REDUCING RISKY DRINKING & ALCOHOL-RELATED HARM IN THE SPORTS SETTING

Volume 1: Chapters 1-9

Melanie Kingsland

Submitted for the Degree of Doctor of Philosophy

School of Medicine and Public Health
Faculty of Health and Medicine
The University of Newcastle

January 2016
DECLARATIONS

Statement of originality

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to this copy of my thesis, when deposited in the University Library*, being made available or loan and photocopying subject to the provisions of the Copyright Act 1968.

*Unless an Embargo has been approved for a determined period.

Thesis by publication

I hereby certify that this thesis is in the form of a series of papers. I have included as part of the thesis a written statement from each co-author, endorsed in writing by the Faculty Assistant Dean (Research Training), attesting to my contribution to any jointly authored papers.

Copyright

I warrant that I have obtained, where necessary, permission from the copyright owners to use any third party copyright material reproduced in the thesis (e.g. questionnaires, artwork, unpublished letters), or to use any of my own published work (e.g. journal articles) in which the copyright is held by another party (e.g. publisher, co-author).

15th January 2016

Melanie Kingsland     Date
ACKNOWLEDGEMENTS

Prior to starting and throughout my PhD I heard stories of stressful, torturous PhD experiences. The fact that my experience was so vastly different I put down to the wonderful people listed below.

First and foremost, I would like to acknowledge the ongoing support of my supervisors – John Wiggers, Luke Wolfenden and Christopher Williams. In particular, a huge thank you to John and Luke for their support and belief in me from the beginning. To John, for your commitment to research that has real-life impact and implications, for teaching me the importance of a well-polished manuscript and for challenging me whenever I became complacent. To Luke, for your skill and commitment to good methodology and ethics, your innovative ideas and your overall enthusiasm and encouragement.

The primary trial for my thesis was a large, collaborative research project primarily involving a partnership between The University of Newcastle, Hunter New England Population Health and the Australian Drug Foundation. I would like to acknowledge the vast support provided by these organisations and thank the numerous people from each whom have been involved in the trial over the years. I would especially like to acknowledge the role of the Australian Drug Foundation’s John Rogerson, Maree Sidey, Bosco Rowland, Vanessa Kennedy, John Reid and Marc Glanville, and Hunter New England Population Health’s Karen Gillham, Jennifer Tindall, Christophe Lecathelinais, Amy Sawyer, Kylie Young and Pennie Gibbins. A special thank you to Christophe for your patience and skill in assisting me with the statistical analysis of all the studies within this thesis. The trial could not have been undertaken with such integrity without the passionate group of Good Sport Project Officers who supported the clubs or the dedicated interviewers who conducted the various surveys – to whom I am extremely grateful. A special thank you to Rebecca Hodder and Christopher Williams for the final proof reading of my thesis and to Deb Mainey for assisting with formatting.

A big thank you to all of the sports clubs that participated in the trial - in particular to the club representatives who implemented the intervention and participated in data collection, and to the club members who participated in data collection.
Thank you to my in-house, peer support – the “PhD Girls” past and present. I could not have chosen a more collegial, supportive and motivating group of people to share this experience with. Good luck to you all.

Finally to my family and friends, thank you for all that you have done over the past six years to make my life balanced and constantly enjoyable, particularly during those times when I transitioned from full-time study, to full-time new mum, to part-time study and work. To Mum and Dad, thank you for always encouraging me, believing in me and supporting me in every way throughout my lengthy education and study. From moving me into my first room on university residence to minding Ari so I could fit in some more time at my desk – I am forever thankful. Likewise, to Denise, my other mum, thank you for always being there to lend a hand, your support is invaluable.

To Trent and Ari – my constant inspirations, providers of unconditional love and support and the best of distractions – without you this thesis would not have been possible. From allowing me to slip away to write for a couple of hours to supporting me to attend conferences on the other side of the world. I am eternally grateful.
# TABLE OF CONTENTS

**DECLARATIONS**
- Statement of originality
- Thesis by publication
- Copyright

**ACKNOWLEDGEMENTS**

**LIST OF TABLES, FIGURES AND BOXES**

**LIST OF ABBREVIATIONS & GLOSSARY**

**THESIS ABSTRACT**
- Background
- Aims
- Methods
- Key findings
- Conclusion and discussion

**THESIS OVERVIEW**

**LIST OF PUBLICATIONS INCLUDED AS PART OF THIS THESIS**
- Co-author statement for Chapter 2
- Co-author statement for Chapter 3
- Co-author statement for Chapter 4
- Co-author statement for Chapter 5
- Co-author statement for Chapter 6
- Co-author statement for Chapter 7
- Co-author statement for Chapter 8

**OTHER PAPERS PUBLISHED DURING CANDIDATURE**
- Papers specifically relevant to the topic of this thesis
- Papers related to alcohol harm reduction broadly
- Papers related to the sports club setting broadly

**CONFERENCE PRESENTATIONS GIVEN DURING CANDIDATURE AND RELEVANT TO THIS THESIS**
- Oral presentation
- Poster presentation

**CHAPTER 1**
- ALCOHOL-RELATED HARM, PREVALENCE OF RISKY ALCOHOL CONSUMPTION AND HARM REDUCTION INTERVENTIONS WITHIN THE GENERAL COMMUNITY AND SPORTS SETTING

**INTRODUCTION**

**DIMENSIONS OF ALCOHOL-RELATED HARM**
- Harm to the drinker
- Harm to others
- Economic burden to society at large
Table of contents cont.

