



DEFENCE PHYSICAL EMPLOYMENT STANDARDS PROJECT

Infantry and Airfield Defence Guards

REPORT 3

REVIEW OF INJURY DATA: INFANTRY AND ADG

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DEFENCE PHYSICAL EMPLOYMENT STANDARDS PROJECT Infantry and Airfield Defence Guards

COMPLETED AND PLANNED REPORTS

No.	Short Title ¹	Date ¹	Type
Completed Reports			
1	Selection of Key Trade Tasks for Detailed Observation	Mar 04	Minor
2	Selection of Potential Endurance Tests & Anthropometric Measures	Sep 04	Minor
3	Review of Injury Data: Infantry and ADG	Mar 05	Minor
Planned Reports			
4	Trade Tasks Movement Analysis: Infantry and ADG	Jun 05	Minor
5	Trade Tasks Risk Analysis: Infantry and ADG	Jul 05	Minor
6	The Effect of Physically Demanding Infantry and ADG Trade Tasks on Cognitive Performance: a Pilot Observational Study	Apr 05	Minor
7	Supplementary Injury Survey: Infantry and ADG	Jul 05	Minor
8	Selection of Criterion Trade Tasks: Infantry and ADG	Mar 05	Minor
9	Trade Task Analysis: Infantry and ADG	Jul 05	Major
10	Reliability of Simulation Tests: Infantry and ADG	Jul 05	Minor
11	Normative Physical Performance Data: Infantry and ADG	Oct 05	Major
12	Physical Performance Standards: Infantry and ADG	Dec 05	Major

¹ In the case of planned reports, both the titles and the dates of publication are provisional.

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CONTENTS

LIST OF TABLES	v
THE AUTHORS	vi
EXECUTIVE SUMMARY.....	vii
REFERENCE DOCUMENTS	x
ABBREVIATIONS AND ACRONYMS	x
1 INTRODUCTION	1
1.1 Background.....	1
1.2 Aim.....	1
1.3 Scope.....	1
2 METHODOLOGY	3
2.1 Identification and Sourcing of Relevant Data	3
2.2 Overview of the Data Analysis.....	3
3 DATA SOURCES	4
3.1 OHSCB and DHSB: Defcare, EpiTrack and DIPP Databases	4
3.2 ADF Population Data	4
3.3 Other Potential Data Sources	4
<i>Compensation Data</i>	<i>4</i>
<i>Rehabilitation Data</i>	<i>4</i>
<i>First Aid Data from Unit Regimental Aid Posts (RAPs)</i>	<i>4</i>
<i>Near-miss or Dangerous Occurrence Reports</i>	<i>5</i>
<i>CATTs Subject Matter Experts</i>	<i>5</i>
3.4 Key Informants.....	5
4 INJURY CLASSIFICATION SYSTEMS.....	6
4.1 Definitions, Systems and Standards.....	6
4.2 Classification Systems Used in Defence Injury Databases.....	7
5 DEFCARE DATA.....	8
5.1 Description of Defcare Data and Associated ADF Population Data.....	8
<i>Scope of the Defcare Database</i>	<i>8</i>
<i>Characteristics and Limitations of Defcare Data</i>	<i>8</i>
<i>Defcare Data Subset for the DPES Project.....</i>	<i>9</i>
<i>ADF Unit Population Data.....</i>	<i>10</i>
5.2 Analysis of Defcare Data	10
<i>Defining the Scope for the PES Analysis</i>	<i>10</i>
<i>Analysis</i>	<i>14</i>
5.3 Results and Discussion	15
<i>All Incidents</i>	<i>15</i>
<i>Incidents Relating to CATTs.....</i>	<i>31</i>
<i>Serious Injuries Relating to CATTs</i>	<i>35</i>
5.4 Injury Incidence Rates	36
6 EPITRACK DATA.....	39
6.1 Description of EpiTrack Data	39
6.2 Characteristics and Limitations of EpiTrack Data.....	41
6.3 Analysis of EpiTrack Data.....	41
6.4 Results and Discussion	42



7	DATA FROM THE DEFENCE INJURY PREVENTION PROGRAM (DIPP)....	46
7.1	Description of DIPP Data	46
7.2	Characteristics and Limitations of DIPP Data	47
7.3	Analysis of DIPP Data.....	47
	<i>Data from East Timor.....</i>	<i>47</i>
	<i>Results from East Timor</i>	<i>52</i>
	<i>Data from the School of Infantry</i>	<i>53</i>
	<i>Results from the School of Infantry.....</i>	<i>53</i>
	<i>Comparison of Data from East Timor and the School of Infantry.....</i>	<i>58</i>
8	COMPARISONS AND EVALUATIONS.....	59
8.1	Defence Injury Databases.....	59
8.2	Comparison of Reported Injury Rates.....	59
	<i>Injury Incidence Rates</i>	<i>59</i>
	<i>Lost Time Injury Incidence Rates.....</i>	<i>61</i>
8.3	Summary: Comparison of Defence Injury Databases.....	63
8.4	Linking Injuries in Infantry and ADG Units to Combat Arms Trades Tasks	63
9	CONCLUSIONS AND RECOMMENDATIONS.....	65
9.1	Conclusions.....	65
9.2	Recommendations for the DPES Project.....	65
	REFERENCES	66
	ANNEXES	69
	Annex 1 – Key Informants	
	Annex 2 – Form AC563 Incident and Fatality Report	



LIST OF TABLES

Table 1.	Defcare Data Fields	10
Table 2.	Defcare Analysis Sequence.....	11
Table 3.	Infantry and ADG Units	12
Table 4.	Incident Counts: by Incident Type within Calendar Years	15
Table 5.	Incident Reports: by Incident Type within Financial Year.....	16
Table 6.	Incident Reports: by Incident Type within Employment Type.....	16
Table 7.	Incident Reports: by Incident Type within Work Status Type	16
Table 8.	Incident Reports: by Incident Type within Nature of Employment.....	17
Table 9.	Incident Reports: by Incident Type within Service Arm	17
Table 10.	Incident Reports: by Incident Type within Type of Unit	17
Table 11.	Incident Reports: by Incident Type within Unit	18
Table 12.	Incident Reports: by Gender within Incident Type.....	19
Table 13.	Incident Reports: by Occupation within Incident Type.....	19
Table 14.	Incident Reports: by Rank within Incident Type	23
Table 15.	Incident Reports: by Training Type within Incident Type.....	24
Table 16.	Incident Reports: by Activity within Incident Type	24
Table 17.	Incident Reports: by Mechanism Group within Incident Type	27
Table 18.	Incident Reports: by Agency Group within Incident Type.....	28
Table 19.	Incident Reports: by Bodily Location Group within Incident Type	28
Table 20.	Incident Reports: by Injury Nature Group within Incident Type	29
Table 21.	Incident Reports: by Severity of Outcome within Incident Type	29
Table 22.	CATT-related Incident Reports: by Activity within Type of Unit.....	32
Table 23.	CATT-related Incident Reports: by Mechanism Group within Type of Unit.....	33
Table 24.	CATT-related Incident Reports: by Agency Group within Type of Unit	33
Table 25.	CATT-related Incident Reports: by Bodily Location Group within Type of Unit.....	34
Table 26.	CATT-related Incident Reports: by Injury Nature Group within Type of Unit.....	34
Table 27.	CATT-related Incident Reports: by Severity of Outcome within Type of Unit.....	34
Table 28.	Estimated Average Unit Populations 2002-2003.....	37
Table 29.	Injury Incident Reporting Rates (per thousand exposed persons per year) 2002-2003: by Unit.....	38
Table 30.	EpiTrack Fields	39
Table 31.	EpiTrack: Aggregated Event Information for Each Day.....	39
Table 32.	EpiTrack Event Codes and Descriptors.....	40
Table 33.	EpiTrack Coverage	40
Table 34.	Estimated Injury Incidence Rates (first presentations per thousand persons per year): by Unit and Year	44
Table 35.	Estimated Injury Incidence Rates (first presentations per thousand persons per year) for Financial Year 2002-2003: by Unit	45
Table 36.	DIPP Injury Surveillance Database: Field Descriptions.....	46
Table 37.	East Timor Injury Presentations: by Venue and Activity Category	48
Table 38.	East Timor Injury Presentations: by Conditions and Activity Category	48
Table 39.	East Timor Injury Presentations: by Surface and Activity Category	49
Table 40.	East Timor Injury Presentations: by Activity and Activity Category	49
Table 41.	East Timor Injury Presentations: by Specific Action and Activity Category.....	50
Table 42.	East Timor Injury Presentations: by Injury Mechanism and Activity Category	50
Table 43.	East Timor Injury Presentations: by Body Part and Activity Category.....	51
Table 44.	East Timor Injury Presentations: by Diagnosis and Activity Category.....	51



Table 45.	East Timor Injury Presentations: by Severity and Activity Category	52
Table 46.	School of Infantry Injury Presentations: by Venue and Activity Category	54
Table 47.	School of Infantry Injury Presentations: by Conditions and Activity Category	55
Table 48.	School of Infantry Injury Presentations: by Surface and Activity Category	55
Table 49.	School of Infantry Injury Presentations: by Activity and Activity Category	55
Table 50.	School of Infantry Injury Presentations: by Specific Action and Activity Category	56
Table 51.	School of Infantry Injury Presentations: by Mechanism and Activity Category	56
Table 52.	School of Infantry Injury Presentations: by Body Part and Activity Category	57
Table 53.	School of Infantry Injury Presentations: by Diagnosis and Activity Category	57
Table 54.	School of Infantry Injury Presentations: by Severity and Activity Category	58
Table 55.	Injury Reporting Rates	60
Table 56.	Lost Time Injury Incidence Rates: ADF	62
Table 57.	Lost Time Injury Incidence Rates 2001: Selected Australian Industries	62
Table 58.	Characteristics of Defence Injury Databases	63

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EXECUTIVE SUMMARY

Military operational tasks are physically demanding and incur the risk of injury. In order to address the issues and costs associated with the high injury rates and focus on ways to reduce the risk of injury to Australian Defence Force (ADF) personnel, the ADF Chiefs of Service Committee (COSC) has endorsed a number of injury prevention strategies aimed at examining, analysing and evaluating injury-related risks and hazards within the ADF. In line with those strategies, COSC has affirmed that ADF employment policy is to be competency based and agreed that physical employment standards should be developed for combat arms trades. The purpose of the Defence Physical Employment Standards Project (DPESP) is to develop these performance-based competency standards.

The ADF has employed the services of the University of Ballarat (UB) to undertake the DPESP. This involves reviewing combat arms trade tasks (CATTs), establishing a set of criterion CATTs, developing a battery of simulation and predictive tests based on the criterion CATTs to be used to assess the physical competency of ADF combat personnel, and making recommendations for associated physical employment standards.

In the initial phase, the study is focused on one Army corps - Infantry, and one Air Force mustering - Airfield Defence Guards (ADG)¹.

Data about ADF injuries can be found mainly in three systems: Defcare is the primary occupational health and safety (OHS) database administered by the Management Information Branch of the Occupational Health Safety and Compensation Branch (OHSCB); EpiTrack and Defence Injury Prevention Program (DIPP) databases are administered under separate programs within the Defence Health Service Branch (DHSB).

- The Defcare database is the primary Defence occupational health and safety (OHS) database. Defcare has a legislative focus and stores OHS information in accordance with the Occupational Health and Safety (Commonwealth Employment) Act, 1991 and Occupational Health and Safety (Commonwealth Employment) Regulations, 1991. Defcare contains information about individual incidents and injuries including characteristics of the injured persons, the incidents and the outcomes. Nominally, its coverage has been global since 1998, but in fact the reporting rate is low, there are many gaps in existing data records and there are many data quality issues relating to the database structure, the incident reporting form, the classification and coding scheme, and to policies and practices regarding reporting, data coding and data management throughout the history of the database.
- EpiTrack is primarily health focused rather than injury focused. As its name suggests, it is an epidemiological database/system where the primary function is to monitor disease and to detect clusters or outbreaks. The monitoring of injury has been incorporated as an extra feature in response to particular issues that have arisen. The information about injuries has a narrower scope and is much less detailed than in Defcare, and is only available in the form of weekly aggregate data for ADF units, rather than for individual incidents or injuries. Like Defcare, there are some data quality issues with EpiTrack relating to classification and coding protocols. When and where reporting has occurred, the coverage has been more complete than Defcare, since reports are submitted by responsible officers in unit health facilities rather than by injured individuals or their supervisors. However, EpiTrack has been limited to Regular units, reporting periods have been intermittent for all units involved, and for many units, involvement in EpiTrack has only commenced quite recently.
- The surveillance aspect of the DIPP program is the most recent development in injury monitoring in the ADF. DIPP databases combine the best features of both Defcare and EpiTrack, and in some respects surpass both. Data are collected through unit health facilities, as with EpiTrack, but is based on individual incidents/injuries, as with Defcare. The data include a comprehensive range of characteristics of the injured persons, the incidents and the outcomes. The classification and coding schemes are the subject of continuing development, with a view to characterising incidents in ways that can better support and facilitate injury prevention activities in the military context. However to date, DIPP has only been implemented in a few locations for relatively short periods. That is about to change, with implementation currently taking place throughout 3 Brigade.

¹ The Army term *corps* has been used generically throughout this report to refer to both Infantry and ADG.



All injury incidence rates and lost time injury incidence rates calculated from Defcare, EpiTrack and DIPP data were compared.

- The rates based on EpiTrack and DIPP were in the range of 1200-1500 injuries per thousand exposed persons per year, similar to the rate of 1420 injuries per thousand exposed persons per year calculated in an American study of a US Army battalion. In contrast, the average rates calculated from Defcare data were around 100 incident reports per thousand exposed persons per year for Infantry, and even lower for ADG. These results support the widely held view that only a very small proportion of ADF injuries are reported through the Defence OHS system.
- Based on limited DIPP data, the estimated injury rate for the trainees at the School of Infantry in 2001 (2138 injuries per thousand exposed persons per year) was almost twice the estimated rate for 2 RAR in East Timor in 2002-2003 (1276 injuries per thousand exposed persons per year).
- Defcare data quality and coverage is not adequate to enable definitive and meaningful comparisons between lost time injury incidence rates in Infantry and ADG, and those in comparable civilian industries.
- Based on DIPP data, the estimated lost time injury incidence rate in 2 RAR in East Timor in 2002-2003 (65 lost time injuries per thousand exposed persons per year) was some 50% higher than in comparable civilian industries in 2001 (ranging from 35 to 50 lost time injuries per thousand exposed persons per year).
- Furthermore, based on DIPP data, the estimated lost time injury incidence rate for trainees at the School of Infantry during 2001 (463 lost time injuries per thousand exposed persons per year) was around seven times as high as that for 2 RAR in East Timor in 2002-2003.

The central aim of this report was to investigate the usefulness of existing data for the purposes of the DPESP. The issue is the extent to which the incidence of injuries of various types can be linked to the performance of various work tasks and in particular to combat arms trades tasks (CATTs), or at least to categories of activity which can be associated with particular tasks.

- EpiTrack data are of little use for this purpose. Injury rates can be calculated for disorders of the knee, disorders of the back, other musculo-skeletal disorders, and for "injuries due to military training", but even the relativities between these categories are difficult to interpret because of ambiguities in coding procedures. There is no further information about activities, mechanisms or agencies, and no information about individual incidents/injuries.
- Defcare data are the most comprehensive in temporal and organisational coverage, and of a similar level of detail as DIPP data with regard to characteristics of injured persons and injury incidents. General identification of the predominant activities, mechanisms, agencies, bodily locations and types of injury confirms the patterns of injury risk identified by subject matter experts in the first stage of DPESP. However, the combination of a classification and coding scheme designed for civilian compensation and difficulties coding Defence activities according to the classification scheme over time make it hard to link these details in any meaningful and informative way to particular trade task activities, and hence to add anything concrete to our knowledge about injury causation.
- DIPP data are available only for two slices of limited temporal and organisational scope, one of which is further limited to a particular class of injuries. Whilst the classification scheme is more informative than that of Defcare, it still falls short of providing the desired linkage between injuries and the performance of particular CATTs, or to categories of activity which can be associated with particular CATTs.

Two specific recommendations were made for the DPESP.

- Existing ADF incident/injury data sources are of limited usefulness for supporting the objectives of the DPESP. The planned supplementary collection of injury data, in the form of a large scale retrospective sample survey of Infantry and ADG personnel, should proceed.



- The retrospective survey should include a strong focus on the activity being undertaken at the time each injury occurred, with particular reference to CATT-related activity categories.

The following general observations were made regarding ADF injury data.

- Better integration of the three ADF health and safety databases/systems would reduce duplication of effort and gaps in coverage.
- To encourage compliance with reporting mandates and accurate reporting, forms and protocols (paper or electronic) should conform to established design principles with regard to clarity, flow and the absence of ambiguities and internal inconsistencies.
- To encourage the use of incident/injury data for management purposes, database structures and coding protocols should be reviewed with a view to providing relevant analytic capabilities and meeting the requirements of end users.
- In particular, to enhance the capacity of injury/incident data to support Injury prevention activities, further development should be undertaken into classification and coding of information about activities in ways which are relevant in the ADF context. In electronic reporting/coding systems, trade-specific drop-down lists of detailed categories are feasible.
- With the increasing availability of computer software for qualitative text analysis, a future complement to classification and coding might be the electronic storage of full-text incident narratives, and the provision of capabilities for individuals to directly interrogate and analyse the narratives for management and research purposes.
- Regardless of whether they are to be coded or analysed qualitatively, the quality and comprehensiveness of narratives is crucial. In an electronic reporting environment these might be improved by the provision of a wider range of contextually-specific and perhaps more detailed model narratives than the abbreviated examples on the current AC563 form.
- Notwithstanding issues specific to the ADF context, in reviewing classification and coding systems, the extent to which these systems can be aligned with existing civilian systems and minimum datasets should be considered. This would facilitate comparison of ADF with civilian industry benchmarks. Civilian systems and minimum datasets also provide guidance on how to structure text narratives for injury prevention purposes.



REFERENCE DOCUMENTS

- A. Commonwealth of Australia. (2002). *Request for Tender for Conduct of a Physical Employment Standards Study for the Australian Defence Force, Part One: Draft Statement of Work*. Canberra.
- B. Commonwealth of Australia. (2002). *Contract C538679 Conduct of a Physical Employment Standards Study for the Australian Defence Force*. Canberra.
- C. Stacy, R.J., Payne, W.R. and Harvey, J.T.. (2004). *Defence Physical Employment Standards Project, Infantry and Airfield Defence Guards; Report 1: Selection of Key Trade Tasks for Detailed Observation*. Canberra: Department of Defence, Defence Personnel Executive.
- D. Defence Health Service Branch. (2000). *Australian Defence Force Health Status Report*. Canberra: Defence Publishing Service.
- E. Defence Safety Management Organisation. (2003). *Defence OHS Incident and Related Data Assessment: Review of data sources as at September 2003*, conducted by Dr Doug Shaw, CSIRO, for the Defence Behavioural Baseline Project.
- F. Defence Health Service Branch. (undated). *Defence Injury Prevention Program: Overview*.
- G. Defence Injury Prevention Program. (2002). *Report of the School of Infantry Injury Surveillance Database 1-2002*.
- H. Defence Injury Prevention Program. (2003). *Report of the Timor Injury Surveillance Database on Injury 8-2003*.
- I. Department of Defence. *Defence Annual Report, 1997-1998 to 2002-2003*.

ABBREVIATIONS AND ACRONYMS

1 HSB	1 st Health Support Battalion
ADF	Australian Defence Force
ADG	Airfield Defence Guard
AFDW	Airfield Defence Wing
CATT	Combat Arms trades Task
Defcare	The primary Defence OHS database maintained by DSMA/OHSCB
DHSB	Defence Health Services Branch
DIPP	Defence Injury Prevention Program
DPESP	Defence Physical Employment Standards Project
DSMA	Defence Safety Management Agency
EpiTrack	A health surveillance system maintained by DHSB
ICD	International Classification of Diseases
ICECI	International Classification of External Causes of Injury
IET	Initial Employment Training
ITS	Infantry Training School (see also SOI)
NCCH	National Centre for Classification in Health
NOHSC	National Occupational Health and Safety Commission
OHSCB	Occupational Health Safety and Compensation Branch
OHS	Occupational Health and Safety
PES	Physical Employment Standards
PT	Physical Training
RAR	Royal Australian Regiment (1 RAR = 1 st Battalion, Royal Australian Regiment, etc.)
SOI	School of Infantry (see also ITS)
STANAG 2050	NATO Standardisation Agreement 2050 on Statistical Classification of Diseases, Injuries, and Causes of Death
TOOCS	Type of Occurrence Classification System
WDL	Working Days Lost



1 INTRODUCTION

1.1 Background

- 1.1.1 Military operational tasks are physically demanding and incur the risk of injury. In order to address the issues and costs associated with the high injury rates and focus on ways to reduce the risk of injury to Australian Defence Force (ADF) personnel, the ADF Chiefs of Service Committee (COSC) has endorsed a number of injury prevention strategies aimed at examining, analysing and evaluating injury-related risks and hazards within the ADF. In line with those strategies, COSC has affirmed that ADF employment policy is to be competency based and agreed that physical employment standards should be developed for combat arms trades. The purpose of the Defence Physical Employment Standards Project (DPESP) is to develop these performance-based competency standards.
- 1.1.2 The ADF has employed the services of the University of Ballarat (UB) to undertake the DPESP. This involves reviewing combat arms trade tasks (CATTs), establishing a set of criterion CATTs, developing a battery of simulation and predictive tests based on the criterion CATTs to be used to assess the physical competency of ADF combat personnel, and making recommendations for associated physical employment standards (see Reference Documents A and B).
- 1.1.3 In the initial phase, the study is focused on one Army corps - Infantry, and one Air Force mustering - Airfield Defence Guards (ADG)¹.

1.2 Aim

- 1.2.1 Within this context, the purpose of this component of the work (WBS: 1.2.1 Epidemiological Review) was to investigate and report on patterns of injury experience within the ADF, with particular reference to relationships between injury occurrence and the performance of particular CATTs. This investigation was to include:
- a. consultation with agents responsible for the relevant Defence Safety Management Agency (DSMA)² and Defence Health Service Branch (DHSB) injury databases, and CATTs subject matter experts;
 - b. review of DSMA and DHSB databases such as Defcare and Defence Injury Prevention Program (DIPP) injury data reports;
 - c. to the extent that relevant information is available, a review of data sources with a more specific organisational and/or functional focus, such as first aid injury/illness treatments, rehabilitation treatment data, and near-miss or dangerous occurrence reports.

1.3 Scope

- 1.3.1 The central purpose of compiling this report was to assess the usefulness of existing data for the purpose of the DPESP - linking injuries to the performance of Infantry and ADG CATTs - and to report on specific analyses undertaken for that purpose.
- 1.3.2 The objective was not to undertake a general review and critique of existing ADF injury data and data systems, nor a comprehensive descriptive analysis of all available injury indicators, along the lines of Chapter 1 of the ADF Health Status Report (Reference Document D).
- 1.3.3 Nevertheless, in pursuing the primary objective, the three main data sources have been critically examined, analysed and compared, within the limited purview of data relating to

¹ The Army term *corps* has been used generically throughout this report to refer to both Infantry and ADG.

² During the course of this study, responsibility for the Defcare database was transferred from DSMA to the Management Information Directorate within the Occupational Health Safety and Compensation Branch (OHSCB). To preserve the historical accuracy of the description of consultations, the term DSMA is used in some places in Sections 1 to 3 of this report. Otherwise the term OHSCB is used.



Infantry and ADG, and with particular regard to those indicators which might inform the DPESP.

1.3.4 The report includes:

- a. broad descriptions of available injury databases;
- b. analyses of data relating to injuries suffered by Infantry and ADG personnel;
- c. more detailed analyses of data relating to injuries sustained in the performance of Infantry and ADG CATTs (to the extent that this distinction is possible);
- d. comparisons of available data sources, and conclusions as to their utility for the analysis of risks associated with the performance of Infantry and ADG CATTs.



2 METHODOLOGY

2.1 Identification and Sourcing of Relevant Data

2.1.1 The primary data sources were identified through consultation with key informants in DSMA and DHSB, who then supplied the relevant data, generally in the form of extensive Excel spreadsheets. Ancillary data were obtained in a variety of forms from a range of Defence sources identified by the Defence PES Project Office. The data sources are discussed in Section 3.

2.1.2 The relevant injury classification systems are discussed in Section 4.

2.2 Overview of the Data Analysis

2.2.1 Extensive preliminary analysis was undertaken in order to select appropriate subsets of the various data sets, with regard to three aspects of scope:

- a. timeframe;
- b. relevant sub-populations of the ADF; and
- c. the contexts in which injury incidents occurred.

2.2.2 The timeframes differed for each primary data source, but were clearly identifiable in each case. The relevant sub-population of ADF was nominally Infantry & ADG combat units, but information was not always available to enable a clear delineation of this sub-population. The context of interest was injuries suffered during the performance of CATTs, but again, none of the databases included information to enable these activities to be unambiguously distinguished. With respect to both subpopulation and context, some approximation and interpolation was required, and so the scope of the resulting filtered data is imprecise. The nature of this approximation and interpolation will be discussed in the relevant sections of the report.

2.2.3 The substantive analyses undertaken on the selected data differed according to the characteristics of each particular dataset. Common themes included:

- a. demographic and organisational profiles of persons injured;
- b. profiles of injury/incident characteristics as site of incident, activity, mechanism, agency, nature of injury, bodily location and severity;
- c. comparisons of these profiles between different organisational groupings;
- d. calculation of approximate injury incidence rates on the basis of a rudimentary standardisation for exposure. This was based on population estimates for units, estimates of equivalent population sizes for Reserves and trainees undergoing initial employment training (IET), and unit establishments for the relevant occupational categories.

2.2.4 These analyses were performed using Excel and SPSS statistical software. The results are presented and discussed in Sections 5 to 7. All relevant Excel and SPSS files have been provided to the Defence PES Project Office in electronic form.



3 DATA SOURCES

3.1 OHSCB and DHSB: Defcare, EpiTrack and DIPP Databases

- 3.1.1 The primary data sources were DSMA/OHSCB and DHSB. Five members of the UB research team attended initial briefings at DSMA and DHSB on Thursday October 16, 2003. Introductory information regarding available relevant data was provided and discussed at those meetings, which was supplemented by subsequent telephone and email communications.
- 3.1.2 Subsequently, relevant injury incident data were provided from the Defcare database by DSMA, and from EpiTrack and Defence Injury Prevention Program (DIPP) health surveillance databases by DHSB, in a mixture of printed and electronic formats.

3.2 ADF Population Data

- 3.2.1 In order to estimate exposures, and hence to calculate standardised injury rates, population data were obtained for Regular Infantry and Airfield Defence Wing (AFDW) units, Reserve Infantry units and the School of Infantry (SOI).

