



The Australian Longitudinal
Study on Male Health

Annual Report 2017



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Acknowledgements

The research on which this report is based was conducted as part of Ten to Men: The Australian Longitudinal Study on Male Health by the University of Melbourne. We are grateful to the Australian Government Department of Health for funding and to the boys and men who provided the survey data.

1 Introduction from the Chief Investigators

Over the past 12 months the Ten to Men team has been busy and productive; consolidating our work from Wave 1, conducting Wave 2, linking to relevant datasets, and raising the profile of the study.

Wave 2 data collection concluded in early June 2016 and we achieved an excellent retention rate of 76%. After extensive data processing and quality assurance, we deposited the Wave 2 dataset with the Australian Data Archive in May 2017 and it is now available for use by the research community. We undertook the first analysis of Wave 2 data for the 2017 Major Report to the Department of Health entitled “Changes in men’s health between Wave 1 and Wave 2”. That report examined changes in health behaviours, health outcomes and health service use in the context of age, region, area socio-economic disadvantage and life transitions. The report will be available at www.tentomen.org.au in July 2017.

We have deposited Wave 2 data with the Australian Data Archive and it is available for researcher access. Wave 1 data have been available since July 2016, and we have received 17 new data access requests since that time. Seven previously approved projects are continuing.

In November 2016 we held our first Ten to Men Data User Workshop at the University of Melbourne. The workshop provided information on the study methodology and the structure of the dataset, advice on statistical adjustment for study design and using sample weights, and information on accessing Ten to Men data.

Over the past 12 months our study team has been disseminating information and promoting the study through a range of activities. We have delivered 10 national and international conference presentations, upgraded the study website, and been active in traditional media and on social media. We have published 15 peer-reviewed articles in national and international journals in the past 12 months. These include a Cohort Profile in the high-impact International Journal of Epidemiology and a collection of nine research papers in a special supplement of BMC Public Health. We also published a prominent article on masculinity and suicidal thinking which garnered significant attention in the lay press both nationally and internationally.

Ten to Men acted as a catalyst for another extremely successful project in 2016. We used data from Ten to Men to support the production of ‘Man Up’, a documentary that was screened in prime time on the ABC in late 2016, rescreened in early 2017 and continues to be available on iView. ‘Man Up’ was viewed by 642,000 Australians and explored the relationship between masculinity, mental health and suicidality.

In 2016/17 Ten to Men was externally reviewed. A report on the findings from the review were delivered to the Department of Health in March 2017.

We would like to acknowledge the contributions of our dedicated team. Our Study Co-ordinator, Dianne Currier, should be congratulated for her unflagging leadership of the study; the fact that Ten to Men is so well regarded is due in no small part to her efforts. Wayne Davidson, who is the Study Administrator and Communications Officer, has looked after organisational matters and helped to raise the profile of the study. As the Cohort Manager,

Robert Lukins has put in place a range of systems that have resulted in our cohort being loyal and engaged. Matthew Spittal, our Study Statistician, has led our data analysis efforts, ably contributing his high-level methodological expertise. Sashane Sahabandu has assisted Matthew, taking responsibility for data management and conducting a variety of analyses. We have also received excellent support from the professional staff at the University of Melbourne, particularly Tracey Mayhew.

In addition, we would like to thank the Department of Health for their continued support of Ten to Men. Finally, and most importantly, we thank the men and boys in the cohort for generously giving up their time to provide information on their health and wellbeing. We look forward to continuing a long and mutually rewarding association with them as we work together to improve the health of Australian males.

Dallas English



Professor Dallas English

J.P.



Professor Jane Pirakis

2 Study personnel and committees

2.1 Study team

Professors Jane Pirkis and Dallas English

Study Co-Chief Investigators

Dr Dianne Currier

Study Co-ordinator

Associate Professor Matthew Spittal

Study Statistician

Mr Robert Lukins

Cohort Manager

Mr Sashane Sahabandu

Data Manager

Mr Wayne Davidson

Study Administration / Communications Officer

Ms Narelle White

Ms Samantha Croy

Casual Cohort Tracking Staff

2.2 Steering Committee

Professor Jane Pirkis

Director - Centre for Mental Health
Melbourne School of Population and Global Health
University of Melbourne

Professor Dallas English

Deputy Head of School
Melbourne School of Population and Global Health
University of Melbourne

Professor Billie Giles-Corti

Director - RMIT Urban Futures Enabling Capability Platform
Director - Healthy Liveable Cities Group
RMIT University

Professor John Carlin

Director - Clinical Epidemiology and Biostatistics Unit
Murdoch Childrens Research Institute

Dr Dianne Currier

Senior Research Fellow
Centre for Epidemiology and Biostatistics
Melbourne School of Population and Global Health
University of Melbourne

Professor Louisa Degenhardt

NHMRC Principle Research Fellow
National Drug and Alcohol Research Centre
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Professor Shyamali Dharmage

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Melbourne School of Population and Global Health
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Professor Jane Gunn

Head of Department
Department of General Practice
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Melbourne School of Population and Global Health
University of Melbourne

Professor John Hopper

Director (Research)
Centre for Epidemiology and Biostatistics
Melbourne School of Population and Global Health
University of Melbourne

Professor Anne Kavanagh

Head, Gender and Women's Health Unit
Centre for Health Equity
Melbourne School of Population and Global Health
University of Melbourne

Associate Professor Louise Keogh

Centre for Health Equity
Melbourne School of Population and Global Health
University of Melbourne

Associate Professor Belinda Lloyd

Head of Research and Workforce Development
Turning Point Alcohol and Drug Centre
Monash University

Professor George Patton

Director of Adolescent Health Research
The Centre for Adolescent Health
Murdoch Children's Research Institute

Associate Professor Lena Sancic

Deputy Head of Department
Department of General Practice
University of Melbourne

Associate Professor Matthew Spittal

Centre for Mental Health
Melbourne School of Population and Global Health
University of Melbourne

Professor David Studdert

Professor of Law and Professor of Medicine
Centre for Health Policy/PCOR
Stanford University School of Medicine
Stanford Law School

Associate Professor Jo Williams

Centre for Population Health Research
School of Health and Development
Deakin University

The Study Steering Committee met three times in the past 12 months. The committee provided expert advice and assisted with planning and development. It focused specifically on developing the Wave 3 proposal and planning for publications based on the Wave 1 data.

2.3 Other collaborators and investigators

Ten to Men is a major resource and there is mounting interest from internal and external researchers in using it to answer pressing questions about male health. In addition to the core group of investigators who comprise the Study Steering Committee (see 2.2), there are currently a further 41 investigators from ten institutions listed on currently active projects as recorded through the Data Access process.

Professor John Adams
University of Technology Sydney

Dr Gregory Armstrong
University of Melbourne

Dr Lee Ashton
University of Newcastle

Professor John Attia
University of Newcastle

Dr Patty Chondos
University of Melbourne

Professor Clare Collins
University of Newcastle

Dr Holger Cramer
University of Duisburg-Essen

Mr Vergil Dolar
University of Melbourne

Mr Rowan Dowling
University of Melbourne

Ms Marnie Downes
Murdoch Childrens Research Institute

Professor Eric Emerson
University of Sydney

Mr Nicholas Fava
University of Melbourne

Professor Gene Feder
University of Bristol

Dr Scott Griffiths
University of Queensland

Professor Kelsey Hegarty
University of Melbourne

Dr Melinda Hutchesson
University of Newcastle

Ms Natalie Ironfield
University of Melbourne

Dr Tania King
University of Melbourne

Ms Lauren Krnjacki
University of Melbourne

Professor Tony LaMontagne
Deakin University

Dr Romy Lauche
University of Technology Sydney

Professor Gwynnyth Llewellyn
University of Sydney

Dr Anna Machlin
University of Melbourne

Dr Allison Milner
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Dr Carl Moller
University of Melbourne

Professor Philip Morgan
University of Newcastle

Dr Angela Nicholas
University of Melbourne

Ms Beth O’Gorman
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Professor Yin Paradies
Deakin University

Dr Ryan Perry
University of Melbourne

Dr Simon Rice
University of Melbourne

Dr Megan Rollo
University of Newcastle

A/Professor Lena Sanci
University of Melbourne

Dr Jeanie Sheffield
University of Queensland

Dr Marisa Schlichthorst
University of Melbourne

Ms Marissa Shields
University of Melbourne

Professor David Sibbritt
University of Technology Sydney

Professor Julie Simpson
University of Melbourne

A/Professor Tim Slade
University of New South Wales

Ms Sharmala Thuraisingam
University of Melbourne

Dr John Wardle
University of Technology Sydney

Ms Bronwyn Wolfaardt
University of Melbourne

3 Publications

In the past 12 months, we have published 15 papers and an editorial in peer-reviewed journals. A further three have been submitted. Abstracts are provided in section 7.