**BURDEN OF ALCOHOL-RELATED HARM**  
Global perspective 4  
Harm to the drinker 4  
Harm to others 8  
Economic burden to society at large 8  
Australian perspective 9  
Harm to the drinker 9  
Harm to others 9  
Economic burden to society at large 10

**GUIDELINES TO REDUCE HEALTH RISKS FROM ALCOHOL CONSUMPTION** 10  
Global perspective 10  
Australian perspective 11

**ALCOHOL CONSUMPTION: VOLUME, PATTERNS & RISK OF HARM** 12  
Global perspective 12  
Volume consumed 12  
Patterns of alcohol consumption & prevalence of risky consumption 13  
Australia perspective 15  
Volume consumed 15  
Patterns of alcohol consumption & prevalence of risky consumption 15

**ALCOHOL AND SPORT** 16  
Burden of alcohol-related harm and risky alcohol consumption associated with people involved in sport 16  
Global perspective 16  
Australian perspective 18  
Sports clubs and venues: an opportunity to reduce risky alcohol consumption and related harms 19  
Strategies for reducing alcohol-related harm in the sports club environment 20  
Current implementation of responsible alcohol management practice in sports settings 21  
Reducing risky alcohol consumption and related harms in the community sports setting: current research evidence 22

**SUMMARY AND THESIS AIDS** 24

**REFERENCES** 26

**CHAPTER 2**  
ALCOHOL CONSUMPTION AND SPORT: A CROSS-SECTIONAL STUDY OF ALCOHOL MANAGEMENT PRACTICES ASSOCIATED WITH AT-RISK ALCOHOL CONSUMPTION AT COMMUNITY FOOTBALL CLUBS 33

**ABSTRACT** 34  
Background 34  
Methods 34  
Results 34  
Conclusions 34
Table of contents cont.

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BACKGROUND</strong></td>
<td>35</td>
</tr>
<tr>
<td><strong>METHODS</strong></td>
<td>37</td>
</tr>
<tr>
<td>Ethics approval</td>
<td>37</td>
</tr>
<tr>
<td>Design and setting</td>
<td>37</td>
</tr>
<tr>
<td>Sample</td>
<td>37</td>
</tr>
<tr>
<td>Community football clubs</td>
<td>37</td>
</tr>
<tr>
<td>Club members</td>
<td>38</td>
</tr>
<tr>
<td>Recruitment procedures</td>
<td>38</td>
</tr>
<tr>
<td>Community football clubs</td>
<td>38</td>
</tr>
<tr>
<td>Club management representatives</td>
<td>38</td>
</tr>
<tr>
<td>Club members</td>
<td>38</td>
</tr>
<tr>
<td>Data collection procedures</td>
<td>38</td>
</tr>
<tr>
<td>Measures</td>
<td>39</td>
</tr>
<tr>
<td>Club alcohol management practices</td>
<td>39</td>
</tr>
<tr>
<td>Club code, size and location</td>
<td>39</td>
</tr>
<tr>
<td>Club member alcohol consumption</td>
<td>39</td>
</tr>
<tr>
<td>Statistical analyses</td>
<td>40</td>
</tr>
<tr>
<td><strong>RESULTS</strong></td>
<td>41</td>
</tr>
<tr>
<td>Sample</td>
<td>41</td>
</tr>
<tr>
<td>Club management representatives</td>
<td>41</td>
</tr>
<tr>
<td>Club members</td>
<td>41</td>
</tr>
<tr>
<td>Association between risky alcohol consumption and club alcohol management practices and characteristics</td>
<td>42</td>
</tr>
<tr>
<td><strong>DISCUSSION</strong></td>
<td>45</td>
</tr>
<tr>
<td><strong>CONCLUSIONS</strong></td>
<td>48</td>
</tr>
<tr>
<td><strong>COMPETING INTERESTS</strong></td>
<td>48</td>
</tr>
<tr>
<td><strong>AUTHORS’ CONTRIBUTIONS</strong></td>
<td>48</td>
</tr>
<tr>
<td><strong>ACKNOWLEDGEMENTS</strong></td>
<td>49</td>
</tr>
<tr>
<td><strong>ENDNOTES</strong></td>
<td>49</td>
</tr>
<tr>
<td><strong>REFERENCES</strong></td>
<td>49</td>
</tr>
<tr>
<td><strong>CHAPTER 3</strong></td>
<td>55</td>
</tr>
<tr>
<td>ADDRESSING ALCOHOL USE IN COMMUNITY SPORTS CLUBS: ATTITUDES OF CLUB REPRESENTATIVES</td>
<td>56</td>
</tr>
<tr>
<td><strong>BACKGROUND</strong></td>
<td>56</td>
</tr>
<tr>
<td><strong>METHODS</strong></td>
<td>56</td>
</tr>
<tr>
<td><strong>RESULTS</strong></td>
<td>57</td>
</tr>
<tr>
<td><strong>DISCUSSION</strong></td>
<td>58</td>
</tr>
<tr>
<td><strong>REFERENCES</strong></td>
<td>58</td>
</tr>
</tbody>
</table>
Table of contents cont.

CHAPTER 4
A CLUSTER RANDOMISED CONTROLLED TRIAL OF A COMPREHENSIVE ACCREDITATION INTERVENTION TO REDUCE ALCOHOL CONSUMPTION AT COMMUNITY SPORTS CLUBS: STUDY PROTOCOL

ABSTRACT
Introduction 61
Methods and analysis 61
Ethics and dissemination 61
Trial registration 62

INTRODUCTION

METHODS AND ANALYSIS

Study aim 62
Study design 63
Research setting 64
Participants and research eligibility 64
  Football clubs 64
  Football club members 64
Recruitment procedures 65
  Football clubs 65
  Football club members 65
Intervention 66
  Intervention development 66
  Intervention content 67
  Intervention delivery 67
  Intervention implementation strategies 69
  Intervention quality assurance 71
  Control group clubs 71
Data collection procedures 71
  Outcome data 71
  Intervention implementation data 71
  Process data 72
  Club characteristic data 72
  Overall data management 73
Measures 73
  Primary outcome measure: alcohol consumption behaviour at the club 73
  Intervention implementation measures 74
  Process measures 74
  Measures of club characteristics 74
Sample size and power calculations 74
Random allocation and blinding 75
Statistical analysis: primary outcome 75
Research trial coordination 76
Trial discontinuation or modification 77

ETHICS AND DISSEMINATION

DISCUSSION
# Table of contents cont.