3.3 Other Potential Data Sources

Compensation Data

- 3.3.1 The Defcare database also holds information relating to the compensation and rehabilitation services provided to members and ex-members of the ADF by the Military Compensation and Rehabilitation Service (MCRS). Whilst compensation records include data on the bodily location of injuries, there is no direct information, and very little indirect information, about causation. OHSCB advised that whilst the compensation side of Defcare holds data on approximately 70,000 cases, only 3,000 of these are able to be linked to a particular incident. In the context of the present analysis, OHSCB was only able to link a compensation record to a similar proportion (around 5%) of injury reports selected for the PES study. Two reasons for this are the fact that many ADF compensation claims are made long after the event which initiated the problem, and the imperfect or non-existent links between Defcare and older payment systems.
- 3.3.2 An analysis of bodily locations of injury (regardless of root cause) from compensation data can be found in the ADF Health Status Report (Reference Document D) at paragraphs 1.96 and 1.97. Considering the almost complete absence of links to the incident data which are the prime focus of the PES study, there is nothing to be added to that analysis.

Rehabilitation Data

- 3.3.3 The Physiotherapy Department at 1 HSB, which runs an Injury Management Program (IMP) with two strands - one for IET trainees and one for trained ADF trade personnel – is in the process of implementing a DIPP style surveillance database. Existing database records include basic information about the injured person (occupation, rank, service arm, unit etc.) as well as clinical information about the injury (nature, bodily location, severity, agency etc.) and the treatment (nature, duration etc). Further information about injury incidents (activity, location etc.) is included in note form and is yet to be entered into the database. At this time, no data are available which could be linked to activities and root causes.

First Aid Data from Unit Regimental Aid Posts (RAPs)

- 3.3.4 Advice from DIPP personnel was that whilst first aid data could be collected from Unit Regimental Aid Posts (RAPs), no records are kept to link injuries to particular trade tasks, and so these data could do no more than confirm the general levels of injuries and injury profiles which are provided more accessibly in DIPP and EpiTrack data. It was decided not to proceed with this line of enquiry.



Near-miss or Dangerous Occurrence Reports

- 3.3.5 Advice from OHSCB and DHSB was that few near-misses or dangerous occurrences are reported in the ADF. The Defcare database does contain some Dangerous Occurrence reports, but the way they have been encoded has changed over time. Incidents and casualties are coded separately in Defcare (e.g. an incident may have more than one casualty) but at times Dangerous Occurrences have also been recorded as unspecified casualties, which cannot be definitively distinguished from actual but poorly specified casualties. It was decided to consider this issue when designing the planned retrospective survey of injuries (WBS 2.1.2).

CATTs Subject Matter Experts

- 3.3.6 Risk assessments for each of 12 trade task activity categories made by Infantry and ADG CATTs subject matter experts have been reported in *DPESP Report No 1: Selection of Key Trade Tasks for Detailed Observation* (Reference Document C). Reference is made to these assessments in Section 8.

3.4 Key Informants

- 3.4.1 Members of the UB research team and key DSMA/OHSCB and DHSB personnel who were present at the initial briefings, together with key informants in the data and information gathering phase, are listed in Annex 1.



4 INJURY CLASSIFICATION SYSTEMS

4.1 Definitions, Systems and Standards

- 4.1.1 Primary information about an injury incident generally takes the form of a free-form narrative either conveyed verbally to a health service provider or written on a reporting form. In the latter case, some closed-form categorical information may also be provided by ticking boxes. The next step within an injury data system is to classify or encode the narrative into a series of categorical fields relating to various aspects of both causes and outcomes of the incident/injury, using standards developed for the purpose. The following summary of current and recent classification standards was compiled after consultation with staff of OHSCB and DHSB.
- 4.1.2 It is useful to begin by defining three related terms. *Disease* has been defined as “an impairment of the normal state of the living animal or plant body or one of its parts” (U.S. National Library of Medicine, 2004). *Disorder*, frequently used in conjunction with *disease*, suggests some irregularity of the system, as in “an abnormal physical or mental condition” (U.S. National Library of Medicine, 2004). *Injury* is the result of trauma, and has been defined as “hurt, damage, or loss sustained” (U.S. National Library of Medicine, 2004).
- 4.1.3 None of these three terms are mutually exclusive. Historically, the classification of injuries has been included within disease taxonomies. However, in the last few decades, increasing emphasis on occupational health and safety (OHS) has resulted in the development of more specialised and comprehensive injury classification systems.
- 4.1.4 The current international standard for disease classification is the International Classification of Diseases and Related Health Problems, tenth revision (ICD-10) (World Health Organisation, 1992). Many variants have been derived, including the Australian Modification referred to as ICD-10-AM, which incorporates supplementary codes of relevance to Australian contexts.
- 4.1.5 ICD-10 and ICD-10-AM code nature and bodily location of injury, as well as external causes including place of occurrence, activity and mechanism of injury (including any substances or procedures or equipment involved in the incident). However, the external cause codes for ICD-10 are sparse, providing inadequate detail for injury prevention purposes. ICD-10-AM extends these considerably.
- 4.1.6 A recent development is the International Classification of External Causes of Injury (ICECI) (WHO Working Group on Injury Surveillance Methods, 2003). This has been developed to meet the need for more detailed coding of external causes, and is intended to replace the many different systems which have been developed for this purpose in different countries. ICECI is in a phase of rapid development. Components of ICECI are also being incorporated into ICD-10 implementations.
- 4.1.7 DHSB staff are currently working with the National Centre for Classification in Health (NCH) to develop these systems (ICD-10-AM, possibly ICD-10, and certainly ICECI) to be of greater utility in military contexts.
- 4.1.8 The Standardization Agreement on Statistical Classification of Diseases, Injuries, and Causes of Death (STANAG 2050) (NATO, 1989) is a NATO Forces Supplement to ICD which is used to classify injuries and their external causes in the US military. A list of STANAG 2050 codes can be found in the *Atlas of Injuries in the U.S. Armed Forces* (Department of Defense Injury Surveillance and Prevention Work Group, 1999). They are based on the earlier ICD-9 standard (World Health Organisation, 1975), and the external cause codes focus on mechanism but not activity or place of occurrence. Consequently, the detail is insufficient for use in injury prevention, and alternatives, including ICECI, are under consideration in the US.



- 4.1.9 In the Australian OHS arena, the Type of Occurrence Classification System (TOOCS) (NOHSC, 1999), was developed in 1987 by the National Occupational Health and Safety Commission for use in coding details of cases reported to workers' compensation agencies. TOOCS was originally based on ICD-9, but TOOCS 3.0 is ICD-10 compatible. As with ICECI, TOOCS has provision for more detailed coding of external causes, with a distinction being made between the *agency* and *mechanism* of injury. The agency is the object, substance or circumstance that was principally involved in or most closely associated with the injury, whereas the mechanism is the action, exposure or occurrence that was the direct cause of the injury (Viner et al., 2003). While a minimum dataset has been required by NOHSC for some years, the complete range of coding systems varies according to state and jurisdiction. The relevant Australian Standard, AS1885.1 (Standards Australia, 1990), is largely based on TOOCS. However, use of TOOCS is limited to Australia, and it is used in the OHS arena but not in the Health arena.
- 4.1.10 The Australian Health sector uses ICD-10-AM and related standards including the Injury Surveillance National Minimum Data Set (Australian Institute of Health and Welfare, 2003).
- 4.1.11 All of the above standards are related. The differences between them pertain both to the contexts in and for which they have been developed (particularly health/medical vs. OHS), and also to differences and changes in conceptualisation of the accident and injury process. The literature of accident/incident and injury classification is reviewed elsewhere, for example by Viner et al. (2003).

4.2 Classification Systems Used in Defence Injury Databases

- 4.2.1 The Defcare coding categories for mechanism, agency, bodily location and nature of injury are based on the TOOCS classification.
- 4.2.2 EpiTrack employs a single 'event' field. The list of event codes was compiled around 1995 under an ABCA (America Britain Canada Australia) arrangement. Most of the entries in the list have been retrospectively linked to elements of the ICD-10 classification system.
- 4.2.3 The coding schemes used to date in DIPP have been generally based on the TOOCS classification. However the lists of categories for each field varied by location, because at the time these databases were implemented, there was no standardised classification system suited to the military context.¹ The databases were a component of ongoing research to examine what local units would want included in the categories related to each field. A standardised set based on ICECI and ICD-10-AM, with some supplementary codes, is currently being implemented, but there are still some interim measures in place due to technical and developmental issues. DHSB are mapping these codes back to TOOCS as best they can to provide information to Defcare/OHSCB also, but the mapping is not straightforward. This lack of consistency between OHS and Health data standards within Australia has been flagged for consideration by NCCH.

¹ A similar shortcoming of the ICD standards with regard to classification of sports injuries has been identified by Finch et al. (1995).



5 DEFCARE DATA

5.1 Description of Defcare Data and Associated ADF Population Data

Scope of the Defcare Database

- 5.1.1 At the time of reporting, the Defcare database is the primary Defence occupational health and safety (OHS) database.¹ Defcare has a legislative focus and stores OHS information in accordance with the Occupational Health and Safety (Commonwealth Employment) Act, 1991 and Occupational Health and Safety (Commonwealth Employment) Regulations, 1991. Section 37 of the Regulations specifies the information that must be captured for certain incident classes. These information requirements are the basis for data elements on the AC563 Defence Incident and Fatality Report Form (see Annex 2).
- 5.1.2 Defcare is populated by reports lodged using the AC563 form. Various sections of this form are supposed to be completed by the person involved or an appointed representative, the person's supervisor, the unit Safety Co-ordinator or Safety Manager and the unit Commander or Manager.
- 5.1.3 The database contains reported data on some 55,000 incidents throughout the ADF. Each incident is represented by a data record. All data, regardless of the incident date, have been entered onto the database since September 1997. There are some obviously invalid dates, stretching back as far as 1900. The data are incomplete for the period prior to 1998, and comprehensive for the period from 1998 to the present, in the sense that data from all AC563 forms in that period have been entered. Around 10% of the data dates from prior to 1998.
- 5.1.4 From the statements of key informants in OHSCB and DHSB and elsewhere in Defence, it is clear that there is a widely held belief that only a small proportion of ADF incidents and injuries are reported on AC563 forms. OHSCB is addressing the issue of under-reporting in its current OHS Incident Module. This will replace the Defcare Corporate database and be imbedded as a portal into the PMKeyS Corporate Human Resources database. Key features will include the ability for electronic submission of incident reports to OHSCB and the ability to link to Personnel information. Individuals will have the ability to access reports that have been submitted on their behalf. Detailed data about incidents within a unit will be visible to that unit, and visibility of incidents across Defence will also be increased.

Characteristics and Limitations of Defcare Data

- 5.1.5 The coded data in Defcare has some serious shortcomings which limit its usefulness for the PES study. These are described in the following paragraphs. Some of these have already been identified in the ADF Health Status Report (Reference Document D).
- 5.1.6 The AC563 form fails in many respects to conform to the principles of good form/questionnaire design (Hicks, 1995; Australian Bureau of Statistics, 1999; Frazer & Lawley, 2000) which is likely to contribute to some of the under-reporting. For example, Question 3 ("What was the result of the incident?") attempts to simultaneously capture information about four different aspects - severity of an injury, occurrence of a disease, duration of incapacity and exposure to hazards. The list of categories is poorly laid out, and is neither mutually exclusive nor exhaustive. The brief instruction ("Tick appropriate box") is not explicit, but it implies that only one response is required, although the categories are not mutually exclusive.
- 5.1.7 There are issues relating to the structural design of the Defcare database. For example, the database has separate "incident" and "casualty" tables, which are not in a one-to-one relationship. Dangerous occurrences not resulting in injury have, during some periods, been coded only into the incident table. During other periods dangerous occurrences have also

¹ It is recognised that the Defcare system will soon be superseded (see paragraph 5.1.4). However, the characteristics of the historical repository of Defcare data will remain as they are described in this report.



been entered into the casualty table as “minor injuries”, with the use of “unspecified” categories for mechanism, bodily location and nature of injury.

- 5.1.8 Not all information from the AC563 form is entered into Defcare. For example, whilst the form includes a Yes/No question about whether any time was lost due to the injury, there is no corresponding field in the database. There are fields for days lost in various categories, but if these fields are empty, there is no way of knowing whether there was actually no time lost or whether the information was unavailable at the time the form was filled in, or simply not provided.
- 5.1.9 In the data fields that are recorded in Defcare, there are many gaps due to missing data on the AC563 forms. For example, in many instances no details of the organisational unit or occupation of the person injured are available. OHSCB staff report that in over 98% of cases supervisors do not indicate that any corrective action is required.
- 5.1.10 There are problems with data quality relating to the coding structure and the coding process. Many of the database fields are coded from less structured text on the AC563 form. Non TOOCS related fields have been coded using protocols that have been revised over time. With TOOCS codes, a TOOCS validation framework is used which disallows invalid combinations. However, the validation rules do not always allow combinations that make sense within the military environment. This means that at times a more general code must be chosen which does not characterise the incident with the degree of definitiveness required. Also, it is well recognized in medical and OHS circles that different coders conceptualise the injury process differently and can produce widely disparate characterisations within the same classification scheme (see for example Culvenor et al., 2003; Viner et al., 2003). OHSCB staff are aware of ambiguities in activity codes such as “drilling” which can refer to many very different military activities, and that interpretations and decisions made by coding staff have not necessarily been consistent between different coders or over time. OHSCB has not attempted to remove inconsistencies created through the coding of TOOCS, activity or site fields.
- 5.1.11 A particular issue from the perspective of the DPESP is that it is not possible to clearly identify particular trade-task related activities. There are no specific codes for military training in the list of activity codes. For example, the activity code may be *walking*, but the injury may have occurred on an exercise or in a car park. In some cases, other fields such as the site or exact location give an indication of the activity, but this is seldom conclusive.¹
- 5.1.12 An assessment of Defence OHS incident and related data sources commissioned as part of the Baseline Behavioural Survey (BBS) Project assessed Defcare as follows: “Granularity good however concerns over accuracy. Implementing actions to improve reporting rates. AC563 mapping good.”² The overall recommendation was “Use with caution”. (Reference Document E).

Defcare Data Subset for the DPES Project

- 5.1.13 OHSCB provided DPESP with a spreadsheet containing 27,215 data records, covering all reported incidents involving Army and ADG personnel which were held in the Defcare database as at December 18, 2003. A list of the 40 data fields supplied is given in Table 1. The selection of records was based on the reported Service Arm of each individual casualty. Because individuals may be posted to non-Army or non-ADG units, some such units are represented in the organisational structure (cost centre) fields. Until recently, OHSCB had no way of independently verifying the details provided on the form or resolving anomalies other than calling the supervisor to clarify details, which involved a substantial administrative burden.

¹ OHSCB staff advise that whilst this is true of coded Defcare data, the raw narratives from the AC563 forms are a rich potential source of contextual information. Examination of such primary material was outside the scope of this report, but is the subject of an observation in Section 9.

² granularity = fineness of detail; mapping = correspondence/linking between information entered on the form and information stored in the database.



Table 1. Defcare Data Fields

Date of incident	Mechanism
Incident description	Mechanism group
PMKeys commencement date	Agency
Period between commencement and date of incident	Agency group
Service arm	Agency subgroup
Casualty on duty status	Bodily location
Casualty employment basis	Bodily location group
Casualty training type	Bodily location subgroup
Casualty work status	Injury nature
Casualty nature of employment	Injury nature group
Casualty occupation	Cost centre name
Gender	Cost centre level number
Age	Cost centre level 1 name
Rank	Cost centre level 2 name
Lost days in hospital	Cost centre level 3 name
Lost days on leave	Cost centre level 4 name
Lost days on light duties	Cost centre level 5 name
Incident site	Cost centre level 6 name
Activity	Cost centre level 7 name
Activity group	Incapacity payment

ADF Unit Population Data

- 5.1.14 Population data were obtained in order to standardise Defcare counts to obtain injury incidence rates. Population data for Regular personnel in both Regular and Reserve units were obtained from the Directorate of Strategic Personnel Planning and Research (DSPPR). Reserve person-days data were provided by Headquarters Army Finance Service Unit. Headquarters Training Command - Army provided trainee throughput data for the School of Infantry.
- 5.1.15 Key informants in Army and ADG provided information about occupational classifications and occupational profiles of Regular units.

5.2 Analysis of Defcare Data

Defining the Scope for the PES Analysis

- 5.2.1 The scope of the analysis was progressively refined by implementing a sequence of inclusion and exclusion criteria, which are described in the following paragraphs and summarized in Table 2.
- 5.2.2 The data set provided by OHSCB included 27,237 records, covering all reported incidents involving Army and ADG personnel as at 18/12/03. Initially, in order to remove any possible selection bias in the earlier incomplete data, the 2,853 data records dated prior to 1998 were excluded, leaving 24,384 records for the period 1/1/98 to 28/11/03.
- 5.2.3 Records relating to Infantry and ADG units were then selected, principally on the basis of Unit. In consultation with the Defence PES Project Office, the units listed in Table 3 were chosen as representing the appropriate organisational scope for this analysis. The table includes units which were provisionally selected for consideration but subsequently excluded. These were concerned with either Special Forces, which is out of scope, or officer training, which is not relevant to the trade task focus of the DPESP. There is provision in a Defcare data record for up to 12 ADF organisational designations based on PMKeyS Cost Centre ID codes, arranged hierarchically from the top down, so that the information gets more specific with each successive organisational structure field. Only seven of these fields were used in the data set supplied. The contents of the final, lowest level field is transferred into a single field which represents the standard designation of the unit. Initially this field was used to select 3,029 relevant records.



Table 2. Defcare Analysis Sequence

Data category/ source	Data subset	Scope	Method	N (Army/ Infantry + ADG)	Caveats/ adjustments	Analysis	Time frame
Incident/Injury counts							
Defcare	1	Army & ADG	All available records	27,237 (27,155 + 82)			1900-2003
	2	Army & ADG	Select by date	24,384 (24,304 + 80)			1998-2003
	3	Infantry & ADG	Select by unit, or in the absence of unit info, by occupation	3,036 (2,956 + 80)	800 Infantry combat arms trades personnel in other units excluded; 1,216 cases omitted because no info on unit or occupation. Estimated 5% undercount.	Frequency tables/summary stats for all fields	1998-2003
	4	Work-related	Select by activity group, incident site, duty status	2,030 (1,978 + 52)	31 cases omitted because no info on either activity group or incident site. Estimated 1% undercount.	Frequency tables/summary stats for all fields	1998-2003
	5	Related to physical performance of CATTs	Select by occupation, incident site, activity, work status and nature of employment, mechanism, agency, nature and bodily location of injury	880 (852 + 28)	380 cases included with no occupational information. Estimated 5% overcount.	Frequency tables/summary stats for all fields Crosstabulations activity x unit type nature of injury mechanism agency bodily location etc.	1998-2003
Populations							
DSPPR	6	Permanent staff in Infantry/ADF units (Regular, Reserve & Sol)					Oct 2002
Sol	7	EFT trainees					2002-3
AFSU	8	EFT Reserves					2002-3
	9	Total unit populations	Combine 6, 7, 8				2002-3 (nominal)
Defence PES Project Office	10	Exposed Combat arms trades populations	Establishment proportions for each unit applied to 9				2002-3 (nominal)
Incidence Rates							
		Unit injury rates	Dataset 3/ Dataset 9		Adjust rates for excluded cases	Breakdown by units	2002-3 (nominal)
		Unit work-related injury rates	Dataset 4/ Dataset 9		Adjust rates for excluded cases	Breakdown by units	2002-3 (nominal)
		Unit CATT-related injury rates	Dataset 5/ Dataset 10		Adjust rates for excluded cases	Breakdown by units	2002-3 (nominal)

Table 3. Infantry and ADG Units

Unit	Bde	Description	Location	Category ¹	Description
ADG					
1 AFDS		ADG	Adelaide	2	Airfield Defence
2 AFDS		ADG	Amberley	2	Airfield Defence
3 AFDS		ADG	Amberley	2	Airfield Defence
Army					
1 RAR	3	Light	Townsville	1	Regular
2 RAR	3	Light	Townsville	1	Regular
3 RAR	3	Parachute	Sydney	1	Regular
5/7 RAR	1	Mechanised	Darwin	1	Regular
6 RAR	7	Motorised	Brisbane	1	Regular
25/49 RQR				3	Integrated Regular/Reserve
1/19 RNSWR				4	Reserve
10/27 RSAR				4	Reserve
11/28 RWAR				4	Reserve
12/40 RTR				4	Reserve
2/17 RNSWR				4	Reserve
31 RQR				4	Reserve
4/3 RNSWR				4	Reserve
41 RNSWR				4	Reserve
42 RQR				4	Reserve
5/6 RVR				4	Reserve
8/7 RVR (4 Bde)				4	Reserve
9 RQR				4	Reserve
School of Infantry				5	Trade training
Excluded from sample					
4 RAR (CDO) ²				1	Commando
AUR				6	Officer training
MON UR				6	Officer training
MUR				6	Officer training
QUR				6	Officer training
RMC – Duntroon				6	Officer training
SUR				6	Officer training
UNSWR				6	Officer training
WAUR				6	Officer training

¹ Categories: 1 Regular Infantry; 2 ADG; 3 Integrated Regular/Reserve Infantry; 4 Reserve Infantry; 5 Trade training; 6 Officer training

² This is an Infantry unit in the process of being remodelled to become a Special Forces unit

5.2.4 The 1520 records for which no unit was identified were examined to see if there was any information in other fields which would allow Infantry and non-Infantry casualties to be discriminated. Of these 1520 records, the occupation field provided unambiguous evidence of Infantry or ADG combat arms trades membership in only 7 cases which were therefore included, 297 were excluded, and the remaining 1,216 records were omitted because they contained no information about either unit or occupation. This gave a total of 3,036 selected records (2,532 involving Regular Infantry, 432 Reserve Infantry and 80 ADG). A further 800 records related to members of Infantry and ADG combat arms trades serving in a wide range of units other than those designated in Table 3. After consultation with Defence informants, it was decided to limit the scope to the designated units and hence to exclude these cases, on the grounds that, regardless of trade, incidents occurring outside these designated units would not have been related to the performance of CATTs. Conversely, it was decided to retain the 52 cases involving non-Infantry ranks, who were assumed to be non-Infantry personnel attached to Infantry units. Among these, there were a number of inconsistencies between an Infantry occupation (such as Rifleman) and a non-Infantry rank (such as Sapper).



- 5.2.5 It is noted that Regular Infantry units, with a population in the order of 3,272 (see Table 25) constitute a little over one eighth of the Army population of around 24,000 (Reference Document I). The 2,532 incident records associated with Regular Infantry units represent a little over one tenth of the 24,304 incident reports involving members of the Army¹.
- 5.2.6 In order to focus on work-related injuries, the dataset was further filtered using the "activity group" field, which distinguishes between three categories: work-related activities, sport and fitness training, and other activities. Most of the excluded cases were related to sport and fitness training. In the substantial number of records where the activity group was not reported, the reported site of the incident was used, in conjunction with the duty status of the person, to select incidents which were likely to be work-related.^{2,3} Thirty one records which included no information about either activity group or site were also omitted. The number of incidents judged to be work-related was 2,030 (1,978 Infantry and 52 ADG). Of the 31 omitted records, 20 would be expected to be Infantry, representing an undercount of 1%, or 6% when compounded with the previous undercount.
- 5.2.7 Finally, the set of incidents indicating injuries associated with the physical performance of CATTs was identified. This was done in consultation with ADF informants, using occupation as the primary indicator, supplemented primarily by site of incident and the detailed activity field. In the absence of unambiguous guidance from the activity descriptors, various ad hoc rules were developed. For example, walking, running, and driving incidents were excluded unless they occurred in field training or bushland context. Marching incidents were generally included, for all incident sites other than a parade ground. All incidents which occurred on a parade ground or a sports ground, or in a gymnasium, were excluded. All 121 parachuting incidents were excluded, since this activity is outside the scope of the DPESP. Finally, exclusions were made on the basis of gender (females excluded), nature of employment (cadets and Defence civilian employees being excluded), rank (non-Infantry ranks being excluded), and mechanism, agency, nature and bodily location of injury. Grounds for exclusion among the characteristics of the incident included exposure to sound and chemical substances, biological agencies such as bites, poisons, burns, exposure and diseases, and disorders unrelated to physical injury. At the conclusion of this process, the number of incidents judged to be related to the performance of CATTs was 880 (852 Infantry and 28 ADG).
- 5.2.8 It should be noted that this final data set includes 501 cases with known combat arms trades occupations and 379 cases with unknown occupations. These 379 cases presumably include some cases which are not related to the performance of CATTs. The number of these is estimated as follows. Of all cases where the occupation was known, only 11% of those provisionally included on the basis of site and activity were subsequently excluded on occupational grounds. It is therefore estimated that of the 379 cases where occupation was not known but which were included on the basis of site and activity, only around 11% (i.e. about 42 cases) should be excluded. These unidentifiable cases represent only a 5% overcount in the 880 selected cases. In aggregate terms, this overcount compensates to some degree for the undercounts discussed in paragraphs 5.2.5 and 5.2.6.

¹ It might be expected that around one tenth of the 1,216 records with no unit identification would also be Infantry-related. However these 120 extra cases, representing a 5% undercount, would make little difference to the relativities.

² This was done in consultation with ADF informants.

³ OHSCB staff advised that the coding of the "site of incident" field from Question 6 of the AC563 form is the subject of a complex protocol, the rules of which have changed over time. The result is an extensive standard list of ADF sites intermixed with a wide range of free text responses, generally providing more specific descriptive information than that in the standard drop-down list.



Analysis

5.2.9 The datasets listed in Table 3 encompass reported injury incidents in Infantry and ADG units during the period 1/1/98 to 28/11/03. Datasets 3, 4 and 5 form a hierarchical sequence; dataset 4 is a subset of dataset 3, and dataset 5 is a subset of dataset 4. For purposes of analysis and reporting, these were reconstituted as three mutually exclusive types of incident:

- Incidents related to the performance of CATTs (dataset 5)
- Other work-related incidents (dataset 4 excluding dataset 5)
- Non work-related incidents (dataset 3 excluding dataset 4)

Dataset 3, all injury incidents, is the combination of these three subsets.

5.2.10 Injuries related to the performance of CATTs (dataset 5) are the primary focus of this report. However as a precursor to a detailed analysis of these incidents, a comparative analysis of all three subsets was undertaken, to place the CATT-related injuries in a broader comparative context. Results of both sets of analyses are presented and discussed in section 5.3.