Published

Cohort profile: Ten to Men (The Australian Longitudinal Study on Male Health). Pirkis J, Currier D, Carlin J, Degenhardt L, Dharmage SC, Giles-Corti B, Gordon IR, Gurrin LC, Hocking JS, Kavanagh A, Keogh L, Koelmeyer R, LaMontagne AD, Patton G, Sanci L, Spittal MJ, Schlichthorst M, Studdert D, Williams J, English DR. *International Journal of Epidemiology*, (Epub ahead of print) 29 September 2016, 1–11

Age matters: exploring correlates of self-rated health across four generations of Australian males. Koelmeyer R, Currier D, Spittal MJ, Schlichthorst M, Pirkis J, English DR. *Behavioural Medicine* 2016 Jul-Sep;42(3):132-42

The Australian Longitudinal Study on Male Health – Methods. Currier D, Pirkis J, Carlin JB, Degenhardt L, Dharmage SC, Giles-Corti B, Gordon IR, Gurrin L, Hocking JS, Kavanagh AM, Keogh LA, Koelmeyer R, LaMontagne AD, Schlichthorst M, Patton G, Sanci LA, Spittal MJ, David M, Studdert, Williams J, English DR. *BMC Public Health* 2016, 16 (Suppl 3):1043, 6-13

The Australian Longitudinal Study on Male Health sampling design and survey weighting: Implications for analysis and interpretation of clustered data. Spittal MJ, John B, Carlin, Currier D, Downes M, English DR, Gordon IR, Pirkis J, Gurrin L. *BMC Public Health* 2016, 16 (Suppl 3):1043, 15-22

Inequalities in socio-economic characteristics and health and wellbeing of men with and without disabilities: A cross-sectional analysis of the baseline wave of the Australian Longitudinal Study on Male Health. Kavanagh AM, Aitken Z, Emerson E, Sahabandu S, Milner A, Bentley R, LaMontagne AD, Pirkis J, Studdert D. *BMC Public Health* 2016, 16 (Suppl 3):1043, 24-31

Health and lifestyle factors associated with sexual difficulties in men – results from a study of Australian men aged 18 to 55 years. Schlichthorst M, Sanci LA, Hocking JS. *BMC Public Health* 2016, 16 (Suppl 3):1043, 71-81

Diabetes in young adult men: Social and health-related correlates. Koelmeyer R, Dharmage SC, English DR. *BMC Public Health* 2016, 16 (Suppl 3):1043, 63-69

Sleep apnoea in Australian men: Disease burden, co-morbidities, and correlates from Ten to Men study. Senaratna, CV, English, DR, Currier, D, Perret, JL, Lowe, A, Lodge, C., Russell, M, Sahabandu, S, Matheson, MC, Hamilton, GS, Dharmage, SC. *BMC Public Health* 2016, 16 (Suppl 3):1043, 51-61



Why do men go to the doctor? Socio-demographic and lifestyle factors associated with healthcare utilisation among a cohort of Australian men. Schlichthorst M, Sanci LA, Pirkis J, Spittal MJ, Hocking JS. *BMC Public Health* 2016, 16 (Suppl 3):1043, 81-90

Life stress and suicidal ideation in Australian men – cross-sectional analysis the Australian Longitudinal Study on Male Health baseline data. Currier D, Spittal MJ, Patton G, Pirkis J. *BMC Public Health* 2016, 16 (Suppl 3):1043, 43-49

Psychosocial job quality, mental health, and subjective wellbeing: a cross-sectional analysis of the baseline wave of the Australian Longitudinal Study on Male Health. LaMontagne AD, Milner A, Krnjacki L, Schlichthorst M, Kavanagh AM, Pirkis J. *BMC Public Health* 2016, 16 (Suppl 3):1043, 34-41

Masculinity and suicidal thinking. Pirkis J, Spittal MJ, Keogh L, Mousaferiadis T, Currier D. *Social Psychiatry and Psychiatric Epidemiology Online Publication* 26 December 2016. DOI 10.1007/s00127-016-1324-2

Psychosocial job stressors and thoughts about suicide among males: a cross-sectional study from the first wave of the Ten to Men cohort. Milner A, Currier D, LaMontagne AD, Spittal MJ, Pirkis J. *Public Health*. 147:72-6. doi: 10.1016/j.puhe.2017.02.003.

Suicidal behaviour in Indigenous compared to non-Indigenous males in urban and regional Australia: Prevalence data suggest disparities increase across age groups. Armstrong G, Pirkis J, Arabena K, Currier D, Spittal MJ, Jorm AF. *Aust N Z J Psychiatry*. 2017 doi:4867417704059.

Socio-economic position and suicidal ideation in men. Pirkis J, Currier D, Butterworth P, Milner A, Kavanagh A, Tibble H, Robinson J, Spittal MJ. *Int J Environ Res Public Health*. 2017;14(4). pii: E365. doi: 10.3390/ijerph14040365

Editorial

Introducing Ten to Men, the Australian longitudinal study on male health. Pirkis J, Macdonald J, English DR. *BMC Public Health*. 2016;16(Suppl 3):1044.

Submitted

Young men's health in emerging adulthood: socioeconomic influences. Currier D, Patton G, Sanci L, Sahabandu S, Spittal MJ, English DR, Pirkis J.

Physical activity and current depression in Australian Males aged 18-55. Lindner R, Cvetkovski S, Spittal M, Pirkis J, English DR, Currier D.

Multilevel regression and poststratification: a modelling approach to estimating population quantities from highly selected survey samples. Downes M, English DR, Pirkis J, Currier D, Gurrin L, Spittal MJ, Carlin JB.

4 Data user workshop

In November 2016 we held the first Ten to Men Data User Workshop at the University of Melbourne. The workshop included presentations from the Chief Investigators, the Study Coordinator, the Study Statistician and the Study Data Manager. The workshop provided information on the study design and methods and the structure of the dataset, advice on statistical adjustment for study design and using sample weights, and information on accessing Ten to Men data. Presentations were followed by a question and answer session. The workshop was attended by approximately 40 participants from university, community and government sectors.

5 Conference presentations and other information dissemination activities

We have been very active in disseminating information about Ten to Men. We have given presentations at a number of national and international conferences, including some for which we won awards (e.g., our poster, 'Masculinity and suicidal thinking' won the Young Investigators award at the European Symposium on Suicide and Suicidal Behaviour in Oviedo). We have also presented at other forums, including seminars, and our findings have attracted significant media attention. Details of our conference presentations, seminar presentations and media coverage are provided below.

