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Orr, Rob Marc; Pope, Rodney R

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*Recommended citation(APA):*

Orr, R. M., & Pope, R. R. (2016). *Combat training injuries in Australian Army personnel*. Australasian Military Medicine Association (AMMA) Conference 2016, Melbourne, Australia.

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# Combat Training Injuries in Australian Army Personnel



Rob Orr<sup>1</sup> & Rod Pope<sup>1</sup>

<sup>1</sup>Tactical Research Unit, Bond University



# Background

- Unlike full-time regular soldiers, part-time soldiers (or ‘reservists’) typically have primary employment outside the military and only become full-time soldiers when called upon to participate in training exercises and local or international military operations

(Williams, 2005)



# Background

- With operational deployments increasing, part-time soldiers now contribute to around 10% of Australian and UK forces  
(Smith & Jans, 2011; Dandeker et al., 2011)
- In the US, reservists make up approximately half of personnel actually fighting in current conflicts  
(Moore & Barnett, 2013)



# Background

- Strategically, the ADF Defence White Paper has acknowledged the importance of integrating ARES and ARA personnel under the government approved plan, BEERSHEBA

(Defence White Paper 2013)

- For this reason, the ability of ARES personnel to effectively work and keep pace with their ARA peers, without experiencing excessive numbers of work health and safety incidents or injuries, is vital

(Moore & Barnett, 2013)





# Background

- Despite the importance of this Reserve capability, preliminary research conducted by the ADF in 2000, based on limited data, suggested that part-time ADF personnel were three times more likely to report injuries that had occurred during physical and military training than full-time personnel

(ADF Health Status Report, 2000)



# Background

- The higher rate of injuries in ARES when compared to ARA has been confirmed by recent research

(McDonald, D., Pope, R. & Orr, R., 2016)

Years	ARES	ARA
2012-2013 (1 year)	30.84	16.49
2013-2014 (1 year)	30.19	16.93
2012-2014 (2 years)	30.50	16.72

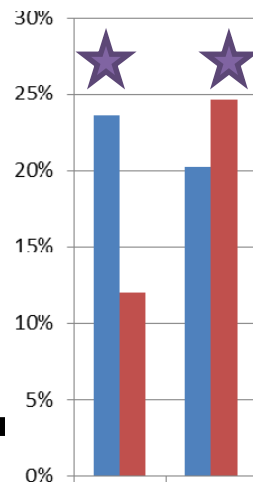
Injuries per 100 person-years of active service



# Background

- In that recent study it was found that while PT injuries were similar between both populations, ARES personnel suffered a higher number of injuries during combat orientated training

(McDonald, D., Pope, R. & Orr, R., 2016)







## Aim

- To further investigate differences in Combat Training Injuries suffered between ARES and ARA personnel

*This research was supported by a grant from the Defence Health Foundation*



# Methods

- Retrospective cohort study, covering 01 Jul 2012 – 30 Jun 2014
- Incident data for ARES & ARA extracted from WHSCAR database by system administrators & made non-identifiable



# Methods

- **Inclusion Criteria:**
  - Incident or injury sustained by Part-time or Full-time personnel during 01 July 2012- 30 June 2014:
  - Member suffered an injury or fatality; and
  - The identified cause of injury met specific inclusion criteria related to combat training (e.g. weapon training, battle PT, etc).
- **Exclusion Criteria:**
  - Foreign defence service on secondment
  - Missing data



# Methods

- Data analysis:
  - Reported combat training-related injury incidence rates were calculated for both ARES and Australian Regular Army (ARA) populations and compared.



## Methods

- Ethics approval from ADHREC (LERP14-024) & BUHREC (RO1907)
- Abstract approved for presentation by JHC (160628)





# Results

**ARES and ARA Population Sizes 2012-2014**

	ARES	ARA	Whole of Army
2012 - 2013	14867	28955	43822
2013 - 2014	15200	29847	45047
Mean pop. 2012-14	15034	29401	44435



## Results

- Of 15,065 WHSCAR reported incidents, 4004 (ARA n=3,292: ARES n= 712) met the data inclusion criteria.
- Overall incidence rate for reported injuries equated to 6.3 combat training-related injuries/100 person-years' service,
  - ARA rate being 5.6 injuries/100 person-years' service
  - ARES rate being 15.1 injuries/100 person-years' service.



## Results

- The leading combat training-related activities to cause injuries were
  - ‘Combat Training’ (44.06%; ARA=42.62%; ARES=50.70%),
  - ‘Physical Training’ (17.68%; ARA=19.96%; ARES=13.34%) and
  - ‘Marching’ (15.61%; ARA=16.25%; ARES=12.64%).



## Results

- ‘Load carriage’ and training for or completing the ‘PESA’ were found to be commonly reported activities being completed at the time of injury in the free-text descriptors







## Results

- Overall, for both populations the leading site of combat training-related injuries was:
  - the ‘knee’ (14.43%; ARA=13.79%; ARES=17.42%)
  - ‘ankle’ (11.14%; ARA=11.15%; ARES=11.10%), and
  - ‘lower back’ (10.09%; ARA=10.69%; ARES=7.30%).





# Results

- The top 3 MOI, whilst the same, varied in presentation.
  - ‘Muscular stress while lifting, carrying, or putting down objects’ (26.50%<sup>1</sup>; ARA=27.88%<sup>1</sup>; ARES=20.08%<sup>2</sup>)
  - ‘Muscular stress with no object being handled’ (19.67%<sup>2</sup>; ARA=19.78%<sup>2</sup>; ARES=15.73%<sup>3</sup>)
  - ‘falls on the same level’ was the leading MOI for ARES (23.46%<sup>1</sup>) whilst being third for ARA (16.40%<sup>3</sup>) and overall (17.66%<sup>3</sup>)



## Discussion

- While the leading activities, sites and nature were generally the same...
  - ARES personnel suffered nearly **3x** times more injuries per 100 full-time equivalent years of active service, during combat orientated training.
- ARES personnel were also more prone to falling as a mechanism of injury as opposed to muscular stressing mechanisms.



## Discussion

- While PT injuries may be similar, ARES personnel are more likely to suffer combat task orientated injuries
- While doing actual combat conditioning and wearing combat loads in public would not be suitable, it is this form of training that is most needed.



## Discussion

- Considering this...
  - ARES personnel may benefit from PT that is combat orientated when presenting for Unit parades as opposed to general PT
  - Supported by research which suggests load carriage should be included at a frequency of 1/7-14 days or injury risk can increase

(Orr et al., 2010; Knapik et al, 2012)





## Concluding remarks

- Given that general PT can be achieved by various means outside of a defence environment and that PT injuries are typically the same between ARA and ARES....
- ARES personnel would benefit from combat focused conditioning whenever presenting for parade or should be encouraged to conduct combat orientated PT (e.g. wearing packs and doing LC on a defence establishment as part of their conditioning)





## Concluding remarks

- More research is needed to distinguish whether differences in fitness exist between ARA and ARES in terms of:
  - General fitness (BFA), and
  - Combat specific fitness (PESA)



# Acknowledgement

- The Defence Health Foundation





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