5.2.11 The following points should be borne in mind when interpreting the results of these analyses.

- a. The 2,956 incidents identified with Infantry units was around one eighth of the total of 24,304 incidents identified with Army units. It is likely that a similar proportion of the 1,216 incidents which could not be identified with a unit (around 150 incidents) would have occurred in Infantry units. Thus the identified incidents probably represent a 5% undercount.
- b. The “work-related” category in the activity group field is very broad, including many vehicle accidents including journey to work, and apparently also incidents related to individual unsupervised physical activity. It seems to have been very liberally interpreted in some cases, and includes some injuries sustained at home, at entertainment venues (understood to include Officers’ Messes), or when off duty. Where such cases were clearly identified they were excluded.
- c. Many non-Infantry trades are represented in both Regular Infantry units and in Reserve units, albeit in relatively small numbers. This makes it difficult to draw a precise boundary around dataset 5: “Infantry and ADG combat trade related incidents”.

5.2.12 Stratification by age and gender is standard practice in epidemiological analysis. In the context of Infantry and ADG, there are too few females to warrant gender breakdowns. Breakdowns by age and length of service were investigated, and are discussed but not tabulated.

5.2.13 Because the risk of disease is often age and gender dependent, it is also standard practice in health epidemiology to perform age (and gender) standardisation when comparing the disease profiles of populations with different age and gender structures. This has not been done in the present report, which for the most part is concerned with characterizing the injury experience of a single relatively homogeneous population – Infantry and ADG combat arms trades personnel. However, when comparisons are made between sub-populations, such as Regulars versus Reserves, and particularly SOI trainees, then the confounding between the effects of different activity regimens and different age profiles makes it difficult to definitively attribute or apportion the causation of any observed differences in injury rates.

5.2.14 In order to establish length of service at the time of the incident, OHSCB has drawn data on employment commencement dates from PMKeyS and matched these to Defcare person data. While the person data match was described as good, some data (around 1900 or 10% of 20,000 matches) are invalid, because the commencement date is later than the incident date. These were excluded from the analysis. One possibility is that some people recorded as having a commencement date after the incident date were ADF members who have subsequently joined the public service resulting in a second commencement date.

Alternatively, errors exist in the original incident data. Different date formats can also cause problems when data are inherited from earlier “legacy” systems.

- 5.2.15 With regard to ultimate outcomes, the ADF Health Status Report (Reference Document D) reported extensively on the basis of working days lost (WDL) calculated by aggregating three Defcare fields: days in hospital, sick days and light duty days. Very little analysis in terms of WDL has been included in this report. This is, in part, because the focus of the PES study is more on causes than on outcomes. But it should also be noted that the quality of the WDL data is especially uncertain. Around 3% of all casualties reported days in hospital, and 10% of those are recorded as “0” hospital days. Around 20% reported sick leave days (5% of which are “0”). In all, 22.6% reported lost time of one sort or the other or both, and 10.5% reported 5 days or more lost time. Around 32% reported light duty days (2% of which are “0”). As discussed in paragraph 5.1.9, in cases where the lost time fields are blank it is not clear whether no time was lost or whether the information was unavailable or simply not provided when the form was filled in.

5.3 Results and Discussion

All Incidents

- 5.3.1 For each of the three subsets of incidents (CATT-related, work-related and non work-related) and for the combined set, profiles are tabulated for the more substantive and informative variables from the list in Table 3. Also included are three other derived variables: calendar year, financial year and unit type. Those fields which have a purely functional role - the date fields and most of the cost centre fields – together with those fields in which there is very little data, such as the days lost and compensation payment fields, are not tabulated.
- 5.3.2 These profiles, shown in Tables 4 to 21, fall into two groups: the organisational contexts of the incidents; and the characteristics of the incidents, the persons injured and the injury outcomes. In the first group (Tables 4 to 11), the percentages of each incident type within each organisational category (i.e. percentages of each row) are shown. In the second group (Tables 12 to 21), the percentages of each characteristic within each type of incident (i.e. percentages of each column) are shown. Most fields in the database are text-encoded, so that the order of categories in these tables is alphanumeric. With ordinal variables such as severity, this results in the categories being listed out of order. In a number of tables, a dash (-) category at the head of the list indicates that the field was blank in some data records. These cases have been retained to clearly indicate the amount of missing data. Calculated percentages include this category, so that they represent the percentage of all cases rather than the percentage of those cases for which the value of variable is known.

Table 4. Incident Counts: by Incident Type within Calendar Years

			Incident type			Total
			Performance of combat arms trades tasks	Other work-related	Not work-related	
Calendar year	1998	Count	199	202	301	702
		% within Calendar year	28.3%	28.8%	42.9%	100.0%
	1999	Count	137	177	150	464
		% within Calendar year	29.5%	38.1%	32.3%	100.0%
	2000	Count	130	151	80	361
		% within Calendar year	36.0%	41.8%	22.2%	100.0%
	2001	Count	118	226	144	488
		% within Calendar year	24.2%	46.3%	29.5%	100.0%
	2002	Count	183	249	149	581
		% within Calendar year	31.5%	42.9%	25.6%	100.0%
	2003	Count	113	145	182	440
		% within Calendar year	25.7%	33.0%	41.4%	100.0%
	Total	Count	880	1150	1006	3036
		% within Calendar year	29.0%	37.9%	33.1%	100.0%



Table 5. Incident Reports: by Incident Type within Financial Year

			Incident type			Total
			Performance of combat arms trades tasks	Other work-related	Not work-related	
Financial year	2002-2003	Count	179	187	186	552
		% within Financial year	32.4%	33.9%	33.7%	100.0%

Table 6. Incident Reports: by Incident Type within Employment Type

			Incident type			Total
			Performance of combat arms trades tasks	Other work-related	Not work-related	
Employment basis	-	Count	239	446	332	1017
		% within Employment basis	23.5%	43.9%	32.6%	100.0%
	Full-time	Count	514	622	591	1727
		% within Employment basis	29.8%	36.0%	34.2%	100.0%
	Part-time	Count	127	82	83	292
		% within Employment basis	43.5%	28.1%	28.4%	100.0%
Total	Count	880	1150	1006	3036	
	% within Employment basis	29.0%	37.9%	33.1%	100.0%	

Table 7. Incident Reports: by Incident Type within Work Status Type

			Incident type			Total
			Performance of combat arms trades tasks	Other work-related	Not work-related	
Work status	-	Count	150	178	178	506
		% within Work status	29.6%	35.2%	35.2%	100.0%
		Count	1	0	0	1
		% within Work status	100.0%	.0%	.0%	100.0%
	Casual	Count	3	2	3	8
		% within Work status	37.5%	25.0%	37.5%	100.0%
	Other	Count	6	5	4	15
		% within Work status	40.0%	33.3%	26.7%	100.0%
	Permanent	Count	705	956	808	2469
		% within Work status	28.6%	38.7%	32.7%	100.0%
	Temporary	Count	15	9	13	37
		% within Work status	40.5%	24.3%	35.1%	100.0%
Total	Count	880	1150	1006	3036	
	% within Work status	29.0%	37.9%	33.1%	100.0%	



Table 8. Incident Reports: by Incident Type within Nature of Employment

		Incident type			Total
		Performance of combat arms trades tasks	Other work-related	Not work-related	
Nature of employment	-	Count	0	0	3
		% within Nature of employment	.0%	.0%	100.0%
	Cadet	Count	0	3	1
		% within Nature of employment	.0%	75.0%	25.0%
	Defence civilian employee	Count	0	2	1
		% within Nature of employment	.0%	66.7%	33.3%
	Holder of an honorary ADF ra	Count	0	0	1
		% within Nature of employment	.0%	.0%	100.0%
Member of the Reserve Forces	Count	195	136	144	475
	% within Nature of employment	41.1%	28.6%	30.3%	100.0%
Permanent member of the ADF	Count	685	1009	856	2550
	% within Nature of employment	26.9%	39.6%	33.6%	100.0%
Total	Count	880	1150	1006	3036
	% within Nature of employment	29.0%	37.9%	33.1%	100.0%

Table 9. Incident Reports: by Incident Type within Service Arm

			Incident type			Total
			Performance of combat arms trades tasks	Other work-related	Not work-related	
Service arm	Army	Count	852	1126	978	2956
		% within Service arm	28.8%	38.1%	33.1%	100.0%
	RAAF	Count	28	24	28	80
		% within Service arm	35.0%	30.0%	35.0%	100.0%
Total	Count		880	1150	1006	3036
	% within Service arm		29.0%	37.9%	33.1%	100.0%

Table 10. Incident Reports: by Incident Type within Type of Unit

			Incident type			Total
			Performance of combat arms trades tasks	Other work-related	Not work-related	
Type of unit	Airfield Defence	Count	28	24	28	80
		% within Type of unit	35.0%	30.0%	35.0%	100.0%
	Regular Infantry	Count	380	739	597	1716
		% within Type of unit	22.1%	43.1%	34.8%	100.0%
	Reserve or Integrated	Count	435	372	368	1175
		% within Type of unit	37.0%	31.7%	31.3%	100.0%
	Infantry Training School	Count	37	15	13	65
		% within Type of unit	56.9%	23.1%	20.0%	100.0%
	Count		880	1150	1006	3036
	% within Type of unit		29.0%	37.9%	33.1%	100.0%



Table 11. Incident Reports: by Incident Type within Unit

			Incident type			Total
			Performance of combat arms trades tasks	Other work-related	Not work-related	
Unit -	Count		1	0	3	4
	% within Unit		25.0%	.0%	75.0%	100.0%
1 Airfield Defence Squadron	Count		5	4	8	17
	% within Unit		29.4%	23.5%	47.1%	100.0%
1 RAR	Count		110	168	182	460
	% within Unit		23.9%	36.5%	39.6%	100.0%
1/19 RNSWR	Count		8	4	12	24
	% within Unit		33.3%	16.7%	50.0%	100.0%
10/27 RSAR	Count		43	42	46	131
	% within Unit		32.8%	32.1%	35.1%	100.0%
11/28 RWAR	Count		40	24	25	89
	% within Unit		44.9%	27.0%	28.1%	100.0%
12/40 RTR	Count		17	19	16	52
	% within Unit		32.7%	36.5%	30.8%	100.0%
2 Airfield Defence Squadron	Count		16	12	14	42
	% within Unit		38.1%	28.6%	33.3%	100.0%
2 RAR	Count		97	230	147	474
	% within Unit		20.5%	48.5%	31.0%	100.0%
2/17 RNSWR	Count		43	31	25	99
	% within Unit		43.4%	31.3%	25.3%	100.0%
25/49 RQR	Count		50	63	55	168
	% within Unit		29.8%	37.5%	32.7%	100.0%
3 Airfield Defence Squadron	Count		7	8	6	21
	% within Unit		33.3%	38.1%	28.6%	100.0%
3 RAR	Count		42	173	61	276
	% within Unit		15.2%	62.7%	22.1%	100.0%
31 RQR	Count		8	12	9	29
	% within Unit		27.6%	41.4%	31.0%	100.0%
4/3 RNSWR	Count		6	4	7	17
	% within Unit		35.3%	23.5%	41.2%	100.0%
41 RNSWR	Count		77	47	45	169
	% within Unit		45.6%	27.8%	26.6%	100.0%
42 RQR	Count		14	33	17	64
	% within Unit		21.9%	51.6%	26.6%	100.0%
5/6 RVR	Count		30	23	27	80
	% within Unit		37.5%	28.8%	33.8%	100.0%
5/7 RAR	Count		57	67	90	214
	% within Unit		26.6%	31.3%	42.1%	100.0%
6 RAR	Count		70	98	106	274
	% within Unit		25.5%	35.8%	38.7%	100.0%
8/7 RVR	Count		29	28	41	98
	% within Unit		29.6%	28.6%	41.8%	100.0%
9 RQR	Count		65	42	43	150
	% within Unit		43.3%	28.0%	28.7%	100.0%
Army	Count		7	2	8	17
	% within Unit		41.2%	11.8%	47.1%	100.0%
Combat Forces	Count		1	1	0	2
	% within Unit		50.0%	50.0%	.0%	100.0%
Depot Coy	Count		3	1	4	8
	% within Unit		37.5%	12.5%	50.0%	100.0%
School of Infantry	Count		34	14	9	57
	% within Unit		59.6%	24.6%	15.8%	100.0%
Total	Count		880	1150	1006	3036
	% within Unit		29.0%	37.9%	33.1%	100.0%



Table 12. Incident Reports: by Gender within Incident Type

		Incident type			Total
		Performance of combat arms trades tasks	Other work-related	Not work-related	
Gender -	Count	6	5	6	17
	% within Incident type	.7%	.4%	.6%	.6%
	Female Count	0	67	31	98
	% within Incident type	.0%	5.8%	3.1%	3.2%
	Male Count	874	1078	969	2921
	% within Incident type	99.3%	93.7%	96.3%	96.2%
Total	Count	880	1150	1006	3036
	% within Incident type	100.0%	100.0%	100.0%	100.0%

Table 13. Incident Reports: by Occupation within Incident Type

		Incident type			Total
		Performance of combat arms trades tasks	Other work-related	Not work-related	
Occupation -	Count	380	518	555	1453
	% within Incident type	43.5%	45.4%	55.5%	48.2%
ABOR CADET (VARIOUS)	Count	0	0	1	1
	% within Incident type	.0%	.0%	.1%	.0%
ADG2	Count	0	0	1	1
	% within Incident type	.0%	.0%	.1%	.0%
ADGI	Count	3	9	5	17
	% within Incident type	.3%	.8%	.5%	.6%
AIRCROWMAN, OBSERVER	Count	0	21	6	27
	% within Incident type	.0%	1.8%	.6%	.9%
AIRFIELD DEFENCE GUARD /T	Count	5	4	1	10
	% within Incident type	.6%	.4%	.1%	.3%
ART ARMT	Count	0	0	1	1
	% within Incident type	.0%	.0%	.1%	.0%
ASSAULT PIONEER	Count	11	9	7	27
	% within Incident type	1.3%	.8%	.7%	.9%
ASST DENTAL	Count	0	1	0	1
	% within Incident type	.0%	.1%	.0%	.0%
ASST MOVEMENT	Count	0	2	0	2
	% within Incident type	.0%	.2%	.0%	.1%
BRICKLAYER	Count	0	0	1	1
	% within Incident type	.0%	.0%	.1%	.0%
BUTCHER	Count	0	1	0	1
	% within Incident type	.0%	.1%	.0%	.0%
CATERER, SUPERVISING STAFF	Count	0	9	2	11
	% within Incident type	.0%	.8%	.2%	.4%
CLERK ADMIN	Count	0	16	18	34
	% within Incident type	.0%	1.4%	1.8%	1.1%
CLERK LEVEL 1	Count	0	1	0	1
	% within Incident type	.0%	.1%	.0%	.0%



		Incident type			Total
		Performance of combat arms trades tasks	Other work-related	Not work-related	
CLERK LEVEL 2	Count	0	0	1	1
	% within Incident type	.0%	.0%	.1%	.0%
CLERK PAY	Count	0	10	5	15
	% within Incident type	.0%	.9%	.5%	.5%
CLERK TECHNICAL	Count	0	4	0	4
	% within Incident type	.0%	.4%	.0%	.1%
COOK	Count	0	11	5	16
	% within Incident type	.0%	1.0%	.5%	.5%
COOK 1	Count	0	1	2	3
	% within Incident type	.0%	.1%	.2%	.1%
COOK 2	Count	0	8	3	11
	% within Incident type	.0%	.7%	.3%	.4%
CREWMAN DRIVER/SIGNALLER	Count	0	1	0	1
	% within Incident type	.0%	.1%	.0%	.0%
DESPATCHER AIR	Count	0	2	0	2
	% within Incident type	.0%	.2%	.0%	.1%
DRIVER	Count	0	29	9	38
	% within Incident type	.0%	2.5%	.9%	1.3%
DRIVER1	Count	0	3	0	3
	% within Incident type	.0%	.3%	.0%	.1%
DRIVER2	Count	0	5	0	5
	% within Incident type	.0%	.4%	.0%	.2%
ELEC TDSMN (RAEME)	Count	0	1	0	1
	% within Incident type	.0%	.1%	.0%	.0%
ELEC TDSMN AAS YEAR 1	Count	0	1	0	1
	% within Incident type	.0%	.1%	.0%	.0%
ENGINEER	Count	0	3	0	3
	% within Incident type	.0%	.3%	.0%	.1%
FIELD ENGINEER 1	Count	0	0	1	1
	% within Incident type	.0%	.0%	.1%	.0%
FITTER ARMAMENT	Count	0	1	1	2
	% within Incident type	.0%	.1%	.1%	.1%
FITTER ARMAMENT 2	Count	0	9	2	11
	% within Incident type	.0%	.8%	.2%	.4%
GROUND DEFENCE OFFICER	Count	0	1	1	2
	% within Incident type	.0%	.1%	.1%	.1%
GUN NUMBER	Count	0	9	2	11
	% within Incident type	.0%	.8%	.2%	.4%
HANDLER AIRCRAFT 1	Count	0	0	2	2
	% within Incident type	.0%	.0%	.2%	.1%
INSPECTOR FOODSTUFFS	Count	0	0	1	1
	% within Incident type	.0%	.0%	.1%	.0%



		Incident type			Total
		Performance of combat arms trades tasks	Other work-related	Not work-related	
INSTRUCTOR	Count	0	4	0	4
	% within Incident type	.0%	.4%	.0%	.1%
INVESTIGATOR MILITARY POLICE	Count	0	2	3	5
	% within Incident type	.0%	.2%	.3%	.2%
MECHANIC RECOVERY	Count	0	2	2	4
	% within Incident type	.0%	.2%	.2%	.1%
MECHANIC VEHICLE	Count	0	15	6	21
	% within Incident type	.0%	1.3%	.6%	.7%
MECHANIC VEHICLE 2	Count	0	3	6	9
	% within Incident type	.0%	.3%	.6%	.3%
MEDICAL NURSING ASSISTANT	Count	0	1	0	1
	% within Incident type	.0%	.1%	.0%	.0%
MEDICAL/NURS ING ASSISTANT	Count	0	8	7	15
	% within Incident type	.0%	.7%	.7%	.5%
MORTARMAN	Count	0	16	4	20
	% within Incident type	.0%	1.4%	.4%	.7%
MUSICIAN 2	Count	0	2	0	2
	% within Incident type	.0%	.2%	.0%	.1%
MUSICIAN 3	Count	0	1	0	1
	% within Incident type	.0%	.1%	.0%	.0%
OP COMM SYS	Count	0	1	0	1
	% within Incident type	.0%	.1%	.0%	.0%
OP CP FIELD	Count	0	1	0	1
	% within Incident type	.0%	.1%	.0%	.0%
OP CP SRG	Count	0	29	22	51
	% within Incident type	.0%	2.5%	2.2%	1.7%
OP CP TR	Count	0	2	0	2
	% within Incident type	.0%	.2%	.0%	.1%
OP PLANT	Count	0	0	1	1
	% within Incident type	.0%	.0%	.1%	.0%
OP RADIO	Count	0	1	0	1
	% within Incident type	.0%	.1%	.0%	.0%
OP SPECIAL VEHICLES	Count	0	0	2	2
	% within Incident type	.0%	.0%	.2%	.1%
PATROLMAN RIFLEMAN	Count	7	3	8	18
	% within Incident type	.8%	.3%	.8%	.6%
PATROLMAN RIFLEMAN 1	Count	0	0	1	1
	% within Incident type	.0%	.0%	.1%	.0%
POLICEMAN MILITARY	Count	0	2	1	3
	% within Incident type	.0%	.2%	.1%	.1%
QMS	Count	0	18	10	28
	% within Incident type	.0%	1.6%	1.0%	.9%



		Incident type			Total
		Performance of combat arms trades tasks	Other work-related	Not work-related	
RECRUIT	Count	21	14	7	42
	% within Incident type	2.4%	1.2%	.7%	1.4%
RIFLEMAN	Count	327	204	191	722
	% within Incident type	37.4%	17.9%	19.1%	23.9%
RIFLEMAN 1	Count	46	27	25	98
	% within Incident type	5.3%	2.4%	2.5%	3.3%
RIFLEMAN 2	Count	59	50	52	161
	% within Incident type	6.8%	4.4%	5.2%	5.3%
RIGGER PARACHUTE	Count	0	1	0	1
	% within Incident type	.0%	.1%	.0%	.0%
RSM	Count	1	2	4	7
	% within Incident type	.1%	.2%	.4%	.2%
SIGNALLER	Count	8	6	4	18
	% within Incident type	.9%	.5%	.4%	.6%
SM	Count	5	10	3	18
	% within Incident type	.6%	.9%	.3%	.6%
STEWARD	Count	0	2	2	4
	% within Incident type	.0%	.2%	.2%	.1%
STEWARD 1	Count	0	1	0	1
	% within Incident type	.0%	.1%	.0%	.0%
STOREMAN TECHNICAL ORDNANCE	Count	0	8	4	12
	% within Incident type	.0%	.7%	.4%	.4%
SUPERVISOR ARMY MESSES	Count	0	1	0	1
	% within Incident type	.0%	.1%	.0%	.0%
SUPERVISOR TECH TELECOM	Count	0	2	0	2
	% within Incident type	.0%	.2%	.0%	.1%
SUPERVISOR TRANSPORT	Count	0	10	1	11
	% within Incident type	.0%	.9%	.1%	.4%
SUPERVISOR WAREHOUSE	Count	0	1	0	1
	% within Incident type	.0%	.1%	.0%	.0%
TECHNICIAN AIRCRAFT	Count	0	0	1	1
	% within Incident type	.0%	.0%	.1%	.0%
TECHNICIAN ELECTRICAL RADAR	Count	0	1	0	1
	% within Incident type	.0%	.1%	.0%	.0%
TRAINER - DEFENCE FORCES	Count	1	0	0	1
	% within Incident type	.1%	.0%	.0%	.0%
Total	Count	874	1141	1000	3015
	% within Incident type	100.0%	100.0%	100.0%	100.0%



Table 14. Incident Reports: by Rank within Incident Type

		Incident type			Total
		Performance of combat arms trades tasks	Other work-related	Not work-related	
Rank -	Count	43	34	45	122
	% within Incident type	4.9%	3.0%	4.5%	4.0%
2nd Lieutenant	Count	0	2	1	3
	% within Incident type	.0%	.2%	.1%	.1%
Aircraftman	Count	10	9	8	27
	% within Incident type	1.1%	.8%	.8%	.9%
Aircraftman Recruit	Count	1	2	0	3
	% within Incident type	.1%	.2%	.0%	.1%
Aircraftwoman	Count	0	1	0	1
	% within Incident type	.0%	.1%	.0%	.0%
Captain	Count	14	37	26	77
	% within Incident type	1.6%	3.2%	2.6%	2.5%
Colonel	Count	1	0	0	1
	% within Incident type	.1%	.0%	.0%	.0%
Corporal	Count	89	148	103	340
	% within Incident type	10.1%	12.9%	10.2%	11.2%
Craftsman	Count	0	37	20	57
	% within Incident type	.0%	3.2%	2.0%	1.9%
Flying Officer	Count	0	1	2	3
	% within Incident type	.0%	.1%	.2%	.1%
Gunner	Count	0	10	5	15
	% within Incident type	.0%	.9%	.5%	.5%
Lance Bombardier	Count	0	5	1	6
	% within Incident type	.0%	.4%	.1%	.2%
Lance Corporal	Count	77	66	87	230
	% within Incident type	8.8%	5.7%	8.6%	7.6%
Leading Aircraftman	Count	13	6	12	31
	% within Incident type	1.5%	.5%	1.2%	1.0%
Lieutenant	Count	17	42	35	94
	% within Incident type	1.9%	3.7%	3.5%	3.1%
Lieutenant Colonel	Count	1	1	4	6
	% within Incident type	.1%	.1%	.4%	.2%
Major	Count	5	16	12	33
	% within Incident type	.6%	1.4%	1.2%	1.1%
Musician	Count	0	3	2	5
	% within Incident type	.0%	.3%	.2%	.2%
Officer Cadet	Count	1	6	9	16
	% within Incident type	.1%	.5%	.9%	.5%
Private	Count	551	533	509	1593
	% within Incident type	62.6%	46.3%	50.6%	52.5%
Private Proficient	Count	3	3	3	9
	% within Incident type	.3%	.3%	.3%	.3%
Private Recruit	Count	9	5	5	19
	% within Incident type	1.0%	.4%	.5%	.6%
Private Trainee	Count	0	0	2	2
	% within Incident type	.0%	.0%	.2%	.1%
Sapper	Count	0	9	6	15
	% within Incident type	.0%	.8%	.6%	.5%
Sergeant	Count	32	82	70	184
	% within Incident type	3.6%	7.1%	7.0%	6.1%
Signalman	Count	0	6	2	8
	% within Incident type	.0%	.5%	.2%	.3%
Staff Cadet	Count	1	0	0	1
	% within Incident type	.1%	.0%	.0%	.0%
Staff Sergeant	Count	2	17	4	23
	% within Incident type	.2%	1.5%	.4%	.8%
Trooper	Count	0	12	4	16
	% within Incident type	.0%	1.0%	.4%	.5%
Warrant Officer Class 1	Count	0	7	5	12
	% within Incident type	.0%	.6%	.5%	.4%
Warrant Officer Class 2	Count	10	50	24	84
	% within Incident type	1.1%	4.3%	2.4%	2.8%
Total	Count	880	1150	1006	3036
	% within Incident type	100.0%	100.0%	100.0%	100.0%



Table 15. Incident Reports: by Training Type within Incident Type

			Incident type			Total
			Performance of combat arms trades tasks	Other work-related	Not work-related	
Training type	-	Count	347	537	570	1454
		% within Incident type	39.4%	46.7%	56.7%	47.9%
	Basic or trade training	Count	140	98	54	292
		% within Incident type	15.9%	8.5%	5.4%	9.6%
	Formal, on-the-job	Count	104	90	56	250
		% within Incident type	11.8%	7.8%	5.6%	8.2%
	Induction	Count	21	16	17	54
		% within Incident type	2.4%	1.4%	1.7%	1.8%
	Informal, on-the-job	Count	15	18	29	62
		% within Incident type	1.7%	1.6%	2.9%	2.0%
	Other	Count	76	109	182	367
		% within Incident type	8.6%	9.5%	18.1%	12.1%
	Task specific	Count	177	282	98	557
		% within Incident type	20.1%	24.5%	9.7%	18.3%
Total	Count	880	1150	1006	3036	
	% within Incident type	100.0%	100.0%	100.0%	100.0%	