5.1 Conference presentations

Professor Jane Pirkis. **Ten to Men: The Australian Longitudinal Study on Male Health.** Workshop on Longitudinal Data to Inform Health Decision Making. *Department of Health, ACT. August 2016.*

Professor John Carlin. **Multilevel regression and post-stratification for addressing participation bias in health survey data.** *International Society of Clinical Biostatistics Conference. Birmingham, UK. August 2016.*

Professor Jane Pirkis. **Masculinity and suicidal thinking.** *16th European Symposium on Suicide and Suicidal Behaviour. Oviedo, Spain. September 2016.*

Professor Jane Pirkis. **Masculinity and suicidal thinking [Poster].** *National Longitudinal Data Conference. Canberra, ACT. October 2016.*

Professor Dallas English. **Ten to Men.** *Cancer Council WA - Cancer Epidemiology Network (CCEN) Perth, WA. November 2016.*

A/Professor Louise Keogh. **Measuring masculinity with Australian men and boys: qualitative and quantitative insights from the national 'Ten to Men' survey.** *The Australian Sociological Association Conference. Melbourne, VIC. November 2016.*

Professor Jane Pirkis. **The future of men's health.** *New Male National Men's health conference. Parramatta, New South Wales, March 2017*

Dr Marisa Schlichthorst. **Masculinity, help-seeking and social support in a sample of 14,000 Australian adult men.** *American Men's Studies Association (AMSA) Conference - Ann Arbor, Michigan, USA. March 2017.*

Professor Dallas English. **Socioeconomic disadvantage and young men's health in Australia – individual and are-level influences.** *15th Annual World Congress on Public Health, Melbourne VIC, April 2017.*

5.2 Seminars

Professor Jane Pirkis. **Drug and Alcohol use by Australian men and boys: early findings from Ten to Men.** *Turning Point Seminar. Melbourne Vic. April 2016.*

Professor Jane Pirkis. **Area-and individual-level socio-economic disadvantage and their relationship to men's mental health.** *Centre for Mental Health Seminar. The University of Melbourne, VIC. November 2016.*

Dr Dianne Currier and Professor Jane Pirkis. **All men are created equal but some are more equal than others. What Ten to Men can tell us about health inequalities in Australian men and boys?** *Melbourne School of Population and Global Health School Seminar. The University of Melbourne, VIC. November 2016.*

Mr Robert Lukins. **Keeping up with the Cohorts.** *Centre for Epidemiology and Biostatistics Work in Progress Seminar. University of Melbourne, May 2017.*

5.3 Media

4/8/2016	Web	Email: Newsletter #155: Ten to Men Longitudinal Study Update
16/8/2016	Web	Spanner in the Works - Newsletter August 2016: Australian Longitudinal Study on Male Health.
7/10/2016	Web	The Melbourne Newsroom: Man Up: What makes blokes seek help? The results may surprise you...*
8/10/2016	Print	Sydney Morning Herald: Self-reliant men more likely to have suicidal thoughts, researchers find
8/10/2016	Print	Sydney Morning Herald: Gus Worland faces hard sell to Man Up in bid to tackle suicide rates
11/10/2016	Radio	ABC Radio National: MAN UP - why is it construction workers are so susceptible to suicide?
11/10/2016	Web	Mumbrella: Adam Ferrier and Adam Hunt help Gus Worland create #manup campaign for suicide documentary
18/10/2016	Web	Man Up: inspired genius or half-baked celebrity expertise?

18/10/2016	Web	The Screen Blog: 'Gus Worland tackles men's mental health in Man Up'
1/11/2016	Web	ANMF Infusion: The Health of Australia's Men and Boys - The Ten to Men Study
1/11/2016	Web	Western Alliance: In Brief "Men's Health"
16/11/2016	Web	Spanner in the Works: November 2016 Newsletter: Ten to Men – The Australian Longitudinal Study on Male Health
25/11/2016	Web	Mumbrella: More men likely to seek help after seeing ABC's 'Man Up' series, research finds
20/12/2016	Web	The Healthy Male: Edition 61
27/01/2017	Web	Spanner in the Works: January 2017 Newsletter Ten to Men – What we've learned video
21/3/2017	Web	Pursuit: Men's self-reliance linked to risk of self-harm
22/3/2017	Web	Australian Huffington Post: Self-reliant men more likely to be at risk of suicidal thoughts
22/3/2017	Web	Get Lifestyle: Masculine ideal of self-reliance puts men at risk
23/3/2017	Web	Emale #159: Men's self-reliance linked to risk of self-harm
29/3/2017	Radio	ABC Radio National: The dangers of male stoicism
29/3/2017	Radio	3JJJ [Interview with Tass Mousaferiadis]
4/4/2017	Web	Upstart – Men's health: a gender sensitive issue
20/4/2017	Web	Mel Industries: Making Sense of Why Western Men Are So Much More Likely to Kill Themselves
2/5/2017	Web	6 Minutes: Erectile dysfunction: how to ask the tough questions

* Man-Up press included where Ten to Men was mentioned or discussed during interview or report.

5.4 Teaching

Members of our study team have also used Ten to Men as a teaching resource in the Masters of Public Health and Masters of Epidemiology courses at the University of Melbourne. Specifically, Ten to Men featured in the following subjects in these course: Gender and Health, Epidemiology 1, and Epidemiology 3.

6 Research themes

We deliberately developed Ten to Men as a resource for the broader research community to use in researching topics of relevance to male health. However, a number of key themes guided research activities of our investigators and collaborators in the past 12 months, with projects often incorporating more than one of these themes.

Methodology

We published the first key methodological articles in 2016. These included the study design, cohort details and the development of the sample weights as well as guidance on how and when to use. We reported in-depth on Wave 2 non-response in Technical Report #6 (January 2017), including undertaking a comparison of sociodemographic, health status and health behaviour characteristics between responders and non-responders. In that report, we also provided information on the statistical power of the sample following Wave 2 and advice on the implications of sample loss at Wave 2 for analysis. The Ten to Men Statistical Methods and Analysis Group continued to explore a number of relevant methodology issues and undertake research in these areas. Current projects the Group is working on include exploring methods for imputing missing data, developing sample weights for Wave 2, developing an analytical strategy for within-household analyses, and investigating the statistical implications of top-up methodologies including snowballing from existing participants.

Physical health

In Wave 1 we collected data on a broad range of health outcomes, individual and socio-environmental health risk and protective factors, as well as information on health service use, health knowledge and attitudes. The breadth of these data have enabled us to examine risk-factors from multiple domains with respect to a diverse range of health and wellbeing outcomes. Over the past 12 months we have published findings based on Wave 1 data on a range of physical health outcomes and risk behaviours including diabetes and sleep apnoea, sexual difficulties, disability and general health status. With Wave 2 data becoming available in early 2017, we prepared a Major Report that examined changes in health behaviours, health outcomes and health service use with respect to age, region of residence, area socio-economic disadvantage and life events/transitions. While the follow-up period between Waves 1 and 2 was relatively short (average 22.3 months) that report provides early indications of vulnerable groups for a range of physical health risk behaviours and outcomes which can be followed further in future waves.

Mental health

Mental illness and suicidal behaviour are major causes of morbidity and mortality in Australian men. Ten to Men is a valuable resource for investigating these multi-determined behaviours and conditions in order to identify potential targets for interventions. We have approach research on mental health in the context of both individual-level and socio-environmental-level determinants. Suicidal behaviour has been a major focus of our research in the mental health domain, and research articles have been published on suicidal behaviour in the context of a range of social determinants including masculinity, indigenous status, individual- and area-level socio-economic factors, and work stress. In other work, we have investigated the

interaction of physical activity and depression, and socio-economic influences on the mental health of young adult men. In our first analysis of Wave 2 data, we examined changes in mental health between Waves 1 and 2 in the 2017 Major Report.

Health and wellbeing over the life course

Identifying age groups, life stages and transitions with higher risk for adverse health outcomes and poorer health behaviours is important for targeting policy and programs. We have been using the cross-sectional baseline wave of data to investigate health behaviours and outcomes in different age groups. Publications from that work include a description of the health status of the cohort by sociological generation, and a paper on the health status and behaviours of young adult men examining the influence of socio-economic factors which has been submitted. With the availability of Wave 2 data, we were able to examine changes in health behaviours, health outcomes and service use by age group as well as investigate four major life events, including two major life transitions, becoming a father for the first time and getting married, to assess the association between those events and changes in health behaviours and status. Those analyses are included in the 2017 Major Report.

Social determinants

A key focus of the 2010 National Male Health Policy was the social determinants of male health. Accordingly Ten to Men was designed to collect data to facilitate research into the role social determinants play in the health and wellbeing of boys and men. We have incorporated social-determinants into our other research themes. The social determinants we have investigated include gender roles and norms, socio-economic position, region of residence, employment, and indigenous status.

7 Study highlights and new findings

7.1 Highlights

- Publication of the Cohort Profile in the International Journal of Epidemiology.
- Publication of the BMC Public Health Special Supplement which included nine research papers and an editorial.
- Publication of a paper on masculinity and suicidal thinking which garnered national and international media attention.

7.2 New findings

Changes in men's health between Waves 1 and 2

The strength of a longitudinal study is its capacity to track changes in behaviour, health and wellbeing over time. The 2017 Major Report presented data from the first follow-up (Wave 2) in Ten to Men (the Australian Longitudinal Study on Male Health) which occurred approximately two years after Wave 1. We reported on changes in health behaviour, health outcomes and patterns of health service use stratified by age, region of residence, area socio-economic disadvantage and four major life events (becoming a father for the first time, marriage or moving in with a partner, divorce or breakup of a serious relationship, becoming unemployed). Our main findings are summarised below.