FUNDING STATEMENT 78
COMPETING INTERESTS 78
ACKNOWLEDGEMENTS 78
REFERENCES 79

## CHAPTER 5

IMPROVING THE IMPLEMENTATION OF RESPONSIBLE ALCOHOL MANAGEMENT PRACTICES BY COMMUNITY SPORTING CLUBS: A RANDOMISED CONTROLLED TRIAL 83

## ABSTRACT

Introduction and aims 84
Design and methods 84
Results 84
Discussion and conclusions 84

## INTRODUCTION

METHODS 87
Design and setting 87
Participant eligibility and recruitment 87
Random allocation and blinding 88
Alcohol management practices 88
   Level 1 88
   Level 2 88
   Level 3 89
Implementation intervention 89
Data collection procedures 93
Measures 93
   Club implementation of alcohol management practices 93
   Usefulness of and satisfaction with implementation intervention strategies 93
Sample size calculations 93
Statistical analysis 94
   Baseline characteristics and accreditation level 94
   Implementation of alcohol management practices 94
   Usefulness of and satisfaction with implementation intervention strategies 95
Ethics approval 95

RESULTS 95
Baseline characteristics and accreditation level 95
Implementation of alcohol management practices 97
Usefulness of and satisfaction with implementation intervention strategies 100

DISCUSSION 102

ACKNOWLEDGEMENTS 104
REFERENCES 105
Table of contents cont.

CHAPTER 6
TACKLING RISKY ALCOHOL CONSUMPTION IN SPORT: A CLUSTER RANDOMISED CONTROLED TRIAL OF AN ALCOHOL MANAGEMENT INTERVENTION WITH COMMUNITY FOOTBALL CLUBS

ABSTRACT
Background 112
Method 112
Results 112
Conclusion 112

INTRODUCTION

METHODS
Trial registration and protocol 114
Design 114
Setting 114
Participant eligibility and recruitment 114
   Clubs 114
   Club members 115
Random allocation and blinding 115
Intervention 115
   Intervention implementation strategies 116
   Control group 117
Data collection procedures and measures 117
   Primary outcome: risky alcohol consumption at sporting clubs 117
   Secondary outcome: risk of overall alcohol-related harm 117
   Club characteristics 118
Statistical analysis 118
Sample size and power calculations 119
Ethics approval 119

RESULTS
Participants 119
   Clubs 119
   Club members 121
Primary outcome: risky alcohol consumption at sporting clubs 122
Secondary outcome: risk of overall alcohol-related harm 124
Random allocation and blinding 124

DISCUSSION

FUNDING SOURCE DECLARATION

COMPETING INTERESTS

ACKNOWLEDGEMENTS

REFERENCES

CHAPTER 7
INTERVENTIONS IN SPORTS SETTINGS TO REDUCE ALCOHOL CONSUMPTION AND ALCOHOL-RELATED HARM: A SYSTEMATIC REVIEW PROTOCOL
Table of contents cont.

ABSTRACT 132
Introduction 132
Methods and analysis 132
Dissemination 132

INTRODUCTION 133
Rationale 133
Objectives 134

METHODS AND ANALYSIS 134
Eligibility criteria 134
Study characteristics 134
Publication characteristics 136
Information sources 136
Electronic databases 136
Other sources 136
Search strategy 137
Study selection 137
Data extraction 137
Data items 138
Assessment of risk of bias 138
Data analysis 139
Summary measures 139
Data synthesis and analysis 140
Issues of clustering 140
Assessment of heterogeneity 140
Assessment of reporting bias 140
Additional analysis 141

ETHICS AND DISSEMINATION 141

DISCUSSION 141

FUNDING STATEMENT 141

COMPETING INTERESTS 141

ACKNOWLEDGEMENTS 142

REFERENCES 142

CHAPTER 8
INTERVENTIONS IN SPORTS SETTINGS TO REDUCE RISKY ALCOHOL CONSUMPTION AND ALCOHOL-RELATED HARM: A SYSTEMATIC REVIEW 146

ABSTRACT 147
Background 147
Methods 147
Results 147
Conclusions 148
Systematic review registration 148

BACKGROUND 148
Objectives 150
<table>
<thead>
<tr>
<th>Table of contents cont.</th>
<th>151</th>
</tr>
</thead>
<tbody>
<tr>
<td>METHODS</td>
<td></td>
</tr>
<tr>
<td>Eligibility criteria for included studies</td>
<td>151</td>
</tr>
<tr>
<td>Interventions</td>
<td>151</td>
</tr>
<tr>
<td>Comparisons</td>
<td>151</td>
</tr>
<tr>
<td>Primary outcomes</td>
<td>151</td>
</tr>
<tr>
<td>Study design</td>
<td>152</td>
</tr>
<tr>
<td>Information sources and search strategy</td>
<td>152</td>
</tr>
<tr>
<td>Study selection/screening</td>
<td>153</td>
</tr>
<tr>
<td>Data extraction</td>
<td>153</td>
</tr>
<tr>
<td>Assessment of risk of bias</td>
<td>154</td>
</tr>
<tr>
<td>Data synthesis and analysis</td>
<td>154</td>
</tr>
<tr>
<td>Assessment of study heterogeneity</td>
<td>155</td>
</tr>
<tr>
<td>RESULTS</td>
<td>155</td>
</tr>
<tr>
<td>Results of the search</td>
<td>155</td>
</tr>
<tr>
<td>Excluded studies</td>
<td>155</td>
</tr>
<tr>
<td>Characteristics of included studies</td>
<td>158</td>
</tr>
<tr>
<td>Risk of bias of included studies</td>
<td>163</td>
</tr>
<tr>
<td>Effect of intervention</td>
<td>166</td>
</tr>
<tr>
<td>Reducing alcohol consumption at the sporting venue and/or overall alcohol consumption</td>
<td>169</td>
</tr>
<tr>
<td>Reducing excessive alcohol consumption or intoxication at the sporting venue and/or overall excessive alcohol consumption or intoxication</td>
<td>169</td>
</tr>
<tr>
<td>Reducing alcohol-related violence or injury at the sporting venue and/or overall alcohol-related violence or injury</td>
<td>170</td>
</tr>
<tr>
<td>DISCUSSION</td>
<td>171</td>
</tr>
<tr>
<td>CONCLUSIONS</td>
<td>173</td>
</tr>
<tr>
<td>FUNDING STATEMENT</td>
<td>173</td>
</tr>
<tr>
<td>COMPETING INTERESTS</td>
<td>173</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>174</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>174</td>
</tr>
<tr>
<td>CHAPTER 9</td>
<td>182</td>
</tr>
<tr>
<td>THESIS FINDINGS AND IMPLICATIONS FOR FUTURE RESEARCH AND PRACTICE</td>
<td></td>
</tr>
<tr>
<td>THESIS FINDINGS</td>
<td>183</td>
</tr>
<tr>
<td>IMPLICATIONS FOR FUTURE RESEARCH AND PRACTICE</td>
<td>189</td>
</tr>
<tr>
<td>Potential enhancement of intervention effectiveness</td>
<td>189</td>
</tr>
<tr>
<td>Association between alcohol industry sponsorship and alcohol-related harms</td>
<td>190</td>
</tr>
<tr>
<td>Extent of alcohol industry sponsorship of sport</td>
<td>192</td>
</tr>
<tr>
<td>Support for addressing alcohol sponsorship of sport</td>
<td>193</td>
</tr>
<tr>
<td>Removing alcohol industry sponsorship in sport through sponsorship substitution</td>
<td>193</td>
</tr>
<tr>
<td>Sustaining effective alcohol management practices of sports clubs</td>
<td>194</td>
</tr>
<tr>
<td>The need to identify strategies that sustain implementation of effective health promotion practices</td>
<td>195</td>
</tr>
</tbody>
</table>
Table of contents cont.