Table 16. Incident Reports: by Activity within Incident Type

			Incident type			Total
			Performance of combat arms trades tasks	Other work-related	Not work-related	
Activity	-	Count	107	45	104	256
		% within Incident type	12.2%	3.9%	10.4%	8.5%
Abseiling		Count	0	0	1	1
		% within Incident type	.0%	.0%	.1%	.0%
Aircraft maintenance		Count	0	2	0	2
		% within Incident type	.0%	.2%	.0%	.1%
Athletics		Count	0	0	1	1
		% within Incident type	.0%	.0%	.1%	.0%
Australian Rules		Count	0	0	24	24
		% within Incident type	.0%	.0%	2.4%	.8%
Baseball/Softball		Count	0	0	5	5
		% within Incident type	.0%	.0%	.5%	.2%
Basketball/netball		Count	0	0	28	28
		% within Incident type	.0%	.0%	2.8%	.9%
Boating		Count	0	0	4	4
		% within Incident type	.0%	.0%	.4%	.1%
Bowling, tenpin		Count	0	0	1	1
		% within Incident type	.0%	.0%	.1%	.0%
Boxing		Count	0	0	6	6
		% within Incident type	.0%	.0%	.6%	.2%
Canyoning		Count	0	0	1	1
		% within Incident type	.0%	.0%	.1%	.0%
Carrying another person (eg. Fireman's lift)		Count	9	7	0	16
		% within Incident type	1.0%	.6%	.0%	.5%
Classroom lectures		Count	0	3	0	3
		% within Incident type	.0%	.3%	.0%	.1%



		Incident type			Total
		Performance of combat arms trades tasks	Other work-related	Not work-related	
Cleaning	Count	1	18	1	20
	% within Incident type	.1%	1.6%	.1%	.7%
Clerical	Count	0	12	0	12
	% within Incident type	.0%	1.1%	.0%	.4%
Climbing	Count	0	0	51	51
	% within Incident type	.0%	.0%	5.1%	1.7%
Construction	Count	4	4	0	8
	% within Incident type	.5%	.4%	.0%	.3%
Cooking	Count	0	10	2	12
	% within Incident type	.0%	.9%	.2%	.4%
Crawling	Count	1	0	0	1
	% within Incident type	.1%	.0%	.0%	.0%
Cricket	Count	0	0	9	9
	% within Incident type	.0%	.0%	.9%	.3%
Cutting	Count	2	9	0	11
	% within Incident type	.2%	.8%	.0%	.4%
Cycling	Count	0	0	20	20
	% within Incident type	.0%	.0%	2.0%	.7%
Digging	Count	14	4	0	18
	% within Incident type	1.6%	.4%	.0%	.6%
Dog handling	Count	0	1	0	1
	% within Incident type	.0%	.1%	.0%	.0%
Drilling	Count	232	100	1	333
	% within Incident type	26.5%	8.8%	.1%	11.0%
Drinking Alcohol	Count	0	0	6	6
	% within Incident type	.0%	.0%	.6%	.2%
Driving	Count	10	79	12	101
	% within Incident type	1.1%	6.9%	1.2%	3.3%
Equipment maintenance	Count	11	24	2	37
	% within Incident type	1.3%	2.1%	.2%	1.2%
Erecting	Count	10	3	0	13
	% within Incident type	1.1%	.3%	.0%	.4%
Explosive ordnance device handling	Count	4	1	0	5
	% within Incident type	.5%	.1%	.0%	.2%
Fighting	Count	0	0	24	24
	% within Incident type	.0%	.0%	2.4%	.8%
Firefighting	Count	0	34	1	35
	% within Incident type	.0%	3.0%	.1%	1.2%
Flying	Count	0	1	0	1
	% within Incident type	.0%	.1%	.0%	.0%
Football, Soccer	Count	0	0	86	86
	% within Incident type	.0%	.0%	8.6%	2.9%
Football, Touch	Count	0	0	63	63
	% within Incident type	.0%	.0%	6.3%	2.1%
Guard duty	Count	102	146	0	248
	% within Incident type	11.7%	12.8%	.0%	8.2%



		Incident type			Total
		Performance of combat arms trades tasks	Other work-related	Not work-related	
Hockey	Count	0	0	1	1
	% within Incident type	.0%	.0%	.1%	.0%
Immersion training	Count	5	3	0	8
	% within Incident type	.6%	.3%	.0%	.3%
Loading weapons	Count	2	2	0	4
	% within Incident type	.2%	.2%	.0%	.1%
Marching	Count	99	27	1	127
	% within Incident type	11.3%	2.4%	.1%	4.2%
Mast/Tower climbing	Count	7	1	0	8
	% within Incident type	.8%	.1%	.0%	.3%
Motor cycle riding	Count	0	26	9	35
	% within Incident type	.0%	2.3%	.9%	1.2%
Motor cycling riding	Count	0	0	6	6
	% within Incident type	.0%	.0%	.6%	.2%
Painting	Count	0	1	0	1
	% within Incident type	.0%	.1%	.0%	.0%
Parachuting	Count	0	121	0	121
	% within Incident type	.0%	10.6%	.0%	4.0%
Physical Training (PT)	Count	0	0	300	300
	% within Incident type	.0%	.0%	30.0%	10.0%
Rugby, union/league	Count	0	0	59	59
	% within Incident type	.0%	.0%	5.9%	2.0%
Running/jogging	Count	82	104	25	211
	% within Incident type	9.4%	9.1%	2.5%	7.0%
Shooting	Count	7	20	1	28
	% within Incident type	.8%	1.8%	.1%	.9%
Skating	Count	0	0	2	2
	% within Incident type	.0%	.0%	.2%	.1%
Skylarking	Count	0	0	3	3
	% within Incident type	.0%	.0%	.3%	.1%
Sleeping	Count	0	49	16	65
	% within Incident type	.0%	4.3%	1.6%	2.2%
Stores handling	Count	37	69	1	107
	% within Incident type	4.2%	6.0%	.1%	3.5%
Surfing	Count	0	0	1	1
	% within Incident type	.0%	.0%	.1%	.0%
Swimming	Count	0	0	15	15
	% within Incident type	.0%	.0%	1.5%	.5%
Table Tennis	Count	0	0	1	1
	% within Incident type	.0%	.0%	.1%	.0%
Vehicle maintenance	Count	6	28	2	36
	% within Incident type	.7%	2.5%	.2%	1.2%
Volleyball	Count	0	0	31	31
	% within Incident type	.0%	.0%	3.1%	1.0%
Walking	Count	112	169	54	335
	% within Incident type	12.8%	14.8%	5.4%	11.1%
Water polo	Count	0	0	3	3
	% within Incident type	.0%	.0%	.3%	.0%



		Incident type			Total
		Performance of combat arms trades tasks	Other work-related	Not work-related	
	% within Incident type	.0%	.0%	.3%	.1%
Weapons familiarisation	Count	10	14	0	24
	% within Incident type	1.1%	1.2%	.0%	.8%
Weight Training	Count	0	0	16	16
	% within Incident type	.0%	.0%	1.6%	.5%
Welding	Count	0	4	0	4
	% within Incident type	.0%	.4%	.0%	.1%
Total	Count	874	1141	1000	3015
	% within Incident type	100.0%	100.0%	100.0%	100.0%

Table 17. Incident Reports: by Mechanism Group within Incident Type

		Incident type			Total
		Performance of combat arms trades tasks	Other work-related	Not work-related	
Mechanism group -	Count	7	7	19	33
	% within Incident type	.8%	.6%	1.9%	1.1%
Being hit by moving objects	Count	81	120	223	424
	% within Incident type	9.2%	10.4%	22.2%	14.0%
Biological factors	Count	2	34	11	47
	% within Incident type	.2%	3.0%	1.1%	1.5%
Body stressing	Count	260	176	212	648
	% within Incident type	29.5%	15.3%	21.1%	21.3%
Chemicals and other substances	Count	0	120	5	125
	% within Incident type	.0%	10.4%	.5%	4.1%
Falls, trips and slips of a person	Count	345	286	279	910
	% within Incident type	39.2%	24.9%	27.7%	30.0%
Heat, radiation and electricity	Count	6	35	19	60
	% within Incident type	.7%	3.0%	1.9%	2.0%
Hitting objects with a part of the body	Count	78	75	84	237
	% within Incident type	8.9%	6.5%	8.3%	7.8%
Mental stress	Count	1	6	3	10
	% within Incident type	.1%	.5%	.3%	.3%
Other and unspecified mechanisms of injury	Count	90	200	148	438
	% within Incident type	10.2%	17.4%	14.7%	14.4%
Sound and pressure	Count	10	91	3	104
	% within Incident type	1.1%	7.9%	.3%	3.4%
Total	Count	880	1150	1006	3036
	% within Incident type	100.0%	100.0%	100.0%	100.0%



Table 18. Incident Reports: by Agency Group within Incident Type

		Incident type			Total	
		Performance of combat arms trades tasks	Other work-related	Not work-related		
Agency group	-	Count	6	5	19	30
		% within Incident type	.7%	.4%	1.9%	1.0%
	Animal, human and biological agencies	Count	141	210	370	721
		% within Incident type	16.0%	18.3%	36.8%	23.7%
	Chemicals and chemical products	Count	1	89	1	91
		% within Incident type	.1%	7.7%	.1%	3.0%
	Environmental agencies	Count	369	286	235	890
		% within Incident type	41.9%	24.9%	23.4%	29.3%
	Machinery and (mainly) fixed plant	Count	0	8	3	11
		% within Incident type	.0%	.7%	.3%	.4%
	Materials and substances	Count	85	71	33	189
		% within Incident type	9.7%	6.2%	3.3%	6.2%
	Mobile plant and transport	Count	41	202	59	302
		% within Incident type	4.7%	17.6%	5.9%	9.9%
	Non-powered handtools, appliances and	Count	112	131	149	392
		% within Incident type	12.7%	11.4%	14.8%	12.9%
	Other and unspecified agencies	Count	62	87	120	269
		% within Incident type	7.0%	7.6%	11.9%	8.9%
	Powered equipment, tools and appliances	Count	63	61	17	141
		% within Incident type	7.2%	5.3%	1.7%	4.6%
Total	Count	880	1150	1006	3036	
	% within Incident type	100.0%	100.0%	100.0%	100.0%	

Table 19. Incident Reports: by Bodily Location Group¹ within Incident Type

			Incident type			Total
			Performance of combat arms trades tasks	Other work-related	Not work-related	
Bodily location group	-	Count	29	21	52	102
		% within Incident type	3.3%	1.8%	5.2%	3.4%
	Head	Count	73	192	101	366
		% within Incident type	8.3%	16.7%	10.0%	12.1%
	Lower limbs	Count	440	322	395	1157
		% within Incident type	50.0%	28.0%	39.3%	38.1%
	Multiple locations	Count	31	77	45	153
		% within Incident type	3.5%	6.7%	4.5%	5.0%
	Neck	Count	9	15	21	45
		% within Incident type	1.0%	1.3%	2.1%	1.5%
	Non-physical locations	Count	0	6	0	6
		% within Incident type	.0%	.5%	.0%	.2%
	Systemic locations	Count	0	163	18	181
		% within Incident type	.0%	14.2%	1.8%	6.0%
	Trunk	Count	162	167	129	458
		% within Incident type	18.4%	14.5%	12.8%	15.1%
	Unspecified locations	Count	10	43	40	93
		% within Incident type	1.1%	3.7%	4.0%	3.1%
	Upper limbs	Count	126	144	205	475
		% within Incident type	14.3%	12.5%	20.4%	15.6%
Total		Count	880	1150	1006	3036
		% within Incident type	100.0%	100.0%	100.0%	100.0%

¹ "Non-physical locations" refers to mental disorders



Table 20. Incident Reports: by Injury Nature Group within Incident Type

			Incident type			Total
			Performance of combat arms trades tasks	Other work-related	Not work-related	
Injury nature group	-	Count	28	14	48	90
		% within Incident type	3.2%	1.2%	4.8%	3.0%
	Diseases of the circulatory system	Count	0	12	1	13
		% within Incident type	.0%	1.0%	.1%	.4%
	Diseases of the digestive system	Count	2	10	3	15
		% within Incident type	.2%	.9%	.3%	.5%
	Diseases of the musculoskeletal system	Count	157	149	170	476
		% within Incident type	17.8%	13.0%	16.9%	15.7%
	Diseases of the nervous system and sense	Count	0	96	4	100
		% within Incident type	.0%	8.3%	.4%	3.3%
	Diseases of the respiratory system	Count	0	18	4	22
		% within Incident type	.0%	1.6%	.4%	.7%
	Diseases of the skin and subcutaneous tissue	Count	0	5	2	7
		% within Incident type	.0%	.4%	.2%	.2%
	Infectious and parasitic diseases	Count	0	24	7	31
		% within Incident type	.0%	2.1%	.7%	1.0%
Injury and poisoning	Count	692	780	747	2219	
	% within Incident type	78.6%	67.8%	74.3%	73.1%	
Mental disorders	Count	0	7	1	8	
	% within Incident type	.0%	.6%	.1%	.3%	
Neoplasms (cancers and benign tumours)	Count	0	2	1	3	
	% within Incident type	.0%	.2%	.1%	.1%	
Other diseases	Count	1	33	18	52	
	% within Incident type	.1%	2.9%	1.8%	1.7%	
Total	Count	880	1150	1006	3036	
	% within Incident type	100.0%	100.0%	100.0%	100.0%	

Table 21. Incident Reports: by Severity of Outcome¹ within Incident Type

			Incident type			Total
			Performance of combat arms trades tasks	Other work-related	Not work-related	
Severity of outcome	-	Count	0	0	3	3
		% within Incident type	.0%	.0%	.3%	.1%
	Death	Count	1	6	10	17
		% within Incident type	.1%	.5%	1.0%	.6%
	Serious personal injury	Count	142	275	237	654
		% within Incident type	16.2%	24.1%	23.7%	21.7%
	Incapacity	Count	85	86	110	281
		% within Incident type	9.7%	7.5%	11.0%	9.3%
	Minor injuries	Count	646	774	640	2060
		% within Incident type	73.9%	67.8%	64.0%	68.3%
Total		Count	874	1141	1000	3015
		% within Incident type	100.0%	100.0%	100.0%	100.0%

¹ Serious personal injury: *Emergency treatment provided by a medical practitioner; or, treated at a hospital; or, admitted to hospital.* Incapacity: *Employee unable to perform work for 5 or more consecutive days or shifts.* Problems with the coding of severity categories has been discussed in paragraph 5.1.7

5.3.3 The number of incident reports per calendar year (Table 4) ranged from 360 in 2000 to 700 in 1998, with no trend being evident. About a third of reported incidents fell into each category (CATT-related, other work-related, not work related), though there was some fluctuation from year to year in the proportions. It should be noted that the data for 2003 were not quite complete; the date of the latest reported incident was 28/11/03. Data for the 2002-2003 financial year were also identified (Table 5) for the purpose of calculating



incidence rates and comparison with data from other sources (see Section 5.4 and Section 8). One notable feature of the dataset was a complete absence of reports from the School of Infantry (and from the other CATC training schools) prior to mid-2002. OHSCB staff advise that this could be due either to a lack of reporting or to changes in either organisational structure or coding structure.

- 5.3.4 Table 6 shows that the division between work-related and non-work-related injuries was similar for full-time and part-time employees. However, for the work-related injuries, a higher proportion of CATT-related injuries occurred among part-time employees. Table 7 shows a similar differential between employees classified as permanent and temporary. Table 8 again shows a similar differential between members of the Reserve Forces and permanent members of the ADF. Crosstabulation of these three items confirmed that all of the casualties classified as temporary and almost all of those classified as part-time were members of the Reserve Forces.
- 5.3.5 Table 9 shows that overall, the proportions of the three types of incident were similar for Infantry and ADG. However Table 10 shows a lower proportion of CATT-related injuries in Regular Infantry units and a higher proportion at the Infantry Training School. There was also a lower proportion of non-work-related injuries at the Infantry Training School than in the Regular or Reserve units. Table 11 shows that within the Regular units (Infantry and ADG), the reporting patterns were reasonably similar from unit to unit, but there was more variability among Reserve units. This is at least in part a consequence of the smaller sample sizes in the Reserve Units. It should be noted that Depot Company is a unit at the Infantry Training School.
- 5.3.6 In some respects, the breakdowns in Tables 12 to 20 reflect the way in which these characteristics were used to classify incidents as CATT-related (see Section 5.2). So, for example, Table 12 reflects the fact that no females undertake CATTs. Table 13 shows incidents involving riflemen were more likely to be CATT-related than either of the other categories. Table 14 shows that work-related incidents almost invariably involved Privates and NCOs. In the case of Privates and Lance Corporals the proportions are even higher for CATT-related incidents.
- 5.3.7 Table 15 relates to the training received by the injured person for the task being undertaken at the time the incident occurred. This information was not recorded in a high proportion of cases. For non-work related injuries, this would presumably not apply in many cases, which may explain the high proportion in the "other" category. The profiles for the two work-related categories are broadly similar, with the highest proportions being in the categories of "task specific", "basic or trade training" and "formal on-the-job".
- 5.3.8 The detailed activity breakdown (Table 16) demonstrates the limitation of the Defcare classification scheme for distinguishing between CATT activities. Over a quarter of the incidents were classified as drilling, with five other categories (guard duty, marching, running/jogging, walking and stores handling) accounting for a further half. Defence informants advise that "guard duty" is a generic category for many different specific duties both on-base and during training exercises. These six categories were also strongly represented in the other work-related incidents, along with parachuting (which was explicitly excluded from CATT activities for the purposes of this analysis – see paragraph 5.2.7), categories relating to vehicles and equipment, and sleeping (a mixture of onsets of various disease/disorders and various mishaps). Most non-work-related incidents were associated with physical training or specific sports.
- 5.3.9 The predominant broad mechanism categories (Table 17) in CATT-related incidents were "body stressing" and "falls, trips and slips". There was a broader spread of classifications among other work-related incidents, including some such as chemicals and sound which were used as grounds for exclusion from the CATT-related category. The situation with agency of injury (Table 18) was similar. The predominant broad agency categories in CATT-related incidents were "environmental" and "animal, human and biological". Again there was a broader spread of classifications among other work-related incidents, including some such as chemicals and mobile plant and transport which were used in some instances as grounds for exclusion from the CATT-related category.



- 5.3.10 With regard to bodily location (Table 19), four categories (head, lower limbs, trunk and upper limbs) were strongly represented in all three profiles. In the case of CATT-related incidents, lower limbs and trunk were more predominant, representing one half and one fifth of all injuries respectively. The broad nature of injury classification (Table 20) was not at all informative, with the overwhelming majority of incidents in all three categories being classified as “injury and poisoning” or “diseases of the musculo-skeletal system”.
- 5.3.11 The profiles of injury severity (Table 21) were very similar for other work-related and non-work-related incidents. For CATT-related tasks, there was a somewhat higher proportion of minor injuries and a correspondingly lower proportion of serious personal injuries.
- 5.3.12 Tables similar to Tables 17 to 20 have been produced using more detailed breakdowns of mechanism, agency, bodily location and nature of injury. They have not been included in this report, being extensive and difficult to present accessibly and meaningfully in printed form. Since the numbers of cells in these tables is large, they are sparsely populated, and require careful interpretation. All tables have been provided to the Defence PES Project Office in electronic form as SPSS output files.
- 5.3.13 Analyses based on age and length of service were also carried out. Age and length of service were highly correlated ($r=0.82$) as a result of the fact that the great majority of members are recruited at around the same age (between 18 and 22 years in three quarters of cases).
- 5.3.14 Both age and length of service were aggregated into 5-year cohorts for analysis (with the exception of the youngest age cohort – 17 to 19 years). Each of these was crosstabulated against characteristics of the injured person, the incident and the injury. These tables were extensive in both dimensions, and have been provided to the Defence PES Project Office in electronic form as SPSS output files. Many of the cell counts were very small. Nevertheless some noticeable differences were observed in the age profiles of some of the more predominant categories. The expected relationships between age, length of service and rank were apparent. With regard to characteristics of the incident, there were no obvious age differences with regard to mechanism group or agency group. However there were age differences, mostly between the youngest age cohort (17-19 years) and all other cohorts, with respect to activity, bodily location of injury and severity of injury. The youngest soldiers/airmen were more often injured when marching or drilling, and less often whilst on guard duty, than those in the older cohorts. They were also more likely to suffer lower limb injuries. The severity of injuries to the youngest cohort were more likely to be minor and less likely to be serious, than those suffered by older cohorts. These results confirm differences that might be expected to stem from the different training and duty regimens of younger members, and from an increasing susceptibility to more serious injury among older members.
- 5.3.15 Generally, parallel results were observed with regard to length of service. The exception was severity, where there was no difference in the injury severity profiles of those with different lengths of service. This may indicate that age rather than experience is the dominant factor, with the injury profile of older recruits being more similar to that of longer serving soldiers/airmen of similar age than to that of younger recruits.

Incidents Relating to CATTs

- 5.3.16 The dataset of central interest to the PES study is the 874 incidents related to the performance of CATTs. Tables 22 to 27 give further breakdowns for this set of cases by type of unit. The variables tabulated are activity (of primary interest for the PES study), and the coarse-grained profiles of mechanism, agency, bodily location, nature and severity of injury.
- 5.3.17 Activity has also been crosstabulated with a number of the other key characteristics including mechanism, agency, bodily location and nature of injury. These tables have not been included here, for the reasons outlined in paragraph 5.3.12. Any clearly observable patterns in these tables generally confirm the obvious (e.g. stepping in holes is likely to be associated with injuries to lower limbs), and as has been discussed, the information about activity is of



limited value since the activity categories are not linked to particular CATTs. All tables have been provided to the Defence PES Project Office in electronic form as SPSS output files.

5.3.18 Tables 22 to 27 show that there were substantial differences in the profiles of incidents reported by the different types of unit. It should be noted however, that the numbers of incidents for ADG and Infantry Training School were small, so that in these cases the proportions can be expected to be more volatile and should be interpreted with caution.

Table 22. CATT-related Incident Reports: by Activity within Type of Unit

		Type of unit				Total
		Airfield Defence	Regular Infantry	Reserve or Integrated	Infantry Training School	
Activity -	Count	1	35	69	2	107
	% within Type of unit	3.6%	9.2%	15.9%	5.4%	12.2%
Carrying another person (eg. Fireman's lift)	Count	1	4	4	0	9
	% within Type of unit	3.6%	1.1%	.9%	.0%	1.0%
Cleaning	Count	0	1	0	0	1
	% within Type of unit	.0%	.3%	.0%	.0%	.1%
Construction	Count	0	3	1	0	4
	% within Type of unit	.0%	.8%	.2%	.0%	.5%
Crawling	Count	0	0	1	0	1
	% within Type of unit	.0%	.0%	.2%	.0%	.1%
Cutting	Count	0	1	1	0	2
	% within Type of unit	.0%	.3%	.2%	.0%	.2%
Digging	Count	0	1	11	2	14
	% within Type of unit	.0%	.3%	2.5%	5.4%	1.6%
Drilling	Count	9	64	150	11	234
	% within Type of unit	32.1%	16.8%	34.5%	29.7%	26.6%
Driving	Count	1	6	2	1	10
	% within Type of unit	3.6%	1.6%	.5%	2.7%	1.1%
Equipment maintenance	Count	0	9	2	0	11
	% within Type of unit	.0%	2.4%	.5%	.0%	1.3%
Erecting	Count	2	3	5	0	10
	% within Type of unit	7.1%	.8%	1.1%	.0%	1.1%
Explosive ordnance device handling	Count	0	3	1	0	4
	% within Type of unit	.0%	.8%	.2%	.0%	.5%
Firefighting	Count	2	0	0	0	2
	% within Type of unit	7.1%	.0%	.0%	.0%	.2%
Guard duty	Count	3	82	17	0	102
	% within Type of unit	10.7%	21.6%	3.9%	.0%	11.6%
Immersion training	Count	0	2	3	0	5
	% within Type of unit	.0%	.5%	.7%	.0%	.6%
Loading weapons	Count	0	1	1	0	2
	% within Type of unit	.0%	.3%	.2%	.0%	.2%
Marching	Count	4	38	42	15	99
	% within Type of unit	14.3%	10.0%	9.7%	40.5%	11.3%
Mast/Tower climbing	Count	0	5	1	1	7
	% within Type of unit	.0%	1.3%	.2%	2.7%	.8%
Not Entered	Count	2	0	0	0	2
	% within Type of unit	7.1%	.0%	.0%	.0%	.2%
Running/jogging	Count	1	41	36	4	82
	% within Type of unit	3.6%	10.8%	8.3%	10.8%	9.3%
Shooting	Count	0	2	5	0	7
	% within Type of unit	.0%	.5%	1.1%	.0%	.8%
Stores handling	Count	0	17	20	0	37
	% within Type of unit	.0%	4.5%	4.6%	.0%	4.2%
Vehicle maintenance	Count	0	5	1	0	6
	% within Type of unit	.0%	1.3%	.2%	.0%	.7%
Walking	Count	1	54	56	1	112
	% within Type of unit	3.6%	14.2%	12.9%	2.7%	12.7%
Weapons familiarisation	Count	1	3	6	0	10
	% within Type of unit	3.6%	.8%	1.4%	.0%	1.1%
Total	Count	28	380	435	37	880
	% within Type of unit	100.0%	100.0%	100.0%	100.0%	100.0%



Table 23. CATT-related Incident Reports: by Mechanism Group within Type of Unit

			Type of unit				Total
			Airfield Defence	Regular Infantry	Reserve or Integrated	Infantry Training School	
Mechanism group	-	Count	2	1	3	1	7
	-	% within Type of unit	7.1%	.3%	.7%	2.7%	.8%
	Being hit by moving objects	Count	2	42	33	4	81
	Being hit by moving objects	% within Type of unit	7.1%	11.1%	7.6%	10.8%	9.2%
	Biological factors	Count	0	2	0	0	2
	Biological factors	% within Type of unit	.0%	.5%	.0%	.0%	.2%
	Body stressing	Count	10	104	129	17	260
	Body stressing	% within Type of unit	35.7%	27.4%	29.7%	45.9%	29.5%
	Falls, trips and slips of a person	Count	10	148	178	9	345
	Falls, trips and slips of a person	% within Type of unit	35.7%	38.9%	40.9%	24.3%	39.2%
	Heat, radiation and electricity	Count	0	5	1	0	6
	Heat, radiation and electricity	% within Type of unit	.0%	1.3%	.2%	.0%	.7%
	Hitting objects with a part of the body	Count	1	22	55	0	78
	Hitting objects with a part of the body	% within Type of unit	3.6%	5.8%	12.6%	.0%	8.9%
	Mental stress	Count	0	1	0	0	1
	Mental stress	% within Type of unit	.0%	.3%	.0%	.0%	.1%
	Other and unspecified mechanisms of injury	Count	3	45	36	6	90
	Other and unspecified mechanisms of injury	% within Type of unit	10.7%	11.8%	8.3%	16.2%	10.2%
	Sound and pressure	Count	0	10	0	0	10
	Sound and pressure	% within Type of unit	.0%	2.6%	.0%	.0%	1.1%
Total		Count	28	380	435	37	880
		% within Type of unit	100.0%	100.0%	100.0%	100.0%	100.0%

