 0.32 | 0.27 | 0.36 |
| | Peacekeeper | 1,008 | 218 | 0.22 | 0.55 | 0.52 | 0.58 | | | |
| 2+ | Comparator | 1,025 | 68 | 0.07 | 0.46 | 0.39 | 0.53 | 0.57 | 0.53 | 0.60 |
| | Peacekeeper | 1,008 | 220 | 0.22 | 0.30 | 0.27 | 0.33 | | | |

Notes:

(a) = Number of delineated mental health conditions suffered from

(b) = Proportion

5.4.2 The cost implications

To quantify this in monetary terms, an estimate of the value of life is needed. There is no agreement on the value of life in the literature. Generally, after Hawthorne et al (142), life values are, (a) estimates extracted from revealed behaviours (e.g., observing wage differentials as a function of occupational risk), or (b) estimates based on discounted loss of lifetime earnings. This second approach is reflected in insurance payouts, court awards, etc. Actual life-value estimates used in Australia in the past 15 years have approximated \$3-4 million or about \$151,000 per annum, which is based on allowing for 40 years of life lost and a discount rate of 3% (143). This estimate is consistent with earlier estimates from the environment industry where the value of life ranged between \$1-5 million (144). The transport sector uses \$151,000 per year of life lost averted (quoted in Abelson 2007 (143)).

In contrast, medical costs are lower. The UK medicine cost-effectiveness threshold has been set at approximately \$46,000, although this is probably an underestimate with the upper threshold at approximately \$69,000 (145). The Australian Pharmaceutical Benefits Advisory Committee (PBAC) will, in general, fund pharmaceuticals where the cost-per-life-saved is up to AUD\$76,000 (146-148). Abelson (143) estimated that for many chronic morbidities the range for relief from condition would be between \$60,000 and \$80,000 per annum. Based on this uncertainty, we accepted the value of \$65,000 per annum, which is consistent with Abelson's (143) estimate for chronic health conditions, the PBAC's upper limit for funding pharmaceuticals (146-148), and Appleby's upper estimate for the UK (145). By applying this life-value to the utility losses reported above, the costs shown in Table 5.6 provide the economic estimates of the excess burden of illness by the number of mental health conditions.

Table 5.6: Estimated excess annual burden of peacekeeping associated with peacekeeping and mental health disorders

| Number of mental health syndromes | Base N. (a) | Value of life (b) | Utility loss (c) | | | Annual per case value lost (d) | | | Estimated total value lost per annum (e) | | |
|-----------------------------------|-------------|-------------------|------------------|-------|------|--------------------------------|-------------|-------------|------------------------------------------|------------------|------------------|
| | | | Mean | 95%CI | | Mean | 95%CI | | Mean | 95%CI | |
| | | | | Lo | Hi | | Lo | Hi | | Lo | Hi |
| 0 (f) | 20,514 | \$65,000 | 0.10 | 0.07 | 0.13 | \$6,395.82 | \$4,639.56 | \$8,152.08 | \$131,201,585.33 | \$95,174,295.93 | \$167,228,874.74 |
| 1 | 7,846 | \$65,000 | 0.31 | 0.27 | 0.36 | \$20,347.23 | \$17,503.22 | \$23,191.23 | \$159,635,517.94 | \$137,322,708.83 | \$181,948,327.05 |
| 2+ | 7,918 | \$65,000 | 0.56 | 0.53 | 0.60 | \$36,723.98 | \$34,174.50 | \$39,273.46 | \$290,763,743.71 | \$270,578,139.84 | \$310,949,347.57 |
| Total | | | | | | | | | \$581,600,846.98 | \$503,075,144.60 | \$660,126,549.35 |

(a) = The base number of Australian peacekeepers is estimated at 36,277. This is the total number of Australian peacekeepers for all deployments since 1988 calculated from the data in Table 1.1.

(b) = Estimated from the literature. See the discussion in Section 8.7

(c) = From Table 8.6

(d) = b x c

(e) = d x a

(f) = Loss due to impact of military service plus peacekeeping. From Table 8.6

The base number (second column of Table 5.6) was calculated from the data presented in Table 1.1 regarding the number of peacekeepers deployed since 1998. Although this includes recent deployments – the implication being that many peacekeepers will still be ADF members – all peacekeepers on these recent deployments are either peacekeeper veterans or will shortly become peacekeeper veterans. As shown, for study peacekeeper veterans who did not meet any of the criteria for a mental health disorder, the annual excess cost per case was estimated at \$6,400 when compared with the matched comparators from the NSMHWB also without any mental health disorders. As noted earlier, this excess cost (i.e., reduced quality of life) may be attributable to a range of other factors such as physical problems or mental health concerns not measured in the current study, the general experience of peacekeeping (or other deployments), or simply being a member of the ADF.

For those who met the CIDI criteria for one mental health condition, the annual excess cost per case was estimated at \$20,000 based on a loss of 0.32 AQL utility points (see Table 5.5), and for those who met the criteria for two or more mental health conditions the annual excess cost was \$37,000 (based on a loss of 0.57 AQL utility points). That the 95% confidence intervals around all three estimates were reasonably tight reflects that the different mental health conditions had similar impacts on peacekeepers' lives (Table 5.4).

These per case costs were extrapolated to the whole population of peacekeepers (from Table 1.1) to arrive at the estimated total value excess costs. For peacekeepers without any mental health conditions, the estimated total excess cost was \$131 million per annum. Although the per case cost for these peacekeepers was small at \$6,400, the total cost reflects that an estimated 20,000 of Australia's peacekeepers fall into this category. For those with one mental health disorder, the total excess cost was estimated at \$160 million, and for those with two or more mental health disorders it was \$291 million. Although the individual excess costs per veteran were substantial at \$20,000 and \$37,000 per annum respectively, fortunately, there were few veterans who suffered these conditions.

Overall, it was estimated that the excess cost to Australian society for illness, disability and mental health conditions among Australia's veteran peacekeepers was \$582 million per annum. The proportion of this which is directly attributable to peacekeeping sequelae *per se* is unknown since this study was unable to differentiate between the effects of the peacekeeping deployment and the impact of military experience more broadly.

5.5 Summary

Consistent with findings in the mental health area, the results presented in this chapter indicate that the peacekeeper sample had worse physical health and poorer quality of life than their civilian counterparts. The most commonly reported medical conditions included back problems, fatigue, depression, allergies, movement problems, and sleeping disorders, with an average of four medical conditions being endorsed by each participant. Only 33% reported being in good or excellent health (compared with 51% in the comparison sample), with 35% reporting their health to be fair or poor (compared with 17%). In comparison with their civilian counterparts, the peacekeepers were nearly three times more likely to report being in fair or poor health. Interestingly, however, on another measure of physical health (the PCS scale from the SF-36), the peacekeeper average score was only marginally (and not significantly) worse than the general population.

The peacekeepers were likely to use health services, with over two thirds seeing a GP in the last three months, 16% seeing a psychiatrist, and 37% seeing an allied health professional. These figures were substantially higher for those with mental health problems; indeed, only 17% of peacekeepers who were classified with a mental health syndrome had not seen any health provider. Most peacekeepers (59%) were satisfied with their health care. Half the sample was taking some kind of prescribed medication, with this figure rising to 70% for those with a mental health condition.

The peacekeeper sample reported a quality of life that was approximately 30% worse than their civilian counterparts, with those diagnosed with mental health conditions reporting even lower quality of life. Importantly, however, even those peacekeepers without significant mental health issues had a poorer quality of life than the comparators.

The quality of life data were used to estimate the excess burden of disease associated with peacekeeping. Based on a life-value of \$65,000 per annum for those with chronic health conditions (143), the estimated excess annual costs per case were \$6,400 for peacekeepers with no health conditions, \$20,000 for those with one mental health syndrome, and \$37,000 for those with two or more mental health disorders. Overall (i.e., aggregated to the estimated Australian population of peacekeepers), it was estimated that the excess cost to Australian society for illness, disability and mental health syndromes among Australia's veteran peacekeepers was \$582 million per annum.

This study was designed to examine the mental health sequelae of peacekeeping in a sample of Australian peacekeepers 10 to 15 years after deployment completion. A cross-sectional design comprising self-report and interview data was adopted. Peacekeepers from seven UN-sanctioned peacekeeping operations in the 1990s and early 2000s were selected to represent a range of missions to which Australia has contributed, providing a final sample of 1,067 veterans.

The primary aim of the study was to provide a profile of the long-term mental health adjustment of Australia's former peacekeepers. Secondary aims were: (a) to provide a preliminary indication of their physical health; (b) to explore relationships between pre-deployment, deployment, and post-deployment factors and current mental health; (c) to explore health service utilisation; and (d) to provide a preliminary estimate of the economic burden of mental health conditions in former peacekeepers.

The primary overall finding from the current study was that, while the majority of Australia's peacekeeper veterans do not report significant problems, the current mental (and physical) health of a substantial minority is relatively poor. Several possible explanations for this finding will be discussed later in this chapter. First, a more detailed summary of key findings will be presented.

6.1 Overview of study findings: Mental health

Mental health was assessed in this study using two approaches. First, a structured clinical interview (the CIDI) was used to explore the prevalence of psychiatric conditions. By inquiring about the first onset of symptoms, the research was able to estimate the prevalence of conditions that were present prior to the first deployment. The CIDI provides a categorical diagnosis – who does, and does not, have the requisite type and number of symptoms for a diagnosis – but does not provide any information about those who do not meet criteria. Thus, the second approach involved the use of self-report measures to assess several related constructs in a dimensional, rather than categorical, fashion. These scales provide a greater depth of information about the whole population.

6.1.1 Pre-deployment mental health

Based on participants' reports of when they first experienced symptoms, it appears that the prevalence of mental health disorders pre-deployment was very low. The prevalence of PTSD, for example, was 2.7% compared with 6.1% in the age matched civilian sample (that is, the NSMHWB sample when they were the age the peacekeepers were prior to their first deployment). GAD in the peacekeeper sample was 1.1% compared with 3.9%, while depression was 1.3% compared with 5.6%. At face value, these figures are not surprising. This was a young military sample, self-selected and screened at recruitment as being suitable for military service; we might expect them to be healthier than their civilian counterparts.