Theories, models and empirical evidence for sustaining effective health promotion practices 196
Use of web-based programs to support the population-wide sustainability of effective alcohol management practices in sports clubs 197
CONCLUSIONS 199
REFERENCES 199
LIST OF TABLES, FIGURES AND BOXES

CHAPTER 1
Table 1.1: A selection of the main diseases, health conditions and injuries to which alcohol is causally linked and the proportion of disease burden (% deaths and % DALYs) attributable to alcohol 3
Table 1.2: Number and distribution of alcohol-attributable deaths and DALYs globally in 2012 5
Table 1.3: Burden of alcohol-related harm across selected high-income and low-mid income countries (2010) 7
Table 1.4: Alcohol consumption recommendations outlined in drinking guidelines for a selection of countries around the world 11
Table 1.5: Recorded annual per capita alcohol consumption for selected high-income and low-middle income countries 13
Table 1.6: Prevalence of heavy-episodic drinking in the past 30 days for selected high-income and low-middle income countries 14

CHAPTER 2
Table 2.1: Characteristics of participating club members 42
Table 2.2: Univariate association between club alcohol management practices and characteristics and at-risk alcohol consumption by club members 43
Table 2.3: Multivariate association between club alcohol management practices and characteristics and at-risk alcohol consumption by club members 45

CHAPTER 3
Table 3.1: Club representative attitudes to alcohol use and alcohol-related sports club practices 57

CHAPTER 4
Table 4.1: CONSORT flowchart estimating the progress of participants through the trial 63
Box 4.1: Intervention strategies by accreditation level 68
Box 4.2: Intervention implementation strategies 69

CHAPTER 5
Table 5.1: Intervention implementation strategies mapped to key theoretical frameworks 90
Table 5.2: Alcohol management practices: control and intervention groups – 2009 and 2011 98
Table 5.3: Change in the proportion of clubs that undertook ‘13 or more’ of the 16 club practices by intervention and control group clubs between baseline and post-intervention – all clubs and by size, region and socio-economic classification 99
List of tables, figures and boxes cont.

Table 5.4: Rating of usefulness and amount of implementation intervention strategies provided to intervention group clubs 101

Figure 5.1: Participant flow according to consort reporting requirements for randomised trials 96

CHAPTER 6
Table 6.1: Intervention strategies by accreditation level 116
Table 6.2: Baseline characteristics of participating football clubs and club members 121
Table 6.3: Alcohol outcomes at baseline and post-intervention, by treatment group 123
Figure 6.1: Participant flow according to consort reporting requirements 120

CHAPTER 8
Table 8.1: Reasons for exclusion of studies after full text review 157
Table 8.2: Characteristics of included studies 160
Table 8.3: Justification of risk of bias assessment for individual studies 164
Table 8.4: Intervention effects of included studies 167
Figure 8.1: PRISMA flowchart 156
Figure 8.2: Risk of bias summary: review authors’ judgments about each risk of bias item for each included study 163
Figure 8.3: Risk of bias graph: review authors’ judgments about each risk of bias item presented as percentages across all included studies 163
LIST OF ABBREVIATIONS

AFL  Australian Football League  
AUDIT Alcohol Use Disorders Identification Test  
DALY Disability-Adjusted Life Year  
GEE Generalised estimating equations  
GFI Graduated frequency index  
HREC Human Research Ethics Committee  
NSW New South Wales  
OR Odds ratio  
PRISMA Preferred Reporting Items for Systematic Reviews and Meta-analyses  
RCT Randomised controlled trial  
RSA Responsible service of alcohol  
SES Socio-economic status  

GLOSSARY  

Club member A person affiliated with a sports club either as a paid financial member (player or non-player) or as a known supporter/fan of the club.  
Football Sports codes including Association football (Soccer), Rugby League, Rugby Union, Australian Rules football and Gaelic Football.
THESIS ABSTRACT

Background

Players and spectators of sport report consuming alcohol at levels that place them at increased risk of alcohol-related harm compared to the overall adult population. Sports clubs represent a promising setting for the implementation of interventions to reduce such consumption and harm.

Aims

This thesis aimed:

1. To identify the characteristics and practices of community football clubs that are associated with risky alcohol consumption (Chapter 2).

2. To assess attitudes of football club management regarding alcohol use at sports clubs and alcohol harm reduction strategies (Chapter 3).

3. To develop (Chapter 4) and evaluate the effectiveness of interventions to:
   a. improve the implementation of alcohol management practices at community sports clubs (Chapter 5);
   b. reduce risky alcohol consumption and alcohol-related harm among community sports club members (players, spectators and officials) (Chapter 6).

4. To systematically review and synthesise current evidence of the effectiveness of interventions to reduce risky drinking and alcohol-related harm in sports settings generally (Chapters 7 and Chapter 8).

5. To provide recommendations for future research and practice regarding interventions to reduce risky alcohol consumption and alcohol-related harm in the sports setting (Chapter 9).