Age

There were clear patterns of change with age across physical and mental health outcomes, health behaviours and health service use.

Older men, were more likely to develop a physical health condition and younger men more likely to develop mental health conditions (depression and anxiety) as well as experience first time suicidal thoughts and suicide attempts at Wave 2. Young men aged 18-29 were twice as likely as men in all other age groups to report a first suicide attempt since wave 1.

Younger men were also more likely to commence risky behaviours including smoking, drinking in excess of national guidelines, and marijuana and other illicit drug use at Wave 2. Younger men engaging in those behaviours at Wave 1 were less likely than older men to have ceased at Wave 2.

Younger men who were not meeting physical activity guidelines at Wave 1 were more likely to be meeting those guidelines at Wave 2 and less likely to have become overweight or obese in the period between Wave 1 and Wave 2.

In terms of service use, among men who had not used health services in the 12 months prior to Wave 1, older men were more likely to have had a consultation with a GP, a dentist, a specialist doctor or used other health services in the 12 months prior to Wave 2.

For older men, private health insurance coverage changed little, with low proportions of new uptake and termination at Wave 2. In contrast, young adult men aged 18-29 had the greatest uptake of private health insurance at Wave 2 but also the highest termination.

Region

We found few differences in health behaviour or outcomes or in service use by region. Compared to men living in Major Cities, men living in Inner Regional Areas were more likely to develop a physical health condition, while those living in Inner Regional areas were more likely to develop anxiety.

In terms of health behaviours, the only difference by region in new risk behaviours we detected was that men in Outer Regional areas were more likely to begin drinking in excess of national guidelines at Wave 2.

There were no differences between regions in likelihood of men making new visits to health services at Wave 2, but there were differences in men no longer using services at Wave 2. Men living in in Outer Regional areas were more likely to have not consulted a GP in the 12 months prior to Wave 2, and men living in both Inner and Outer Regional areas were more likely to have not had a dentist visit in the past 12 months at Wave 2.

Men in Inner Regional areas were the least likely to have taken up private health insurance at Wave 2.

Area socio-economic disadvantage

Increasing socioeconomic disadvantage was associated with increased risk for poorer health outcomes and lower levels of service use, however there were few differences in terms of health behaviour.

Self-rated health declined in men who lived in the most socio-economically disadvantaged areas, and risk for developing depression and anxiety and experiencing first time suicidal thoughts and suicide attempts increased.

Non-drinkers who lived in areas of lower socio-economic disadvantage were more likely to have begun drinking at Wave 2, while drinkers in those areas were less likely to have ceased. There was also higher risk of no longer meeting physical activity guidelines at Wave 2 for men living in areas of greater disadvantage.

In terms of service use, among men who had not used health services in the 12 months prior to Wave 1, men who lived in areas of greater socio-economic disadvantage were less likely to have had a consultation with a GP, a dentist, a specialist doctor or used other health services in the 12 months prior to Wave 2. We also found that men living in areas of greater socio-economic disadvantage had lower uptake and higher termination of private health insurance coverage compared to men living in less disadvantaged areas.

Life events

Of the four life-events examined we found that becoming unemployed and experiencing a relationship breakup were associated with increased risk for a range of health harming behaviours, poorer health outcomes and changes in health service use patterns.

Changes in health outcomes for men experiencing those events included declining self-rated health, developing mental health conditions and suicidal thoughts and attempts and, for unemployed men, developing a disability or physical health condition.

Relationship breakup increased the risk of starting to use alcohol and new drinking in excess of national guidelines as well as starting to use marijuana and other illicit drugs. Ex-smokers who experienced a relationship breakup were also more likely to resume smoking. For men who became unemployed risk of new illicit drug use increased, but they were also more likely to cease alcohol use at Wave 2.

Becoming unemployed or experiencing a relationship breakup were associated with increased likelihood of using specialist and other health services, but not GP consultations, in the past 12 months at Wave 2. Likelihood of uptake of private health insurance was lower and termination higher for men who had experienced these life events.

We found fewer changes associated with marrying/moving in with a partner and becoming a first-time father.

Among men who married or moved in with a partner at Wave 2 there was a higher risk for anxiety, suicidal thoughts and suicide attempts. There were no differences in risk for physical health conditions or health behaviours associated with marriage/cohabitation, however there was an increase in the likelihood of a new GP consultation in the past 12 months at Wave 2.

Becoming a father for the first time at Wave 2 was associated with several positive changes including lower risk for developing depression, higher likelihood of ceasing to drink in excess of guidelines, and lower resumption of smoking among ex-smokers.

7.3 Other new findings

In the past 12 months we have reported a raft of new findings in reports and research papers. That work is presented below in the form of abstracts from published papers where available or as summaries of reports and work-in-progress. We have grouped findings by research theme, however as many span multiple research themes we note the other relevant themes.

Methodology research theme

Wave 2 non-respondent characteristics

Ten to Men Technical Report 2017. Currier D, Sahabandu S, Spittal MJ, Pirkis J, English DR. Report prepared for the Australian Government Department of Health. Melbourne: The University of Melbourne.

Summary

As noted above, we retained 76% of the cohort at Wave 2. The vast majority of the remainder are regarded as still being in the study, and we anticipate many will re-engage at Wave 3. Technical Report #6 (2017) reported on characteristics of Wave 2 non-respondents. The full report is available at <http://tentomen.org.au/index.php/technical-reports.html> .

With respect to a socio-demographic characteristics, men aged 18 years and older at Wave 1 (Wave 1 Adults) who did not respond at Wave 2 were younger, and a greater proportion were born outside Australia, Indigenous, not married/de facto, not parents, had not completed year 12, were unemployed, worked in low skilled occupations, and lived in an area of greater socio-economic disadvantage compared to those who did respond at Wave 2. There was little difference in region of residence between responders and non-responders. For Young Men aged 15 to 17 years at Wave 1, a greater proportion of Wave 2 non-responders were born outside Australia, Indigenous, and lived in areas of greatest socio-economic disadvantage compared to Wave 2 responders. There were only small differences in age, region of residence, current education attendance, or employment between young men responders and non-responders. For boys aged 10 to 14 years at Wave 1, a greater proportion of Wave 2 non-responders were born outside Australia, Indigenous, lived in areas of greatest socio-economic disadvantage and were slightly older compared to Wave 2 responders. There was little difference in region of residence between boy responders and non-responders.

With respect to health status and health behaviour indicators, among Wave 1 adults a smaller proportion of non-responders reported a lifetime or 12 month health condition, and rated their health as good to excellent, while a greater proportion of non-responders reported a disability and screened positive for current depression at Wave 1. Compared to men who responded at Wave 2, a greater proportion of non-responders did not meet physical activity guidelines, smoked, and used illicit drugs at Wave 1. For young men there were no significant differences in health status indicators between those who responded at Wave 2 responders and those who did not. In terms of health behaviours a greater proportion of non-respondents reported using alcohol in the past 12 months at Wave 1, but there was no difference between responders and non-responders in physical activity level, body weight and smoking status. There was also no difference in health status between boys who responded at Wave 2 and

those who did not. Smoking status was the only health behaviour where non-responders differed from responders, with non-responders more likely to have reported smoking at Wave 1.

Ten to Men design and methods

The Australian Longitudinal Study on Male Health – Methods. Currier D, Pirkis J, Carlin JB, Degenhardt L, Dharmage SC, Giles-Corti B, Gordon IR, Gurrin L, Hocking JS, Kavanagh AM, Keogh LA, Koelmeyer R, LaMontagne AD, Schlichthorst M, Patton G, Sanci LA, Spittal MJ, David M, Studdert, Williams J, English DR. *BMC Public Health, 2016, 16(Suppl 3):1030*

Abstract

Background: The Australian Longitudinal Study on Male Health (Ten to Men) was established in 2011 to build the evidence base on male health to inform policy and program development.