These data, however, need to be interpreted cautiously. Asking people (both peacekeeper and civilian) when they first experienced symptoms – especially when the answer may have been 20 years ago – raises questions regarding the accuracy of the person's recall. It is asking a great deal for the participant to be confident about their age at the time the symptom first appeared, yet this is the only source of data available to determine whether symptom onset was before, rather than during or shortly after, their first deployment. In addition, when asking about symptom onset, the CIDI does not do a good job of ensuring that all symptoms required for a diagnosis were present at the same time. It may be that the person developed one or two symptoms of, say, depression at that time, but did not meet criteria for the full diagnosis until later.

One feature of the data that increases confidence about the validity of the recall, however, is that not every diagnosis was lower in the peacekeeper sample. Alcohol use disorders, both abuse and dependence, were significantly higher in the peacekeeper sample than in their civilian counterparts. This suggests that the lower prevalence of other disorders was not simply a function of a 'negative response bias' to all questions. It is reasonable to assume that, when these peacekeepers first joined the ADF, heavy alcohol consumption was an accepted part of this male dominated culture. In that context it is not surprising that we see high rates of disorder.

In summary, while the data need to be interpreted cautiously, there is no evidence to suggest a pervasive vulnerability in terms of pre-existing psychiatric disorder, although the high level of alcohol use disorders is of concern. It is, of course, possible that alcohol was being used, at least to some

extent, as a way of managing distress, anxiety, and other aversive emotions. This may have mitigated against the development of more adaptive coping strategies.

6.1.2 Current mental health disorders

The prevalence of current mental health disorders among these Australian peacekeepers was high. Approximately one third of the sample, 30%, met diagnostic criteria for at least one mental health condition, with 22% having a single disorder, 7% meeting criteria for two disorders, and a further 2% meeting criteria for three or more. This compares with a matched community (NSMHWB) sample in which only 12% met criteria for at least one condition. In the absence of any other obvious explanation, it is reasonable to assume that peacekeeping deployments carry a significant risk in terms of the subsequent development of psychopathology.

Nearly 17% of peacekeepers, for example, met criteria for a current (in the last 12 months) diagnosis of PTSD. This figure is more than double that of the currently serving ADF deployed sample and around three times that of both the civilian comparison sample and the AGWVHS sample. Across deployments, the PTSD rate ranged from a low of 9% for the INTERFET sample to a high of 23% for Rwanda veterans and 19% for Somalia veterans. That those two deployments resulted in high rates of PTSD is, perhaps, not surprising. The level of exposure to trauma on those two missions – both in terms of threat to themselves and their colleagues, and in terms of exposure to the suffering of others – is well known. The high rates of PTSD in veterans from deployments such as UNTAET (18%), Western Sahara (18%), and Namibia (15%), however, are unexpected. Those deployments were not generally considered to be characterised by high levels of traumatic exposure. Although it is not immediately clear why so many participants have developed this particular mental health problem, some possible explanations are discussed below.

Whatever the explanation, it does not appear to be a simple case of endorsing all symptoms. The other anxiety disorder assessed in the current study, GAD, was much less prevalent (although still higher than the comparison groups). A prevalence of just under 5% was found for GAD in the peacekeepers, compared to 3% in the civilian sample and less than 1% in both the AGWVHS and the currently serving ADF deployed sample. Again, participants from Rwanda and Somalia reported the

highest rates. As noted in Chapter 1, GAD is characterised by a general tendency to worry about several life areas and, as such, may be more influenced by personality style than by life stress.

The rates for major depression relative to the comparator samples are not quite so clear cut. While peacekeepers in the current study had a depression prevalence of 7%, the figure was 9% for Gulf War veterans and 6% for currently serving ADF personnel, but only 3% for the civilian sample. Statistical comparison was possible only for the civilian (NSMHWB) sample (the peacekeeper rate was significantly higher), but observation of the rates suggests that the prevalence of depression does not differ greatly across the three military samples. Within the current sample, unlike the anxiety disorders, depression was not more common in participants from Rwanda and Somalia; indeed, it was Western Sahara that proved to be an outlier here, with a depression rate in excess of 15%.

Alcohol use disorders – both abuse (12%) and dependence (11%) – were substantially higher than the civilian sample (around 4%), the AGWVHS sample (also around 4%), and the ADF deployed sample (around 2%). As noted above, however, this pattern of heavy alcohol use appears to have predated their first deployment, perhaps suggesting that it reflects more of an age-related cultural phenomenon than a sequel of stressful life experiences.

On the basis of the categorical diagnoses, therefore, it appears that the peacekeeper sample may be showing a particular constellation of psychopathology characterised by high rates of PTSD combined with high rates of alcohol use. Although the substance abuse may be influenced by sub-culture, this does not preclude the possibility that it is also being used as a form of self-medication. Depression, on the other hand, appears to be less specific to peacekeepers and occurs at higher rates in military samples more broadly when compared to civilians.

6.1.3 *Associated constructs of psychological health and wellbeing*

Self-report measures of psychological health and wellbeing (e.g., the PCL, GHQ-12, K10) generally supported the diagnostic findings with significant numbers of peacekeepers reporting high rates of psychological distress. Equally, observation of the distribution of scores on these symptom measures tells us more about the whole population: the scores were 'skewed' towards the low end of the range, meaning that a large number of participants endorsed very few, if any, symptoms on these measures.

The PCL, being a relatively pure measure of DSM-IV PTSD, should mirror the PTSD findings from the CIDI interview reported above. One important caveat is that the time frame for the CIDI in this study is 12 months while the PCL time frame is one month. Although this may suggest that PCL rates would be lower than CIDI rates, in a population of this chronicity the difference in time frames would not be expected to have a major influence on prevalence. Using the recommended PCL cut-off for a probable PTSD diagnosis, 20% of the peacekeeper sample scored above the cut-off (compared with 17% on the CIDI). PTSD rates using the PCL in the AGWVHS were 8% (compared with 5% on the CIDI), and 7% and 6% in the Deployed Health Study data from East Timor and Bougainville respectively. Thus, PTSD prevalence using the PCL is slightly higher than the CIDI prevalence, which is not unusual for a self-report measure. The unusual group here is the ADF deployed sample, in which fewer participants met the cut-off on the PCL (only 3%) than met criteria for PTSD on the CIDI (8%). It is not clear why this anomaly occurred. The fact remains, however, that the current peacekeeper sample is reporting much higher PTSD rates (on both the CIDI and the PCL) than would be expected on the basis of other military studies.

The GHQ-12 and K10 are both measures of general psychological distress. Comparisons for the GHQ are not readily available from most of the comparator groups in the current study. It is of interest to note, however, that the peacekeeper sample reported remarkably similar rates of 'caseness' on the GHQ to both a UK sample from the Iraq deployment and the AGWVHS sample – within a few percentage points of each other. This suggests, again, that there was not a general over-reporting of symptoms in the current sample.

The proportion of peacekeepers who scored in the 'very high' range on the K10 (14%), however, was substantially higher than comparable rates for the civilian sample and the ADF deployed sample (both around 3%), as well as the Deployed Health Studies samples from East Timor (7%) and Bougainville (5%). People scoring in this high range are at considerable risk of meeting criteria for a diagnosable disorder (about 10 times the risk for the general population) and have a 6% chance (20 times the population risk) of making a suicide attempt. While this is clearly of concern, it should also be noted that over two thirds of the sample fell into the low or low to moderate score ranges, suggesting little or no risk of current disorder. In summary, the GHQ and PCL self-report measures largely support the earlier findings: the proportion of peacekeepers reporting poor mental

health outcomes is equivalent to, or worse than, other veteran samples (depending on the measure adopted), but a substantial proportion also report low psychological ill health.

The rates of suicidal ideation, suicide planning, and suicide attempts are all substantially higher in the peacekeeper sample – three to five times more common – than in either the civilian or ADF deployed samples. With 11% thinking about suicide, 6% actually making a plan, and 1% making an attempt, this is an area of particular concern. These rates are almost double those reported in other peacekeeper studies (58,149). When viewed in the context of other mental health conditions, however, the level of suicidality is less surprising. A mounting body of evidence suggests that suicide is strongly linked to mental health problems in general (150), and PTSD in particular (151), as well as to trauma exposure (152), and military service (153). There would clearly be a case for assertively targeting suicide prevention programs at both current and past peacekeeper veterans.

A similar picture emerged in other related areas. Anger, for example, is a problem often associated with PTSD; it has the potential to cause substantial damage to relationships, as well as other areas of social and occupational functioning. In the peacekeeper sample, while 60% reported little or no problem with anger, around 16% reported high or extreme anger. When psychiatric disorders occur comorbidly with high levels of anger, treatment becomes increasingly difficult (154) and more complex, multi-component interventions are required. It would seem sensible to make anger management a high priority for peacekeeper veterans generally, and to ensure that those with diagnosable mental health problems are thoroughly assessed in this area prior to attempting other interventions.

The construct of demoralisation – loss of a sense of purpose, discouragement, feelings of being unable to cope – is also associated with mental health problems. Around one third of the current sample scored above the cut-off on this scale, slightly higher than the proportion reporting significant mental health problems. It may be that this reflects a broader problem with ex-military personnel, although, in the absence of comparative data, this remains a matter of speculation. Finally, social isolation was also a problem reported by higher than expected numbers of peacekeepers. Around 40% of the peacekeeper sample were very or moderately socially isolated, compared with only 7% in the general Australian community; only one quarter were very socially connected, compared with nearly 60% in the general community. The relationship between mental health problems and poor

social support is well documented, including in peacekeeper samples from Scandinavia (155-158) and the Netherlands (70,159). Like demoralisation, however, the proportion of the current sample reporting social isolation is somewhat higher than might be expected on the basis of the psychological health indices. This is an important issue: social support is widely accepted to be a buffer against stress and a protective factor in the development of mental health problems. The fact that so many of the sample are reporting social isolation (as well as demoralisation) suggests a substantial risk profile for the development of further mental health problems in a sub-population of the current sample.