Table 24. CATT-related Incident Reports: by Agency Group within Type of Unit

			Type of unit				Total
			Airfield Defence	Regular Infantry	Reserve or Integrated	Infantry Training School	
Agency group	-	Count	1	1	3	1	6
	-	% within Type of unit	3.6%	.3%	.7%	2.7%	.7%
	Animal, human and biological agencies	Count	6	54	68	13	141
	Animal, human and biological agencies	% within Type of unit	21.4%	14.2%	15.6%	35.1%	16.0%
	Chemicals and chemical products	Count	0	1	0	0	1
	Chemicals and chemical products	% within Type of unit	.0%	.3%	.0%	.0%	.1%
	Environmental agencies	Count	10	152	198	9	369
	Environmental agencies	% within Type of unit	35.7%	40.0%	45.5%	24.3%	41.9%
	Materials and substances	Count	3	39	42	1	85
	Materials and substances	% within Type of unit	10.7%	10.3%	9.7%	2.7%	9.7%
	Mobile plant and transport	Count	2	28	11	0	41
	Mobile plant and transport	% within Type of unit	7.1%	7.4%	2.5%	.0%	4.7%
	Non-powered handtools, appliances and	Count	2	55	46	9	112
	Non-powered handtools, appliances and	% within Type of unit	7.1%	14.5%	10.6%	24.3%	12.7%
	Other and unspecified agencies	Count	2	24	35	1	62
	Other and unspecified agencies	% within Type of unit	7.1%	6.3%	8.0%	2.7%	7.0%
	Powered equipment, tools and appliances	Count	2	26	32	3	63
	Powered equipment, tools and appliances	% within Type of unit	7.1%	6.8%	7.4%	8.1%	7.2%
Total		Count	28	380	435	37	880
		% within Type of unit	100.0%	100.0%	100.0%	100.0%	100.0%



Table 25. CATT-related Incident Reports: by Bodily Location Group within Type of Unit

			Type of unit				Total
			Airfield Defence	Regular Infantry	Reserve or Integrated	Infantry Training School	
Bodily location group	-	Count	8	12	8	1	29
		% within Type of unit	28.6%	3.2%	1.8%	2.7%	3.3%
	Head	Count	2	36	34	1	73
		% within Type of unit	7.1%	9.5%	7.8%	2.7%	8.3%
	Lower limbs	Count	9	168	240	23	440
		% within Type of unit	32.1%	44.2%	55.2%	62.2%	50.0%
	Multiple locations	Count	1	18	10	2	31
		% within Type of unit	3.6%	4.7%	2.3%	5.4%	3.5%
	Neck	Count	0	8	1	0	9
		% within Type of unit	.0%	2.1%	.2%	.0%	1.0%
	Trunk	Count	6	83	66	7	162
		% within Type of unit	21.4%	21.8%	15.2%	18.9%	18.4%
	Unspecified locations	Count	0	5	4	1	10
		% within Type of unit	.0%	1.3%	.9%	2.7%	1.1%
	Upper limbs	Count	2	50	72	2	126
		% within Type of unit	7.1%	13.2%	16.6%	5.4%	14.3%
Total	Count	28	380	435	37	880	
	% within Type of unit	100.0%	100.0%	100.0%	100.0%	100.0%	

Table 26. CATT-related Incident Reports: by Injury Nature Group within Type of Unit

			Type of unit				Total
			Airfield Defence	Regular Infantry	Reserve or Integrated	Infantry Training School	
Injury nature group	-	Count	1	16	10	1	28
		% within Type of unit	3.6%	4.2%	2.3%	2.7%	3.2%
	Diseases of the digestive system	Count	0	1	1	0	2
		% within Type of unit	.0%	.3%	.2%	.0%	.2%
	Diseases of the musculoskeletal system	Count	8	80	60	9	157
		% within Type of unit	28.6%	21.1%	13.8%	24.3%	17.8%
	Injury and poisoning	Count	19	282	364	27	692
		% within Type of unit	67.9%	74.2%	83.7%	73.0%	78.6%
	Other diseases	Count	0	1	0	0	1
		% within Type of unit	.0%	.3%	.0%	.0%	.1%
Total		Count	28	380	435	37	880
		% within Type of unit	100.0%	100.0%	100.0%	100.0%	100.0%

Table 27. CATT-related Incident Reports: by Severity of Outcome¹ within Type of Unit

			Type of unit				Total
			Airfield Defence	Regular Infantry	Reserve or Integrated	Infantry Training School	
Severity of outcome	Death	Count	0	0	1	0	1
		% within Type of unit	.0%	.0%	.2%	.0%	.1%
	Serious personal injury	Count	4	81	56	1	142
		% within Type of unit	19.0%	21.3%	12.9%	2.6%	16.2%
	Incapacity	Count	7	50	23	5	85
		% within Type of unit	33.3%	13.2%	5.3%	13.2%	9.7%
	Minor injuries	Count	10	249	355	32	646
		% within Type of unit	47.6%	65.5%	81.6%	84.2%	73.9%
Total	Count	21	380	435	38	874	
	% within Type of unit	100.0%	100.0%	100.0%	100.0%	100.0%	

¹ *Serious personal injury*: Emergency treatment provided by a medical practitioner; or, treated at a hospital; or, admitted to hospital. *Incapacity*: Employee unable to perform work for 5 or more consecutive days or shifts. Problems with the coding of severity categories has been discussed in paragraph 5.1.7



- 5.3.19 The most clearly predominant activity categories (Table 22) were drilling and marching for the Infantry Training School and drilling for ADG and Reserve units. Drilling, marching and running/jogging were well represented in all four profiles, as was guard duty for the Regular units.
- 5.3.20 With regard to mechanism (Table 23), “body stressing” and “falls, trips and slips” accounted for over two thirds of all CATT-related injuries. Reports from the Infantry Training School had a much higher proportion of “body stressing” than the other types of unit, and a correspondingly lower proportion of “falls, trips and slips”. This is consistent with an intensive training regimen for trainees who have not adapted fully to the physical demands of the job, but carried out on less demanding terrain. The differences with regard to agency (Table 24) were also consistent with this scenario. Whilst Infantry “environmental agencies” predominated overall, accounting for 42% of all CATT-related injuries, Infantry Training School reports had higher proportions of “animal, human and biological agencies” and “non-powered handtools, appliances and equipment”, and a correspondingly lower proportion of “environmental agencies”.
- 5.3.21 The predominant body location for CATT-related injuries was “lower limbs”, which accounted for half of all reports. This was followed by “trunk” and “upper limbs” which together accounted for a further third of all reports. The differences with regard to bodily location were not so marked as for mechanism and agency. Infantry Training School reports had a slightly higher proportion of lower limb injuries and a substantially lower proportion of upper limb injuries. Reserve units reported a higher proportion of lower limb injuries and a lower proportion of trunk injuries than did Regular units.
- 5.3.22 Nature of injury (Table 26) was almost exclusively coded using two categories. Reserve units reported a higher proportion of “injury and poisoning” and a lower level of “diseases of the musculo-skeletal system” than did Regular units. With ADG units, the proportions tended to differ in the opposite direction.
- 5.3.23 As to severity (Table 27), the Infantry Training School reported a lower level of serious personal injury than the other types of unit. ADG units reported the highest proportion of incapacity injuries, and both ADG and Regular Infantry units had higher proportions of serious personal injury than Reserve units or the Infantry Training School.
- 5.3.24 Breakdowns by age and length of service produced broadly similar results to those reported for all injuries in paragraphs 5.3.14 and 5.3.15, though the patterns were rather more subject to “random noise” because of the smaller sample sizes. These tables have been provided to the Defence PES Project Office in electronic form as SPSS output files.

Serious Injuries Relating to CATTs

- 5.3.25 In order to explore the characteristics of CATT-related incidents which led to more serious injuries, the 646 “minor injury” incidents (Table 27) were omitted, and a set of crosstabulations similar to Tables 22 to 26 were produced based on only the 228 incidents which resulted in more serious injury.
- 5.3.26 The overall profiles of these “serious injury incidents” with regard to activity, mechanism, agency, bodily location and nature of injury were very similar to the profiles based on all injuries (Tables 22 to 26 and paragraphs 5.3.19 to 5.3.22).
- 5.3.27 The numbers of incidents in many of the cells in these tables, particularly those relating to ADG and Infantry Training School, were extremely small, so that the proportions could be expected to be even more volatile than in Tables 22 to 26. Nevertheless, the differences in profiles of serious injury incidents reported by the different types of unit were very similar to those based on all injuries.
- 5.3.28 Considering the similarities to Tables 22 to 26, the “serious injury” tables have not been included in this report.



5.4 Injury Incidence Rates

5.4.1 To enable valid comparisons between the numbers of injuries in different units and groups of units, crude annualised injury rates, or injury incidence rates^{1,2}, were calculated for each unit for the financial year 2002-2003, on the basis of the number of persons exposed i.e. the unit populations. A one-year period was used in order to cover a full annual training cycle. This approach assumes that each individual is equally exposed to hazards throughout the period, which is obviously not the case in an Infantry or ADG unit. However, it provides a feasible first order method of standardisation at the unit level.

5.4.2 For Regular units, the population as at 9 October 2002³ was used as an estimate of the unit population throughout the financial year 2002-2003.

5.4.3 For Reserve units, an equivalent full-time population was calculated by adding to the number of Regular members as at the October date, an estimated full-time equivalent (EFTE) number of Reserve members. The latter figure was calculated as

$$\text{EFTE Reserves} = D/dw$$

Where D = total Reserve days worked in the unit in the particular year
 d = days/working week = 5
 w = working weeks/year = 46

5.4.4 For the School of Infantry, a similar calculation was done for trainees, as follows:

$$\text{EFTE Trainees} = tc/dw$$

Where t = total number of trainees in the particular year
 c = duration of the course in working days
 d = days/working week = 5
 w = working weeks/year = 46

5.4.5 A second level of standardisation was also applied to the injuries associated with CATTs. The associated population in this case was the estimated number of combat arms trades personnel in each unit. This was calculated by ascertaining the proportion of each unit's staff establishment which falls into the category of combat arms trades, and applying that proportion to the population figures for 2002-2003. These calculations are shown in Table 28. This approach assumes that the proportions of combat arms trades personnel stay constant as the unit population fluctuates, and also assumes equal exposure to hazards, both of which are reasonable approximations in the absence of more detailed information about unit composition and individual exposures to hazards.

¹ *Crude annualised injury rate* is an epidemiological term. The rate is "crude" as opposed to being adjusted for age or gender, and "annualised" in that it is expressed as an annual rate of injury although it might be based on data for a shorter period (as is the case in other sections of this report). *Incidence rate* is a synonymous term used in the OHS context. These rates are usually expressed as injuries per thousand persons/employees per year (or injuries per thousand exposed persons/employees per year if exposure is a relevant concept). In a *frequency rate*, also used in the OHS context, the number of hours worked by each individual (or hours of exposure of each individual) is also taken into account. These rates are usually expressed as the injuries per million hours worked (or per million hours of exposure). In a situation where most employees are full-time and work around 2000 hours per year, the numerical value of the frequency rate is approximately half that of the incidence rate. In this report, the conversion of Reserve days worked to equivalent full-time persons is essentially a conversion of these part-time workers from a frequency basis to an incidence basis. Throughout this report, the preferred term is *incidence rate*. The occurrences to which this can be applied include *incidents*, *injuries*, *reports* and *presentations*. The first of these, which may lead to terminological confusion, arises in DEFCARE as a result of hazardous occurrences or near misses; in DEFCARE there is a distinction between a *casualty* (an injured person) and an *incident* (which may or may not have resulted in an injury).

² Epidemiologists distinguish between *incidence* (the number of new cases in a particular period of time), *prevalence* (the number of cases existing at a particular point in time), and *period prevalence* (the number of cases existing during a particular period of time). To the extent that incidents reported to Defcare involve chronic or recurring injuries, annualised rates calculated from Defcare data may arguably be regarded as *period prevalence rates*.

³ This date, which was selected for administrative convenience, is the anniversary of the commissioning of the PMKeyS personnel management system within the Army.

5.4.6 The results of these calculations are shown in Table 28. The estimated average total unit populations and the estimated average unit combat arms trades populations are referred to in Table 3 as datasets 9 and 10. These two sets of population estimates were used as denominators with injury counts for 2002-2003 of the type 3, 4 and 5 (see Table 3) to produce, for each unit, reporting rates in incidents per thousand exposed persons per year for:

- all injuries
- work related injuries
- CATT related injuries

These rates are shown in Table 29.

Table 28. Estimated Average Unit Populations 2002-2003

Unit	Est Av. Regular Pop'n	Reserve/ Trainee Person days	Reserve/ Trainee EFT ¹	Est Av. Unit Pop'n	Est Regular/ Reserve CAT ² fraction	Est Trainee CAT ² fraction	Est Av. CAT ² Pop'n
<i>Airfield Defence Wing</i>	353			353	0.904		319
1 RAR	736			736	0.849		625
2 RAR	709			709	0.880		624
3 RAR	652			652	0.889		579
5/7 RAR	575			575	0.797		458
6 RAR	600			600	0.876		526
<i>Total Regular</i>	3272			3272			2813
1/19 RNSWR	18	9632	41.88	60	0.852		51
10/27 RSAR	25	14386	62.55	88	0.824		73
11/28 RWAR	18	13498	58.69	77	0.815		63
12/40 RTR	12	8862	38.53	51	0.823		42
2/17 RNSWR	22	13809	60.04	82	0.855		70
25/49 RQR	82	12038	52.34	134	0.885		119
31 RQR	14	4578	19.90	34	0.854		29
4/3 RNSWR	22	11503	50.01	72	0.849		61
41 RNSWR	11	7773	33.80	45	0.889		40
42 RQR	13	9789	42.56	56	0.893		50
5/6 RVR	32	10045	43.67	76	0.868		66
8/7 RVR (4 Bde)	28	11374	49.45	77	0.835		64
9 RQR	33	22170	96.39	129	0.844		109
<i>Total Reserve</i>	330	149457	649.80	980			836
School of Infantry	186	18291	79.53	266	1.00	1.00	266
<i>Total Infantry</i>	3788	167748	729.34	4518			3915

¹ EFT = Equivalent full time

² CAT = Combat arms trades

5.4.7 In general the “all injuries” rates in Table 29 are higher than the “work-related injuries” rates, which is to be expected, since the scope of work related injuries is smaller but the population base is the same for both of these rates.

5.4.8 In general, the CATT injury rates are smaller again than the “work-related injuries” rates. This is not necessarily to be expected, since both the scope of injuries and the exposed population are reduced in this case. In fact it is, to some degree at least, an artefact of the imprecise standardisation process. The reduction of around 15% in exposed population based on unit establishment is much less than the reduction in the scope and number of injuries effected by the process of close scrutiny which has been described in Section 5.2. The true exposure to CATTs is something less than has been estimated here, since combat arms trades personnel do not engage in these activities for all of their working hours. Consequently the corresponding injury rates are underestimated to some degree.

*Table 29. Injury Incident Reporting Rates^{1,2} (per thousand exposed persons per year)
2002-2003: by Unit*

Unit	All injuries		Work related injuries		CATT related injuries	
	Count	Rate	Count	Rate	Count	Rate
Total Air Field Defence Wing	33	87	20	52	12	38
1 RAR	51	69	28	38	14	22
2 RAR	70	99	41	58	11	18
3 RAR	36	55	31	48	5	9
5/7 RAR	54	94	37	64	19	41
6 RAR	54	90	22	37	11	21
Total Regular	265	81	159	49	60	21
1/19 RNSWR	9	150	6	100	4	78
10/27 RSAR	22	250	16	182	6	83
11/28 RWAR	5	65	3	39	2	32
12/40 RTR	15	294	13	255	7	167
2/17 RNSWR	12	146	12	146	10	143
25/49 RQR	26	194	16	119	6	51
31 RQR	4	118	3	88	0	0
4/3 RNSWR	10	139	8	111	5	82
41 RNSWR	32	711	25	556	17	425
42 RQR	9	161	5	89	0	0
5/6 RVR	9	118	5	66	4	61
8/7 RVR (4 Bde)	21	273	13	169	11	171
9 RQR	23	178	18	140	8	73
Total Reserve	197	201	143	146	80	96
School of Infantry	54	203	43	162	31	117
Total Infantry	516	114	345	76	171	44

¹ The systematic errors in these figures due to incorrect omission or inclusion of cases with missing data are estimated to be no more than 6% (refer to Table 3 and paragraphs 5.2.5 to 5.2.8).

² Average rates for each type of unit and each injury context are shown in boldface.

5.4.9 There is considerable variability in reporting rates between Regular Infantry units, and between Reserve Infantry units. This is to be expected, since the numbers of reports are not large in most categories. Nevertheless, there are clear and consistent differences between the groups. In general, incident reporting rates are broadly similar in Reserve Infantry units and in the School of Infantry, and similar but lower in ADG and Regular Infantry units. Corresponding average rates (the boldface figures in Table 29) differ by factors of 2 to 6 times. Differences in reporting rates between Reserves and Regulars may be explained to some degree in procedural and cultural terms. Regulars receive free health care regardless of submitting an injury report, whereas Reserves are more motivated to report any injury which affects their civilian employment. Reservists' attitudes to compensation might also be more aligned with civilian attitudes than is the case for Regulars.

5.4.10 On the assumption that unit populations remained reasonably constant between 1998 and 2003, the unit population figures from 2002-2003 (Table 28) were also used as denominators with the total injury counts for each unit (Table 11) to calculate approximate average rates for the six year period. The all-injury rates for Infantry and ADG were 108 and 35 reports per thousand exposed persons per year respectively. The Infantry figure was almost identical to the 2002-2003 figure of 114. The much lower ADG figure (35 vs 87) results from a substantial increase in the number of reports from ADG units in 2002-2003, although the reporting rate still remained below that of the Infantry. Whether this is due to an increase in unit population, a change in reporting practices, a fundamental underlying increase in injury rate, or a random fluctuation related to the relatively small size of ADG units and hence the small number of reports per year, is not known.

5.4.11 These rates are discussed further in Section 8, in comparison with rates derived from EpiTrack and DIPP datasets.



6 EPITRACK DATA

6.1 Description of EpiTrack Data

- 6.1.1 EpiTrack is a health surveillance system derived from a NATO system called EpiNATO. Each unit submits weekly summary data to the EpiTrack Health Surveillance Officer in DHSB. A variety of submission modes is supported, including Excel and Access.
- 6.1.2 Unlike Defcare and DIPP databases, the EpiTrack database is not based on individual cases or incidents. Each EpiTrack record contains aggregate counts pertaining to one type of event in one unit over a one-week period. The weekly summary is compiled from the case records of medical practitioners and other health service providers in the unit. EpiTrack fields are listed in Table 30. The unit, start date of the week and the event code are specified in the first three fields. The penultimate field lists the end date for the week, and the final field contains a population count for the unit for that week. The intervening fields contain aggregated counts for each day of the week. Table 31 lists specifications for these fields. Table 32 lists the event codes used in the third field. The initial list of event codes was compiled around 1995 under an ABCA (America Britain Canada Australia) arrangement. Most of the entries in the list have been retrospectively linked to elements of the ICD-10 classification system (World Health Organisation, 1992). In July 2001, in response to a high rate of sports injuries in Bougainville, the code 21 for sports injuries was replaced by a series of codes 211-218 for particular sports, giving a current total of 40 event codes.
- 6.1.3 The EpiTrack dataset supplied contained 9588 records. This included data from all Regular Infantry battalions for the different time periods shown in Table 33. The 4th Battalion RAR was outside the scope of the PES study (see Table 3) and was excluded, leaving 8702 records. Separate EpiTrack codes were allocated to 1 RAR in Townsville and East Timor because of a period of simultaneous reporting from both locations by sections of the battalion, and similarly to 2 RAR for operation Anode. For those battalions with the longest reporting history, reporting has been intermittent, with periods of regular reporting separated by periods of no reporting. DHSB attributes this to dependence on the motivation of particular individuals within the battalions. Reporting through EpiTrack became mandatory for all level 2 and 3 health care facilities (RAPs and hospitals) in September 2003, but full compliance has not yet been achieved. EpiTrack does not include Reserve units. The School of Infantry has recently joined the EpiTrack system, but no data were available as at February 2004.

Table 30. EpiTrack Fields

Unit code	Wednesday Subs Attend	Friday Refer for Cons
Start date	Wednesday Light Duties	Saturday First Attend
Event code	Wednesday Off All Duties	Saturday Subs Attend
Monday First Attend	Wednesday Admit	Saturday Light Duties
Monday Subs Attend	Wednesday Refer for Cons	Saturday Off All Duties
Monday Light Duties	Thursday First Attend	Saturday Admit
Monday Off All Duties	Thursday Subs Attend	Saturday Refer for Cons
Monday Admit	Thursday Light Duties	Sunday First Attend
Monday Refer for Cons	Thursday Off All Duties	Sunday Subs Attend
Tuesday First Attend	Thursday Admit	Sunday Light Duties
Tuesday Subs Attend	Thursday Refer for Cons	Sunday Off All Duties
Tuesday Light Duties	Friday First Attend	Sunday Admit
Tuesday Off All Duties	Friday Subs Attend	Sunday Refer for Cons
Tuesday Admit	Friday Light Duties	End date
Tuesday Refer for Cons	Friday Off All Duties	Average weekly troop strength
Wednesday First Attend	Friday Admit	

Table 31. EpiTrack: Aggregated Event Information for Each Day

First attendances
Subsequent attendances
Light duties (total days)
Off all duties (total days)
Admissions to hospital
Referrals for specialist consultations



Table 32. *EpiTrack Event Codes and Descriptors*¹

Code	Event Descriptor
1	Intestinal Infectious Disease
2	Sexually Transmitted Diseases (STDs)
3	Other Infectious and Parasitic Diseases
31	Malaria
32	Dengue Fever
4	Alcohol and Drug Abuse
5	Mental Disorders
51	Reaction to Severe Stress and Disorders of Adjustment
6	Eye Disorders
7	Disorders of the Ear, Nose and Throat
81	Diseases of the Upper Respiratory Tract - Including URTI
82	Diseases of the Lower Respiratory Tract - Including Asthma
9	Diseases of the Teeth, Oral Cavity, Salivary Glands and Jaws
11	Diseases of the Digestive System
12	Gynaecological Problems and Complications of Pregnancy - Including Normal Pregnancy
131	Eczematous Skin Conditions
132	Other Dermatological Conditions
14	Disorders of the Knee
15	Disorders of the Back
16	Other Musculo-Skeletal Disorders (excluding Knees and Backs)
17	Complications of Medical Care
18	Other Diseases and Symptoms Not Elsewhere Classified
19	Injuries - When due to Road Traffic Accident (RTA = Collision with any moving means of transport)
20	Injuries - When due to Military Training
21	Injuries - When due to Sport (superseded)
211	Injuries Due to Volley Ball
212	Injuries Due to Rugby League
213	Injuries Due to Rugby Union
214	Injuries Due to Soccer
215	Injuries Due to Touch Football
216	Injuries Due to Aussie Rules
217	Injuries Due to Cricket
218	Injuries Due to Other Sports
22	Injuries - When due to Hostile Action
23	Injuries - When due to all causes other than RTAs, Training, Sports, or Hostile Action
24	Climatic Injury (Heat and Cold)
25	NBC Indicators (Operational Only)
900	Miscellaneous/Administration: Routine Vaccinations
901	Miscellaneous/Administration: Routine Medicals
902	Miscellaneous/Administration: Repeat Prescriptions (including spectacles)
903	Other Miscellaneous/Administration

¹ The **boldface** injury-related codes and descriptors are those of relevance to the PES study

Table 33. *EpiTrack Coverage*

EpiTrack Code	Unit	First date	Last date	Duration (weeks)	N records	Weeks of data
11	2 RAR – East Timor & Townsville	08-Oct-01	16-Nov-03	110	2040	51
15	1 RAR - East Timor	26-Jan-01	26-Oct-03	143	1142 ²	31
25	3 RAR	29-Apr-02	08-Feb-04	93	3320	83
27	6 RAR	03-Nov-03	08-Feb-04	14	520	13
42	5/7 RAR	06-Jan-03	11-May-03	18	680	17
104	1 RAR - Townsville	14-Jul-03	26-Oct-03	15	600	15
108	2 RAR - Op ANODE	11-Aug-03	19-Oct-03	10	400	10
Excluded						
14	4 RAR ¹	16-Apr-01	08-Oct-01	26	886 ²	26

¹ 4 RAR is out of scope and was excluded (see Table 3).

² There are 40 records of data per reporting week, one record for each event code. The anomalous counts are due to the fact that there were initially only 33 event codes prior to the addition of the extra sports codes.



6.2 Characteristics and Limitations of EpiTrack Data

- 6.2.1 The overarching limitation of EpiTrack data is the fact that it does not contain information about individual cases or incidents. The data entered into EpiTrack have already been aggregated within each unit from individual case records to the level of daily summaries. This is adequate and appropriate for the original purpose of the EpiNato system, which was to monitor disease and detect clusters of disease occurrences. However, it is inadequate and inappropriate for investigating injury causation, which requires detailed information about individual cases and incidents.
- 6.2.2 The second major problem with EpiTrack with regard to injuries, is the coding protocol. As a general principle, a classification system should separately address each aspect or dimension of the entity to be classified (such as the mechanism, agency, nature, bodily location, etc. of an injury). Within each dimension, categories should be mutually exclusive (i.e. only one should apply to a particular case) and exhaustive (i.e. every case should fit into a category - this may necessitate an "other" category), and should generally provide even coverage (i.e. a similar level of detail) across the range of possibilities. With respect to injuries at least, the EpiTrack "event" classification does not conform to these principles. It seems that the original unidimensional list, which might be described as "nature of disease/disorder" (see paragraph 4.1.3) has been expanded to include aspects of injury causation which have been identified from time to time as being important. The resulting list is thus a two dimensional mixture of "cause" and "nature" categories. The coverage of causation is exhaustive through the use of an "other" category, though it is very uneven, with much more detail about sport than other causes. The coverage of nature of disease/disorder is also uneven, with knee and back disorders being explicitly distinguished from other musculo-skeletal disorders.
- 6.2.3 DHSB staff advise that, according to current EpiTrack protocols, the categories are regarded as mutually exclusive. Each presentation to a health service provider in the unit is supposed to contribute to the unit's count for just one event code. This is achieved by categorising all injuries by causation and reserving the "nature" categories for disorders rather than injuries (see paragraph 4.1.3). For example, a presentation for an eye injury sustained playing cricket is supposed to be recorded as a 217 (injury due to cricket) rather than a 6 (eye disorder). Similarly, a presentation for a knee injury sustained during an assault exercise should be coded as a 20 (due to Military Training) rather than a 14 (disorders of the knee). Notwithstanding this current policy, it is unclear why codes 14 and 15 were introduced in the first place if it was not to distinguish two major types of injury in the ADF. Be that as it may, there is certainly potential for ambiguity and confusion regarding the distinction between a musculo-skeletal disorder and an injury, and this is exacerbated by the dual nature of the list of event categories. In the light of this, it was decided to include categories 14-16 in the following analysis, a decision that was justified by the resulting statistics (see Section 6.4).