Methods: Ten to Men is a national longitudinal study with a stratified multi-stage cluster random sample design and oversampling in rural and regional areas. Household recruitment was conducted from October 2013 to July 2014. Males who were aged 10 to 55 years residing in private dwellings were eligible to participate. Data were collected via self-completion paper questionnaires (participants aged 15 to 55) and by computer-assisted personal interview (boys aged 10 to 14). Household and proxy health data for boys were collected from a parent via a self-completion paper-based questionnaire. Questions covered socio-demographics, health status, mental health and wellbeing, health behaviours, social determinants, and health knowledge and service use.

Results: A cohort of 15,988 males aged between 10 and 55 years was recruited representing a response fraction of 35%.

Conclusion: Ten to Men is a unique resource for investigating male health and wellbeing. Wave 1 data are available for approved research projects.

Analytical strategies for adjusting for study design

The Australian Longitudinal Study on Male Health sampling design and weighting: Implications for analysis and interpretation Spittal MJ, John B. Carlin, Currier D, Downes M, English DR, Gordon IR, Pirkis J, Gurrin L. *BMC Public Health, 2016, 16 (Suppl 3):1062*

Abstract

Background: The Ten to Men study used a complex sampling scheme to identify potential participants for the baseline survey. This raises important questions about when and how to adjust for the sampling design when analysing data from the baseline survey.

Methods: We describe the sampling scheme used in Ten to Men focusing on four important elements: stratification, multi-stage sampling, clustering and sample weights. We discuss how these elements fit together when using baseline data to estimate a population parameter (e.g., population mean or prevalence) or to estimate the association between an exposure and an

outcome (e.g., an odds ratio). We illustrate this with examples using a continuous outcome (weight in kilograms) and a binary outcome (smoking status).

Results: Estimates of the population mean or prevalence of a disease are likely to be influenced by the extent to which the sampling design is addressed in an analysis. Treating the data as if they came from a simple random sample and ignoring the sample weights is likely to give biased estimates and to give confidence intervals that are too narrow. Accounting for the sample design using weights and acknowledging the hierarchical (clustered) nature of the data in the method of analysis will likely produce unbiased population estimates that have wider confidence intervals than an unweighted analysis. In contrast, estimates of an association between an exposure and an outcome are generally similar whether the sampling design is accounted for or not.

Conclusions: The extent to which the Ten to Men sampling design is accounted for in any analysis of the baseline data will depend on the research question. When the goals of the analysis are to estimate the prevalence of a disease or risk factor in the population or the magnitude of a population-level exposure-outcome association, our advice is to adopt an analysis that respects the sampling design.

Analysis methods for population estimates

Multilevel regression and poststratification: a modelling approach to estimating population quantities from highly selected survey samples. Downes M, English DR, Pirkis J, Currier D, Gurrin L, Spittal MJ, Carlin JB. (submitted)

Abstract

Background: Large-scale surveys in population health face increasing difficulties in recruiting representative samples of participants. Non-participation, item non-response and attrition, even in well-designed surveys, often result in highly selected survey samples. We aimed to assess the feasibility of multilevel regression and poststratification (MRP), a method previously used to forecast U.S. presidential election results, for addressing participation bias in the context of Ten to Men, a large national health survey of Australian males.

Methods: MRP was used to generate estimates of parameters representing population descriptive quantities from the baseline wave of the Ten to Men survey. Population data for poststratification was obtained from the 2011 Australian Census.

Results: Full Bayesian analyses were performed in RStan and results showed greater consistency and precision across states of varying sizes when compared with estimates obtained using conventional sampling weights. Estimates for smaller states exhibited a greater degree of shrinkage towards the national estimate.

Conclusion: MRP may be a promising analysis approach to address potential participation bias in health survey data when estimating population descriptive quantities. Further work is required to formally evaluate the MRP approach under different forms or degrees of severity of participation bias and to further understand the importance of model selection and the inclusion of complex interaction terms.

Physical health research theme

Disability

Inequalities in socio-economic characteristics and health and wellbeing of men with and without disabilities: A cross-sectional analysis of the baseline wave of the Australian Longitudinal Study on Male Health. Kavanagh AM, Aitken Z, Emerson E, Sahabandu S, Milner A, Bentley R, LaMontagne AD, Pirkis J, Studdert D. *BMC Public Health*, 2016,16 (Suppl 3):1042

Abstract

Background: Internationally, men with disabilities have higher rates of social and economic disadvantage and poorer health and wellbeing than men without disabilities. No single study has provided comprehensive, population-level information about the magnitude of such differences among adult men using a well-validated instrument to measure disability.

Methods: We analysed baseline data from *Ten to Men* – an Australian longitudinal study of male health. *Ten to Men* used a stratified multi-stage cluster random sample design to recruit a national sample of males aged 10 to 55 years residing in private dwellings. Data were collected between October 2013 and July 2014 from 15,988 males. This analysis was restricted to 18-55 year old participants with data available on age and disability (n = 13,569). We compared the demographic, socio-economic characteristics and health and wellbeing of men with and without disabilities using chi squared tests for proportions and t tests for continuous variables. Linear regression adjusted for age was used to assess the association between disability status and health and wellbeing, which were measured using the SF-12 mental and physical health component scores and the Personal Wellbeing Index.

Results: 6.4% of men had a disability (compared with 7.94% of age and region matched men in the 2014-15 National Health Survey reporting mild to severe limitation due to disability). Men with disabilities were statistically significantly older and more likely to be born in Australia, speak English at home, be Aboriginal or Torres Strait Islander (ATSI) and were less likely to be married or de facto, or to live in urban areas. They were less likely to have completed secondary school, be employed and live in affordable housing, and were more likely to live on low incomes, in more socio-economically disadvantaged areas, and in rental accommodation and to experience shortages of money. Among employed men, those with disabilities were less likely to be in high skilled jobs, work fewer hours and were more likely to report that they would prefer to work more. Men with disabilities had lower levels of social support and community participation and poorer mental and physical health and overall wellbeing.

Conclusion: Adult men with disabilities experience marked social and economic disadvantage and poorer health and wellbeing. Improving the health and wellbeing of disabled men should be a priority for public health researchers and policy-makers.

Sexual difficulties

Health and lifestyle factors associated with sexual difficulties in men – results from a study of Australian men aged 18 to 55 years. Schlichthorst M, Sanci LA, Hocking JS. *BMC Public Health*, 2016, 16 (Suppl 3):1043

Abstract

Background: Sexual difficulties (SD) are common among men of all ages and can have considerable impact on quality of life and indications for future health. SD are associated with mental and physical wellbeing and with relationship satisfaction, yet they are rarely discussed with medical professionals who are often ill equipped to assess and manage them. This paper provides an overview on the status of SD in Australian men from 18 to 55 years of age and will form a baseline comparison for future analyses of SD based on Ten to Men data.

Methods: We used data from Ten to Men, the Australian Longitudinal Study on Male Health. SD was measured using eight items on organic and psychological sexual problems. We examined associations of a range of health and lifestyle factors (smoking, alcohol consumption, illicit drug use, obesity and new sexual partners, self-rated health status, disability, pain medication, diagnosed physical and mental health conditions) with the specific SDs and the rate of SD using logistic and negative binomial regression. The sample included 12,636 adult males who had previously been sexually active. Analysis was stratified by age (18-34 years versus 35-55 years).

Results: This paper shows that experiencing SD is relatively common among Australian men – overall half the sample (54%; 95%CI: 0.53-0.55) experienced at least one SD for more than three months over the past 12 months. While more common in older men aged 45 to 55 years, almost half the 18 to 24 year old men (48%) also reported at least one SD highlighting that SD affects men of all ages. We found that the rate of SD was associated with both lifestyle and health factors, although the strongest associations were observed for health factors. Lifestyle factors associated with an increased SD rate in men of all ages included smoking, harmful alcohol consumption and drug use in the past 12 months. Health factors associated with increased SD rate included poor overall self-rated health, daily pain medication, disability, a physical health condition and a mental health condition. Obesity was only associated with an increased rate of SD in men aged 35 to 55 years.

Early-onset diabetes

Diabetes in young adult men: Social and health-related correlates. Koelmeyer R, Dharmage SC, English DR. *BMC Public Health*, 2016, 16 (Suppl 3):1061

Abstract

Background: Diabetes is a global public health issue. It is associated with significant disability, morbidity and mortality risks and substantial healthcare costs. Of great concern is the fact that its prevalence is rising, particularly amongst the young, while epidemiological data regarding the incidence, prevalence and complications of early-onset type 2 diabetes is noted to be sparse.