Posttraumatic growth (PTG) is a complex construct. Although open to various interpretations, one thing is certain – it is not simply one end of a continuum with poor adjustment on the other. On the contrary, individuals with PTSD often report higher levels of PTG than those without PTSD and it seems that growth is facilitated and maintained by endorsement, rather than absence, of PTSD symptoms (160). PTG in the study sample was below that reported elsewhere in the peacekeeper literature (28-32), perhaps because most studies reporting high PTG levels were undertaken within one to two years of the deployment. In the current study, deployments were up to 22 years earlier and any immediate PTG as a result of the experience may have faded. Interestingly, a higher number of deployments was associated with increased PTG. This finding is consistent with other research suggesting that individuals with the most severe trauma exposure, and veterans with the heaviest combat experiences, tend to report the greatest personal growth (14, 161). It seems reasonable to assume that personal growth occurs when a person's fundamental beliefs in areas such as personal resilience, safety, moral behaviour, and fairness are challenged. Only then is a re-evaluation of oneself and one's belief required to accommodate these challenges (14, 162).

6.1.4 Risk and protective factors: Possible explanations for mental health status

Several potential risk and protective factors were considered in the current study in an attempt to explain the findings regarding mental health status. Table 4.5 provides a list of the key variables that were explored in univariate analyses, that is, each variable was considered individually in isolation of any other variable. Such an analysis, however, presents a somewhat misleading picture, since many variables are related to, or dependent upon, each other. Thus, subsequent tables show the relative contributions of these variables to each disorder or construct, controlling for all other variables in the same set. Only those that remain significant when controlling for other variables are

shown in those tables. Overall, few variables exerted a significant influence on mental health outcomes.

None of the demographic variables reliably predicted mental health status. Although employment status (and, to a lesser extent, income) showed some relationship when considered as individual variables, these relationships are more likely to be a result of mental health problems rather than a predictor or cause. Similar issues of directionality exist with regard to physical health and pessimism. Self-reported physical health status (but not the more objective measure of physical functioning from the SF-36) was associated with all mental health conditions except PTSD. The dispositional measure of pessimism was associated with depression and alcohol use disorders (but not with the anxiety disorders PTSD or GAD). Although these findings may well reflect reality – physical health and pessimism are both closely related to mental health – they are best conceptualised as being associated variables, rather than factors that predict or cause psychological dysfunction. It may also, of course, reflect a reporting bias: those with poor mental health may simply be more likely to see everything in a negative light and, therefore, to report poor physical health and feelings of pessimism.

The most likely variables to influence mental health outcomes are those related to military service and trauma history; indeed, that is the rationale for conducting such research on military populations. The number of deployments was not a predictor of mental health conditions except for depression, a finding that remained strong even when controlling for other variables: those peacekeepers who had been deployed more than once were twice as likely to meet criteria for a diagnosis of depression. The fact that number of deployments was not a predictor of other conditions such as PTSD, while at first sight seems counter-intuitive, is consistent with much previous research on the subject from the UK armed forces (163, 164). It is, however, not consistent with much US research which does find such a relationship (165,166). In interpreting the current data, however, it should be remembered that three quarters of study participants had only ever been deployed once, with one fifth having deployed twice, and only 7% three or more times. In order to address this question adequately, a sample with greater deployment history would be required. It is also worth noting that previous literature has consistently found duration of deployment (rather than number of

deployments) to be an important factor in subsequent adjustment (25, 27, 37, 164, 167, 168); unfortunately, that variable was not measured in the current study.

The next question was whether type of deployment – high or low stress – would predict mental health adjustment. Interestingly, this variable also did not predict the presence of any psychiatric diagnosis. It is, however, worth noting that peacekeepers from Rwanda and Somalia tended to report higher levels of mental health problems than those from other deployments, although this difference did not generally reach significance. Of interest also in this context is the finding that, for most of the analyses, there were no significant differences in health status between deployments even though they took place over a 13-year period. This suggests that the study findings are not specific to a particular era within the study range – although, as noted below, they may not be applicable to later deployments.

While the number and location of deployments were not significant predictors of adjustment, the number of actual traumatic experiences, both on deployment and over the course of their lives more broadly, was a powerful predictor of PTSD and GAD. This suggests that it is not the number of deployments, nor the type of deployment, but rather the actual experience of trauma (both on and off deployment) that influences the development of these anxiety disorders. This result is entirely consistent with the ADF mental health prevalence study findings: while deployment history was not associated with the prevalence of anxiety disorders, experience of specific potentially traumatic events significantly increased the risk for those conditions. The obvious cautionary note here is the potential for a reporting bias influenced by current mental state; while the number and location of deployments are ‘objective facts’, self-reporting of trauma exposure is much more subjective data at risk of contamination by current mental state. Notwithstanding that caveat, the general finding that higher levels of trauma exposure and life stress are associated with worse mental health outcomes is consistent with a large body of literature from the mental health field.

As noted in Sections 2.6.4 and 4.4.8, potential predictors of the related constructs of psychological distress were generally not explored since these are largely a function of the primary mental health conditions. Suicidal ideation, however, was looked at in more detail. Not surprisingly, suicidal ideation was strongly associated with demoralisation (those who were demoralised were 17 times more likely to report suicidal ideation than the non-demoralised); such feelings of hopelessness

are often the core to suicidality. Importantly, suicidal ideation was also associated with severe anger (those with severe anger were four times more likely to report suicidal ideation than the non-angry), and social isolation (those who were socially isolated were nine times more likely than the socially connected to report suicidal ideation). This suggests that anger management and strategies aimed at enhancing social connectedness (such as interpersonal psychotherapy, or IPT) may be useful interventions for reducing suicide in high risk peacekeepers.

6.1.5 *Mental health and wellbeing: Summary*

The findings regarding the mental health of Australia's peacekeeper veterans are mixed. First, it is clear from the current data that a substantial proportion – around half to two thirds – are not currently complaining of mental health issues and do not appear to be at significant imminent risk. Rates of some disorders, particularly PTSD and alcohol use disorders, are higher than expected and compare unfavourably with other military (and civilian) populations, while other disorders (such as depression) show similar prevalence rates to those found in a range of other military samples. A similar picture emerges when self-report data (rather than diagnostic interview) are used: while several areas of psychological dysfunction are higher among peacekeepers than expected, others are not. Of particular concern, however, is the relatively high rate of suicidality, as well as the high rates of social isolation and demoralisation that may confer substantial risk for future problems in this population.

6.2 Overview of study findings: Physical health, service use, and satisfaction

Although not a primary aim of the current study, preliminary evidence was collected regarding the physical health status of the peacekeeper sample. A mixed picture emerged. The self-reported general health of participants was worse than the comparators: one third of peacekeepers reported their health to be very good or excellent, compared with over half the comparators, and over one third of peacekeepers reported they were in fair or poor health compared with only 17% of comparators. On the other hand, the physical health (PCS) scale of the SF-36 revealed that the peacekeeper sample scored only marginally, and not significantly, below the population norm. Thus, it may be that the reported physical conditions are at the less severe end of severity and are not having a substantial impact on physical functioning. The peacekeepers reported a range of medical conditions,

with back problems, fatigue, depression, allergies, movement problems, sleeping disorders, and headaches all being endorsed by at least one third of participants. Interestingly, this list of 'high prevalence' medical problems is very similar to those reported in the AGWVHS, although the Gulf veterans tended to endorse them at substantially higher rates. These symptoms are generally associated with stress reactions – in the AGWVHS, the same symptoms were the most frequently reported by the comparator group, albeit at lower rates. Thus, these somatic symptoms may be best explained as physical manifestations of the anxiety and depression discussed in the previous section.

It is, perhaps, encouraging to note that the peacekeeper sample was highly likely to use health services, with over two thirds seeing a GP in the last three months. Those with mental health conditions were two to three times more likely to use health services than those without; indeed, only 17% of peacekeepers who were diagnosed with a mental health problem had not seen any health provider in the last three months. Of veterans with a mental health disorder, 80% had consulted with a general practitioner in the last three months and 32% had seen a psychiatrist. In the Pathways to Care study (a study of veterans recently compensated for a mental health condition), 88% reported seeing a GP and 38% a psychiatrist (13). Thus, consultation rates were largely comparable across these two studies, despite data collection being nearly ten years apart. There was also evidence of multiple health service use in the current study, particularly by younger veterans, a finding similar to that reported in the Pathways to Care study. This level of service use is substantially higher than the general population; the NSMHWB revealed that only 41% of women and 28% of men with mental health problems had sought help. One explanation for this is the greater accessibility to healthcare provided to veterans through the Repatriation system. It may also indicate that repeated efforts to raise awareness of mental health issues in veterans have paid off in terms of encouraging them to seek care. A further possible explanation is that the severity of the mental health problem is greater in peacekeepers compared with those in the NSMHWB. Some evidence to support this hypothesis comes from the findings regarding pharmacotherapy.

The use of prescribed and over the counter (OTC) medications was also high in the peacekeeper sample: half were taking some kind of prescribed medication, with this figure rising to 70% for those with a mental health condition. This is probably an appropriate rate of medication use given the demographic and health status of the sample, although may be a little on the high side.

Further study would be required to determine whether the type and dosage of pharmacotherapy is appropriate and whether all have been given access to sufficient doses of evidence-based non-drug health care and/or psychological treatment.

Although most participants were satisfied with their health care, a significant proportion were not: 41% of participants scored below the threshold for satisfaction, and the figure was higher (46%) for those with a mental health condition. This was consistent with the Pathways to Care study, in which the proportion of peacekeeper cases expressing dissatisfaction was between 33% and 43% (13). These figures suggest that, at least among peacekeepers with a mental health condition, the level of dissatisfaction with health care has not changed much during the years between the two studies. (Importantly, satisfaction with health care as assessed in this report is not comparable with the DVA Veterans' Satisfaction Surveys which are concerned with services provided by DVA).