Methods

Aims 1 to 3 have been addressed through a series of studies undertaken within community football clubs and club members in urban and rural areas of New South Wales, Australia. These studies involved: a cross-sectional survey of 1428 football club members...
from 88 football clubs (Aim 1); a cross-sectional survey of 101 community football club management representatives (Aim 2); a randomised controlled trial of 87 football clubs (Aim 3a); and, a cluster randomised controlled trial of members of community football clubs (N=1411 at pre-intervention; N=1143 post-intervention)(Aim 3b). Aim 4 was addressed through a systematic review of published and grey literature.

Key findings

- Members of clubs that served alcohol to intoxicated people (OR: 2.23, 95%CI: 1.26-3.93; p=0.0074) conducted ‘happy hour’ promotions (OR: 2.84, 95%CI: 1.84-4.38; p<0.0001) or provided alcohol-only awards and prizes (OR: 1.80, 95%CI: 1.16-2.80; p=0.0084) were at significantly greater odds of consuming alcohol at risky levels than members of clubs that did not undertake such practices (Chapter 2).

- Over half of sports club representatives believed that players often consume too much alcohol (55%), 95-99% agreed that it is important that clubs ensure alcohol is served responsibly and that doing so is a responsibility of the club, and 75% believed that their club could benefit from assistance to encourage responsible alcohol consumption (Chapter 3).

- Following an organisational change intervention, 88% of community sports clubs in the intervention group reported implementing ‘13 or more’ of 16 responsible alcohol management practices, compared with 65% of control group clubs (OR: 3.7, 95%CI: 1.1-13.2; p=0.04) (Chapter 5).

- Following an alcohol management intervention, members of community sports clubs from the intervention group reported significantly lower proportions of: risky alcohol consumption at the club (Intervention: 19%; Control: 24%; OR: 0.63, 95%CI 0.40-1.00; p=0.05); risk of alcohol-related harm (Intervention: 38%; Control: 45%; OR: 0.58, 95%CI 0.38-0.87; p<0.01); alcohol consumption risk (Intervention: 47%; Control: 55%; OR: 0.60, 95%CI 0.41-0.87; p<0.01) and possible alcohol dependence (Intervention: 1%; Control: 4%; OR: 0.20, 95% CI 0.06-0.65; p<0.01) compared to members of control group clubs (Chapter 6).

- A systematic review found only three controlled trials within any sports setting (non-elite/community to elite/professional level) that assessed the effects of interventions to reduce risky alcohol consumption and harm amongst sportspeople and fans. The
included studies, which were from the United States, Ireland and Australia, included community and elite level sporting populations and interventions of varied content and intensity. Two of the studies reported positive intervention effects (Chapter 8).

**Conclusion and discussion**

The findings of this thesis support the findings of earlier non-controlled studies and provide the first randomised controlled trial evidence showing that interventions with community sports clubs can improve alcohol management practices and reduce risky alcohol consumption and alcohol-related harm amongst club members. Such interventions were also found to be acceptable to sports club management. However, as found in the subsequent systematic review, the generalisability of these findings to other countries, other sports and other levels of professionalism is unknown. A potential opportunity exists for increasing the effectiveness of the intervention in reducing risky alcohol consumption and related harm through addressing alcohol industry sponsorship of sports clubs. Similarly, a need exists to investigate mechanisms for supporting sports clubs to sustain the implementation of alcohol management practices over time.
THESIS OVERVIEW

CHAPTER 1 - Alcohol-related harm, prevalence of risky alcohol consumption and harm reduction interventions within the general community and sports settings

This introductory chapter outlines the burden of illness associated with risky levels of alcohol consumption and related harm and highlights the greater prevalence of such consumption and harm amongst sports people and spectators/fans compared to general populations throughout the world. Interventions to reduce risky alcohol consumption and related harm in licensed premises broadly are described, with a focus on those interventions that have the potential to be implemented in the sports club setting. Such evidence indicates that compliance with responsible alcohol service practices, implementation of pricing controls, and restriction of trading hours are effective strategies for reducing harm in licensed premises broadly, and have the potential to be implemented in the sports club setting. A review of studies in the sports setting indicates that free or cheap alcohol promotions, drinking games, and alcohol-related sponsorship are factors associated with risky alcohol consumption and should also be addressed in harm reduction interventions in this setting. While evidence suggests that sports clubs and venues are a potentially promising setting for reducing risky alcohol consumption and related harm amongst sports players and fans, there is a lack of rigorous experimental evidence regarding the effectiveness of such interventions in this setting.

CHAPTER 2 - Alcohol consumption and sport: a cross-sectional study of alcohol management practices associated with at-risk alcohol consumption at community football clubs

(Paper published in BMC Public Health)

The study reported in this chapter was undertaken in the context of limited research investigating modifiable practices associated with risky alcohol consumption in the sports setting generally, and particularly at the non-elite sports level. The cross-sectional study examined the association between the alcohol management practices and characteristics of 72 community football clubs and risky alcohol consumption by 1428 club members (players, spectators and officials). The study found that members of clubs that served alcohol to intoxicated people (OR: 2.23, 95% CI: 1.26-3.93; p=0.0074), conducted ‘happy
hour’ promotions (OR: 2.84, 95% CI: 1.84-4.38; p<0.0001) or provided alcohol-only awards and prizes (OR: 1.80, 95% CI: 1.16-2.80; p=0.0084) were at significantly greater odds of consuming alcohol at risky levels than members of clubs that did not. A non-significant positive association between alcohol sponsorship and at-risk alcohol consumption was also found. These results provided additional evidence for the development of interventions to reduce risky alcohol consumption in the sports club setting.

CHAPTER 3 - Addressing alcohol use in community sports clubs: attitudes of club representatives
(Paper published in the Australian and New Zealand Journal of Public Health)

The cross-sectional study reported in this chapter was undertaken to assess the amenability of sports club managers/administrators to interventions targeting risky alcohol consumption within the sports club setting, including their attitudes and beliefs towards alcohol use at sports clubs. Sports club management representatives from 101 community sports clubs participated in the study. Over half of club representatives indicated that players often consumed too much alcohol (55%), with 95-99% agreeing that it was important that clubs ensured that alcohol was served responsibly, and that doing so was a responsibility of the club. Ninety-five per cent reported that the club would find it difficult to survive without revenue from alcohol sponsorship. Three-quarters believed that their club could benefit from assistance to encourage responsible alcohol consumption by members. The findings suggested that the majority of sports clubs may be supportive of interventions to address risky alcohol consumption among club members through improving club practices regarding alcohol provision.