6.3 Analysis of EpiTrack Data

- 6.3.1 Just four categories of event are of direct relevance to the PES study:

- 14 Disorders of the Knee
- 15 Disorders of the Back
- 16 Other Musculo-Skeletal Disorders (excluding Knees and Backs)
- 20 Injuries - When due to Military Training

- 6.3.2 The remaining injury categories were also included in the analysis:

- 19 Injuries - When due to Road Traffic Accident (RTA = Collision with any moving means of transport)
- 21 Injuries - When due to Sport (and the associated categories 211-218)
- 22 Injuries - When due to Hostile Action
- 23 Injuries - When due to all causes other than RTAs, Training, Sports, or Hostile Action
- 24 Climatic Injury (Heat and Cold)



- 6.3.3 The EpiTrack dataset supplied contained 9588 records. This included data from all Regular Infantry units, for the different time periods shown in Table 33. After exclusion of 4 RAR (out of scope – see paragraph 5.2.3), 8702 records remained. Of these, the 3471 records relating to the categories listed in paragraphs 6.3.1 and 6.3.2 were analysed. Of these, around one third (1100 records) pertained to the four most directly relevant categories listed in paragraph 6.3.1.
- 6.3.4 Whilst the EpiTrack dataset provides no differentiation between different trade task activities, overall rates in these four categories, and of injuries generally, were examined for purposes of triangulation against Defcare and DIPP data.
- 6.3.5 The most direct indicator of injury incidence is the number of first presentations. Because of the different unit populations and more particularly the intermittent nature of the reporting, simple total counts would be meaningless and misleading. The counts were standardised as follows. For each unit/week/event data record, the total number of first presentations was divided by the average unit population figure for the week to give an average rate per person for that week. These weekly rates were annualised by multiplying by 46 (working weeks/year), and further multiplied by 1000 to produce a weekly estimate of the incidence rate per thousand persons per year for each type of event for each unit. The mean of these weekly annualised incidence rate estimates was calculated for each calendar year, using whatever weekly estimates were available for each unit. The results, rounded to whole numbers, are shown in Table 34. The overall means for each injury/disorder category were calculated using all 220 unit-weeks of available data. The results of a similar analysis for financial year 2002-2003 are shown in Table 35.

6.4 Results and Discussion

- 6.4.1 It is noteworthy to compare the rates in the disorder categories (14-16) and the injury causation categories (20-24 and 211-218). It would be expected that most musculo-skeletal injuries in this population would be caused either by military training or sport (together with hostile action, climatic and “other” causes when operationally deployed) and should be coded as such according to the protocol outlined in paragraph 6.2.3. However, Tables 34 and 35 show that the reporting rates in the disorder categories were much higher (mean value of 923 over units/calendar years) than those in the causation categories (mean values of 335 for category 20, 191 for the 21 group, and 151 for categories 22-24). This suggests a general lack of compliance with the coding protocol, with many injuries being coded using the musculo-skeletal disorder categories. This could involve either coding according to the outcome rather than the cause, or coding both ways (double counting). DHSB staff consider that the former is more likely than the latter. This pattern of reporting was reasonably consistent across all units and across the whole time period, although it was perhaps more pronounced in the more recent data when the extent of EpiTrack training in the units has been reduced. One battalion, 6 RAR, reported no injuries due to military training during their first two months of reporting, in November and December 2003.
- 6.4.2 In the light of paragraphs 6.2.3 and 6.4.1, event codes 14-16 were included as de facto injury categories in the calculation of injury rates.
- 6.4.3 The mean weekly annualised rate for reported first injury-related presentations was 1614 per thousand exposed persons per year. There was considerable variation in the rates, both between units and within units from year to year. It must be remembered that some of the unit/year estimates are based on reporting periods of only a few months.
- 6.4.4 The rates calculated from EpiTrack data for the financial year 2002-2003 were on average slightly higher than the mean weekly annualised rates, with a mean of 1784. These are based on a much smaller sample of 81 unit weeks.
- 6.4.5 Tables 34 and 35 show that the rates for 1 RAR were particularly high. On investigation, the mean rates were found to be substantially influenced by just two anomalously high weekly rates for Event 16: Other Musculo-Skeletal Disorders (excluding Knees and Backs). These occurred during May 2003, at the beginning of a period of deployment in East Timor. Whilst it is possible that the injury rate was higher than usual during initial deployment, the use of



an underestimated population base is likely to have contributed substantially to the calculated rates. For May, the reported population was 85, only around 11% of full battalion strength, whilst the June figure of 770 was effectively full strength. Population figures reported to EpiTrack are generally revised only monthly, and it seems likely that during a rapid “ramp up” period, the reported population was a substantial underestimate for much of the month of May. When combined with the fact that this was one of only two months of reporting by 1 RAR in 2002-2003, this has resulted in a considerable overestimate of the true injury rate for that year (see Table 35). When data from 1 RAR for May 2003 were omitted, the resulting mean rate for all units in all years was 1552 and for all units in financial year 2002-2003 it was 1452 per thousand persons per year.

- 6.4.6 Note that whilst days lost are recorded, they are only recorded in aggregate form for all presentations in a week. Hence it is not possible to know how many of the first presentations in a week resulted in lost time, and thus it is not possible to calculate lost time injury incidence rates.



Table 34. Estimated Injury Incidence Rates (first presentations per thousand persons per year): by Unit and Year

	Year	2001		2002		2003							2004		
	Unit	11	15	11	25	11	15	25	27	42	104	108	25	27	Mean ¹
Code	Event														
14	Disorders of the Knee	107	69	127	92	303	163	126	284	138	514	87	86	179	171
15	Disorders of the Back	44	106	120	149	360	218	122	607	149	445	54	123	335	199
16	Other Musculo-Skeletal Disorders	50	200	100	322	661	1566	387	1098	531	1007	103	258	551	553
	<i>Total Musculo-Skeletal Disorders</i>	200	374	347	563	1324	1947	635	1989	817	1965	244	466	1065	923
19	Injuries due to Road Traffic Accident	25	6	16	17	28	0	21	0	9	0	0	37	0	14
20	Injuries due to Military Training	32	25	241	214	1360	128	407	0	184	307	87	417	48	335
21	Injuries due to Sport	.	56	.	.	.	.	.	.	.	.	.	.	.	56
211	Injuries Due to Volley Ball	41	.	11	23	5	85	4	48	12	77	0	0	0	26
212	Injuries Due to Rugby League	57	.	0	0	38	13	10	0	0	15	0	0	0	12
213	Injuries Due to Rugby Union	0	.	0	0	69	0	28	0	0	153	5	0	0	24
214	Injuries Due to Soccer	9	.	8	22	17	48	18	10	6	215	5	12	0	32
215	Injuries Due to Touch Football	0	.	6	59	95	18	17	0	39	46	11	12	0	32
216	Injuries Due to Aussie Rules	3	.	0	4	93	3	15	0	0	0	16	0	0	15
217	Injuries Due to Cricket	0	.	0	1	11	0	6	0	0	0	5	0	0	3
218	Injuries Due to Other Sports	6	.	35	68	17	200	28	10	53	15	5	25	48	51
	<i>Total Injuries due to Sport</i>	116	56	60	178	344	365	126	68	111	521	49	49	48	191
22	Injuries due to Hostile Action	0	6	0	4	0	2	1	0	0	0	0	0	0	1
23	Injuries due to all other causes	104	306	269	209	11	113	87	131	57	31	54	0	178	116
24	Climatic Injury (Heat and Cold)	16	25	30	75	0	87	4	0	100	0	5	0	18	34
	Total Injuries/Musculo-Skeletal disorders	492	800	961	1260	3067	2642	1282	2188	1278	2824	438	969	1358	1614

EpiTrack Unit codes: 11 2 RAR – East Timor & Townsville; 15 1 RAR - East Timor; 25 3 RAR; 27 6 RAR; 42 5/7 RAR; 104 1 RAR – Townsville; 108 2 RAR - Op ANODE

¹ Weighted by number of weeks of reporting by each unit in each year



Table 35. Estimated Injury Incidence Rates (first presentations per thousand persons per year) for Financial Year 2002-2003: by Unit

	Year	2002-2003				Mean ¹
		11	15	25	42	
Code	Event					
14	Disorders of the Knee	176	292	101	138	136
15	Disorders of the Back	337	182	136	149	165
16	Other Musculo-Skeletal Disorders	419	3450 ²	341	531	696
	<i>Total Musculo-Skeletal Disorders</i>	<i>932</i>	<i>3924²</i>	<i>578</i>	<i>817</i>	<i>998</i>
19	Injuries due to Road Traffic Accident					18
		13	0	25	9	
20	Injuries due to Military Training	1305	130	324	184	385
21	Injuries due to Sport	.	.	.	.
211	Injuries Due to Volley Ball	0	178	18	12	30
212	Injuries Due to Rugby League	7	7	7	0	5
213	Injuries Due to Rugby Union	34	0	3	0	5
214	Injuries Due to Soccer	0	90	16	6	20
215	Injuries Due to Touch Football	53	22	36	39	37
216	Injuries Due to Aussie Rules	73	0	10	0	14
217	Injuries Due to Cricket	14	0	5	0	4
218	Injuries Due to Other Sports	40	224	50	53	67
	<i>Total Injuries due to Sport</i>	<i>221</i>	<i>522</i>	<i>144</i>	<i>111</i>	<i>183</i>
22	Injuries due to Hostile Action	0	7	2	0	2
23	Injuries due to all other causes	28	263	165	57	136
24	Climatic Injury (Heat and Cold)	0	215	36	100	63
	<i>Total Injuries/Musculo-Skeletal disorders</i>	<i>2499</i>	<i>5061²</i>	<i>1273</i>	<i>1278</i>	<i>1784</i>

EpiTrack Unit codes: **11** 2 RAR – East Timor & Townsville; **15** 1 RAR - East Timor; **25** 3 RAR; **42** 5/7 RAR

¹ Weighted by number of weeks of reporting by each unit

² These rates are substantially influenced by a small number of reports which are suspected to be inaccurate. See Paragraph 6.4.5

7 DATA FROM THE DEFENCE INJURY PREVENTION PROGRAM (DIPP)

7.1 Description of DIPP Data

- 7.1.1 During the period 1991-2000 there was a concerted and successful effort to reduce rates of injury and discharge at the Army Recruit Training Centre (ARTC). In April 2000 the Director General Defence Health Service decided to adopt the ARTC model of injury prevention for application across the ADF. The program to implement this has become known as the Defence Injury Prevention Program (DIPP) (Reference Document F).
- 7.1.2 To date, pilot DIPP implementations have taken place for various periods at the School of Infantry, School of Armour, School of Artillery, and in East Timor. At present, DIPP is being implemented throughout 3 Brigade.
- 7.1.3 One aspect of DIPP is the monitoring of injuries via an injury surveillance database. The database is managed locally within each unit, and is populated by reports from the medical practitioners and other health service providers within the unit. A report is triggered by the first presentation in connection with a particular injury incident or condition.

Table 36. DIPP Injury Surveillance Database: Field Descriptions

Field name	Description
daterep	Date injury reported
dateinj	Date of onset of injury
injduxt	Free text regarding activity (only used if the person lists activity as 'other')
venue	Place at which injury occurred (location)
by Broad Activity Category	Broad categories of activity, eg army training, normal duties, PT – supervised
activ2	More specific categorisation of activity, eg patrolling, circuit training, driving, lifting
activ3	Specific action at time of injury, eg running, throwing, lifting, twisting/turning, steeping down, falling
conditio	Usually coded as dry, wet, hot, cold or NA
visibil	Usually coded as good, poor, light, dark or NA
surface	Descriptions such as rough, slippery, rocky, grassy or NA
strappng	Little used – indicates whether strapping or protective equipment was used at time of injury
specstrap	Little used – free text description of PPE used, if any
cause	Injury mechanism eg stepped in hole/gutter/uneven ground, aggravation of previous injury, overexertion, fall
causetxt	Free text description (only used if 'other' is selected as the 'cause' - not clearly distinguished from the following field)
descrip	Free text description of what transpired to cause the injury
bodypart	Body part injured eg knee joint, ankle joint, upper arm
diagnos	Diagnosis eg tissue injury, tendon sprain, laceration
referral	Mostly to physiotherapist, to doctor, or no referral
refertxt	Only used if 'other' selected as 'referral'
severity	No further treatment, mild (1-3 further trts), moderate (3-6 further trts), severe (6+ further trts)
ptspdays	Days of PT & sport restrictions only
sickdays	Days of PT, sport & work restrictions
wkdays	Days off work
mnthofyr	Month of year in which injury occurred - note that data in this field are unreliable due to a form problem in the database for this field only
treatby	Usually doctor/medical officer (Sol) physiotherapist (East Timor)
totrestr	Total days restricted = total of the three restriction categories above
subunit	Organisational subunit – different levels used at SOI & in East Timor
unit	Organisational unit – different levels used at SOI & in East Timor
oncourse	On a course at time injured – yes, no, true, false
reserve	Yes or no (East Timor only)



- 7.1.4 A database record consists of the data from one report. The data fields are listed in Table 36. The coding schemes used in DIPP to date are generally based on the TOOCS classification. However, the lists of categories for each field varied by location, because at the time these databases were implemented, there was no standardised classification system suited to the military context. The databases were a component of ongoing research to examine what local units would want included in the categories related to each field.
- 7.1.5 Within the Infantry/ADG scope of the DPESP, data were available from the School of Infantry (SOI) database for the period 20/4/01 to 15/10/01 (26 weeks, 144 records), and from the East Timor database for the period 2/11/02 to 30/4/03 (26 weeks, 152 records). In each case, the raw data were made available in the form of an Excel spreadsheet, and in addition the standard DIPP reports based on the dataset were provided in printed form (Reference Documents G and H).

7.2 Characteristics and Limitations of DIPP Data

- 7.2.1 Whilst not being directly linked to specific trade task activities, the DIPP data structure includes a much richer and more clearly defined suite of incident and injury characteristics than does either Defcare or EpiTrack.
- 7.2.2 Nevertheless, the obvious limitation of DIPP as a data source at the present time is its narrow organisational scope. The only available data of direct relevance to the DPESP were gathered over limited periods of time at two Infantry locations.

7.3 Analysis of DIPP Data

Data from East Timor

- 7.3.1 The East Timor DIPP data relate to injured persons presenting for treatment by physiotherapists at a central battalion facility between 2/11/02 and 30/4/03, a period of 179 days or just under 26 weeks. The dataset comprises 152 records.
- 7.3.2 The records include both date of report and date of onset of injury. In most cases the reporting date was soon after the date of onset, but there are a number of cases where the date of onset was long before the date of report, by up to ten years. DIPP staff confirm that these relate to pre-existing or chronic injuries. There is one case where the reporting date was well outside the reporting period, and three cases where the date of injury was later than the date of report. These anomalies raise a general question about reporting accuracy.
- 7.3.3 In most cases the first activity field clearly distinguishes between “normal duties” and supervised or unsupervised physical training (PT). In a few “other” cases, the second and third activity fields clearly identify an incident as work-related. On this basis, 5 records were not related either to trade tasks or PT and were excluded from detailed analysis. Of the remaining 147 records, 78 records related to PT, and 67 records were categorised as relating to normal non-PT military duties. In one anomalous case basketball was classified as military training.
- 7.3.4 The incidence rate was estimated directly using an estimated population base 475.9 person years calculated by DIPP staff. The resulting incidence rate is 319 presentations per thousand exposed persons per year ($152/475.9 \times 1000$), of which 51% (163 per thousand exposed persons per year) were PT-related and 44% (141 per thousand exposed persons per year) were work-related.
- 7.3.5 DIPP staff estimate that these presentations for physiotherapy might represent one third of all injuries. Furthermore, because of the wide dispersion of troops in East Timor, not all eligible casualties were able to present at the physiotherapy unit. Considering these factors, the recorded data might represent one quarter of all injuries. On this basis, the rate for all injuries is estimated as 1276 injuries per thousand exposed persons per year.



7.3.6 Thirty of the 147 cases (20.4%) resulted in time off work. Assuming that most lost time injuries are included in this dataset, this represents a lost time injury incidence rate of 65 per thousand persons per year.

7.3.7 In Tables 37 to 45, characteristics of both the incident and the injury are crosstabulated against the first level broad activity categories, for all 147 cases (normal duties & PT). In a few of these tables asterisked entries at the head of the list indicate that in some data records the field was left blank or coded "Not applicable". The order of the tables progresses from the venue, through conditions, activities and causes to body location, diagnosis and severity. The discussion following the tables focuses primarily on the injuries incurred during normal non-PT military duties i.e. the first three columns. Because a number of these tables are quite lengthy, and the total number of cases is quite small, percentages have been omitted to improve readability. Tables including percentages have been provided to the Defence PES Project Office in electronic form as SPSS output files.

Table 37. East Timor Injury Presentations: by Venue and Activity Category

Count		ACTIV1					Total
		Military training (not PT)	Normal Duties	Other	PT - Supervised by other	PT- Unsupervised	
VENUE	* Not applicable	1	0	0	0	0	1
	5AVN hanger area	0	1	0	0	0	1
	Aidabeletin	0	1	0	0	0	1
	AO Matilda	6	23	2	1	0	32
	Balibo FOB	0	0	1	0	0	1
	Batagade FOB	1	3	0	4	0	8
	Dili	1	2	0	4	1	8
	Dirt road / track	0	0	0	1	0	1
	Field training area (Murray Bridge)	1	0	0	0	0	1
	Gym	0	1	0	1	12	14
	Gym - weight room	0	0	0	1	1	2
	Gym- grassed area	0	0	0	0	1	1
	Home	0	0	0	0	1	1
	Maliana FOB	0	1	0	0	2	3
	Moleana FOB	1	18	1	23	23	66
	Unknown	0	1	0	0	0	1
	Volleyball court Moleana	0	0	0	1	0	1
	Workshops	0	3	0	1	0	4
Total		11	54	4	37	41	147

Table 38. East Timor Injury Presentations: by Conditions and Activity Category

Count		ACTIV1					Total
		Military training (not PT)	Normal Duties	Other	PT - Supervised by other	PT- Unsupervised	
SURFACE	* Not applicable	5	26	0	2	10	43
	OK	1	8	1	10	8	28
	Rough	5	17	0	21	23	66
	Slippery	0	3	3	4	0	10
Total		11	54	4	37	41	147



Table 39. East Timor Injury Presentations: by Surface and Activity Category

Count		ACTIV1					Total
		Military training (not PT)	Normal Duties	Other	PT - Supervised by other	PT- Unsupervised	
SURFACE	* Not applicable	5	26	0	2	10	43
	OK	1	8	1	10	8	28
	Rough	5	17	0	21	23	66
	Slippery	0	3	3	4	0	10
Total		11	54	4	37	41	147

Table 40. East Timor Injury Presentations: by Activity and Activity Category

Count		ACTIV1					Total
		Military training (not PT)	Normal Duties	Other	PT - Supervised by other	PT- Unsupervised	
ACTIV2	* Not applicable	0	4	0	0	0	4
	2.4km run	0	0	0	5	2	7
	Aerobic training (Cardio)	0	0	0	0	1	1
	Area maintenance	0	2	0	0	0	2
	Aviation maintenance	0	1	0	0	0	1
	Basketball	1	0	0	0	0	1
	Battle PT	0	0	0	3	0	3
	Cardio	0	0	0	0	1	1
	Chin Ups	0	0	0	0	1	1
	Circuit training	0	0	0	2	0	2
	Clearing buildings	0	1	0	0	0	1
	Cricket	0	0	0	0	1	1
	Desk / computer work	0	2	0	0	0	2
	Driving	2	5	0	0	0	7
	fire & movement	1	1	0	0	0	2
	General PT	0	0	0	1	1	2
	Jumping from truck	0	2	0	0	0	2
	Lift and carry	0	2	0	1	0	3
	lifting	0	4	0	0	0	4
	Loading trucks	0	3	2	0	0	5
	Marching	1	0	0	0	0	1
	Other non-physical	0	1	0	0	0	1
	Overuse	0	1	0	0	0	1
	Passenger in vehicle	0	1	0	0	0	1
	Patrolling	2	12	1	0	0	15
	Pushups	0	0	0	0	1	1
	Range shoot	0	1	0	0	0	1
	Ropes	1	0	0	0	0	1
	Rugby League	0	0	0	1	0	1
	Running / Jogging	1	1	0	12	21	35
	Shooting	0	0	1	0	0	1
	Soccer	0	0	0	1	0	1
	Tennis	0	0	0	0	1	1
	Touch Football	0	0	0	4	1	5
	Unknown	2	4	0	0	0	6
	Volleyball	0	0	0	5	0	5
	Walking	0	5	0	0	2	7
	Weights - free	0	1	0	2	8	11
Total		11	54	4	37	41	147



Table 41. East Timor Injury Presentations: by Specific Action and Activity Category

Count		ACTIV1					Total
		Military training (not PT)	Normal Duties	Other	PT - Supervised by other	PT- Unsupervised	
ACTIV3	* No data entered	0	7	0	2	1	10
	* Not applicable	0	1	0	0	0	1
	Boxing	0	0	0	0	1	1
	Carrying	0	1	0	1	0	2
	Driving	2	4	0	0	0	6
	Fall from height	1	1	0	0	0	2
	Fall from vehicle	0	0	1	0	0	1
	Firing weapon	0	0	1	0	0	1
	Heaves / chinups	0	0	0	2	1	3
	Jumping / landing	1	0	0	2	0	3
	Jumping from truck	0	2	0	0	0	2
	Leopard crawl	1	0	0	0	0	1
	Lifting	0	4	1	1	6	12
	Overhead work	0	1	0	1	0	2
	Overuse - Upper limb	0	2	0	1	0	3
	Patrolling	2	7	0	0	0	9
	Pulling	0	1	0	0	1	2
	Pushing	0	0	0	1	2	3
	Rowing / paddling	0	0	0	0	1	1
	Running	3	5	0	24	23	55
	Sitting	0	1	0	0	0	1
	Squatting	0	1	0	0	1	2
	Standing	0	2	0	0	0	2
	Stepping down	0	7	0	0	0	7
	swinging	0	0	0	0	1	1
	Tackle / being tackled	0	0	0	1	0	1
	Twisting / turning	0	2	1	1	0	4
	Unknown	1	3	0	0	1	5
	Walking	0	2	0	0	2	4
Total		11	54	4	37	41	147

Table 42. East Timor Injury Presentations: by Injury Mechanism and Activity Category

Count		ACTIV1					Total
		Military training (not PT)	Normal Duties	Other	PT - Supervised by other	PT- Unsupervised	
CAUSE	* No data entered	1	0	0	2	0	3
	Aggravation of previous injury	1	7	0	4	6	18
	Collision with fixed object	2	3	0	1	0	6
	Fall from height	1	6	1	1	0	9
	Fall on same level	0	1	0	1	1	3
	Other	0	8	1	6	1	16
	Overexertion	2	8	0	2	8	20
	Overuse (gradual onset/not traumatic)	3	8	1	6	14	32
	Stepped in hole/gutter/uneven ground	1	10	1	14	11	37
	Struck by Object	0	3	0	0	0	3
Total		11	54	4	37	41	147



Table 43. East Timor Injury Presentations: by Body Part and Activity Category

Count		ACTIV1					Total
		Military training (not PT)	Normal Duties	Other	PT - Supervised by other	PT- Unsupervised	
BODYPART	achilles tendon	0	2	0	3	7	12
	Ankle joint	0	9	0	7	10	26
	calf	0	1	0	2	2	5
	Cervical spine joints / discs	3	5	1	4	2	15
	Elbow joint	0	1	0	1	1	3
	feet	1	4	0	0	1	6
	fingers	0	0	0	1	0	1
	foot	0	0	0	0	3	3
	Foot - ST	0	0	0	1	0	1
	Glenohumeral (Shoulder) joint	0	1	0	0	0	1
	Hip flexor	1	0	0	0	0	1
	Hip joint	0	0	0	1	0	1
	Knee joint	3	4	1	4	1	13
	Lumbar spine joints / discs	2	7	0	3	1	13
	Muscle tear	0	1	0	0	0	1
	Neck - ST	0	1	0	0	0	1
	Sacroiliac (SI) joint	0	0	0	1	1	2
	shins	0	0	0	6	3	9
	shoulder	0	7	0	1	6	14
	thigh	0	0	0	1	0	1
	Thoracic spine joints / discs	1	7	1	1	2	12
	Upper arm - ST	0	1	0	0	0	1
	Wrist joint	0	3	1	0	1	5
Total		11	54	4	37	41	147

Table 44. East Timor Injury Presentations: by Diagnosis and Activity Category

Count		ACTIV1					Total
		Military training (not PT)	Normal Duties	Other	PT - Supervised by other	PT- Unsupervised	
DIAGNOS	Bruising	0	0	0	1	0	1
	Compartment Syndrome	0	0	0	4	3	7
	deep wound requiring sutures	0	1	0	0	0	1
	Disc bulge/protrusion	1	2	0	0	0	3
	Dislocation	0	0	0	0	1	1
	Fascial strain / Fasciitis	0	0	0	2	0	2
	Instability -joint	0	0	1	0	0	1
	Intervertebral hypomobility	0	1	0	0	0	1
	Ligament / Tendon rupture	0	6	0	2	0	8
	Ligament / Tendon sprain or tear	0	7	2	6	11	26
	Meniscus tear	0	0	0	2	0	2
	Muscle strain	0	1	0	4	3	8
	Neuritis / neuropraxia / neural lesion	0	2	0	0	0	2
	non-specific low back pain	0	0	0	1	0	1
	Nonspecific soft-tissue injury	1	2	0	1	0	4
	Patellofemoral Pain / Chondromalacia Patella	2	2	0	0	0	4
	plantar fasciitis	1	3	0	0	1	5
	shoulder impingement	0	1	0	0	0	1
	soft tissue injury	3	12	1	6	10	32
	Sprain	0	1	0	0	0	1
	strain	0	1	0	0	0	1
	Tendonitis	0	4	0	5	10	19
	Vertebral hypomobility	1	5	0	1	2	9
	wry neck	2	3	0	2	0	7
Total		11	54	4	37	41	147

Table 45. East Timor Injury Presentations: by Severity and Activity Category

	ACTIV1					Total
	Military training (not PT)	Normal Duties	Other	PT - Supervised by other	PT- Unsupervised	
SEVERITY * No data entered	0	2	0	1	1	4
Severe (6+ treatments/referred to hospital)	0	5	0	3	1	9
Moderate (3-6 further treatments)	7	26	2	23	24	82
Mild (1-3 further treatments)	3	18	2	8	15	46
No further treatment needed	1	3	0	2	0	6
Total	11	54	4	37	41	147

Results from East Timor

- 7.3.8 It should be kept in mind that these data are not representative of the full range of injuries, being derived from reports of presentations for treatment by a physiotherapist. DHSB staff have advised that this would have followed a process of triage, whereby persons with more serious injuries would have been evacuated, and those with cuts and abrasions, bruising, and minor sprains and strains would have been treated on the spot or in RAP facilities.
- 7.3.9 The site or “venue” information (Table 37) is not very informative. Most sites were identified by the general operational area in which the incident occurred. Conditions (Table 38) were a mixture of wet and dry, with the large proportion of “not applicable”. Surface conditions (Table 39) were also mixed, with a similarly high proportion of “not applicable”. DIPP staff advise that these assignments are often made when the cause is overuse, and the injury cannot be associated with one particular incident or venue.
- 7.3.10 The two more detailed activity fields (Tables 40 and 41) were not always clearly distinguished in the reports, with “patrolling” in particular occurring frequently in both. The most frequently reported activities were running, jogging, patrolling, lifting, driving, walking and stepping down. Running and jogging were mostly associated with PT, whilst patrolling and stepping down were reported only in the context of normal (occupational) duties.
- 7.3.11 The most commonly reported cause of injury (Table 42) was stepping in holes/gutters/uneven ground, followed by overuse (gradual onset/not traumatic) and over-exertion. There were also a substantial number of reports of aggravation of previous injuries.
- 7.3.12 Consistent with the predominant causes, the most frequently reported bodily location of injury (Table 43) was the ankle, followed by a group of almost equally frequent locations – Achilles tendon, cervical spine, thoracic spine, lumbar spine, knee and shoulder. The predominant diagnoses (Table 44) were soft tissue injury, ligament/tendon sprain or tear, and tendonitis.
- 7.3.13 Consistent with paragraph 7.3.8, over half of the injuries were diagnosed (Table 45) as being of moderate severity (requiring 3-6 further treatments), and a further third were diagnosed as being of mild severity (requiring 1-3 further treatments). There were few injuries requiring no further treatment. As a result of this, no further filtering on severity was undertaken, as was done with Defcare data (see paragraph 5.3.25).