6.3 Overview of study findings: Quality of life and cost burden

Consistent with the findings regarding mental and physical health, quality of life in the peacekeeper sample was generally inferior to that of the comparable civilian (NSMHWB) sample. While 47% of civilians fell in the top 10% of the possible score range for quality of life, only 22% of peacekeepers scored in this range. Similarly, while only 3% of civilians scored in the bottom 20% of the possible score range, 16% of peacekeepers fell into this category. Overall, it was estimated that peacekeepers report a quality of life that is, on average, 30% worse than that of their civilian counterparts. This compromised quality of life is likely to be explained by the extent of mental and physical health problems in the sample. All the mental health conditions and associated psychological dysfunction constructs were associated with significantly reduced quality of life. It is reasonable to assume that effective treatment (or, better, prevention) of these conditions would result in associated improvements in quality of life.

Figure 5.9 places these study findings on peacekeepers' quality of life in the context of other health conditions in the general Australian community. The level of similarity across these two samples is encouraging in terms of supporting the validity of the measures. The data suggest that peacekeepers' health-related quality of life is very similar to that of members of the general community with comparable health status. That is, peacekeepers from this study who had no known

mental or physical health conditions reported very similar quality of life to (unmatched) civilian comparators who also had no known health conditions. Peacekeepers with a physical disability only had AQL scores roughly equivalent to those in the general community with irritable bowel syndrome, chronic health care needs, or general hospital outpatients. Peacekeepers with one mental health condition were comparable to those in the general community with depression. Peacekeepers with two or more mental health conditions were comparable to the elderly living in residential care or those with chronic conditions. The fact that these peacekeepers still reported slightly better quality of life than veterans undergoing treatment for PTSD is interesting – testament to the level of disability and poor quality of life associated with chronic, severe PTSD.

The final aspect of this study involved estimating the costs associated with long-term peacekeeping. To our knowledge, this is the first study to use these health-related quality of life scores in an attempt to examine the excess burden of illness due to peacekeeping. Notwithstanding the study limitations and the difficulties inherent in this area of health economics, the findings provide a preliminary indication of both individual and aggregate losses from a societal perspective. This estimate provides the broadest perspective since it aims to reflect all losses associated with ill health, including health service costs, costs borne by other sectors (e.g., legal costs) and costs borne by the individual (e.g., loss of wages, marital breakdown). Although this approach is consistent with that taken in the health economics literature, it must be recognised that the costs are simply extrapolated from AQL scores; no attempt is made to compute the actual costs in each domain.

Subject to this caveat, the estimated excess costs per case per annum are considerable at \$20,000 for those with one mental health condition and \$37,000 for those with two or more mental health conditions. The estimated annual cost to Australia of the health impact of peacekeeping was \$582 million. Considered in this light, it becomes clear that the prevention, early intervention, and effective management of the mental health effects of peacekeeping must be a priority not simply with the aim of reducing human suffering (important though that is), but also with the aim of avoiding substantial costs to the Australian community.

6.4 Implications for policy and programs

The implications of the study findings are relatively obvious and largely consistent with initiatives adopted by the Australian Defence Force and the Department of Veterans' Affairs over the last decade in the area of post-deployment health. The key finding is that peacekeeping missions appear to be associated with substantial risk for subsequent mental health problems. The fact that the rates of PTSD were high – substantially higher than those found among currently serving personnel or among other deployment studies – highlights the importance of assertively addressing this issue in current and future peacekeeping deployments. The suggestion sometimes heard anecdotally, that peacekeeping missions are easier, less stressful, and less damaging than combat deployments, is not supported by the current findings. The fact that depression rates were broadly comparable with other deployment studies suggests that the specific element of trauma exposure should be central to interventions with this population, whereas more general mental health prevention and intervention strategies may be applicable across all military deployments (including for peacekeepers). Although the field of prevention – building psychological resilience prior to deployment – is still in its infancy, it is certainly a goal worthy of pursuit. In the meantime, however, concentrating on effective screening, early recognition, and easy access to evidence-based care must remain a high priority. Although initiatives are in place to address these issues, the current data emphasise the importance of ensuring that service delivery in reality matches the policy platform.

Leading on from the area of early intervention, the current data highlight the importance of effective recognition and management of existing chronic conditions. The evidence suggests that much is being done: health care use, particularly in mental health, is high. This may reflect the success of recent psychoeducation strategies and the improved mental health literacy that was driven in large part by the advocacy of the Vietnam era veterans. Nevertheless, the current findings are clear that the cost of mental health problems in Australia's peacekeeper veterans – in terms of both economic and human costs – remain substantial. The fact that a large proportion of peacekeepers continues to suffer disorders such as PTSD raises the question of whether they are receiving the best possible evidence-based care. There may be a case for some kind of clinical audit of services to ensure that they are in line with best practice treatment guidelines for these conditions.

On a related issue, 'provider overlap' is high. Most peacekeepers who were seeing a psychologist were also seeing a psychiatrist, and only just over one third of those with a diagnosed mental health condition had seen a specialist mental health practitioner in the last three months. This suggests that a substantial proportion is probably not receiving evidence-based treatment at the moment (although it is not possible to comment on how many have received such treatment in the past). There may be a case for following up those with an accepted mental health disability to ensure that they have received an adequate dose of evidence-based care at some point.

The level of suicidality, with around 10% of peacekeepers admitting to suicidal ideation, is of particular concern. It may be worth considering a strategy to specifically target existing mental health and suicide prevention programs at this group. Such interventions would consider not only the high prevalence conditions, but also associated features such as anger and social isolation (both of which were strongly associated with suicidal ideation).

A final implication of the current findings is that of service planning for the future. Given the duration of illness, it is unreasonable to expect substantial drops in disorder prevalence over the coming years. Thus, two fifths of Australia's peacekeepers are likely to continue to have a need for some kind of mental health care and support, even if only at a low intensity. As this group continues to age, they will present particular challenges for care in terms of both physical and mental health. Budgetary and service development projections should bear this in mind.

6.5 Implications for future research

Several recommendations for future research emerge from the current findings, many of which are methodological issues that it was not possible to address in this study. Obviously, best practice should be followed with respect to study design and recruitment methods in any future research. Given the slow response rate of veterans to complete questionnaires that was experienced in this study, ample time should be allowed for the data collection phase of future studies. Where representativeness of participants is not assured, consideration should be given to the weighting of data to achieve a statistical approximation of representativeness.

Although there may always be a need to collect some data retrospectively, issues such as response bias and inaccurate recall make these data difficult to interpret. Wherever possible,

longitudinal studies tracking veterans from initial recruitment (or at least immediately post-deployment) would overcome many of these issues. (We note that such a study is currently underway.) Data collection at these early time points may be restricted to specific areas of interest such as exposure to potentially traumatic events. Longitudinal designs have many other advantages in informing our understanding of psychological health and wellbeing, allowing us to track the course of psychological health and wellbeing at recruitment and training, through military service, transition out of the military, and adjusting to life as a veteran. The potential for intervention exists at each of these points.

While appropriate comparators for this type of research are important in teasing out the effects of military service in general, or of specific deployments, selection of suitable groups is notoriously difficult. Using a matched military cohort who have not been on the specific deployment in question is of limited value, since those personnel will almost certainly have served on alternative deployments. Personnel who have never deployed, on the other hand, represent an atypical group. Such samples, however, are useful for general (non-statistical) comparisons and should be used accordingly. Matched civilian samples, while not directly comparable with serving personnel for several reasons, nevertheless also provide an important point of comparison. Like the current research, future studies should adopt this approach in order to ensure the best possible understanding of study findings.

Due to conflicting findings across studies, the relationship between exposure to potentially traumatic events (deployment-related and other) and mental health needs further research. It would be particularly valuable to tease out the differential impact of pre-deployment (or pre-recruitment) exposures, deployment exposures, and post-deployment (or post-military) exposures. While the former will, of necessity, be based on retrospective reporting, longitudinal designs will assist in collecting contemporaneous data from the other two time periods. This line of research should also include further exploration of the relationship between the number of deployments, deployment length, and related health syndromes.

The current study included a dispositional measure of optimism/pessimism and found, as expected, that pessimism was associated with adverse outcomes. The difficulty of determining directionality, however, makes these findings hard to interpret. Increased use of this type of measure – coping and personality styles – at the early stages of longitudinal designs will assist in teasing out

which aspects are predictive (and, presumably, risk or protective factors), and which are simply correlates or results of current mental state. Identification of prior risk and protective factors has the potential to drive pre-deployment strategies designed to increase psychological resilience.

Although the findings on health service use were encouraging, particularly in comparison with the general population, a significant minority of those with identified health problems were not receiving care. Satisfaction among those engaged in health services was relatively low. Further research to elucidate why some veterans are not accessing care, and why so many are dissatisfied with their care, has the potential to improve outcomes for this population.

6.6 Strengths and limitations

As reflected in the membership of the Advisory Committee, the research aims and design were established following extensive consultation with DVA, the veteran community, and key researchers in the field from around Australia. Although this research had many strengths, such as rigorous selection procedures, large sample size, and the use of structured clinical interviews, there are also some limitations that suggest caution in generalising from the current findings. The participation rate was approximately 47% of those who were initially drawn, and 72% of those in scope. The final number of study participants was 1,067. Although the participation rate exceeded those of other Australian peacekeeper studies which were between 13% and 43% (37, 59, 62), low participation rates may lead to an increased risk of bias (169). There were significant (albeit small) differences between study participants and non-responders in age, socio-economic background and deployment (Table 3.1), suggesting that study participants may not have been fully representative of the whole peacekeeper population. In particular, of course, the prevalence of mental health conditions in the non-responders is unknown. (It is, however, worth noting that the prevalence in the non-responders would have had to be very small to wipe out the large increases found in the sample; with regard to PTSD, for example, even if none of the non-responders met criteria – which is highly unlikely – the prevalence among peacekeepers would still have been much higher than the comparators.)