CHAPTER 4 - A cluster randomised controlled trial of a comprehensive accreditation intervention to reduce alcohol consumption at community sports clubs: study protocol
(Paper published in BMJ Open)

This chapter outlines the study methodology for a trial of a responsible alcohol management intervention in community football clubs. The study was designed as a cluster randomised controlled trial with clubs randomised to control and intervention groups. The 2.5 year long intervention had a primary aim of reducing risky alcohol consumption by football club members and was based on evidence from studies from both
the sports club setting and licensed venues generally. In particular, the intervention was based on an existing program, *Good Sports*, that involved the implementation of alcohol management practices to decrease the supply of alcohol to intoxicated members, cease the provision of cheap and free alcohol, increase the availability and cost-attractiveness of non-alcoholic and low-alcoholic beverages, remove high alcohol drinks and cease drinking games. The intervention utilised a three-tiered accreditation framework designed to motivate implementation of alcohol management practices and a suite of organisational change and capacity building support strategies that involved project officer support, funding, accreditation rewards, training and observational audit feedback. Outcome data were collected pre- and post-intervention through cross-sectional telephone surveys of club members. The primary outcome measure, risky alcohol consumption by club members, was assessed using a graduated frequency index. Implementation of alcohol management practices was measured by club management representative report. The impact of the implementation strategies on modifying club alcohol management practices is reported in Chapter 5 and the primary outcomes of the study are reported in Chapter 6.

**CHAPTER 5 - Improving the implementation of responsible alcohol management practices by community sporting clubs: a randomised controlled trial**

(Paper published in Drug and Alcohol Review)

This chapter reports the findings of a randomised controlled trial of an intervention to improve the implementation of responsible alcohol management practices by community football clubs. Eighty-seven community football clubs participated in the trial, with football clubs randomised to control or intervention conditions. Interviews were undertaken with a management representative from each club pre- and post-intervention to assess alcohol management practice implementation. Club representatives were also asked to report on the usefulness of specific intervention strategies and the appropriateness of the amount of support provided. Following two years of intervention, 88% of intervention clubs reported ‘13 or more’ of 16 responsible alcohol management practices, significantly greater than the proportion of control clubs reporting this level of implementation (65%)(OR: 3.7, 95%CI: 1.1-13.2; p=0.04). All intervention strategies were considered highly useful and three-quarters or more of clubs rated the amount of support to be sufficient. These findings demonstrated that a multi-strategy implementation
intervention can improve the alcohol management practices of community football clubs. Further research is required to assess the long-term sustainability of such improvements.

CHAPTER 6 - Tackling risky alcohol consumption in sport: a cluster randomised controlled trial of an alcohol management intervention with community football clubs

(Paper published in Journal of Epidemiology and Community Health)

This chapter reports the findings of a cluster randomised controlled trial of the effectiveness of an alcohol management intervention in reducing risky alcohol consumption and risk of alcohol-related harm amongst community football club members. Eighty-eight football clubs participated in this trial and were randomised to control or intervention groups. Cross-sectional samples of club members completed pre- (N=1411) and post-intervention (N=1143) surveys reporting on their consumption of alcohol at the club and overall. Post-intervention, a significantly lower proportion of intervention club members reported: risky alcohol consumption at the club (Intervention: 19%; Control: 24%; OR: 0.63, 95%CI 0.40-1.00; p=0.05); risk of alcohol-related harm (Intervention: 38%; Control: 45%; OR: 0.58, 95%CI 0.38-0.87; p<0.01); alcohol consumption risk (Intervention: 47%; Control: 55%; OR: 0.60, 95%CI 0.41-0.87; p<0.01) and possible alcohol dependence (Intervention: 1%; Control: 4%; OR: 0.20, 95%CI 0.06-0.65; p<0.01) compared to members of control group clubs. These findings showed that a multi-component alcohol management intervention can reduce risky alcohol consumption by community football club members within the club setting, as well as reducing the overall risk of alcohol-related harm. To further enhance the intervention effect, futures trials are required to assess the incremental effect of additional strategies, such as addressing alcohol industry sponsorship of sports clubs.

CHAPTER 7 - Interventions in sports settings to reduce alcohol consumption and alcohol-related harm: a systematic review protocol

(Paper published in BMJ Open)

This chapter describes the prospectively registered protocol for a systematic review of interventions designed to reduce alcohol consumption and alcohol-related harms in the sports setting. Studies were to be included in the review that had implemented interventions within a sport setting and either measured: alcohol consumption, excessive
alcohol consumption or intoxication or alcohol-related injury or violence. Randomised controlled trials, staggered enrolment trials, stepped-wedged trials, quasi-randomised trials, quasi-experimental trials and natural experiments were to be included, with studies without a parallel comparison group excluded. Data were to be sourced from both electronic databases and grey literature and both published and unpublished reports were to be included. To determine eligibility, two authors were to independently screen the titles and abstracts of papers identified through the search strategy and then independently examine the full text of papers that progressed through to a second stage of screening. Using the procedures and tools outlined in the Cochrane Handbook for Systematic Reviews, two authors were to independently extract data from studies that were deemed eligible for inclusion in the review and assess their risk of bias. The outcomes of trials that were sufficiently homogeneous were to be combined in a meta-analysis.

CHAPTER 8 - Interventions in sports settings to reduce risky alcohol consumption and alcohol-related harm: a systematic review

(Paper published in Systematic Reviews)

This chapter reports the conduct and findings of the systematic review outlined in Chapter 7. The searches generated 6382 papers and screening of titles and abstracts identified 45 papers for full text assessment. Of these, three studies were deemed eligible and included in the review. One of these studies was a randomised controlled trial of a cognitive-behavioural intervention with athletes within an Olympic training facility in the United States. The study reported a significant change in alcohol use between pre-test and follow-up between intervention and control groups. The other two studies were cluster randomised controlled trials conducted in community sports clubs in Ireland and Australia (the study reported in Chapter 6 of this thesis). Whereas the Australian study found a range of positive intervention effects, the Irish study found no significant intervention effect for any of the outcomes assessed. The interventions of the two cluster trials differed in a number of ways, including length and dose of intervention. Due to the heterogeneity of included studies, no quantitative data synthesis was undertaken.