Methods: We used data from the baseline wave of Ten to Men, a national cohort study of Australian males, to investigate the social and health-related correlates of Australian males aged 18 - 49 years reporting being diagnosed with diabetes.

Results: 2.95% (95% CI: 2.54% - 3.43%) of men aged 18-49 in the Ten to Men cohort reported having been diagnosed with diabetes in their lifetime (compared to 1.35% of age and region matched men in the 2014-15 National Health Survey). Within this age group, approximately 75% of those diagnosed with diabetes are expected to be living with a known diagnosis of type 2 diabetes; the remainder are expected to have been living with type 1 diabetes. Of the twenty social and health-related factors considered, we found evidence to support the association of eighteen factors after adjusting for age and body mass index. The strongest correlates of reporting a diabetes diagnosis, associated with a ≥ 2 -fold increase in the odds of reporting diabetes were being aged 35-49 years, being unemployed, being obese, seeing a doctor for a check-up more frequently, reporting comorbid high blood pressure or physical or mental health comorbidities and worse self-rated and physical health status.

Conclusion: Australian males aged 18-49 years who are living with a known diagnosis of diabetes are more likely to be socio-economically disadvantaged and suffer substantially worse health status than Australian males aged 18-49 years living without a diabetes diagnosis. Based on the associations detected in this study, older, single males living in regional areas who are socioeconomically disadvantaged, obese and/or who have other comorbidities may be an important subgroup to target for diabetes screening, disease management and prevention efforts.

Sleep apnoea

Sleep apnoea in Australian men: Disease burden, co-morbidities, and correlates from Ten to Men study. Senaratna CV, English DR, Currier D, Perret JL, Lowe A, Lodge C, Russell M, Sahabandu S, Matheson MC, Hamilton GS, Dharmage SC. *BMC Public Health*, 2016, 16 (Suppl 3):1029

Abstract

Background: Obstructive sleep apnoea is a common disorder with under-rated clinical impact, which is increasingly being recognised as having a major bearing on global disease burden. Men are especially vulnerable and become a priority group for preventative interventions. However, there is limited information on prevalence of the condition in Australia, its co-morbidities, and potential risk factors.

Methods: We used data from 13,423 adult men included in the baseline wave of Ten to Men, an Australian national study of the health of males, assembled using stratified cluster sampling with oversampling from rural and regional areas. Those aged 18-55 years self-completed a paper-based questionnaire that included a question regarding health professional-diagnosed sleep apnoea, physical and mental health status, and health-related behaviours. Sampling weights were used to account for the sampling design when reporting the prevalence estimates. Odds ratios were used to describe the association between health professional-diagnosed sleep apnoea and potential correlates while adjusting for age, country of birth, and body-mass index (BMI).

Results: Prevalence of self-reported health professional-diagnosed sleep apnoea increased from 2.2% in age 18-25 years to 7.7% in the age 45-55 years. Compared with those without sleep apnoea, those with sleep apnoea had significantly poorer physical, mental, and self-rated health as well as lower subjective wellbeing and poorer concentration/remembering ($p < 0.001$ for all). Sleep apnoea was significantly associated with older age ($p < 0.001$), unemployment ($p < 0.001$), asthma ($p = 0.011$), chronic obstructive pulmonary disease/chronic bronchitis ($p = 0.002$), diabetes ($p < 0.001$), hypercholesterolemia ($p < 0.001$), hypertension ($p < 0.001$), heart attack ($p < 0.001$), heart failure ($p < 0.001$), angina ($p < 0.001$), depression ($p < 0.001$), post-traumatic stress disorder ($p < 0.001$), other anxiety disorders ($p < 0.001$), schizophrenia ($p = 0.002$), overweight/obesity ($p < 0.001$), insufficient physical activity ($p = 0.006$), smoking ($p = 0.005$), and high alcohol consumption ($p < 0.001$).

Conclusion: Health professional-diagnosed sleep apnoea is relatively common, particularly in older males. Associations between sleep apnoea and cardiovascular, metabolic, respiratory, and psychiatric disorders have important clinical and public health implications. As men are especially vulnerable to sleep apnoea as well as some of its chronic co-morbidities, they are potentially a priority group for health interventions. Modifiable lifestyle related factors such as smoking, alcohol consumption, level of physical activity and BMI are possible key foci for interventions.

GP service use

Why do men go to the doctor? Socio-demographic and lifestyle factors associated with healthcare utilisation among a cohort of Australian men. Schlichthorst M, Sanci LA, Pirkis J, Spittal MJ, Hocking JS. *BMC Public Health*, 2016,16 (Suppl 3):1028

Abstract

Background: Men use health services less often than women and frequently delay seeking help even if experiencing serious health problems. This may put men at higher risk for developing serious health problems which, in part, may explain men's higher rates of some serious illnesses and shorter life span relative to women. This paper identifies factors that contribute to health care utilisation in a cohort of Australian men by exploring associations between socio-economic, health and lifestyle factors and the use of general practitioner (GP) services.

Methods: We used data from Ten to Men, the Australian Longitudinal Study on Male Health. Health care utilisation was defined in two ways: at least one GP visit in the past 12 months and having at least yearly health check-ups with a doctor. Associations between these two measures and a range of contextual socio demographic factors (education, location, marital status, country of birth, employment, financial problems etc.) as well as individual health and lifestyle factors (self-rated health, smoking, drinking, healthy weight, pain medication) were examined using logistic regression analysis. The sample included 13,763 adult men aged 18 to 55 years. Analysis was stratified by age (18 to 34 year versus 35 to 55 years).

Results: Overall, 81% (95%CI: 80.3-81.6) of men saw a GP for consultation in the 12 months prior to the study (compared to 76.8% of age and region matched men in the 2014-15 National

Health Survey). The odds of visiting a GP increased with increasing age ($p < 0.01$), but decreased with increasing remoteness of residence ($p < 0.01$). Older men, smokers and those who rate their health as excellent were less likely to visit a GP in the last 12 months, but those on daily pain medication or with co-morbidities were more likely to have visited a GP. However, these factors were not associated with consulting a GP in the last 12 months among young men.

Overall, 39% (95%CI: 38.3-39.9) reported having an annual health check. The odds of having an annual health check increased with increasing age ($p < 0.01$), but showed no association with area of residence ($p = 0.60$). Across both age groups, the odds of a regular health check increased with obesity and daily plain medication, but decreased with harmful levels of alcohol consumption.

Conclusion: The majority of men (61%) did not engage in regular health check-up visits, representing a missed opportunity for preventative health care discussions. Lower consultation rates may translate into lost opportunities to detect and intervene with problems early and this is where men may be missing out compared to women.

Mental Health Research Theme

Life Stress and suicidal thoughts

Life stress and suicidal ideation in Australian men – cross-sectional analysis of Ten to Men baseline data. Currier D, Spittal MJ, Patton G, Pirkis J. *BMC Public Health*, 2016, 16 (Suppl 3):1031

Abstract

Background: Suicide is a leading cause of death in Australian males aged 18 to 55. Non-fatal suicidal behaviours and thoughts are indicators of increased risk for future suicide. Suicidal behaviour is complex and multi-determined. Research supports the involvement of stressful life events in suicide and suicidal behaviour, however the evidence regarding suicidal thoughts is less developed. This study investigates stressful life events in relation to suicidal ideation in a large cohort of adult males recruited into Ten to Men, the Australian Longitudinal Study on Male Health.

Methods: Baseline data from a national cohort of 13, 884 males aged 18-55 years on suicidal behaviour, psychiatric disorder and life events was used. Multivariable logistic regressions were conducted with current suicidal ideation as the outcome and 12 month life events, 12 month depression, anxiety and harmful/hazardous alcohol use, and socio-demographics as covariates. Further logistic regression models investigated the relative risk of life stress alone, depression/alcohol/anxiety alone and co-occurring life stress and depression/alcohol/anxiety.

Results: In multivariable models there was an independent contribution to suicidal ideation for six of 24 life events (ORs 1.27-1.95), 12 month depression (OR 4.49) harmful alcohol use (OR 1.38) and anxiety disorders (OR 1.27). Life events co-occurring with depression (OR 10.3) was

higher risk than either alone (depression OR 6.6; life stress OR 2.6). There was a lesser effect for co-occurrence in the anxiety and harmful alcohol use models.