A second major limitation, although one that is common to most other similar research, is the need to rely on retrospective reporting in areas such as timing of first symptom onset and prior history of trauma exposure. Given that some of these experiences may have occurred decades earlier, the

accuracy of recall cannot be guaranteed. This may simply be a problem of normal forgetting. Of more concern, however, is that memory is often a function of present state; people who are depressed are more likely than those who are not depressed to access negative memories. This is particularly a problem in the context of reporting past trauma exposure, since it is strongly related to current mental health. Whether this is best explained as a causal relationship (i.e., trauma exposure 'causes' or contributes to subsequent mental health problems) or as a mood-influenced response bias (i.e., those with mental health problems are more likely to remember and report unpleasant events from their past), must remain somewhat speculative. Given the substantial body of data from around the world on the role of life stress in the development of psychiatric disorder, however, the former seems the most likely explanation.

A third caveat relates to the purposes of the study – that is, to assess the long-term mental and physical health sequelae of participation in Australian peacekeeping missions from 1989 to 2002. The study results, therefore, cannot separate the impact of military service generally from the specific impact of peacekeeping experiences in terms of current mental and physical health. In addition to the index deployment, participants will have had a range of other experiences during their military career with the potential to influence current mental health. Over the decade since the deployments reported in this study occurred, mental health policy and practice in the ADF has changed substantially. Thus, caution is required in generalising these findings to the current generation of ADF personnel deployed on peacekeeping missions.

A fourth caution in interpreting the results is that, like all such studies, the data rely on self-reports of symptoms and other information. This is by no means necessarily a bad thing: there is no reason to assume that a purely 'objective' measure (if, indeed, such a measure were available) would provide a better indication of the person's internal mental state than his/her own self report. There is, nevertheless, potential for impaired memory, personal motivations, current stressors, and other factors to influence response. The current design minimised this problem in assessing the presence of diagnosable conditions by using a structured interview. While this approach still relies on self-report, it has a higher level of objectivity than a questionnaire.

A final caveat relates to the comparator samples used to help interpret the current results. It is important to recognise that all those studies also had limitations; the results from those studies – and

the subsequent comparisons – also, therefore, need to be interpreted with some caution. For the purpose of the current report, some of the comparators are stronger than others; the ADF Mental Health Prevalence Study, the AGWVHS, and the NSMHWB all used a similar methodology (and measures) to the current research, making the comparisons more valid. Some other comparisons, such as the South Australian Health Omnibus Survey (135) and the Hu et al (2005) study (138) of health-related quality of life (see Section 5.3), may be less valid since different methodologies were used and the samples were less similar on key variables.

6.7 Summary and conclusions

This study of Australia's peacekeeping veterans has demonstrated substantial negative impacts on both physical and mental health for a substantial minority of the population. Rates of PTSD and substance use are higher than those following other recent deployments, while rates of depression and generalised anxiety are comparable. A range of associated features, such as anger, demoralisation, suicidality, and social isolation are also common, representing important risk factors for future problems.

The results highlight the need for ongoing vigilance in this area. It is incumbent upon those with responsibility for the care and wellbeing of current and past members of the Defence Force to ensure that prevention, early intervention, and effective management of established disorders is of the highest possible standard. The potential savings, in terms of both economic and human costs, are considerable.

7.0 REFERENCES

1. Forbes D, Hawthorne G, Elliott P, McHugh T, Biddle D, Creamer M, et al. A concise measure of anger in combat-related posttraumatic stress disorder. *Journal of Traumatic Stress*. 2004;17(3):249-56.
2. Hawthorne G, Mouthaan J, Forbes D, Novaco RW. Response categories and anger measurement: do fewer categories result in poorer measurement? Development of the DAR5. *Soc Psychiatry Psychiatr Epidemiol*. 2006;41(2):164-72.
3. Kessler RC, Andrews G, Colpe LJ, Hiripi E, Mroczek DK, Normand SL, et al. Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychol Med*. 2002;32(6):959-76.
4. Gray MJ, Litz BT, Hsu JL, Lombardo TW. Psychometric properties of the Life Events Checklist. *Assessment*. 2004;11(4):330-41.
5. Hawthorne G. Measuring social isolation in older adults: development and initial validation of the Friendship Scale. *Social Indicators Research*. 2006;77(3):521-48.
6. Kissane DW, Wein S, Love A, Lee XQ, Kee PL, Clarke DM. The Demoralization Scale: a report of its development and preliminary validation. *J Palliat Care*. 2004;20(4):269-76.
7. Hawthorne G, Sansoni J, Hayes LM, Marosszeky N, Sansoni E. Measuring patient satisfaction with incontinence treatment. Melbourne: Centre for Health Service Development, University of Wollongong and the Department of Psychiatry, The University of Melbourne for the Commonwealth Department of Health and Ageing, September 2006.
8. Goldberg D. The General Health Questionnaire. In: McDowell I, Newell C, editors. *Measuring Health: A Guide to Rating Scales and Questionnaires*. New York: Oxford University Press; 1972.
9. Ware JE, Kosinski MA, Dewey J. *How to Score Version 2 of the SF-36 Health Survey (Standard and Acute Forms)*. Lincoln: Quality Metric Inc., 2000.
10. Hodson S. Development of a traumatic stress exposure scale for the Rwanda research. Sydney: MacQuarie University, 2001.
11. Swann J. A psychometric analysis of the Traumatic Stress Exposure Scale - Revised. Research report. Canberra: Department of Defence, Commonwealth of Australia, 2004 09/2002.
12. Hawthorne G, Richardson J, Osborne R. The Assessment of Quality of Life (AQoL) instrument: a psychometric measure of health-related quality of life. *Qual Life Res*. 1999;8(3):209-24. Epub 1999/09/03.
13. Hawthorne G, Hayes L, Kelly C, Creamer M. Pathways to Care in veterans recently compensated for a mental health condition. Melbourne: Australian Centre for Posttraumatic Mental Health, August 2004.
14. Tedeschi RG, Calhoun LG. The Posttraumatic Growth Inventory: measuring the positive legacy of trauma. *Journal of Traumatic Stress*. 1996;9(3):455-71.
15. Scheier MF, Carver CS, Bridges MW. Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): a reevaluation of the Life Orientation Test. *J Pers Soc Psychol*. 1994;67(6):1063-78.
16. Demyttenaere K, Bruffaerts R, Posada-Villa J, Gasquet I, Kovess V, Lepine JP, et al. Prevalence, severity, and unmet need for treatment of mental disorders in the World Health Organization World Mental Health Surveys. *Jama*. 2004;291(21):2581-90.
17. Kessler RC, Ustun TB. The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). *International Journal of Methods in Psychiatric Research*. 2004;13(2):93-121.
18. United Nations. *United Nations Peacekeeping Operations: Principles and Guidelines*. New York: United Nations, Department of Peacekeeping Operations, Department of Field Support, 2008.

19. Annual Reports 2010-2011. Canberra: Department of Veterans' Affairs, 2011.
20. ABS. Seifa: socio-economic indexes for areas. Canberra: Australian Bureau of Statistics; 1993. 11 computer disks (3 1/2 in.), 1 spiral bound users manual (85 , 25 cm.) in box 8 x 3 x 5 cm. p.
21. Kluge T, Lonnum A, Udjus L. Diseases in the UNEF troops 1956-1961/2. *Review Internationale des Services Sante Armee de Mare at de l'Air.* 1963;36(Suppl 5):26-46.
22. Lundin T, Otto U. Stress reactions among Swedish health care personnel in UNIFIL, South Lebanon 1982-1984. *Stress Medicine.* 1989;5:237-46.
23. Carlstrom A, Lundin T, Otto U. Mental adjustment of Swedish UN soldiers in South Lebanon in 1988. *Stress Medicine.* 1990;6:303-10.
24. Lundin T, Otto U. Swedish UN soldiers in Cyprus, UNFICYP: their psychological and social situation. *Psychother Psychosom.* 1992;57(4):187-93.
25. Ballone E, Valentino M, Occhiolini L, Di Mascio C, Cannone D, Schioppa FS. Factors influencing psychological stress levels of Italian peacekeepers in Bosnia. *Military Medicine.* 2000;165(12):911-5.
26. Han CS, Kim YK. Psychiatric symptoms reported by international peacekeeping personnel in the Western Sahara Desert. *J Nerv Ment Dis.* 2001;189(12):858-60.
27. Adler AB, Huffman AH, Bliese PD, Castro CA. The impact of deployment length and experience on the well-being of male and female soldiers. *Journal of Occupational Health Psychology.* 2005;10(2):121-37. Epub 2005/04/14.
28. Dirkzwager AJE, Bramsen I, van der Ploeg HM. Factors associated with posttraumatic stress among peacekeeping soldiers. *Anxiety, Stress & Coping.* 2005;18(1):37-51.
29. Litz BT, Bolton E, Hoff RA, King DR, King LA, McTeague L. Mental health outcomes associated with the Bosnia Peacekeeping Operation. Boston: National Centre for PTSD - Behavioural Sciences Division & Boston University School of Medicine, 1999 Project II-R96051.
30. Maguen S, Litz BT, Wang JL, Cook M. The stressors and demands of peacekeeping in Kosovo: predictors of mental health response. *Military Medicine.* 2004;169(3):198-206.
31. Newby JH, McCarroll JE, Ursano RJ, Fan Z, Shigemura J, Tucker-Harris Y. Positive and negative consequences of a military deployment. *Military Medicine.* 2005;170(10):815-9.
32. Thomas S, Dandeker C, Greenberg N, Kelly V, Wessely S. Serving in Bosnia made me appreciate living in Bristol: stressful experiences, attitudes, and psychological needs of members of the United Kingdom Armed Forces. *Military Medicine.* 2006;171(5):376-80. Epub 2006/06/10.
33. Bartone PT, Adler AB, Vaitkus MA. Dimensions of psychological stress in peacekeeping operations. *Military Medicine.* 1998;163(9):587-93.
34. Mehlum L. Alcohol and stress in Norwegian United Nations peacekeepers. *Military Medicine.* 1999;164(10):720-4.
35. Hotopf M, David A, Hull L, Ismail K, Unwin C, Wessely S. The health effects of peacekeeping (Bosnia, 1992-1996): a cross-sectional study--comparison with nondeployed military personnel. *Military Medicine.* 2003;168(5):408-13.
36. Maguen S, Stalnakar M, McCaslin S, Litz BT. PTSD subclusters and functional impairment in Kosovo peacekeepers. *Military Medicine.* 2009;174(8):779-85. Epub 2009/09/12.
37. East Timor Health Study Project Completion Report. Brisbane: Centre for Military and Veterans' Health, The University of Queensland, 9 April 2009.
38. Mehlum L, Koldslund BO, Loeb ME. Risk factors for long-term posttraumatic stress reactions in unarmed UN military observers: a four-year follow-up study. *J Nerv Ment Dis.* 2006;194(10):800-4.
39. Di Nicola M, Occhiolini L, Di Nicola L, Vellante P, Di Mascio R, Guizzardi M, et al. Stress management and factors related to the deployment of Italian peacekeepers in Afghanistan. *Military Medicine.* 2007;172(2):140-3. Epub 2007/03/16.
40. MacDonald C, Chamberlain K, Long N, Mirfin K. Stress and mental health status associated with peacekeeping duty for New Zealand defence force personnel. *Stress Medicine.* 1999;15:135-241.