Data from the School of Infantry

- 7.3.14 Data from the School of Infantry (SOI) database relate to all injury presentations during the period the period 21/6/01 to 15/10/01, a period of 116 days or 16½ weeks. There are 144 records, of which 134 pertain to trainees on course. Unlike the East Timor data, these data encompass all injuries, not just those requiring physiotherapy.
- 7.3.15 The records include both date of report and date of onset of injury. In most cases the reporting date was soon after the date of onset, and in only one case was the period more than two months – in this case around 14 months. As expected there was little if any evidence of long term chronic injuries in this population. There is one case where the reporting date was well outside the reporting period, and two cases where the date of injury was later than the date of report. As with the East Timor data, these anomalies raise a general question about reporting accuracy.
- 7.3.16 Incidence rates were estimated using a variant of the methodology described in paragraph 6.3.5. The Regular staff population for 2001 was assumed to be equal to the October 2002 figure of 186 (see Section 5.4). The trainee population base of 62.7 person years calculated by DIPP staff for the reporting period was converted to an EFT trainee population of 174 ($=62.7/(116/7)*46$), making a total of 360 EFT persons. On the basis of these figures, the estimated incidence rate for presentations for all injuries was 1110 ($=144/(360*(116/7))*46*1000$) per thousand exposed persons per year, and for trainees 2138 per thousand exposed persons per year.
- 7.3.17 After an examination of the *site*, *activity*, *body part* and *diagnosis* fields, 35 records were excluded because they were clearly out of the scope of the PES study (illness, off-duty etc.), or because there was insufficient information to establish whether they were within scope. Of the remaining 109 records, the first activity field was coded as “Army training” in 103 cases, and the remaining 6 as “Normal duties”; 102 cases were “on course” and 7 were not. It was assumed that 7 cases involved School staff and 102 cases involved trainees.
- 7.3.18 Whilst a number of the incidents were PT-related rather than trade-task related, no further disaggregation was undertaken, on the grounds that the distinction between physical training and trade training is less pronounced and less relevant in the IET context than in Regular units. The incidence rate for work/training-related injuries among trainees was 1627 per thousand persons per year.
- 7.3.19 Twenty nine of the 102 cases (28.4%) resulted in time off work. This represents a lost time injury incidence rate of 463 per thousand persons per year.
- 7.3.20 In Tables 46 to 54, characteristics of both the incident and the injury are crosstabulated against the two categories of the first activity field, for all 147 cases. In these tables asterisked entries at the head of the list indicate that in some data records the field was left blank or coded “Not applicable”. The order of the tables progresses from the venue, through conditions, activities and causes to body location, diagnosis and severity. Because a number of these tables are quite lengthy, and the total number of cases is quite small, percentages have been omitted to improve readability. Tables including percentages have been provided to the Defence PES Project Office in electronic form as SPSS output files.

Results from the School of Infantry

- 7.3.21 Apart from the generic “Singleton Military Area”, the most commonly reported sites or “venues” (Table 46) were bush/scrub and obstacle course, followed by PT area – Oval and external sports grounds. Conditions (Table 47) were most often dry, and surface conditions (Table 48) were frequently reported as rough or slippery. It should be noted that the condition categories are not mutually exclusive, and it is not known what order of precedence was applied.



- 7.3.22 There was a substantial number of “not applicable” entries in the venue and condition fields. DIPP staff advise that these assignments are often made when the cause is overuse, and the injury cannot be associated with one particular incident or venue. The frequent occurrence of “not applicable” entries for this sort of data is consistent with the experience of the research team in other injury surveillance projects.
- 7.3.23 The two more detailed activity fields (Tables 49 and 50) were not always clearly distinguished in the reports, with running and marching in particular occurring frequently in both. DHSB staff report that if no more detailed information was available, the same descriptor was frequently used in both fields. The most frequently reported activities were running, jogging, marching, obstacle course, fire and movement, general PT, and jumping/landing.
- 7.3.24 The most commonly reported causes of injury (Table 51) were stepping in holes/gutters/uneven ground, followed by overuse (gradual onset/not traumatic) and falls on the same level. Stepping and falling injuries are consistent with heavy load carriage under fatiguing conditions. There were also a substantial number of reports of aggravation of previous injuries.
- 7.3.25 Consistent with the predominant causes, the most frequently reported bodily location of injury (Table 52) was the knee joint, followed by lower leg and ankle, followed in turn by lower back. The predominant diagnoses (Table 53) were ligament/tendon sprain or tear, and muscle strain. The great majority of the injuries were diagnosed (Table 54) as being of low severity (requiring no further treatment) or mild severity (requiring 1-3 further treatments).

Table 46. School of Infantry Injury Presentations: by Venue and Activity Category

Count		ACTIV1		Total
		Army training	Normal duties	
VENUE	* No data entered	4	0	4
	* Not applicable	16	2	18
	BAC	2	0	2
	Bitumen road	1	0	1
	Bush / scrub	14	0	14
	Challenge Route	3	0	3
	Dirt road / track	1	0	1
	Drill square	1	0	1
	External area and barracks	2	0	2
	External Sports Grounds	7	0	7
	Field Firing	2	0	2
	Field training area	5	0	5
	Gym	1	0	1
	Gym- grassed area	1	0	1
	Gym-ropes	2	0	2
	Obstacle Course	11	0	11
	Parade Ground	1	0	1
	Park / Grassed Area	1	0	1
	Pool	1	0	1
	PT area- Oval	8	0	8
	Range	1	0	1
	RDJ	4	0	4
	Singleton Military Area	12	4	16
	Unknown	2	0	2
Total		103	6	109



Table 47. School of Infantry Injury Presentations: by Conditions and Activity Category

Count		ACTIV1		Total
		Army training	Normal duties	
CONDITIO	* Not applicable	49	4	53
	Cold	11	1	12
	Dry	30	1	31
	Dusty	1	0	1
	Hot	2	0	2
	Wet	7	0	7
	Windy	3	0	3
Total		103	6	109

Table 48. School of Infantry Injury Presentations: by Surface and Activity Category

Count		ACTIV1		Total
		Army training	Normal duties	
SURFACE	* Not applicable	32	5	37
	Long Grass	1	0	1
	OK	28	1	29
	Rocky	5	0	5
	Rough	26	0	26
	Slippery	11	0	11
Total		103	6	109

Table 49. School of Infantry Injury Presentations: by Activity and Activity Category

Count		ACTIV1		Total
		Army training	Normal duties	
ACTIV2	* No data entered	3	0	3
	* Not applicable	9	1	10
	10km march & stretcher	2	0	2
	15 km CFA	3	0	3
	2.4km run	1	0	1
	6km march	3	0	3
	8km march/ intro stretcher	2	0	2
	BAC	2	0	2
	Basketball	1	0	1
	Battle PT	1	0	1
	Challenge (ARTC)	2	0	2
	Circuit training	1	0	1
	Cross-country running	1	0	1
	Execise	1	0	1
	Fieldcraft	2	0	2
	fire & movement	14	0	14
	General PT	7	0	7
	Hard Corps	4	0	4
	Interval Training	2	0	2
	Marching	9	0	9
	Obstacle Course	11	0	11
	Other non-physical	0	1	1
	PUSHUPS	1	0	1
	RDJ	4	0	4
	Ropes	4	1	5
	Rugby Union	1	0	1
	Running / Jogging	10	2	12
	Swimming	1	0	1
	Touch Football	1	0	1
	Walking	0	1	1
Total		103	6	109



Table 50. School of Infantry Injury Presentations: by Specific Action and Activity Category

Count		ACTIV1		Total
		Army training	Normal duties	
ACTIV3	* No data entered	13	1	14
	* Not applicable	13	1	14
	Carrying	1	1	2
	Climb / descend rope	1	0	1
	Climbing	1	0	1
	Cutting	1	0	1
	Going to ground	5	0	5
	Gradual onset	1	0	1
	Heaves / chinups	1	0	1
	Jumping / landing	8	0	8
	Leopard crawl	1	0	1
	Marching	17	0	17
	Overuse - Lower limb	1	0	1
	Pushups	1	0	1
	RDJ	1	0	1
	Running	29	2	31
	Situps	1	0	1
	Swimming	1	0	1
	Twisting / turning	4	0	4
	Walking	2	1	3
Total		103	6	109

Table 51. School of Infantry Injury Presentations: by Mechanism and Activity Category

Count		ACTIV1		Total
		Army training	Normal duties	
CAUSE	* No data entered	23	1	24
	Aggravation of previous injury	12	0	12
	Collision with fixed object	1	0	1
	Fall from height	6	0	6
	Fall on same level	11	1	12
	Other	10	0	10
	Overexertion	8	0	8
	Overuse (gradual onset/not traumatic)	13	1	14
	Stepped in hole/gutter/uneven ground	14	2	16
	Struck by object	5	1	6
Total		103	6	109



Table 52. School of Infantry Injury Presentations: by Body Part and Activity Category

Count		ACTIV1		Total
		Army training	Normal duties	
BODYPART	* No data entered	11	2	13
	Abdomen - ST	3	0	3
	Acromioclavicular (AC) joint	2	0	2
	Ankle joint	13	2	15
	Bones of feet / toes	1	0	1
	Clavicle	1	0	1
	Elbow joint	2	0	2
	Foot - ST	4	0	4
	Genitalia	1	0	1
	Groin - ST	2	0	2
	Hand - ST	3	0	3
	HEAD - ST	1	0	1
	Knee joint	27	0	27
	Lower arm - ST	2	0	2
	Lower back - ST	8	0	8
	Lower leg - ST	15	1	16
	Lower leg- Ant ST	1	0	1
	Lower leg-post ST	1	0	1
	Mandible (jaw)	1	1	2
	Patella	2	0	2
	Upper arm - ST	2	0	2
Total		103	6	109

Table 53. School of Infantry Injury Presentations: by Diagnosis and Activity Category

Count		ACTIV1		Total
		Army training	Normal duties	
DIAGNOS	* No data entered	25	2	27
	Abrasion	2	0	2
	Blister	1	1	2
	Burn	1	0	1
	Bursitis	2	0	2
	Chafing	1	0	1
	Compartment Syndrome	3	0	3
	Concussion	1	0	1
	Fracture	0	1	1
	Laceration	5	1	6
	Ligament / Tendon sprain or tear	18	1	19
	Meniscus tear	1	0	1
	Muscle strain	18	0	18
	non-specific low back pain	4	0	4
	Nonspecific soft-tissue injury	7	0	7
	Patellofemoral Pain / Chondromalacia Patella	3	0	3
	Rupture	1	0	1
	Stress fracture	6	0	6
	Stress related changes	1	0	1
	Tendonitis	3	0	3
Total		103	6	109



Table 54. School of Infantry Injury Presentations: by Severity and Activity Category

		ACTIV1		Total
		Army training	Normal duties	
SEVERITY	* No data entered	9	1	10
	Severe (6+ treatments/referred to hospital)	2	0	2
	Moderate (3-6 further treatments)	20	0	20
	Mild (1-3 further treatments)	34	2	36
	No further treatment needed	38	3	41
Total		103	6	109

7.3.26 As was done with Defcare data (see paragraph 5.3.25), in order to explore the characteristics of those incidents which led to more serious injuries, the 41 “no further treatment needed” incidents (Table 54) were omitted, and a set of tables similar to Tables 46 to 53 were produced based on only the 58 incidents which resulted in more serious injury.

7.3.27 As was found with Defcare data, the profiles of these “more serious injury incidents” with regard to the various characteristics of both the incident and the injury were very similar to the profiles based on all injuries (Tables 46 to 53 and paragraphs 7.3.20 to 7.3.23). These “more serious injury incidents” tables have not been included in the report.

Comparison of Data from East Timor and the School of Infantry

7.3.28 There are many similarities in the patterns described above in the data from SOI and East Timor. The most noticeable differences are:

- The reported venues and activity settings exhibit the sorts of differences to be expected between a training establishment and an operational area.
- There were far more knee injuries and far fewer spinal injuries reported at SOI than in East Timor.
- There was a much lower proportion of minor injuries reported in East Timor than at SOI. This is to be expected since, as has been discussed (paragraph 7.3.4), the Timor data were selective whereas the SOI data were more comprehensive.

7.3.29 DIPP staff advise that the differences in the patterns of injury for SOI and East Timor are as expected. In East Timor vehicle and plant drivers/operators/occupants presented with many of the back injuries, which were caused by the rough terrain throwing them around in the vehicles/plant. Also in East Timor there would have been a much greater level of lifting/carrying tasks than at SOI, sometimes in a fatigued state. SOI, on the other hand, necessarily involves high levels of lower-limb activity, and so tends to be associated with a higher proportion of lower limb injuries.

7.3.30 The estimated injury incidence rates for SOI and East Timor are compared and discussed in Section 8.



8 COMPARISONS AND EVALUATIONS

8.1 Defence Injury Databases

- 8.1.1 Data about ADF injuries can be found in three centrally administered systems: Defcare (OHSCB), EpiTrack (DHSB) and DIPP (DHSB). The following comments are based primarily on an examination of data pertaining to Infantry and ADG units.
- 8.1.2 The Defcare database is the primary Defence occupational health and safety (OHS) database, and the main repository of injury/incident reports. Defcare contains information about individual incidents and injuries including characteristics of the injured persons, the incidents and the outcomes. Nominally, its coverage has been global since 1998, but in fact the reporting rate is low, there are many gaps in existing data records and there are many data quality issues relating to the database structure, the incident reporting form, the classification and coding scheme, and to policies and practices regarding reporting, data coding and data management throughout the history of the database.
- 8.1.3 EpiTrack is primarily health focused rather than injury focused. As its name suggests, it is an epidemiological database/system where the primary function is to monitor disease and to detect clusters or outbreaks. The monitoring of injury has been incorporated as an extra feature in response to particular issues that have arisen. The information about injuries has a narrower scope and is much less detailed than in Defcare, and is only available in the form of weekly aggregate data for ADF units, rather than for individual incidents or injuries. Like Defcare, there are some data quality issues with EpiTrack relating to classification and coding protocols. When and where reporting has occurred, the coverage has been more complete than Defcare, since reports are submitted by responsible officers in unit health facilities rather than by injured individuals or their supervisors. However, EpiTrack has been limited to Regular units, reporting periods have been intermittent for all units involved, and for many units, involvement in EpiTrack has only commenced quite recently.
- 8.1.4 The surveillance aspect of the DIPP program is the most recent development in injury monitoring in the ADF. DIPP data combine the best features of both Defcare and EpiTrack, and in some respects surpasses both. Data are collected through unit health facilities, as with EpiTrack, but is based on individual incidents/injuries, as with Defcare. The data include a comprehensive range of characteristics of the injured persons, the incidents and the outcomes. The classification and coding schemes are the subject of continuing development, with a view to characterising incidents in ways that can better support and facilitate injury prevention activities in the military context. However to date, DIPP has only been implemented in a few locations for relatively short periods. That is about to change, with implementation currently taking place throughout 3 Brigade.

8.2 Comparison of Reported Injury Rates

Injury Incidence Rates

- 8.2.1 Injury incidence rates calculated from Defcare, EpiTrack and DIPP data are summarised in Table 55.
- 8.2.2 In much of the published research in this and related fields, injury occurrence is quantified in terms of cumulative incidence (% of subjects who sustain injuries during a particular period) rather than injury incidence rates. Measurement of cumulative incidence requires the identification of individual cases, which for ethical and practical reasons is not feasible when retrospectively analysing injury reporting databases.



8.2.3 Calculation of injury incidence rates, as in this report, does not require identification of individual cases. Two studies of military populations in which incidence rates have been reported are those undertaken by Knapik et al. (1993) and Knapik et al. (1999). Knapik et al. (1993) examined injuries in a volunteer cohort of 298 male soldiers assigned to an Infantry battalion in Alaska. The injury incidence rate, based on a retrospective analysis of medical records for a 6-month period, was 1420 injuries per thousand persons per year. Knapik et al. (1999) examined injuries to 230 of 249 senior¹ US Army officers attending the US Army War College during the 1999 academic year. The injury incidence rate, based on a retrospective analysis of medical records for a 12-month period, was reported as 7.3 injuries per hundred persons per month, which equates to 876 injuries per thousand persons per year. These figures are included in Table 55 for comparison.²

Table 55. Injury Reporting Rates

Paragraph/Reference	Data Source	Population	Duration	Scope	Incidence Rate ¹
5.4.6	Defcare	All Regular	1 year (2002-2003)	All injuries	114
5.4.10		Infantry units	6 years (1998-2003)	All injuries	109
5.4.6	Defcare	ADG units	1 year (2002-2003)	All injuries	87
5.4.10			6 years (1998-2003)	All injuries	35
5.4.6	Defcare	School of Infantry	1 year (2002-2003)	All injuries	203
6.4.3	EpiTrack	All Regular	Intermittent	All injuries	1614
6.4.5		Infantry units	(2001-2004)		(1552 ²)
8.2.5	EpiTrack	1 RAR East Timor	31 weeks (2001-2003)	All injuries	2642 (1509 ²)
7.3.3	DIPP	2 RAR East Timor	26 weeks (2002-2003)	Physiotherapy presentations All injuries (conjectural)	319 1276
7.3.13	DIPP	Staff and trainees at School of Infantry	26 weeks (2001)	All injuries	1110
7.3.15	DIPP	Trainees at School of Infantry	26 weeks (2001)	All injuries	2138
Knapik et al., 1993		One US Army battalion	6 months	All injuries	1420
Knapik et al., 1999		US Army War College	1 year	All injuries	876

¹ Estimated rate per thousand persons per year.

² After adjustment by omission of data from 1 RAR for the month of May 2003. Refer to paragraph 6.4.5.

¹ The term "senior" is assumed to have been used in the American college student sense i.e. final year undergraduate.

² Incidence rates in two populations are usually compared by calculating an *incidence rate ratio*. This is often regarded as an estimate of the *relative risk* of injury in the two populations being compared. These two terms have not been used here, and nor have the ratios been explicitly calculated, for two reasons. Firstly, a number of the entries in Table 55 relate to different measures based on either the same population or two overlapping populations, and so in many cases the comparison is not between two distinct populations. Secondly, the measures are all reporting rates; any differences in actual risk of injury between different groups is confounded by the demonstrated differences in reporting rates for the different databases, and also by possible differences in reporting rates in different organisational contexts.



- 8.2.4 The overall injury incidence rate estimated from EpiTrack data from all Regular Infantry units is 1614 per thousand persons per year, or 1552 if what are considered to be artificially inflated rates for 1 RAR for the Month of May 2003 are excluded (see paragraph 6.4.5).
- 8.2.5 DIPP and EpiTrack data from East Timor relate to different periods and different units:
- DIPP: 2 RAR 2/11/02 -30/4/03
(26 Weeks)
 - EpiTrack: 1 RAR 26/1/01-1/2/01, 5/3/01-15/4/01, 12/5/03-26/10/03
(1+6+24 =31 weeks).

Nevertheless, the two periods are of similar duration and from the same operational area and presumably similar conditions were involved. The rate for DIPP is 319 physiotherapy centre presentations per thousand persons per year, which is estimated by DIPP staff to represent 1276 per thousand persons per year for all injuries (see paragraph 7.3.5). The comparative figure for EpiTrack is 2642, or 1509 if what are considered to be artificially inflated rates for the Month of May 2003 are excluded (see paragraph 6.4.5). These two rates, 1276 and 1509, the overall Regular Infantry rate of 1552, and the figure of 1420 derived from the data of Knapik et al. (1993) for a US Army battalion, are all of a similar order of magnitude.

- 8.2.6 In contrast, the average rates calculated from Defcare data are around 100 incident reports per thousand persons per year for Infantry, and even lower for ADG. These rates are less than one twelfth of the EpiTrack, DIPP and Knapik rates. Furthermore, Defcare includes some reports relating to occupationally related disease whereas the EpiTrack and DIPP rates relate specifically to physical injury. It is interesting to note that a recent Canadian report (Chief Review Services, Department of National Defence, 2003) cited an estimated reporting rate of 10-15% of all incidents for DSMA. This figure was presumably based on advice from DSMA. However, the foregoing analysis indicates that the Defcare reporting rate in Infantry units is around one twelfth of the rate calculated from DIPP data and around one fifteenth of the rate calculated from EpiTrack data, which implies that only 7-9% of all injuries are reported to Defcare.
- 8.2.7 The estimated all injury rates for the School of Infantry were almost twice the average rates for Infantry units in general. This was the case for rates based on DIPP data for trainees (2138 vs 1276) and on Defcare data (203 vs 114). In the latter case, only a definite three and a possible six of the total of 65 reports related to staff, and the remaining 59 to 62 cases related to trainees. This congruence suggests that, whilst the injury rate among trainees at SOI was twice the average for Infantry units, the rate of reporting to Defcare was similar at SOI to the average for Infantry units.

Lost Time Injury Incidence Rates

- 8.2.8 Injury incidence rates in civilian industries are only readily available for lost time injuries. We have seen that there is some ambiguity regarding the interpretation of blank lost time entries in Defcare (see paragraphs 5.1.9 and 5.2.14). However, if we take Defcare reports at face value, and further, if we assume that, notwithstanding the general evidence of under-reporting in Defcare, there is no under-reporting of lost time injuries i.e. that all lost time injuries are reported to Defcare, then the lost time injury incidence rate can be estimated by multiplying the Defcare rate of 109 (Table 55) by the proportion of lost time injury reports in Defcare (22.6%). This results in an estimated incidence rate of around 25 per thousand persons per year (Table 56), which compares favourably with national incidence rates for lost time injury compensation claims in a range of comparable industrial sectors, listed in Table 57 (NOHSC, 2004). However the comparison may not be a valid one. The assumption that injuries which would lead to lost time compensation claims in civilian industrial contexts would necessarily result in lost time in the very different operational and cultural environment of the ADF, and would be reported as such, is perhaps a rash one.



- 8.2.9 A similar calculation based on the proportion of Defcare reports in the categories of “death”, “serious personal injury” or “incapacity” (31.6% - see Table 21), results in an estimated incidence rate of around 34 per thousand persons per year (Table 56).
- 8.2.10 The lost time injury compensation claim incidence rate of 20 for Government Administration and Defence, also included in Table 57, is somewhat lower than the Defcare rate of 25. On the face of it, this would appear to make sense, since the Defence rate would presumably be higher than other areas of Government Administration.¹ However, ADF compensation claims lag an average of ten years behind the occurrence of the compensable injury, compared to an average of one month in the civilian sector (Reference Document D, paragraph 1.95), and so the ADF claims for a particular year in the main relate to injuries sustained much earlier.
- 8.2.11 Another approach would be to explore the relationship between the incidence of lost time injuries and the incidence of all injuries. Unfortunately, contemporary data of this sort are held only in the confidential corporate databases of individual organisations, and are not freely available. However, in his early and influential work in industrial accident prevention, Heinrich (1959) estimated that 1 in every 30 injury incidents results in “serious” injury. As a first approximation, if we apply this proportion to the EpiTrack and DIPP rates of 1200-1500 injuries per thousand person years in Regular units, we get estimated rates of 40-50 “serious” injuries per thousand person years (Table 56), which is comparable with the most of the lost time incidence rates in Table 57. Applying the “Heinrich proportion” to the DIPP rate for trainees at SOI, we get an estimated rate of 99 “serious” injuries per thousand person years (Table 56).
- 8.2.12 Lost time injury rates can also be calculated directly from DIPP data. The figure of 65 lost time injuries per thousand persons per year for East Timor (Table 56) is some 50% higher than the “Heinrich proportion” would indicate. For trainees at SOI, the figure is 463 lost time injuries per thousand persons per year, a factor of almost six and a half times the “Heinrich proportion” estimate, as a result of the fact that over one in five injuries reported at SOI resulted in lost time. Whilst the DIPP data sets are relatively small, these differences are too large to be attributed to sampling error.