With only three studies identified, the review highlighted the limited availability of rigorous experimental evidence regarding the effectiveness of interventions in reducing risky alcohol consumption and alcohol-related harms in the sports setting. Replication of
the trials included in this review is needed, both in other jurisdictions and across different sports codes and levels of professionalism.

CHAPTER 9 - Thesis findings and implications for future research and practice

This chapter provides a summary of the findings of this thesis and discusses the implications of such findings for further research and practice. Two key issues are explored in depth: 1) potential enhancement of intervention effectiveness in reducing risky alcohol consumption and alcohol-related harm in sports clubs; and, 2) sustaining improvements in alcohol management practices of sports clubs.

In investigating the first of these issues, a growing body of evidence associating alcohol industry sponsorship with risky alcohol consumption and harm is described, as is the extent of alcohol industry sponsorship of sport from community-based amateur clubs through to professional sportspeople. Given this evidence, it is proposed that to potentially enhance the effectiveness of the intervention (Good Sports) reported in Chapter 6 of this thesis, an additional alcohol management practice be included in the intervention that seeks to remove alcohol industry sponsorship of sports clubs. It is proposed that the incremental effectiveness of such an intervention enhancement relative to the already effective Good Sports program be tested in a controlled trial.

The second of the issues explored in the final chapter of this thesis is the sustainability of the reported improvements in alcohol management practices in sports clubs that received the intervention. The need for strategies to sustain such practices is investigated as well as current theories, models and empirical evidence for sustaining effective health promotion practices in various organisations. A web-based solution is proposed as a potentially efficient strategy to provide sports clubs with ongoing support to sustain alcohol management practice improvements. It is proposed that a comparative effectiveness trial be conducted to compare the effectiveness of such a web-based intervention compared to face-to-face delivery of a sustainability strategy and a no-support based control in sustaining club implementation of alcohol management practices.
LIST OF PUBLICATIONS INCLUDED AS PART OF THIS THESIS

The main body of this thesis consists of seven papers that are either published or accepted for publication in peer-reviewed journals. The details of these papers are listed below. As these papers have been written as stand-alone publications there is some overlap in content between the papers, particularly in the background and methods sections. The papers included in this thesis include references to appendices, which were not included in the published versions.

Chapter 2


Chapter 3


Chapter 4


Chapter 5

Chapter 6


Chapter 7


Chapter 8

CO-AUTHOR STATEMENT FOR CHAPTER 2

By signing below I confirm that Melanie Kingsland contributed to the publication entitled:


By:
- Determining the research question and study design.
- Determining the measures.
- Leading the data collection tool development and data collection.
- Leading the data analysis.
- Leading the writing of the manuscript.

<table>
<thead>
<tr>
<th>FULL NAME OF CO-AUTHOR</th>
<th>SIGNATURE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luke Wolfenden</td>
<td></td>
<td>03/12/2015</td>
</tr>
<tr>
<td>Bosco Rowland</td>
<td></td>
<td>30/11/2015</td>
</tr>
<tr>
<td>Karen Gillham</td>
<td></td>
<td>01/12/2015</td>
</tr>
<tr>
<td>Vanessa Kennedy</td>
<td></td>
<td>30/11/2015</td>
</tr>
<tr>
<td>Robyn Ramsden</td>
<td></td>
<td>27/11/2015</td>
</tr>
<tr>
<td>Richard Colbran</td>
<td></td>
<td>30/11/2015</td>
</tr>
<tr>
<td>Sarah Weir</td>
<td></td>
<td>01/12/2015</td>
</tr>
<tr>
<td>John Wiggers</td>
<td></td>
<td>03/12/2015</td>
</tr>
</tbody>
</table>

Professor Robert Callister 08/12/15

Assistant Dean Research Training
Faculty of Medicine and Health
The University of Newcastle
CO-AUTHOR STATEMENT FOR CHAPTER 3

By signing below I confirm that Melanie Kingsland contributed to the publication entitled:


By:

- Contributing to the research question, study design and development of measures.
- Leading the data collection tool development and data collection.
- Contributing to the data analysis.
- Contributing to writing the manuscript.

<table>
<thead>
<tr>
<th>FULL NAME OF CO-AUTHOR</th>
<th>SIGNATURE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luke Wolfenden</td>
<td></td>
<td>03/12/2015</td>
</tr>
<tr>
<td>Bosco Rowland</td>
<td></td>
<td>30/11/2015</td>
</tr>
<tr>
<td>Vanessa Kennedy</td>
<td></td>
<td>30/11/2015</td>
</tr>
<tr>
<td>Karen Gillham</td>
<td></td>
<td>01/12/2015</td>
</tr>
<tr>
<td>John Wiggers</td>
<td></td>
<td>03/12/2015</td>
</tr>
</tbody>
</table>

Professor Robert Callister 08/12/15

Assistant Dean Research Training
Faculty of Medicine and Health
The University of Newcastle

Signature Date
CO-AUTHOR STATEMENT FOR CHAPTER 4

By signing below I confirm that Melanie Kingsland contributed to the publication entitled:


By:

- Contributing to the development of the research design, data collection measures and procedures and data analysis plan.
- Leading the intervention and implementation strategy development.
- Leading the writing of the manuscript.

<table>
<thead>
<tr>
<th>FULL NAME OF CO-AUTHOR</th>
<th>SIGNATURE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luke Wolfenden</td>
<td></td>
<td>03/12/2015</td>
</tr>
<tr>
<td>Bosco Rowland</td>
<td></td>
<td>30/11/2015</td>
</tr>
<tr>
<td>Jennifer Tindall</td>
<td></td>
<td>01/12/2015</td>
</tr>
<tr>
<td>Karen Gillham</td>
<td></td>
<td>01/12/2015</td>
</tr>
<tr>
<td>Patrick McElduff</td>
<td></td>
<td>03/12/2015</td>
</tr>
<tr>
<td>John Rogerson</td>
<td></td>
<td>01/12/2015</td>
</tr>
<tr>
<td>John Wiggers</td>
<td></td>
<td>03/12/2015</td>
</tr>
</tbody>
</table>

Professor Robert Callister 08/12/15
Assistant Dean Research Training
Faculty of Medicine and Health
The University of Newcastle
CO-AUTHOR STATEMENT FOR CHAPTER 5

By signing below I confirm that Melanie Kingsland contributed to the publication entitled:


By:

- Contributing to the development of the research design, data collection procedures and data analysis plan.
- Determining the measures.
- Leading the intervention and implementation strategy development.
- Managing the intervention delivery.
- Leading the data collection tool development and data collection.
- Leading the data analysis.
- Leading the writing of the manuscript.