41. Orsillo SM, Roemer L, Litz BT, Ehlich P, Friedman MJ. Psychiatric symptomatology associated with contemporary peacekeeping: an examination of post-mission functioning among peacekeepers in Somalia. *Journal of Traumatic Stress*. 1998;11(4):611-25.
42. Adler AB, Litz BT, Castro CA, Suvak M, Thomas JL, Burrell L, et al. A group randomized trial of critical incident stress debriefing provided to U.S. peacekeepers. *Journal of Traumatic Stress*. 2008;21(3):253-63. Epub 2008/06/17.
43. Maguen S, Litz BT. Predictors of barriers to mental health treatment for Kosovo and Bosnia peacekeepers: a preliminary report. *Military Medicine*. 2006;171(5):454-8. Epub 2006/06/10.
44. Baggaley MR, Piper ME, Cumming P, Murphy G. Trauma related symptoms in British soldiers 36 months following a tour in the former Yugoslavia. *J R Army Med Corps*. 1999;145(1):13-4. Epub 1999/04/27.
45. Bolton EE, Litz BT, Glenn DM, Orsillo S, Roemer L. The impact of homecoming reception on the adaptation of peacekeepers following deployment. *Military Psychology*. 2002;14(3):241-51.
46. Bolton EE, Glenn DM, Orsillo S, Roemer L, Litz BT. The relationship between self-disclosure and symptoms of posttraumatic stress disorder in peacekeepers deployed to Somalia. *Journal of Traumatic Stress*. 2003;16(3):203-10.
47. Bramsen I, Dirkzwager AJ, van der Ploeg HM. Predeployment personality traits and exposure to trauma as predictors of posttraumatic stress symptoms: a prospective study of former peacekeepers. *Am J Psychiatry*. 2000;157(7):1115-9.
48. Elhai JD, Don Richardson J, Pedlar DJ. Predictors of general medical and psychological treatment use among a national sample of peacekeeping veterans with health problems. *J Anxiety Disord*. 2007;21(4):580-9. Epub 2006/09/13.
49. Gray MJ, Bolton EE, Litz BT. A longitudinal analysis of PTSD symptom course: delayed-onset PTSD in Somalia peacekeepers. *J Consult Clin Psychol*. 2004;72(5):909-13.
50. Greenberg N, Iversen A, Hull L, Bland D, Wessely S. Getting a peace of the action: measures of post traumatic stress in UK military peacekeepers. *Journal of the Royal Society of Medicine*. 2008;101(2):78-84. Epub 2008/02/27.
51. Litz BT, Orsillo SM, Friedman M, Ehlich P, Batres A. Posttraumatic stress disorder associated with peacekeeping duty in Somalia for US military personnel. *Am J Psychiatry*. 1997;154(2):178-84.
52. Litz BT, King LA, King DW, Orsillo SM, Friedman MJ. Warriors as peacekeepers: features of the Somalia experience and PTSD. *J Consult Clin Psychol*. 1997;65(6):1001-10.
53. Mehlum L, Weisaeth L. Predictors of posttraumatic stress reactions in Norwegian U.N. peacekeepers 7 years after service. *Journal of Traumatic Stress*. 2002;15(1):17-26.
54. Richardson JD, Naifeh JA, Elhai JD. Posttraumatic stress disorder and associated risk factors in Canadian peacekeeping veterans with health-related disabilities. *Canadian Journal of Psychiatry*. 2007;52(8):510-8. Epub 2007/10/25.
55. Richardson JD, Pekevski J, Elhai JD. Post-traumatic stress disorder and health problems among medically ill Canadian peacekeeping veterans. *Aust N Z J Psychiatry*. 2009;43(4):366-72. Epub 2009/03/20.
56. Souza WF, Figueira I, Mendlowicz MV, Volchan E, Mendonca-de-Souza AC, Duarte AF, et al. Negative affect predicts posttraumatic stress symptoms in Brazilian volunteer United Nations peacekeepers in Haiti. *J Nerv Ment Dis*. 2008;196(11):852-5. Epub 2008/11/15.
57. Stapleton JA, Asmundson GJ, Woods M, Taylor S, Stein MB. Health care utilization by United Nations peacekeeping veterans with co-occurring, self-reported, post-traumatic stress disorder and depression symptoms versus those without. *Military Medicine*. 2006;171(6):562-6.
58. Thoresen S, Mehlum L. Traumatic stress and suicidal ideation in Norwegian male peacekeepers. *J Nerv Ment Dis*. 2008;196(11):814-21. Epub 2008/11/15.
59. Ward W. Psychiatric morbidity in Australian veterans of the United Nations peacekeeping force in Somalia. *Aust N Z J Psychiatry*. 1997;31:184-93.

60. Weisaeth L, Mehlum L, Mortensen MA. Peacekeeper stress: new and different? *NCP Clinical Quarterly*. 1996;6(1).
61. Yarvis JS, Bordnick PS, Spivey CA, Pedlar D. Subthreshold PTSD: a comparison of alcohol, depression, and health problems in Canadian peacekeepers with different levels of traumatic stress. *Stress, Trauma and Crisis*. 2005;8:195-213.
62. Hodson S, Ward D, Rapee R. Postdeployment predictors of traumatic stress: Rwanda, a case study. In: Kearney GE, Creamer M, Marshall R, Goynes A, editors. *Military Stress and Performance: The Australian Defence Force Experience*. Melbourne: Melbourne University Press; 2003. p. 151-63.
63. Hawthorne G, Korn S. *Peacekeeping and mental health: a systematic review of the literature*. Melbourne: The University of Melbourne for the Department of Veterans' Affairs, 2009.
64. Ikin JF, Sim MR, McKenzie DP, Horsley KW, Wilson EJ, Harrex WK, et al. Life satisfaction and quality in Korean War veterans five decades after the war. *J Epidemiol Community Health*. 2009;63(5):359-65. Epub 2009/04/16.
65. Kulka RA, Fairbank JA, Hough RI, Jordan BK, Marmar CR, Weiss DS. *Trauma and the Vietnam War Generation: Report of Findings from the National Vietnam Veterans Readjustment Study*. New York: Brunner/Mazel; 1990. p. 322
66. O'Toole BI, Catts SV, Outram S, Pierse KR, Cockburn J. The physical and mental health of Australian Vietnam veterans 3 decades after the war and its relation to military service, combat, and post-traumatic stress disorder. *Am J Epidemiol*. 2009;170(3):318-30. Epub 2009/07/01.
67. Ikin JF, Sim MR, Creamer MC, Forbes AB, McKenzie DP, Kelsall HL, et al. War-related psychological stressors and risk of psychological disorders in Australian veterans of the 1991 Gulf War. *Br J Psychiatry*. 2004;185(2):116-26.
68. Stimpson NJ, Thomas HV, Weightman AL, Dunstan F, Lewis G. Psychiatric disorder in veterans of the Persian Gulf War of 1991. Systematic review. *Br J Psychiatry*. 2003;182:391-403. Epub 2003/05/02.
69. Hoge CW, Castro CA, Messer SC, McGurk D, Cotting DI, Koffman RL. Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. *N Engl J Med*. 2004;351(1):13-22.
70. Dirkzwager AJ, Bramsen I, Ader H, van der Ploeg HM. Secondary traumatization in partners and parents of Dutch peacekeeping soldiers. *Journal of Family Psychology*. 2005;19(2):217-26. Epub 2005/06/29.
71. Schlesselman J. Sample size requirements in cohort and case-control studies of disease. *Am J Epidemiol*. 1974;99(6):381-4.
72. Sim M, Abramson M, Forbes A, Glass D, Ikin J, Ittak P, et al. *Australian Gulf War Veterans' Health Study Volumes 1,2 & 3*. Melbourne: Monash University, Department of Epidemiology and Preventive Medicine, 2003.
73. Adams G, Gulliford MC, Ukoumunne OC, Eldridge S, Chinn S, Campbell MJ. Patterns of intra-cluster correlation from primary care research to inform study design and analysis. *J Clin Epidemiol*. 2004;57(8):785-94. Epub 2004/10/16.
74. Hodson SE, McFarlane AC, Van Hooff M, Davies C. *Mental Health in the Australian Defence Force – 2010 ADF Mental Health Prevalence and Wellbeing Study: Executive Report*. Canberra: Department of Defence, October 2011.
75. McFarlane AC, Hodson SE, Van Hooff M, Davies C. *Mental health in the Australian Defence Force: 2010 ADF Mental Health and Wellbeing Study: Full report*. Canberra: Department of Defence, 2011.
76. Cronbach LJ. Studies of acquiescence as a factor in the true-false test. *J Educ Psychol*. 1942;33(6):401-15.
77. Lampe L, Slade T, Issakidis C, Andrews G. Social phobia in the Australian National Survey of Mental Health and Well-Being (NSMHWB). *Psychol Med*. 2003;33(4):637-46.
78. Slade T, Johnston A, Oakley Browne MA, Andrews G, Whiteford H. 2007 National Survey of Mental Health and Wellbeing: methods and key findings. *Aust N Z J Psychiatry*. 2009;43(7):594-605. Epub 2009/06/17.