Table 56. Lost Time Injury Incidence Rates: ADF¹

Data source	Basis	Lost time/serious injury incidence rate (per thousand persons per year)
Defcare	Direct	25
Defcare	Serious injuries	34
EpiTrack	Heinrich proportion ¹	52
DIPP East Timor	Heinrich proportion ¹	43
DIPP East Timor	Direct	65
DIPP SOI trainees	Heinrich proportion ¹	71
DIPP SOI trainees	Direct	463

¹ Heinrich (1959)*Table 57. Lost Time Injury Incidence Rates 2001: Selected Australian Industries*

Industry	Lost time injury and disease claim incidence rate (per thousand employees)
Agriculture Forestry and Fishing	37.9
Construction	46.8
Government Administration and Defence	20.0
Manufacturing	49.4
Mining	48.5
Transport and Storage	48.8
<i>All industries</i>	28.3

Source NOHSC (2004)

¹ The lost time injury compensation claim incidence rate for the ADF in 1997-98 was 44.2 (Reference Document D, paragraph 1.104)

- 8.2.13 In summary, it can be said that Defcare data quality and coverage is not adequate to enable definitive and meaningful comparisons between lost time injury incidence rates in Infantry and ADG, and those in comparable civilian industries. However, based on DIPP data, the estimated lost time injury incidence rate in 2 RAR in East Timor in 2002-2003 was some 50% higher than in comparable civilian industries in 2001. Furthermore, the estimated lost time injury incidence rate for trainees at the School of Infantry during 2001 was around seven times as high as that for 2 RAR in East Timor in 2002-2003.

8.3 Summary: Comparison of Defence Injury Databases

- 8.3.1 Various characteristics of the three databases are summarised in Table 58. Clearly, Defcare is in many respects the largest and most comprehensive repository, but it is clear from Section 8.2 that it suffers severely from under-reporting.
- 8.3.2 Defcare also has a number of data quality problems (see Sections 5.1 and 5.2). Some of these have a long history, and have been exacerbated by organizational changes and their legacies, and by changes in database protocols over time.
- 8.3.3 Both EpiTrack and DIPP databases are less comprehensive in scope, both temporally and organizationally, are more narrowly focused, and do not rely on reporting by individual injured persons and their supervisors. As a result, there are fewer data quality problems, though some quality issues have been identified in this report. Table 58 shows that overall, DIPP data has the best characteristics of the three data sets, for reasons which have been outlined in paragraph 8.1.4.

Table 58. Characteristics of Defence Injury Databases

Aspect	Defcare	EpiTrack	DIPP
General			
Agency	OHSCB	DHSB	DHSB
Purpose	OHS Management	Health monitoring	Injury prevention
Status	Mandatory	Mandatory (recent)	Developmental
Data source	Self report (AC563)	Health facilities	Health facilities
Data Quantity			
Extent of database	Large	Medium	Small
Organisational scope	Comprehensive	Selective	Specific
Temporal scope	Long	Medium	Short
Temporal coverage	Comprehensive	Intermittent	Selected periods
Reporting unit	Individual casualty	Organisational unit	Individual casualty
Reporting rate	Low	High	High
Data Quality			
Reporting bias	Severity bias likely	No apparent bias	Known bias (E. Timor)
Completeness of reports	Poor	Good	Good
Data scope	Known limitations	Limited by aggregation	Good
Structural problems	Known problems	Problems identified	No problems
Coding quality	Known problems	Problems indicated	Problems identified

8.4 Linking Injuries in Infantry and ADG Units to Combat Arms Trades Tasks

- 8.4.1 The central aim of this report was to investigate the usefulness of existing data for the purposes of the DPESP. The issue is the extent to which the incidence of injuries of various types can be linked to the performance of various work tasks and in particular to combat arms trades tasks (CATTs), or at least to categories of activity which can be associated with particular tasks. Such a set of categories has been developed during the first phase of the PES study, and reported in *DPESP Report No 1: Selection of Key Trade Tasks for Detailed Observation* (Reference Document C).



- 8.4.2 EpiTrack data are of little use for this purpose. As the analysis of Sections 6.3 and 6.4 has shown, injury rates can be calculated for disorders of the knee, disorders of the back, other musculo-skeletal disorders, and for “injuries due to military training”, but even the relativities between these categories are difficult to interpret because of ambiguities in coding procedures. There is no further information about activities, mechanisms or agencies, and no information about individual incidents/injuries.
- 8.4.3 Defcare data are the most comprehensive in temporal and organisational coverage, and of a similar level of detail as DIPP data with regard to characteristics of injured persons and injury incidents. The analyses of Section 5.3 (especially Tables 22-27 and paragraphs 5.3.19 to 5.3.24) have enabled broad identification of the predominant activities, mechanisms, agencies, bodily locations and types of injury. There are no surprises in the broad profiles of these characteristics. They confirm the patterns of injury risk previously identified by subject matter experts and reported in *DPESP Report No 1: Selection of Key Trade Tasks for Detailed Observation* (Reference Document C). However, the combination of a classification and coding scheme designed for civilian compensation and the coding difficulties that have been experienced over time make it difficult to link these details in any meaningful and informative way to particular trade task activities, and hence to add anything concrete to our knowledge about injury causation.
- 8.4.4 DIPP data are available only for two slices of limited temporal and organisational scope, one of which is further limited to a particular class of injuries. The characteristics of these incidents have been summarised in Section 7.3. Whilst the classification scheme is more informative than that of Defcare, it still falls short of providing the desired linkage between injuries and the performance of particular CATTs, or to categories of activity which can be associated with particular CATTs.



9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

9.1.1 Existing ADF incident/injury data sources are of limited usefulness for supporting the objectives of the DPESP.

9.1.2 The following observations about data system design, implementation and usage are incidental to the central objectives of this report for the purposes of the DPESP. They are presented for consideration by the wider Defence community.

- a. Better integration of the three ADF health and safety databases/systems would reduce duplication of effort and gaps in coverage.
- b. To encourage compliance with reporting mandates and accurate reporting, forms and protocols (paper or electronic) should conform to established design principles with regard to clarity, flow and the absence of ambiguities and internal inconsistencies.
- c. To encourage the use of incident/injury data for management purposes, database structures and coding protocols should be reviewed with a view to providing relevant analytic capabilities and meeting the requirements of end users.
- d. In particular, to enhance the capacity of injury/incident data to support Injury prevention activities, further development should be undertaken into classification and coding of information about activities in ways which are relevant in the ADF context. In electronic reporting/coding systems, trade-specific drop-down lists of detailed categories are feasible.
- e. With the increasing availability of computer software for qualitative text analysis, a future complement to classification and coding might be the electronic storage of full-text incident narratives, and the provision of capabilities for individuals to directly interrogate and analyse the narratives for management and research purposes.
- f. Regardless of whether they are to be coded or analysed qualitatively, the quality and comprehensiveness of narratives is crucial. In an electronic reporting environment these might be improved by the provision of a wider range of contextually-specific and perhaps more detailed model narratives than the abbreviated examples on the current AC563 form.
- g. Notwithstanding issues specific to the ADF context, in reviewing classification and coding systems, the extent to which these systems can be aligned with existing civilian systems and minimum datasets should be considered. This would facilitate comparison of ADF with civilian industry benchmarks. Civilian systems and minimum datasets also provide guidance on how to structure text narratives for injury prevention purposes.

9.2 Recommendations for the DPES Project

9.2.1 Because of the limited usefulness of existing ADF incident/injury data sources for supporting the objectives of the DPESP, the planned supplementary collection of injury data, in the form of a large scale retrospective sample survey of Infantry and ADG personnel, should proceed.¹

9.2.2 The retrospective survey should include a strong focus on the activity being undertaken at the time each injury occurred, with particular reference to CATT-related activity categories.

¹ The retrospective survey took place during June 2004, and will be the subject of a later report in this series.



REFERENCES

- Australian Bureau of Statistics. (1999). *An Introduction to Sample Surveys: A User's Guide*. Cat. No.1299.0, ABS, Canberra.
- Australian Institute of Health and Welfare 2003. *Injury Surveillance National Minimum Data Set. National Health Data Dictionary. Version 12*. AIHW Cat. No. HWI 57. Canberra: Australian Institute of Health and Welfare.
- Chief Review Services, Department of National Defence, Canada. (2003). *Program Evaluation: The DND/CF General Safety Program. Final Report*. October 2003. Annex E. Retrieved from www.dnd.ca/crs/pdfs/gsaftp_e.pdf on July 29, 2004.
- Culvenor, J., Cowley, S. and Harvey, J. (2003). Impact of training health and safety representatives on concepts of accident causation and prevention. *J. Occ. Health and Safety Aust. & NZ*, 19(3): 279-292.
- Department of Defense Injury Surveillance and Prevention Work Group, (1999). *Atlas of Injuries in the U.S. Armed Forces*, Supplement to *Military Medicine*, 164 (8).
- Finch, C., Ozanne-Smith, J. and Williams, F. (1995). *The Feasibility of Improved Data Collection Methodologies for Sports Injuries: Summary Report*. Monash University Accident Research Centre.
- Frazer, L. and Lawley, M. (2000). *Questionnaire Design and Administration: a Practical Guide*. Brisbane: John Wiley & Sons.
- Heinrich, H.W. (1959). *Industrial Accident Prevention*. 4th ed. New York: McGraw-Hill.
- Hicks, C.M. (1995). *Research for Physiotherapists: Project Design and Analysis*. Edinburgh; New York: Churchill Livingstone.
- Knapik, J., Ang, P., Reynolds, K. and Jones, B. (1993). Physical fitness, age, and injury incidence in infantry soldiers. *Aviation, Space and Environmental Medicine*, 35(6): 598-603.
- Knapik, J.J., Canham-Chervak, M.L., McCollam, R., Craig, S. and Hoedebecke, E. (1999). *An Investigation of Injuries Among Officers Attending the US Army War College During Academic Year 1999*. Army Center for Health Promotion and Preventative Medicine. Report number A684173.
- National Occupational Health and Safety Commission. (1999). *Type of Occurrence Classification System (TOOCS)*, 2nd Edition, NOHSC, Sydney.
- National Occupational Health and Safety Commission (2004). *NOHSC Online Statistics Interactive (NOSI) Databases*. Retrieved June 4, 2004 from the World Wide Web: <http://www.nohsc.gov.au/OHSInformation/NOSI/>
- North Atlantic Treaty Organisation (NATO). (1989). *Standardization Agreement on Statistical Classification of Diseases, Injuries, and Causes of Death (STANAG 2050)*, NATO Forces Supplement to ICD, 1962 revised 1989.
- Standards Australia. (1990). *Workplace Injury and Disease Recording Standard, AS 1885.1-1990*, Standards Australia, Homebush.
- U.S. National Library of Medicine. (2004). *Medline Plus Medical Dictionary*. Retrieved June 28, 2004 from the World Wide Web: www.mayoclinic.com.au/tools/Dictionary.asp
- Viner, D., Harvey, J. and Borys, D. (2003). A critical evaluation of the Australian Accident Classification Standard, *Safety in Australia*, 25 (2): 27-37.



WHO Working Group on Injury Surveillance Methods. (2003). *International Classification of External Causes of Injuries (ICECI): Data Dictionary, version 1.1a*. Consumer Safety Institute, Amsterdam and AIHW National Injury Surveillance Unit, Adelaide.

World Health Organisation (WHO). (1975). *International Classification of Diseases, ninth revision (ICD-9)*, WHO, Geneva.

World Health Organisation (WHO). (1992). *International Classification of Diseases and Related Health Problems, tenth revision (ICD-10)*, WHO, Geneva.





ANNEXES



Annex 1. Key Informants

1. Defence Safety Management Agency / Occupational Health Safety and Compensation Branch¹

1.1 Initial briefing

UB personnel

Dr John Culvenor
Dr Jack Harvey
Dr Leonie Otago
Professor Warren Payne
Dr Bob Stacy

Key DSMA/OHSCB personnel

Mr Tony Mitchell, DSMA, Director Policy and Programs
Ms Bronwyn Peisley, DSMA, Director Safety Information and Management
Mr Dean Stanton, OHSC Management Information, Safety Information Management Unit

1.2 Provision of data and associated information

Mr Dean Stanton, OHSC Management Information, Safety Information Management Unit
Mr Brian Handreck, OHSC Management Information, Manager Defcare Reporting

2. Defence Health Service Branch

2.1 Initial briefing

UB personnel as for DSMA/OHSCB briefing

Key DHSB personnel

Air Commodore Tony Austin, Director General Defence Health Service
Colonel Steve Rudzki, Director Preventative Health
Dr Rodney Pope, Co-ordinator, Defence Injury Prevention Program

2.2 Provision of data and associated information

Dr Rodney Pope, Project Director, Defence Injury Prevention Program (DIPP databases)
Lieutenant Commander Peter Schilling, Directorate of Preventative Health (EpiTrack database)
Lieutenant Ricky Su, 1 HSB (1 HSB database)

3. Other informants

Mr Mike Power, Directorate of Strategic Personnel Planning and Research (Regular Infantry and AFDW populations)
Warrant Officer Class Two Rick Lovelock, Headquarters Training Command - Army (IET throughput data)
Major Wendy Farnham, Headquarters Army Finance Service Unit (Army Reserve days data)
Mr John Mathieson, Defence PES Project Office (Infantry unit establishment data, occupations and ranks)
Major Brett de Masson, Army Personnel (Infantry occupations, ranks, worksites, activity descriptions)
Flight Lieutenant Harvey Reynolds, 1 AFDS (ADG units, occupations, ranks)
Flight Lieutenant Ian Ackland, HQAFW (AFDW unit establishment data)

¹ During the course of this study, responsibility for the Defcare database was transferred from DSMA to the Management Information Directorate within the Occupational Health Safety and Compensation Branch (OHSCB). To preserve the historical accuracy of the description of consultations, the term DSMA is used in some places in Sections 1 to 3 of this report. Otherwise the term OHSCB is used.



Annex 2. Form AC563 Incident and Fatality Report

See file *ac563.pdf*



AC 563
Revised Dec 2003

Incident and Fatality Report

This form is to be completed and processed as a high priority

DO NOT FAX THIS PAGE TO DSMA

All Occupational Health and Safety (OHS) incidents caused by work-related employment in Defence, or as a result of a Defence undertaking, are to be reported using this form. This includes OHS incidents for all Defence employees, cadets, and third parties (contractors and general public). The Defence Safety Management Agency (DSMA) collect data on this form under the *Occupational Health and Safety (Commonwealth Employment) Act 1991* and the *Australian Radiation Protection and Nuclear Safety Act 1998*. Personal information provided on this form is protected by the *Privacy Act 1988*. For assistance in completing this form, see your supervisor or contact DSMA (see below).

Form completion

The supervisor of the person involved is responsible for ensuring that Parts 1 and 2 are completed (with signatures) and distributed within the prescribed timeframes as detailed below. Where more than one person is injured, a separate form must be completed for each person. Where exposures do not result in an immediate injury or disease (eg noise or asbestos), and multiple people are involved, attach a separate sheet with the full name, date of birth, PMKeys ID, and service number of each person. If more space is necessary to complete any of the data fields, attach a separate sheet.

General public or contractors

Defence employees (ADF and civilian) are to also complete the AD088 - COMCOVER Notification Record, where an incident involves a member of the general public or a contractor. For further information refer to DEFGRAM 236/2000 or contact Defence Insurance on Ph (03) 9450 7065 or Fax (03) 9450 7054. The AD088 can be found at <http://pubsdb.cbr-dps.defence.gov.au/wfs/>

Compensation claims

Completion of this form is not an admission of liability or a claim for compensation. A copy of the completed form will assist in compensation determinations. Compensation claim forms for military personnel and cadets are obtained from the Department of Veterans Affairs (DVA) on 1300 550 461, and for civilians from the Defence Service Centre on 1800 000 677 or at Civilian Rehabilitation and Compensation (CR&C).

Signals

This form must be completed, even if a DISCON signal (eg FATALCAS or NOTICAS) has been raised.

COMCARE reporting

Chief of the Defence Force (CDF) has declared that COMCARE reporting requirements do not apply if the OHS incident occurred during an:

- ADF operational deployment; or
- ADF deployment in support of the United Nations; or
- organised ADF sporting activity (See DI(G)14-2 for a definition of sport).

Reporting procedure ➔ Type and definition of incident ▼		All incidents report to DSMA			Specific incidents report to COMCARE		Radiation incidents report to ARPANSA	
		By phone	By fax (AC 563 Part 1)	By fax (AC 563 Part 2)	By phone	By fax (AC 563 Part 1)	By phone	By fax (AC 563 Part 1)
FATALITY	Death	Two hours	24 hours	28 days	Two hours	24 hours	Two hours	24 hours
SERIOUS PERSONAL INJURY (SPI)	Emergency treatment provided by a medical practitioner; or, treated at a hospital; or, admitted to hospital.		24 hours	28 days		24 hours	24 hours	24 hours
INCAPACITY (30+ days)	Employee unable to perform work for 30 or more consecutive days or shifts.		24 hours	28 days		24 hours		
INCAPACITY (5-29 days)	Employee unable to perform work for 5-29 consecutive days or shifts.		24 hours	28 days				
DISEASE	Any disease resulting from the person's employment that did not result in a fatality, SPI or incapacity.		28 days	28 days				
MINOR INJURY	Any injury that does not result in an SPI.		28 days	28 days				
EXPOSURE	Exposure to workplace hazards (eg noise or radiation) that did not result in a fatality, SPI or incapacity.		24 hours	28 days		24 hours	24 hours	24 hours
DANGEROUS OCCURRENCE (DO)	'Near miss' incidents that could have, but did not, result in a fatality, incapacity, SPI or actual exposure.		24 hours	28 days		24 hours	24 hours	24 hours

Additional distribution (To take place according to Group Standard Operating Procedures (SOPs) which may include:

<ul style="list-style-type: none"> • Employee (except fatality) and member or employee file (Mandatory) • Supervisor 	<ul style="list-style-type: none"> • Unit Safety Coordinator or Manager • CSIG Regional Coordinator (ROHSCO) 	<ul style="list-style-type: none"> • Command Safety Officer and/or Higher Headquarters • Group Safety Coordinator
--	--	---

Contact details

DSMA		COMCARE		ARPANSA	
24 hour helpline	1800 019 955	24 hour Hotline	1300 366 979	BH phone	02 9545 8329
Primary fax	02 6266 8566	Fax (All states)	1300 305 916	Director, Regulatory Branch	
Alternative fax	02 6266 3868			24 hour phone	02 9432 5384
Web (Intranet)	http://dsma.dcb.defence.gov.au	Web	http://www.comcare.gov.au	Emergency Officer	
Mail	BP-1-A005 Department of Defence CANBERRA ACT 2600			Fax (All states)	02 9545 8348
				Web	http://www.arpansa.gov.au



Incident and Fatality Report

Workplace registration no. (Optional)

- Sections 1 to 10 are to be completed by the supervisor of the person involved, or the person involved, or an appointed representative.

Part 1 – Incident notification

1. Details of person involved

Category (Tick appropriate box)		
Navy <input type="checkbox"/>	Army <input type="checkbox"/>	Air Force <input type="checkbox"/> Reserves <input type="checkbox"/>
ADF cadet <input type="checkbox"/>	Civilian employee <input type="checkbox"/>	Contractor <input type="checkbox"/> General public (visitor) <input type="checkbox"/>
Full name (Family name last)		
Rank or designation	Employee ID	ECN, mustering or occupation
Date of birth	Gender (Tick appropriate box) Male <input type="checkbox"/> Female <input type="checkbox"/>	
Unit or organisation name	Defence Group (eg DPE, IG, Army etc)	
Normal workplace address		
Phone number	Fax number	

2. Date and time the incident occurred

(Or approximate date of first exposure or onset of disease)

Date	Time
------	------

3. What was the result of the incident?

(Tick appropriate box)			
Fatality <input type="checkbox"/>	Incapacity (5 - 29 days) <input type="checkbox"/>	Incapacity (Over 30 days) <input type="checkbox"/>	Serious personal injury <input type="checkbox"/>
Dangerous occurrence <input type="checkbox"/>	Minor incident or injury <input type="checkbox"/>	Disease <input type="checkbox"/>	
Exposure <input type="checkbox"/>	Length of exposure Date from <input type="text"/> Date to <input type="text"/>		

4. Incident treatment details

What level and type of treatment, if any, did the injury(s) or disease(s) require?	
Location: Hospital <input type="checkbox"/> Medical centre <input type="checkbox"/> Aid post or sick bay <input type="checkbox"/> On-the-spot <input type="checkbox"/>	Treated by: Doctor <input type="checkbox"/> Nurse or medic <input type="checkbox"/> First aid attendant <input type="checkbox"/> Other <input type="checkbox"/> Specify <input type="text"/>
Brief description of the most serious injury or disease 	
Tick one or more boxes to indicate the location of the most serious injury or disease: Head <input type="checkbox"/> Neck <input type="checkbox"/> Trunk <input type="checkbox"/> Upper limb <input type="checkbox"/> Lower limb <input type="checkbox"/> Systemic <input type="checkbox"/> Non-physical location <input type="checkbox"/> Multiple locations <input type="checkbox"/> Right side <input type="checkbox"/> Left side <input type="checkbox"/> Front <input type="checkbox"/> Back <input type="checkbox"/>	

5. Duty status at time of the incident (Tick appropriate box)

At your normal workplace <input type="checkbox"/>	Away from normal workplace <input type="checkbox"/>
AND (Tick appropriate box)	
On duty <input type="checkbox"/>	Off duty <input type="checkbox"/>
If the incident was the result of a vehicle accident, when did the incident occur? Road traffic accident at work <input type="checkbox"/> On shift work break <input type="checkbox"/> Authorised absence or normal work break <input type="checkbox"/> Commuting to or from work <input type="checkbox"/> Non work related travel <input type="checkbox"/>	
If a military vehicle was involved, has form AC626 Vehicle Accident Report been completed and forwarded to DSMA? Yes <input type="checkbox"/> No <input type="checkbox"/>	

6. Details of where the incident occurred

(Attach additional pages if required)

At which Defence establishment or other location did the incident occur? (eg overseas, HMAS Albatross Nowra, Robertson Barracks Palmerston NT etc)
Where on the Defence establishment or other location did the incident occur? (eg stores building, guard house, administration office, etc)
In which State or Region did the incident occur? (eg Sth East QLD)

7. Describe how the incident happened (Read all instructions first)

What task was being undertaken at the time? (eg changing vehicle tyre, photocopying, etc)
What machinery, equipment, substances or items (if any) were in use at the time of the incident? (eg GS 110 Land Rover, photocopier, etc)
What specific activity was the person doing at the time of the incident? (eg jacking up the vehicle to change the right hand rear tyre on the side of the highway; trying to remove jammed paper from inside the photocopier)
What went wrong? (eg the jack slipped on the gravel surface, causing the vehicle to fall on my leg; unable to remove jammed paper, burned my hand inside photocopier)

8. Witness(es) details (Attach additional witness details separately)

Full name		
Rank or designation	Employee ID	Phone number
Contact work address		

9. Supervisor's details (Normal workplace supervisor)

Full name		
Signature	Rank or designation	Employee ID
Phone number	Fax number or email address	
Workplace cost centre code (For correct identification of unit)		
Describe what immediate action has been taken, or is proposed, to prevent a similar incident. 		
Has Comcare been notified?	Yes <input type="checkbox"/>	If 'Yes', date <input type="text"/>
	No <input type="checkbox"/>	

10. Details of person completing Part 1

Is the person completing Part 1 any of the following?		
The person in section 1 <input type="checkbox"/>	The supervisor in section 9 <input type="checkbox"/>	Other <input type="checkbox"/>
If 'Other', full name <input type="text"/>		
Rank or designation	Phone number	Fax number

NOTE: Refer to cover page for distribution details

STAFF-IN-CONFIDENCE (After first entry)

Part 2 – Incident report

- Supervisor or appointed representative must complete sections 11 to 17.
- Safety Coordinator or Safety Manager must complete section 18.
- Commander or manager must complete section 19 (A copy of the completed Part 1 is to accompany Part 2 when being processed.)

Details of person involved (Copy from Part 1)

Full name		
Rank or designation	Employee ID	Date of incident or first exposure

11. Treatment centre details

Name and location of the medical facility where the injured person was treated	
Is it a Defence Medical Facility? (Tick appropriate box) Yes <input type="checkbox"/> No <input type="checkbox"/> If 'No', provide referral number and details (ADF members only)	
Date of first treatment	

12. Work time lost details

Was any time lost, or do you expect any time to be lost, from work? (Tick appropriate box) Yes <input type="checkbox"/> No <input type="checkbox"/>	
If 'Yes', how much time was lost or is expected to be lost from work as a result of the incident? (Enter total work days or full shifts in appropriate boxes)	
Hospital	Sick leave
Compensation or convalescence leave	Total
On return to work, was this person employed on light or restricted duties? (Tick appropriate box) Yes <input type="checkbox"/> No <input type="checkbox"/> Has not returned yet <input type="checkbox"/>	
If 'Yes', for how many full days or shifts?	

13. Control of the workplace (Tick appropriate box)

The workplace was controlled by Defence (a Defence controlled workplace may have contractors conducting work under Defence supervision) <input type="checkbox"/>	OR	The workplace was being controlled by a contractor (when a contractor isolates the general area surrounding the work being conducted by the contractor's employees) <input type="checkbox"/>
	OR	Non-Defence workplace eg Running track in National Park <input type="checkbox"/>

14. Injured person's work or task experience

Briefly describe the main (normal) duties performed by the injured person or the person reporting Dangerous Occurrence or exposure.		
Was the activity being supervised? (Tick appropriate box) Yes <input type="checkbox"/> No <input type="checkbox"/>		
If 'Yes', provide the full name of the activity supervisor		
Rank or designation	Phone number	Fax number
What experience, if any, did the injured person have in the task being carried out at the time of the incident? (eg 3 months)		

15. Injured person's work details (At the time of the incident)

What was the injured person's basis of employment?		
Permanent Full-time <input type="checkbox"/>	Permanent Part-time <input type="checkbox"/>	ADF cadet on duty <input type="checkbox"/>
Casual Full-time <input type="checkbox"/>	Casual Part-time <input type="checkbox"/>	
Other eg Visitor <input type="checkbox"/>	If 'Other', specify	
What were the injured person's official hours of duty? (using 24-hour clock)		
Start time	Finish time	
What were the shift arrangements (on the day of the incident)? (Tick appropriate box)		
Up to and including 8 hours <input type="checkbox"/> More than 8 hours <input type="checkbox"/>		

16. Training details

What type of training had the injured person received in the task being undertaken? (Select the boxes which most accurately reflect training conducted)		
Induction <input type="checkbox"/>	Trade <input type="checkbox"/>	Task specific <input type="checkbox"/>
On-the-job <input type="checkbox"/>	Formal course <input type="checkbox"/>	Not applicable <input type="checkbox"/>

17. Remedial actions

What actions have been taken, and/or will need to be taken, to prevent similar incidents?

18. Safety Advisor, Safety Coordinator or Safety Manager's details

Full name		
Rank or designation	Employee ID	Phone number
Fax number or email address		
Signature		Date completed

19. Commander or Manager's details

Full name		
Rank or designation	Employee ID	Phone number
Fax number or email address		
Comments		
What investigations have been completed and/or actions taken?		
Signature		Date completed

NOTE: Refer to cover page for distribution details