Conclusion: Life events appear to be related to suicidal ideation independent of depression, anxiety and harmful alcohol use in adult males, however if life events occur in the context of depression that risk is substantially increased.

Masculinity and suicidal ideation (also social determinants research theme)

Masculinity and suicidal thinking. Pirkis J, Spittal M, Keogh L, Mousaferiadis T, Currier D. *Journal of Social Psychiatry and Psychiatric Epidemiology*. March 2017, Volume 52, Issue 3, pp 319–327

Abstract

Purpose: Males feature prominently in suicide statistics, but relatively little work has been done to date to explore whether endorsement of dominant masculinity norms heightens the risk of or is protective against suicidal thinking. This paper aimed to further knowledge in this area.

Methods: We used baseline data from 13,884 men (aged 18–55) in the Australian Longitudinal Study on Male Health (Ten to Men) cohort. These men filled in self-complete questionnaires in 2013/14 which covered a range of topics, including conformity to dominant masculinity norms and suicidal thinking. We conducted logistic regression analyses to estimate the strength of association between these two variables.

Results: After controlling for other key predictors of suicidal thinking, one characteristic of dominant masculinity—self-reliance—stood out as a risk factor for suicidal thinking (AOR 1.34; 95% CI 1.26–1.43).

Conclusions: It suggests that one particular element of dominant masculinity—being self-reliant—may place men at increased risk of suicidal thinking. This finding resonates with current theories of how suicidal thinking develops and leads to action. It also has implications for the full gamut of suicide prevention approaches that target males in clinical settings and in the general population, and for our broader society. Further work is needed, however, to confirm the direction of the relationship between self-reliance and suicidality, and to unpack the means through which self-reliance may exert an influence.

Socio-economic position and suicidal ideation (also social determinants research theme)

Socio-Economic Position and Suicidal Ideation in Men. Pirkis J, Currier D, Butterworth P, Milner A, Tibble H, Robinson J, Spittal MJ. *International Journal of Environmental Research and Public Health*. 2017, 14, 365

Abstract

People in low socio-economic positions are over-represented in suicide statistics and are at heightened risk for non-fatal suicidal thoughts and behaviours. Few studies have tried to tease

out the relationship between individual-level and area-level socio-economic position, however. We used data from Ten to Men (the Australian Longitudinal Study on Male Health) to investigate the relationship between individual-level and area-level socio-economic position and suicidal thinking in 12,090 men. We used a measure of unemployment/employment and occupational skill level as our individual-level indicator of socio-economic position. We used the Index of Relative Socio-Economic Disadvantage (a composite multidimensional construct created by the Australian Bureau of Statistics that combines information from a range of area-level variables, including the prevalence of unemployment and employment in low skilled occupations) as our area-level indicator. We assessed suicidal thinking using the Patient Health Questionnaire (PHQ-9). We found that even after controlling for common predictors of suicidal thinking; low individual-level and area-level socio-economic position heightened risk. Individual-level socio-economic position appeared to exert the greater influence of the two; however. There is an onus on policy makers and planners from within and outside the mental health sector to take individual- and area-level socio-economic position into account when they are developing strategic initiatives.

Employment and mental wellbeing and suicidal behaviour (also social determinants research theme)

Psychosocial job stressors and thoughts about suicide among males: a cross-sectional study from the first wave of the Ten to Men cohort. Milner A, Currier D, LaMontagne AD, Spittal MJ, Pirkis J. *Public Health*.2017, 147:72-6

Abstract

Objectives: Psychosocial job stressors are known to be associated with poor mental health. This research seeks to assess the relationship between psychosocial working conditions and suicidal ideation using a large dataset of Australian males.

Methods: Data from wave 1 of the Australian Longitudinal Study on Male Health (Ten to Men) was used to assess the association between suicidal ideation in the past two weeks and psychosocial working conditions using logistic regression. The sample included 11,052 working males. The exposures included self-reported low job control, high job demands, job insecurity and low fairness of pay. We controlled for relevant confounders.

Results: In multivariable analysis, persons who were exposed to low job control (odds ratio [OR] 1.15, 95% confidence interval [CI] 1.05–1.26, $P = 0.003$), job insecurity (OR 1.69, 95% CI 1.44–1.99, $P < 0.001$) and unfair pay (OR 1.19, 95% CI 1.11–1.27, $P < 0.001$) reported elevated odds of thoughts about suicide. Males employed casually or on fixed-term contracts reported higher odds of suicidal ideation (OR 1.32, 95% CI 1.09–1.61, $P = 0.005$).

Conclusion: Psychosocial job stressors are highly prevalent in the working population and workplace suicide prevention efforts should aim to address these as possible risk factors.

Psychosocial job quality, mental health, and subjective wellbeing: a cross-sectional analysis of the baseline wave of the Australian Longitudinal Study on Male Health. LaMontagne AD, Milner A, Krnjacki L, Schlichthorst M, Kavanagh AM, Pirkis J. *BMC Public Health*, 2016, 16 (Suppl 3):1049

Abstract

Background: Employment status and working conditions are strong determinants of male health, and are therefore an important focus in the Australian Longitudinal Study on Male Health (Ten to Men). In this paper, we describe key work variables included in Ten to Men, and present analyses relating psychosocial job quality to mental health and subjective wellbeing at baseline.

Methods: A national sample of males aged 10 to 55 years residing in private dwellings was drawn using a stratified multi-stage cluster random sample design. Data were collected between October 2013 and July 2014 for a cohort of 15,988 males, representing a response fraction of 35%. This analysis was restricted to 18-55 year old working age participants (n = 13,456). Work-related measures included employment status, and, for those who were employed, a number of working conditions including an ordinal scale of psychosocial job quality (presence of low job control, high demand and complexity, high job insecurity, and low fairness of pay), and working time-related stressors such as long working hours and night shift work. Associations between psychosocial job quality and two outcome measures, mental health and subjective wellbeing, were assessed using multiple linear regression.

Results: The majority of participants aged 18-55 years were employed at baseline (85.6%), with 8.4% unemployed and looking for work, and 6.1% not in the labour force. Among employed participants, there was a high prevalence of long working hours (49.9% reported working more than 40 hours/week) and night shift work (23.4%). Psychosocial job quality (exposure to 0/1/2/3+ job stressors) prevalence was 36%/ 37%/ 20%/ and 7% of the working respondents. There was a dose-response relationship between psychosocial job quality and each of the two outcome measures of mental health and subjective wellbeing after adjustment for potential confounders, with higher magnitude associations between psychosocial job quality and subjective wellbeing.

Conclusions: These results extend the study of psychosocial job quality to demonstrate associations with a global measure of subjective wellbeing. Ten to Men represents a valuable new resource for the longitudinal and life course study of work and health in the Australian male population.

Indigenous status and suicidal behaviour (also social determinants research theme)

Suicidal thoughts and attempts in Indigenous compared to non-Indigenous males in Australia: prevalence data suggest disparities increase across age groups. Armstrong G, Pirkis J, Arabena K, Currier D, Spittal M, Jorm AF. *Australian and NZ Journal of Psychiatry*. Online publication April 10, 2017

Abstract

Objectives: We compare the prevalence of suicidal thoughts and attempts between Indigenous and non-Indigenous males in urban and regional Australia, and examine the extent to which any disparity between Indigenous and non-Indigenous males varies across age groups.

Methods: We used data from the baseline wave of The Australian Longitudinal Study on Male Health (Ten to Men), a large-scale cohort study of Australian males aged 10–55 years residing in urban and regional areas. Indigenous identification was determined through participants self-reporting as Aboriginal, Torres Strait Islander or both. The survey collected data on suicidal thoughts in the preceding 2 weeks and lifetime suicide attempts.

Results: A total of 432 participants (2.7%) identified as Indigenous and 15,425 as non-Indigenous (97.3%). Indigenous males were twice as likely as non-Indigenous males to report recent suicidal thoughts (17.6% vs 9.4%; odds ratio = 2.1, $p < 0.001$) and more than three times as likely to report a suicide attempt in their lifetime (17.0% vs 5.1%; odds ratio = 3.6; $p < 0.001$). The prevalence of recent suicidal thoughts did not differ between Indigenous and non-Indigenous males in younger age groups, but a significant gap emerged among men aged 30–39 years and was largest among men aged 40–55 years. Similarly, the prevalence of lifetime suicide attempts did not differ between Indigenous and non-Indigenous males in the 14- to 17-years age group, but a disparity emerged in the 18- to 24-years age group and was even larger among males aged 25 years and older.