79. Haley RW. Point: bias from the "healthy-warrior effect" and unequal follow-up in three government studies of health effects of the Gulf War. *Am J Epidemiol*. 1998;148(4):315-23. Epub 1998/08/26.
80. McGuire A, Waller M, Bleier J, Loos C, Nielsen L, Cosgrove T, et al. Bougainville Health Study Project Completion Report. Brisbane: Centre for Military and Veterans' Health, The University of Queensland, April 2009.
81. WHO. ICS-10: International Statistical Classification of Diseases and Related Health Problems. Geneva: World Health Organization, 1990. 10th Revision.
82. Robins LN, Wing J, Wittchen HU, Helzer JE, Babor TF, Burke J, et al. The Composite International Diagnostic Interview. An epidemiologic instrument suitable for use in conjunction with different diagnostic systems and in different cultures. *Arch Gen Psychiatry*. 1988;45(12):1069-77.
83. ABS. Household income and income distribution. Canberra: Australian Bureau of Statistics, 30 August 2011. Report No.: 6523.0.
84. WHOQoL Group. The World Health Organization Quality of Life Assessment (WHOQOL): development and general psychometric properties. *Soc Sci Med*. 1998;46(12):1569-85.
85. Power M, Quinn K, Schmidt S. Development of the WHOQOL-old module. *Qual Life Res*. 2005;14(10):2197-214. Epub 2005/12/06.
86. Goldberg D, Williams P. A User's Guide to the General Health Questionnaire. Windsor: NFER-Nelson; 1988.
87. McKenzie DP, Ikin JF, McFarlane AC, Creamer M, Forbes AB, Kelsall HL, et al. Psychological health of Australian veterans of the 1991 Gulf War: an assessment using the SF-12, GHQ-12 and PCL-S. *Psychol Med*. 2004;34(8):1419-30.
88. Unwin C, Blatchley N, Coker W, Ferry S, Hotopf M, Hull L, et al. Health of UK servicemen who served in Persian Gulf War. *Lancet*. 1999;353(9148):169-78.
89. Goldberg DP. The Detection of Psychiatric Illness by Questionnaire: A Technique for the Identification and Assessment of Non-Psychotic Psychiatric Illness. London: Institute of Psychiatry, Oxford University Press, 1972. Maudsley Monographs 21.
90. Kessler RC, Barker PR, Colpe LJ, Epstein JF, Gfroerer JC, Hiripi E, et al. Screening for serious mental illness in the general population. *Arch Gen Psychiatry*. 2003;60(2):184-9.
91. Kahn RS, Brandt D, Whitaker RC. Combined effect of mothers' and fathers' mental health symptoms on children's behavioral and emotional well-being. *Arch Pediatr Adolesc Med*. 2004;158(8):721-9. Epub 2004/08/04.
92. Patel V, Araya R, Chowdhary N, King M, Kirkwood B, Nayak S, et al. Detecting common mental disorders in primary care in India: a comparison of five screening questionnaires. *Psychol Med*. 2008;38(2):221-8. Epub 2007/12/01.
93. Blanchard E, Jones-Alexander J, Buckley T, Forneris C. Psychometric properties of the PTSD Checklist (PCL). *Behav Res Ther*. 1996;34:669-73.
94. Weathers F, Litz B, Herman D, Huska J, Keane T, editors. The PTSD checklist (PCL): reliability, validity, and diagnostic utility. Annual Meeting of the International Society for Traumatic Stress Studies; 1993 24-27 October 1993; San Antonio, Texas.
95. Mueser KT, Salyers MP, Rosenberg SD, Ford JD, Fox L, Carty P. Psychometric evaluation of trauma and posttraumatic stress disorder assessments in persons with severe mental illness. *Psychological Assessment*. 2001;13(1):110-7. Epub 2001/04/03.
96. Hawthorne G, Osborne R, Sansoni J, Taylor A. The SF-36 Version 2: critical analysis of population weights, scoring algorithms and population norms. *Qual Life Res*. 2007;16(4):661-73. DOI: 10.1007/s11136-006-9154-4.
97. Jenkinson C, Stewart-Brown S, Petersen S, Paice C. Assessment of the SF-36 version 2 in the United Kingdom. *J Epidemiol Community Health*. 1999;53(1):46-50.
98. Taft C, Karlsson J, Sullivan M. Performance of the Swedish SF-36 version 2.0. *Qual Life Res*. 2004;13(1):251-6.
99. Schunemann HJ, Guyatt GH. Commentary--goodbye M(C)ID! Hello MID, where do you come from? *Health Serv Res*. 2005;40(2):593-7.

100. McHugh T, Forbes D, Bates G, Hopwood M, Creamer M. Anger in PTSD: is there a need for a concept of PTSD-related posttraumatic anger? *Clin Psychol Rev.* 2012;32(2):93-104. Epub 2012/01/13.
101. Novaco R. Dimensions of anger reactions. Irvine, CA: University of California, 1975.
102. Hawthorne G. Perceived social isolation in a community sample: its prevalence and correlates with aspects of peoples' lives. *Soc Psychiatry Psychiatr Epidemiol.* 2008;43(2):140-50.
103. Tedeschi RG, McNally RJ. Can we facilitate posttraumatic growth in combat veterans? *Am Psychol.* 2011;66(1):19-24. Epub 2011/01/12.
104. Calhoun LG, Cann A, Tedeschi RG, McMillan J. A correlational test of the relationship between posttraumatic growth, religion, and cognitive processing. *Journal of Traumatic Stress.* 2000;13(3):521-7.
105. Powell S, Rosner R, Butollo W, Tedeschi RG, Calhoun LG. Posttraumatic growth after war: a study with former refugees and displaced people in Sarajevo. *Journal of Clinical Psychology.* 2003;59(1):71-83.
106. Bates GW, Trajstman SE, Jackson CA. Internal consistency, test-retest reliability and sex differences on the Posttraumatic Growth Inventory in an Australian sample with trauma. *Psychol Rep.* 2004;94(3 Pt 1):793-4.
107. Hawthorne G, Richardson J, Day N, editors. A comparison of the Assessment of Quality of Life (AQoL) with four other generic utility instruments. XII Medical Symposium "Quality of Life Measurement in Clinical Studies"; 2000; Helsinki, Finland: *Annals of Medicine.*
108. Hawthorne G, Richardson J. Measuring the value of program outcomes: a review of multiattribute utility measures. *Expert Review of Pharmacoeconomics Outcomes Research.* 2001;1(2):215-28.
109. Hawthorne G, Richardson J, Day NA. A comparison of the Assessment of Quality of Life (AQoL) with four other generic utility instruments. *Ann Med.* 2001;33(5):358-70.
110. Hawthorne G, Osborne R. Population norms and meaningful differences for the Assessment of Quality of Life (AQoL) measure. *Aust N Z J Public Health.* 2005;29(2):136-42.
111. Brewin CR, Andrews B, Valentine JD. Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *J Consult Clin Psychol.* 2000;68(5):748-66.
112. Ozer EJ, Best SR, Lipsey TL, Weiss DS. Predictors of Posttraumatic Stress Disorder and symptoms in adults: a meta-analysis. *Psychol Bull.* 2003;129(1):52-73.
113. Bae H, Kim D, Koh H, Kim Y, Park JS. Psychometric properties of the life events checklist-Korean version. *Psychiatry Investigation.* 2008;5(3):163-7. Epub 2008/09/01.
114. Prati G, Pietrantonio L. Optimism, social support, and coping strategies as factors contributing to posttraumatic growth: A meta-analysis. *Journal of Loss & Trauma.* 2009;14(5):364-88.
115. Peleg G, Barak O, Harel Y, Rochberg J, Hoofien D. Hope, dispositional optimism and severity of depression following traumatic brain injury. *Brain Injury.* 2009;23(10):800-8. Epub 2009/08/22.
116. Shearman E, Czech DR, Burdette T, McDaneil T, Joyner B, Zwald D. A comparison of optimism levels and life stress levels among NCAA Division I athletes and non athletes. *Journal of Issues in Intercollegiate Athletics.* 2011;4:190-206.
117. Hakstian RA, Walen TE. A k-sample significance test for independent alpha coefficients. *Psychometrika.* 1976;41(2):219-31.
118. Peer E, Gamliel E. Too reliable to be true? Response bias as a potential source of inflation in paper-and-pencil questionnaire reliability. *Practical Assessment, Research and Evaluation.* 2011;16(9):1-8. Epub 20 June.
119. Landis JR, Koch GG. The measurement of observer agreement for categorical data. *Biometrics.* 1977;33:159-74.
120. McCall WA. How to measure in education. New York: Macmillan; 1922.
121. SPSS. PASW/SPSS 18.0 for Windows. Chicago: SPSS Inc.; 2008.
122. Lynn P, Beerten R, Laiho J, Martin J. Recommended standard final outcome categories and standard definitions of response rate for social surveys. Colchester: Institute for Social and Economic Research, University of Essex, 2001 2001-23.