<table>
<thead>
<tr>
<th>FULL NAME OF CO-AUTHOR</th>
<th>SIGNATURE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luke Wolfenden</td>
<td></td>
<td>03/12/2015</td>
</tr>
<tr>
<td>Jennifer Tindall</td>
<td></td>
<td>01/12/2015</td>
</tr>
<tr>
<td>Bosco Rowland</td>
<td></td>
<td>30/11/2015</td>
</tr>
<tr>
<td>Maree Sidey</td>
<td></td>
<td>30/11/2015</td>
</tr>
<tr>
<td>Patrick McElduff</td>
<td></td>
<td>03/12/2015</td>
</tr>
<tr>
<td>John Wiggers</td>
<td></td>
<td>03/12/2015</td>
</tr>
</tbody>
</table>

Professor Robert Callister 08/12/15

Assistant Dean Research Training
Faculty of Medicine and Health
The University of Newcastle
CO-AUTHOR STATEMENT FOR CHAPTER 6

By signing below I confirm that Melanie Kingsland contributed to the publication entitled:


By:

- Contributing to the development of the research design, data collection measures and procedures and data analysis plan.
- Leading the intervention and implementation strategy development.
- Managing the intervention delivery.
- Leading the data collection tool development and data collection.
- Leading the data analysis.
- Leading the writing of the manuscript.

<table>
<thead>
<tr>
<th>FULL NAME OF CO-AUTHOR</th>
<th>SIGNATURE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luke Wolfenden</td>
<td></td>
<td>03/12/2015</td>
</tr>
<tr>
<td>Jennifer Tindall</td>
<td></td>
<td>01/12/2015</td>
</tr>
<tr>
<td>Bosco Rowland</td>
<td></td>
<td>30/11/2015</td>
</tr>
<tr>
<td>Christophe Lecathelinais</td>
<td></td>
<td>30/11/2015</td>
</tr>
<tr>
<td>Karen Gillham</td>
<td></td>
<td>01/12/2015</td>
</tr>
<tr>
<td>Pennie Dodds</td>
<td></td>
<td>29/11/2015</td>
</tr>
<tr>
<td>Maree Sidey</td>
<td></td>
<td>30/11/2015</td>
</tr>
<tr>
<td>John Rogerson</td>
<td></td>
<td>01/12/2015</td>
</tr>
<tr>
<td>Patrick McElduff</td>
<td></td>
<td>03/12/2015</td>
</tr>
<tr>
<td>FULL NAME OF CO-AUTHOR</td>
<td>SIGNATURE</td>
<td>DATE</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------</td>
<td>------------</td>
</tr>
<tr>
<td>Ian Crundall</td>
<td></td>
<td>30/11/2015</td>
</tr>
<tr>
<td>John Wiggers</td>
<td></td>
<td>03/12/2015</td>
</tr>
</tbody>
</table>

**Professor Robert Callister**

Assistant Dean Research Training  
Faculty of Medicine and Health  
The University of Newcastle

Signature: 08/12/15
CO-AUTHOR STATEMENT FOR CHAPTER 7

By signing below I confirm that Melanie Kingsland contributed to the publication entitled:


By:

- Determining the review questions and study eligibility criteria.
- Determining the search strategy.
- Leading the development of the screening, data extraction, risk of bias and meta-analysis processes and tools.
- Completing review registration.
- Leading the writing of the manuscript.

<table>
<thead>
<tr>
<th>FULL NAME OF CO-AUTHOR</th>
<th>SIGNATURE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luke Wolfenden</td>
<td></td>
<td>03/12/2015</td>
</tr>
<tr>
<td>John Wiggers</td>
<td></td>
<td>03/12/2015</td>
</tr>
</tbody>
</table>

Professor Robert Callister

Assistant Dean Research Training
Faculty of Medicine and Health
The University of Newcastle

Signature  Date

08/12/15
CO-AUTHOR STATEMENT FOR CHAPTER 8

By signing below I confirm that Melanie Kingsland contributed to the publication entitled:


By:
- Determining the review questions and methodology.
- Co-screening of all title/abstracts and full-texts.
- Conducting the narrative synthesis.
- Leading the writing of the manuscript.

<table>
<thead>
<tr>
<th>FULL NAME OF CO-AUTHOR</th>
<th>SIGNATURE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Wiggers</td>
<td></td>
<td>03/12/2015</td>
</tr>
<tr>
<td>Khanrin Vashum</td>
<td></td>
<td>03/12/2015</td>
</tr>
<tr>
<td>Rebecca Hodder</td>
<td></td>
<td>30/11/2015</td>
</tr>
<tr>
<td>Luke Wolfenden</td>
<td></td>
<td>03/12/2015</td>
</tr>
</tbody>
</table>

Professor Robert Callister
Assistant Dean Research Training
Faculty of Medicine and Health
The University of Newcastle

Signature Date
08/12/15
OTHER PAPERS PUBLISHED DURING CANDIDATURE

During candidature, the candidate co-authored eight additional relevant publications – four papers specifically relevant to the topic of this thesis, two relevant to alcohol-harm reduction generally and two relevant to the sport club setting generally. The details of these papers are provided below.

Papers specifically relevant to the topic of this thesis


Papers related to alcohol harm reduction broadly


Papers related to the sports club setting broadly


CONFERENCE PRESENTATIONS GIVEN DURING CANDIDATURE AND RELEVANT TO THIS THESIS

During candidature, the candidate presented the contents of this thesis at eight conferences, five of which were international conferences. The details of these presentations are provided below.

**Oral presentation**


**Poster presentation**