Conclusion: Our paper presents unique data on suicidal thoughts and attempts among a broad age range of Indigenous and non-Indigenous males. The disparity in the prevalence of suicidal thoughts increased across age groups, which is in contrast to the large disparity between the Indigenous and non-Indigenous suicide rates in younger age groups.

Depression and physical activity

Physical activity and current depression in Australian Males aged 18-55. Lindner R, Cvetkovski S, Spittal M, Pirkis J, English DR, Currier D. (submitted)

Abstract

Purpose: Current guidelines recommend 150 minutes/week of physical activity for improved mental wellbeing. While there is evidence of a protective effect of physical activity on depression, findings vary considerably regarding the effects of duration and intensity of physical activity. In a large cohort of men we examine the relationship of duration and intensity of physical activity to current depression.

Methods: Using baseline data from 13,884 adult participants in the Australian Longitudinal Study on Male Health we compared current depression in men who completed 150 minutes of physical activity in the past week with men who did no. Overall activity time was examined using logistic regression with restricted cubic splines. Intensity of physical activity was examined by logistic regression using an isothermal substitution method of substituting hours of moderate activity with hours of vigorous activity.

Results: Completing at least 150 minutes/week of physical activity was associated with lower odds of moderate/severe depression. Increasing duration beyond 150 minutes/week was

associated with decreasing odds for depression. Among physically active men, each additional hour of moderate activity replaced with vigorous activity reduced the odds of depression.

Conclusions: In adult men, physical activity at the recommended level was associated with a reduction in current depression. Increased duration of physical activity was associated with increased reduction in odds for depression, as was undertaking vigorous activity rather than moderate activity. Men have a lower uptake of mental health services and promoting higher levels of physical activity is potentially a low cost intervention for improving men's mental wellbeing.

Health and wellbeing over the life course research theme

Generational differences in health status and behaviours (also physical health theme)

Age matters: exploring correlates of self-rated health across four generations of Australian males. Koelmeyer R, Currier D, Spittal MJ, Schlichthorst M, Pirkis J, English DR. *Behavioral Medicine*, 42:3, 132-142

Abstract

20-34 year old (Gen Y) males were more likely to report good-excellent self-rated health than males aged 50-55 years (Baby boomers) (93.4% and 85.4% respectively). There were generational differences in some health behaviours, but not others. Generation Y participants were most likely to report sufficient physical activity (62.9%), followed by males aged 35 – 49 years (Generation X) (56.6%) and then the Baby Boomer cohort (53.4%); the level of physical activity amongst Generation Z is 50%. The prevalence of obesity increased with age, ranging from 10.6% of males aged 10-19 years (Generation Z) to 25.8% of Baby Boomer males. Other factors did not vary across the four generations, with 93.6% - 96.1% of participants not achieving the recommended serves of fruit and vegetables.

Young men's health and lifestyle characteristics: regional and socioeconomic influences. (also social determinants research theme)

Young men's health in emerging adulthood: socioeconomic influences. Currier D, Patton G, Sanci L, Sahabandu S, Spittal MJ, English DR, Pirkis J. (submitted)

Abstract

Introduction: Emerging adulthood is a neglected phase of the life course in health. Health problems and risk emerging at this time may not only have long term consequences men's health but also affect the next generation as young men move into marriage and parenthood. It is a time where social transitions are linked to health and where socioeconomic factors are likely to play an important role in shaping health.

Methods: Mental and physical health and health risks including alcohol, drugs, tobacco, physical activity, fruit and vegetable consumption and body weight were compared by area

disadvantage and Year 12 (high school) completion in 2264 young men aged 18-25 participating in the Australian Longitudinal Study on Male Health (Ten to Men). Logistic regression was used to investigate the relative importance of area disadvantage and Year 12 completion.

Results: After adjustment for confounding variables and area disadvantage Year 12 non-completion was associated with diminished self-reported health, injury and disability, poorer mental health, suicidal behaviour, harmful alcohol use, drug use, insufficient physical activity, being overweight or obese and smoking. Area disadvantage, though also linked to many of these adverse outcomes in unadjusted analysis, was no longer associated with most after statistical adjustment.

Conclusion: Young men living in areas of socioeconomic disadvantage have higher rates of health problems and risks, however non-completion of high school was a more powerful predictor of a range of adverse health outcomes and behaviours. Retaining young men in education is likely to benefit the health of men across the life-course.

8 Student projects

Building the capacity of the next generation of male health researchers is an important part of Ten to Men's activities. In the short time since Wave 1 data has been available we have begun to attract Master of Public Health students conducting research projects, and PhD students. Below, we describe the projects that these students are working on using selected text from their research proposals.

8.1 Current Master of Public Health research projects

Ms Marissa Shields. Exploring the relationship between masculinity, social support, and self-reported mental wellbeing

The aim of this study is to investigate associations between masculine norms, social support, and men's self-reported mental wellbeing. Previous research has shown that certain aspects of masculinity are negatively associated with mental wellbeing, although fewer studies have taken measures of social support into account. Little research of this kind has been done in Australia and research internationally has not had access to a large population cohort. As such, this study will take into account a variety of relevant effect modifiers to investigate how conformity to masculine norms, social support, and mental wellbeing are associated in Australian men. This research addresses a gap in currently available knowledge and will provide a basis for future research on the temporal sequence of any observed associations.

Mr Nicholas Fava. Understanding mental health, service-use and rurality in Australian men with a disability

This study will examine the intersection of mental health, service use and rurality in men with a disability. There is a need to understand whether rurality correlates to different mental health outcomes and history of service use for men with a disability, as previous studies suggest that there may be an unmet demand for services in rural areas. As men with a disability are at higher risk of mental ill-health, research is needed to inform resource allocation by the Primary Health Networks and the National Disability Insurance Scheme.

Mr Vergil Dolar. Associations between obesity risk factors, depression and anxiety in Australian boys and young men

Depression is one of the leading causes of illness and disability among Australian adolescents and is often found co-occurring with obesity. Adolescent depressive symptomatology is more likely to persist and carry on into adulthood as clinical depression. Studies suggest that a bi-directional relationship exists between obesity and depression and, therefore, preventing the onset of one may reduce the risk of the other. This project will explore the association between risk factors for being overweight or obese and depression and anxiety among adolescent Australian males.

Mr Rowan Dowling. Quality of life and mental health of 15-25 year old Australian males who use ecstasy.

Young males are particularly likely to engage in risk-taking behaviour, including substance use. Research suggests that ecstasy use is particularly prevalent in young Australians; however existing research on the outcomes of ecstasy use focuses on regular users and symptomatology. This project will examine associations of ecstasy use, mental health and quality of life in a population based sample of young Australian men. The study aims to improve our understanding of how ecstasy use affects physical, social and emotional functioning of young Australians.

Ms Bronwyn Wolfaardt. The role of masculinity and informal help seeking in men with depression: a literature review.

Worldwide, the number of people suffering with depression is on the rise. Depression can be managed however men are less likely to seek help than women, with conformity to masculine norms being an important barrier preventing men from seeking help. A recent systematic review found that conforming to traditional masculine norms can have a negative impact on the way men experience depression and their willingness to seek help in a formal setting. It has been found that having a good social support system in place can act as a protective factor for men with depression symptoms, however, it is well known that men have lower levels of social support than women. This project will investigate the role of masculinity and informal help seeking in men with depression.

8.2 Current PhD projects

Ms Marnie Downes. Multilevel regression and post-stratification for addressing participant bias in health survey data

Large-scale surveys in population health are increasingly hampered by the difficulty of recruiting representative samples of participants, making the interpretation of findings difficult, especially with respect to the prevalence and incidence of health conditions. New methods for generating accurate estimates of public opinion based on highly non-representative surveys have been developed recently in political science, using multilevel regression models and poststratification. This project will apply and evaluate those methods for the purpose of obtaining accurate population estimates in health surveys.