



SUICIDE IN SOUTH AUSTRALIA: SPECIFIC FEATURES, TRENDS AND REASONS FOR DISPARITIES IN NUMBERS

Amy E. Austin B.Hlth.Sc. (Hons)

**Discipline of Anatomy and Pathology, School of Medical Sciences, The University
of Adelaide, Frome Road and Pathology, Forensic Science SA, 21 Divett Place,
Adelaide, South Australia, Australia**

Thesis submitted to The University of Adelaide in partial fulfilment of the requirements
for the degree of Doctor of Philosophy

May 2015

Table of contents

DECLARATION	4
PUBLICATIONS AND PRESENTATIONS	5
ACKNOWLEDGEMENTS	9
FINANCIAL SUPPORT	9
ABSTRACT	10
ABBREVIATIONS	12
CHAPTER 1: OVERVIEW OF GENERAL POPULATION SUICIDE	13
1.1 INTRODUCTION	13
1.1.1 History of reported victims	14
1.2 GENERAL CHARACTERISTICS OF SUICIDE	16
1.2.1 Sex of victims	16
1.2.2 Age of victims	17
1.2.3 Methods of suicide	19
1.3 SUICIDE AMONG FIRST PEOPLES	22
1.3.1 Suicide among Aboriginal people in Australia	22
1.3.2 Suicide among first peoples internationally	23
1.4 CLASSIFICATIONS OF SELF-HARM	24
1.4.1 Murder-suicide	25
1.4.2 Parasuicide	26
1.5 CONTRIBUTING FACTORS TO SUICIDE	28
1.5.1 Substance abuse	28
1.5.2 Mental illness	29

1.5.3 Other miscellaneous factors	31
1.6 SUICIDE NOTES	32
1.7 CAVEATS	33
1.8 SYNOPSIS	35
i. AIMS	35
ii. HYPOTHESES	36
1.9 REFERENCES	37
CHAPTER 2: AN ANALYSIS AND EVALUATION OF SUICIDE IN SA	52
2.1 INTRODUCTION	52
2.2 MATERIALS AND METHODS	55
2.3 RESULTS	57
2.3.1 Prevalence of suicide in SA	57
2.3.2 Age distribution and methods of suicide in SA	63
2.3.3 Specific characteristics of suicide in SA	66
2.3.4 Specific methods of suicide in SA	68
2.4 DISCUSSION AND CONCLUSIONS	82
2.5 REFERENCES	86
CHAPTER 3: PUBLICATIONS FROM SPECIFIC FINDINGS IN MEDICOLEGAL CASES	88
3.1 CONTEXTUAL STATEMENT	88
i. ORIGINAL PAPERS	89
3.2 <i>Causes of community suicides among indigenous South Australians</i>	89
3.3 <i>Physician suicide</i>	94
3.4 <i>Suicide and fatal single occupant motor vehicle collisions</i>	99

3.5	<i>Prison suicides in South Australia: 1996–2010</i>	107
3.6	<i>Body mass index and suicide</i>	112
ii.	CASE REPORTS	117
3.7	<i>Recent firing range suicides in South Australia</i>	117
3.8	<i>Head impalement – an unusual form of suicide</i>	122
3.9	<i>Multiple injuries in suicide simulating homicide: report of three cases</i>	128
3.10	<i>Skin messages in suicide – an unusual occurrence</i>	135
CHAPTER 4: GENERAL CONCLUSIONS		140
	FUTURE DIRECTIONS	144
APPENDIX		145

DECLARATION

This work 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 individual, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide.

I give consent to this copy of my thesis, when deposited in The University of Adelaide Library, being made available for loan and photocopying, subject to the provisions of the *Copyright Act 1968*.

I also give permission for the digital version of my thesis to be made available on the World Wide Web via the University's Digital Research Repository as well as the Library Catalogue.

Amy E. Austin

PUBLICATIONS AND PRESENTATIONS

The following reviews, original papers, case reports, editorial and abstracts were published, or accepted for publication or presentation during the period of my candidature. *Denotes papers included in the present thesis.

i. REVIEWS

Austin AE, van den Heuvel C, Byard RW. Suicide in forensic practice – an Australian perspective. *Aust J Forensic Sci.* 2011;43:65–76.

Austin AE, Byard RW. ‘Suicide in the young’. In: *Encyclopedia of Forensic and Legal Medicine*, 2nd ed. Eds. Payne-James J, Byard RW. Elsevier | Academic Press. 2015 (In press).

ii. ORIGINAL PAPERS

Byard RW, **Austin AE**, van den Heuvel C. Characteristics of asphyxial deaths in adolescence. *J Forensic Leg Med.* 2011;18:107–9.

Austin AE, van den Heuvel C, Byard RW. Causes of community suicides among indigenous South Australians. *J Forensic Leg Med.* 2011;18:299–301.*

Austin AE, Winskog C, van den Heuvel C, Byard RW. Recent trends in suicides utilizing helium. *J Forensic Sci.* 2011;56:649–51.

Austin AE, van den Heuvel C, Byard RW. Cluster hanging suicides in the young in South Australia. *J Forensic Sci.* 2011;56:1528–30.

