Original communication

Ten years of suicide mortality in Australia: Socio-economic and psychiatric factors in Queensland

Kairi Kõlves, Boyd Potts, Diego De Leo[*]

Australian Institute for Suicide Research and Prevention, National Centre of Excellence in Suicide Prevention, WHO Collaborating Centre for Research and Training in Suicide Prevention, Griffith University, Australia

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ABSTRACT

Background: With the exception of the United States, in recent years suicide rates have been declining in most western countries. Notoriously, suicide rates fluctuate − especially in males − in response to a range of socio-political and environmental factors, some of them difficult to identify. Our aim was to obtain an updated profile of main commonalities in suicide cases of Queensland residents between 2002 and 2011 to inform prevention strategies.
Methods: Data were obtained from the Queensland Suicide Register (QSR), including police and toxicology reports, post-mortem autopsy and Coroner's findings. Data are crosschecked with records from the National Coronial Information System. Age-standardised rates (ASR) of suicide, Poisson regression and Chi^2 tests are presented.
Results: A total of 5752 suicides by Queensland residents was registered between 2002 and 2011; 76.9% by males and 23.1% by females. The average ASR was 14.3 per 100,000, with a significant decrease between 2002 and 2011. Rates declined significantly in males, not in females. On average, rates were 3.41-times higher in males. ASR for Aboriginal and Torres Strait Islander peoples was significantly higher than for other Australians. Overall, male suicide rates were particularly high in remote areas, as well as in the most disadvantaged ones. One third of suicide cases presented history of previous suicidal behaviour, and half a detected and treated mental disorder. Hanging was the most common method.
Conclusions: Suicide rates have declined in Queensland, Australia. It is problematic to say if this was due to suicide prevention programs or other factors.

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1. Introduction

The recent World Health Organization's report on suicide (*Preventing Suicide: A Global Imperative*) has indicated that, globally, during the period 2000−2012 suicide figures have declined by 9%: from 883,000 to 804,000.[1] With the notable exception of the United States, most western countries have witnessed remarkable declines in suicide rates. The reasons for these changes are unknown, even if they are generally attributed to improvements in health conditions and quality of life of individuals.[1]

The WHO report also highlights the fact that, in order to develop suitable suicide prevention programs for a community or country, a deeper understanding of the existing data is required. Governments are then compelled to improve data quality in order to measure the effectiveness of their interventions.[1]

The Queensland Suicide Register (QSR) is a comprehensive suicide database that runs since 1990 and is managed by the Australian Institute for Suicide Research and Prevention (AISRAP). The QSR includes a wide range of high-quality data on all suicides by Queensland residents.

Aim of the current paper is to analyse the most recent information in order to inform suicide prevention planning in Queensland, and possibly Australia. Analyses of suicide trends by age and gender and in vulnerable populations, such as Aboriginal and Torres Strait Islander peoples, are presented. In addition, suicide methods, and socio-demographic and psychiatric characteristics of people who died by suicide in the ten years between 2002 and 2011 are explored.

* Corresponding author. Australian Institute for Suicide Research and Prevention, National Centre of Excellence in Suicide Prevention, World Health Organization Collaborating Centre for Research and Training in Suicide Prevention, Griffith University, Level 1, Building M24 Psychology, 176 Messines Ridge Road, Mt Gravatt campus, QLD 4122, Australia. Tel.: +61 7 373 53366; fax: +61 7 373 53450.
E-mail address: d.deleo@griffith.edu.au (D. De Leo).

2. Methods

2.1. The Queensland Suicide Register

Information sources of the QSR include police report of death to a Coroner (Form 1), post-mortem autopsy report, toxicology report and Coroner's findings, including narrative of circumstances of death (who the deceased person was, and how, when and where the person died). Documents are crosschecked with records from the National Coronial Information System (NCIS). The QSR scrutinises all cases of possible suicide to determine the level of probability that the death was due to suicide. Following a decision tree described elsewhere,[2] cases are classified into three different levels: 1) beyond reasonable doubt; 2) probable; and, 3) possible.

For the present analyses, only cases falling into the categories of Beyond Reasonable Doubt and Probable were included.

The QSR procedures are approved by the Griffith University Human Research Ethics Committee (CSR/02/10/HREC).

2.2. Definition of variables

2.2.1. Remoteness

The Accessibility/Remoteness Index of Australia (ARIA+) is the standard Australian Bureau of Statistics (ABS) endorsed measure of remoteness, and forms the basis for the ABS "Remoteness Structure" component of the Australian Statistical Geography Standard (ASGS).[3] It is a continuous index with values ranging from 0 (high accessibility) to 15 (high remoteness). The index is based on road distance measurements from over 12,000 populated localities to the nearest Service Centres in five-size categories, based on population size.[4]

Each area in Queensland corresponds to one of five categories of remoteness: Major Cities, Inner Regional, Outer Regional, Remote, and Very Remote. In this article, Metropolitan areas are those categorised as Major Cities; Regional areas are those categorised as Inner Regional and Outer Regional; and, Remote areas are those categorised as Remote and Very Remote.