123. Edwards P, Roberts I, Sandercock P, Frost C. Follow-up by mail in clinical trials: does questionnaire length matter? *Control Clin Trials*. 2004;25(1):31-52. Epub 2004/02/26.
124. Cohen J. *Statistical power analysis for the behavioural sciences*. 2nd ed. Hillsdale: Lawrence Erlbaum; 1988.
125. Jackson DN. Acquiescence response styles: problems of identification and control. In: Berg IA, editor. *Response Set in Personality Assessment*. Chicago: Aldine; 1967. p. 71-114.
126. Hotopf M, Hull L, Fear NT, Browne T, Horn O, Iversen A, et al. The health of UK military personnel who deployed to the 2003 Iraq war: a cohort study. *Lancet*. 2006;367(9524):1731-41. Epub 2006/05/30.
127. Andrews G, Slade T. Interpreting scores on the Kessler Psychological Distress Scale (K10). *Aust N Z J Public Health*. 2001;25(6):494-7. Epub 2002/02/05.
128. Gallaway MS, Millikan AM, Bell MR. The association between deployment-related posttraumatic growth among U.S. Army soldiers and negative behavioral health conditions. *J Clin Psychol*. 2011;67(12):1151-60. Epub 2011/11/02.
129. Benetato BB. Posttraumatic growth among operation enduring freedom and operation Iraqi freedom amputees. *J Nurs Scholarsh*. 2011;43(4):412-20. Epub 2011/10/25.
130. Pietrzak RH, Goldstein MB, Malley JC, Rivers AJ, Johnson DC, Morgan CA, 3rd, et al. Posttraumatic growth in veterans of Operations Enduring Freedom and Iraqi Freedom. *J Affect Disord*. 2010;126(1-2):230-5. Epub 2010/04/20.
131. Fontana A, Rosenheck R. Psychological benefits and liabilities of traumatic exposure in the war zone. *J Trauma Stress*. 1998;11(3):485-503. Epub 1998/08/05.
132. Levine SZ, Laufer A, Stein E, Hamama-Raz Y, Solomon Z. Examining the relationship between resilience and posttraumatic growth. *J Trauma Stress*. 2009;22(4):282-6. Epub 2009/07/14.
133. Harrison Health Research. *Findings from the Autumn 2008 Health Survey*. Adelaide: 2008 August 2008.
134. Taylor AW, Dal Grande E, Wilson DH. The South Australian Health Omnibus Survey 15 years on – has public health benefited? *South Australian Public Health Bulletin*. 2006:30-2.
135. Wilson D, Wakefield M, Taylor A. The South Australian Health Omnibus Survey. *Health Promot J Austr*. 1992;2(3):47-9.
136. Sansoni J, Hawthorne G, Marosszeky N, Moore K, Fleming G, Owen E. *Validation and clinical translation of the Revised Continence and Patient Satisfaction Tools: Final report*. Wollongong: Centre for Health Service Development, University of Wollongong for the Commonwealth Department of Health and Ageing, July 2011.
137. Hawthorne G, Korn S, Richardson JR. Population norms for the AQoL derived from the 2007 Australian National Survey of Mental Health and Wellbeing. *Aust N Z J Public Health*. 2013;37(1):7-16.
138. Hu TW, Wagner TH, Hawthorne G, Moore K, Subak LL, Versi E. Economics of incontinence. In: Facey V, Abrams P, Cardozo L, Khoury S, editors. *Incontinence: 3rd International Consultation, Volume 1: Basics and Evaluation*. Paris: Organisation of Medical Consultations & Edition 21; 2005. p. 73-97.
139. Drummond M, O'Brien B, Stoddart G, Torrance G. *Methods for the Economic Evaluation of Health Care Programmes*. 2nd ed. Oxford: Oxford University Press; 1998.
140. Manning W. Panel on cost-effectiveness in health and medicine recommendations: identifying costs. *Journal of Clinical Psychiatry*. 1999;60(Suppl 3):54-8.
141. Weinstein MC, Siegel JE, Gold MR, Kamlet MS, Russell LB. Recommendations of the panel on cost-effectiveness in health and medicine. *JAMA*. 1996;276(15):1253-8.
142. Hawthorne G, Cheek F, Goldney R, Fisher L. The excess cost of depression in South Australia: a population-based study. *Aust N Z J Psychiatry*. 2003;37(3):362-73.
143. Abelson P. *Establishing a monetary value for lives saved: Issues and controversies*. Sydney: Applied Economics and Department of Economics, Sydney University, 2007.
144. Knieser L. Compensating wage differentials for fatal injury risk in Australia, Japan and the USA. *Journal of Risk and Uncertainty*. 1991;4:79-90.
145. Appleby J, Devlin N, Parkin D. NICE's cost effectiveness threshold. *BMJ*. 2007;335(7616):358-9. Epub 2007/08/25.

146. George B, Harris A, Mitchell A. Cost-effectiveness analysis and the consistency of decision making: evidence from pharmaceutical reimbursement in Australia (1991 to 1996). *Pharmacoeconomics*. 2001;19(11):1103-9. Epub 2001/12/12.
147. Makarounas-Kirchmann K, Stoelwinder J, Kirchmann M. Predicting successful listing of pharmaceuticals on the PBS. International Health Economics Association; Copenhagen, Denmark, 2007.
148. Sweeny K. Key aspects of the Australian Pharmaceutical Benefits Scheme. Pharmaceutical Industry Project Working Paper Series. Melbourne: Centre for Strategic Economic Studies, Victoria University of Technology, 2007. Working Paper No. 35.
149. Sareen J, Cox BJ, Afifi TO, Stein MB, Belik SL, Meadows G, et al. Combat and peacekeeping operations in relation to prevalence of mental disorders and perceived need for mental health care: findings from a large representative sample of military personnel. *Arch Gen Psychiatry*. 2007;64(7):843-52. Epub 2007/07/04.
150. Nepon J, Belik SL, Bolton J, Sareen J. The relationship between anxiety disorders and suicide attempts: findings from the National Epidemiologic Survey on Alcohol and Related Conditions. *Depress Anxiety*. 2010;27(9):791-8. Epub 2010/03/11.
151. Panagioti M, Gooding PA, Tarrier N. A meta-analysis of the association between posttraumatic stress disorder and suicidality: the role of comorbid depression. *Compr Psychiatry*. 2012;53(7):915-30. Epub 2012/04/10.
152. Stein DJ, Chiu WT, Hwang I, Kessler RC, Sampson N, Alonso J, et al. Cross-national analysis of the associations between traumatic events and suicidal behavior: findings from the WHO World Mental Health Surveys. *PLoS One*. 2010;5(5):e10574. Epub 2010/05/21.
153. Nock MK, Deming CA, Fullerton CS, Gilman SE, Goldenberg M, Kessler RC, et al. Suicide among soldiers: a review of psychosocial risk and protective factors. *Psychiatry*. 2013;76(2):97-125. Epub 2013/05/02.
154. Forbes D, Parslow R, Creamer M, Allen N, McHugh T, Hopwood M. Mechanisms of anger and treatment outcome in combat veterans with posttraumatic stress disorder. *Journal of Traumatic Stress*. 2008;21(2):142-9. Epub 2008/04/12.
155. Michel PO, Lundin T, Larsson G. Stress reactions among Swedish peacekeeping soldiers serving in Bosnia: a longitudinal study. *Journal of Traumatic Stress*. 2003;16(6):589-93.
156. Thoresen S, Mehlum L. Risk factors for fatal accidents and suicides in peacekeepers: is there an overlap? *Military Medicine*. 2004;169(12):988-93. Epub 2005/01/14.
157. Thoresen S, Mehlum L. Suicide in peacekeepers: risk factors for suicide versus accidental death. *Suicide and life-threatening behavior*. 2006;36(4):432-42. Epub 2006/09/19.
158. Thoresen S, Mehlum L, Moller B. Suicide in peacekeepers--a cohort study of mortality from suicide in 22,275 Norwegian veterans from international peacekeeping operations. *Soc Psychiatry Psychiatr Epidemiol*. 2003;38(11):605-10.
159. Dirkzwager AJ, Bramsen I, van der Ploeg HM. Social support, coping, life events, and posttraumatic stress symptoms among former peacekeepers: a prospective study. *Personality and Individual Differences*. 2003;34:1545-59.
160. Dekel S, Ein-Dor T, Solomon Z. Posttraumatic growth and posttraumatic distress: A longitudinal study. *Psychological Trauma: Theory, Research, Practice, and Policy*. 2012;4(1):94.
161. Elder GH, Jr., Clipp EC. Combat experience and emotional health: impairment and resilience in later life. *J Pers*. 1989;57(2):311-41. Epub 1989/06/01.
162. Tedeschi RG, Calhoun LG. Posttraumatic growth: conceptual foundations and empirical evidence. *Psychological Inquiry*. 2004;15(1):1-18.
163. Jones M, Rona RJ, Hooper R, Wessely S. The burden of psychological symptoms in UK Armed Forces. *Occup Med*. 2006;56(5):322-8. Epub 2006/05/25.
164. Rona RJ, Fear NT, Hull L, Greenberg N, Earnshaw M, Hotopf M, et al. Mental health consequences of overstretch in the UK armed forces: first phase of a cohort study. *BMJ*. 2007;335(7620):603. Epub 2007/08/01.

165. Phillips CJ, Leardmann CA, Gumbs GR, Smith B. Risk factors for posttraumatic stress disorder among deployed US male marines. *BMC Psychiatry*. 2010;10:52. Epub 2010/06/29.
166. Reger MA, Gahm GA, Swanson RD, Duma SJ. Association between number of deployments to Iraq and mental health screening outcomes in US Army soldiers. *J Clin Psychiatry*. 2009;70(9):1266-72. Epub 2009/08/20.
167. Castro CA, Adler AB. OPTEMPO: effects on soldier and unit readiness. *Parameters*. 1999;29(3):86–95.
168. Vincent C, Chamberlain K, Long N. Relation of military service variables to posttraumatic stress disorder in New Zealand Vietnam War veterans. *Military Medicine*. 1994;159(4):322-6. Epub 1994/04/01.
169. Moser C, Kalton G. *Survey methods in social investigation*. 2nd ed. London: Heinemann Educational; 1971. p. 549