Austin AE, van den Heuvel C, Byard RW. Physician suicide. *J Forensic Sci.* 2013;58 Suppl 1:S91–3.*

Austin AE, van den Heuvel C, Byard RW. Suicide and fatal single occupant motor vehicle collisions. *Aust J Forensic Sci.* 2013;45:43–8.*

Austin AE, van den Heuvel C, Byard RW. Prison suicides in South Australia: 1996–2010. *J Forensic Sci.* 2014;59:1260–2.*

Austin AE, van den Heuvel C, Byard RW. Body mass index and suicide. *Am J Forensic Med Pathol.* 2014;35:145–7.*

iii. CASE REPORTS

Austin AE, van den Heuvel C, Heath KJ, Gilbert JD, Byard RW. Recent firing range suicides in South Australia. *J Forensic Sci.* 2012;57:1495–6.*

Austin AE, Heath KJ, Gilbert JD, Byard RW. Head impalement – an unusual form of suicide. *J Forensic Leg Med.* 2012;19:264–6.*

Austin AE, Guddat SS, Tsokos M, Gilbert JD, Byard RW. Multiple injuries in suicide simulating homicide: report of three cases. *J Forensic Leg Med.* 2013;20:601–4.*

Austin AE, Byard RW. Skin messages in suicide – an unusual occurrence. *J Forensic Leg Med.* 2013;20:618–20.*

iv. EDITORIAL

Byard RW, **Austin AE**. The role of forensic pathology in suicide. *Forensic Sci Med Pathol.* 2011;7:1–2.

v. PRESENTATIONS

Austin AE, van den Heuvel C, Byard RW. Indigenous Australians, suicide and the autopsy. 19th Triennial Meeting of the International Association of Forensic Sciences; 2011 Sep 12–7; Madeira, Portugal.

Austin AE, van den Heuvel C, Heath KJ, Gilbert JD, Byard RW. Firing range suicide – a notable occurrence. 21st International Symposium on the Forensic Sciences; 2012 Sep 23–7; Hobart, Australia.

Austin AE, van den Heuvel C, Byard RW. Body mass index and suicide – is there an association? 21st International Symposium on the Forensic Sciences; 2012 Sep 23–7; Hobart, Australia.

Austin AE, van den Heuvel C, Byard RW. Community suicides among indigenous people in South Australia. The National Suicide Prevention Conference; 2013 Jul 24–6; Melbourne, Australia.

Austin AE, van den Heuvel C, Byard RW. Prison suicides in South Australia: retrospective review of deaths and contemporary analyses. The National Suicide Prevention Conference; 2013 Jul 24–6; Melbourne, Australia.

Austin AE, van den Heuvel C, Byard RW. Body mass index and suicide in South Australia. The National Suicide Prevention Conference; 2013 Jul 24–6; Melbourne, Australia.

ACKNOWLEDGEMENTS

I would like to extend my sincere appreciation to my supervisors, Professor Roger Byard and Associate Professor Corinna van den Heuvel, whose support, advice and enthusiasm throughout my candidature, was invaluable. I also thank the staff of South Australia Police, the State Coroner's Office and Forensic Science SA, who assisted with the collection of data featured in this work, particularly the specialist pathologists at Forensic Science SA who performed the autopsies. Acknowledgement is also given to the staff at the National Coronial Information System and the Australian Bureau of Statistics, for the provision of nationally accrued data.

FINANCIAL SUPPORT

This work was supported by an Australian Postgraduate Award.

ABSTRACT

Suicide constitutes a significant and yet under-recorded component of preventable mortality in many communities. Prevalent methods of suicide vary over time, and are influenced by the availability of noxious agents as well as ideas of what constitutes lethal techniques. Despite indications of self-destructive acts in many instances, it is sometimes difficult to accurately designate the manner of death as suicide, resulting in misclassifications among individual records. For example, deaths due to drug overdose, a fall from a height and drowning may be 'accidental', intentional or homicidal. Such ambiguities are carefully considered in forensic medicolegal investigations, through integration of death scene and autopsy findings. Thus, single forensic centres that service an explicit geographical area and have direct access to case information may produce more valid suicide data than larger and less specific national registers which rely upon records that may be incomplete or inaccurate. The following study was undertaken to examine suicide among medicolegal deaths in South Australia, to compare this with South Australian data on national registers and to delineate the characteristics of such cases.

A manual and electronic search was undertaken of pathology files at Forensic Science SA in Adelaide, Australia, for cases of suicide. All cases had undergone full police and coronial investigations. Case details were examined and the sex, age and race of victims, as well as reports on toxicology, the circumstances of death and/or means of suicide were collated.

Significant changes in the sex-, age- and method-specific patterns of suicide over recent years were identified. Specifically, there was a general decline in the rates of male suicides although, no statistically significant changes were observed in the registered rates for females. Available data from national registers were also reviewed from the National Coronial Information System and from the Australian Bureau of Statistics. After separating victims by sex, an overall under-reporting of suicides of 5.4% of local male cases as well as 13.5% of local female cases in the National Coronial Information System, and of 4.9% of local male cases as well as 14.0% of local female cases by the Australian Bureau of Statistics, was recorded, with a progressive increase in differences between reported numbers of suicides over time and particularly in recent years. Also, when cases were sub-classified according to the method used or specific groups of victims, further trends were discerned over time, including a decrease in overall deaths by carbon monoxide inhalation and male hangings, whereas hangings preponderated among Aboriginal as well as incarcerated people in South Australia. Additionally, overall drug-related deaths, asphyxial deaths using helium and female hangings, all showed increases compared to previous years. This study has demonstrated that despite a modest decline in the overall rate of suicide in South Australia, there have been marked and rapid alterations in the means of specific forms of suicide and among particular victim subgroups identified from local datasets. Such trends were not identifiable in national reports of death.

ABBREVIATIONS

ABS	—	Australian Bureau of Statistics
CO	—	Carbon monoxide
FSSA	—	Forensic Science SA
ICD-10	—	International Statistical Classification of Diseases and Related Health Problems, 10 th revision
LPG	—	Liquefied petroleum gas
NCIS	—	National Coronial Information System
NSW	—	New South Wales
NT	—	Northern Territory
BDM	—	Registrar of Births, Deaths and Marriages
SA	—	South Australia