2.2.2. Socio-Economic Indexes for Areas (SEIFA)

Socio-Economic Indexes for Areas (SEIFA) were developed by the ABS to rank areas in Australia according to relative socioeconomic advantage and disadvantage. The indexes are based on information from five-yearly Censuses. SEIFA 2011 is based on 2011 Census data, and consists of four indexes, each focussing on a different aspect of socio-economic advantage and disadvantage and being a summary of a different subset of Census variables.[5] SEIFA 2011 is released according to the Australian Statistical Geography Standard (ASGS).

The Index of Relative Socio-Economic Disadvantage (IRSD) summarises variables that indicate relative disadvantage. It ranks areas on a continuum from most disadvantaged to least disadvantaged. A low score on this index indicates a high proportion of relatively disadvantaged people in an area. However, an area with a very high score does not automatically imply a large proportion of relatively advantaged people, as there are no variables in the index to indicate this.

The Index of Relative Socio-Economic Advantage and Disadvantage (IRSAD) summarises variables that indicate either relative advantage or disadvantage. This index ranks areas on a continuum from most disadvantaged to most advantaged. An area with a high score on this index has a relatively high incidence of advantage and a relatively low incidence of disadvantage.

The Index of Economic Resources (IER) summarises variables relating to the financial aspects of relative socioeconomic advantage and disadvantage. These include indicators of high and low income, as well as variables that correlate with high or low wealth. Areas with higher scores have relatively greater access to economic resources than areas with lower scores.

The Index of Education and Occupation (IEO) summarises variables relating to the educational and occupational aspects of relative socio-economic advantage and disadvantage. This index focuses on the skills of the people in an area, both formal qualifications and skills required to perform different occupations. A low score indicates that an area has a high proportion of people without qualifications, without jobs, and/or with low-skilled jobs. A high score indicates many people with high qualifications and/or highly skilled jobs.

For ease of interpretation, quantiles are used for the current analysis rather than index scores, as recommended by ABS. *The indexes are assigned to areas, not to individuals*. They indicate the collective socio-economic characteristics of the people living in an area.[5]

2.3. Population data

The following population data were used in order to calculate rates or make relevant comparisons.

Population numbers by gender and age — Estimated Resident Population (ERP) by Region, Age & Sex, 2001 to 2013.[6] *Remoteness* — The 2011 Census of Population and Housing.[7] *Socio-Economic Indexes for Areas (SEIFA)* — Queensland Regional Database.[8] *Aboriginal and Torres Strait Islander peoples* — Estimates and Projections, Aboriginal and Torres Strait Islander Australians, 2001 to 2026 from the ABS.[9] *Employment status* — 2011 Census of Population and Housing Time Series Profile.[10]

2.4. Statistical analysis

Age-standardised suicide rates (ASR) were calculated using the direct method and the Australian population of 2001 as the standard. The rate ratios (RR) were calculated using the ASR of all of Queensland as the denominator, providing an indication of the regional mortality rate relative to the all-of-Queensland rate. Confidence intervals are shown for the calculated ASRs and RRs. Poisson regression analyses were performed to determine any significant linear trends in suicide rates by gender, age group and Indigenous background. Incidence Rate Ratios (iRR), with 95% confidence intervals (95% CI), are presented. Chi^2 were calculated to compare groups and Chi^2_{trend} to measure change in prevalence in time. The analysis was performed with IBM SPSS version 22.0.

3. Results

3.1. Suicide incidence and rates by gender and age

A total of 5752 suicides by Queensland residents was registered between 2002 and 2011 (as 'beyond reasonable doubt' or 'probable'); 4422 were males (76.9%) and 1330 females (23.1%). The average yearly incidence was 575 suicides, with 442 males and 133 females (Fig. 1a). The average ASR was 14.3 per 100,000 persons, with a significant decrease from 16 in 2002 to 13.5 in 2011 (iRR = 0.985, 95%CI: 0.976–0.994, p = 0.001) (Fig. 1b). The male ASR declined significantly from 25.5 in 2002 to 19.5 in 2011 (average 22.3; iRR = 0.98 95%CI: 0.97–0.99, p < 0.001). The female ASR was relatively stable, with a non-significant increase from 6.8 in 2002 to 7.2 in 2011 (average 6.5; iRR = 1.01 95%CI: 0.99–1.03, p = 0.149). The male ASR was significantly higher than the female ASR during the reported period, being on average of 3.41 times higher (95%CI: 3.21–3.62).