Suicide and mental health in rural, remote and metropolitan areas in Australia

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ABSTRACT

Objectives: To compare the prevalence of mental health disorders and the use of professional help by area of residence, age and sex; and to determine whether the differences parallel differences in suicide rates.

Design: Retrospective cross-sectional analysis of Australian national mortality data (1997–2000) and the National Survey of Mental Health and Wellbeing (1997), using broad area-of-residence classifications based on the Rural, Remote and Metropolitan Area (RRMA) index.

Main outcome measures: (a) Suicide rates; (b) prevalence of depression, anxiety and substance-use disorders; and (c) use of health professionals for mental health problems — by age, sex and area of residence.

Results: Higher suicide rates were evident for men, particularly young men in rural (40.4 per 100 000; *z*, 3.2) and remote (51.7 per 100 000; *z*, 7.2) populations compared with metropolitan (31.8 per 100 000) populations. Although the proportion of young men reporting mental health disorders did not differ significantly between rural (23.5%; *z*, –0.5) and remote (18.8%; *z*, –1.6) areas compared with metropolitan (25.6%) areas, young men with a mental health disorder from non-metropolitan areas were significantly less likely than those from metropolitan areas to seek professional help for a mental health disorder (11.4% v 25.2%; *z*, –2.2).

Conclusions: There is a need to investigate why young men in non-metropolitan areas, the population with the greatest suicide risk, do and do not engage with mental health services.

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In Australia, suicide rates have consistently been found to be higher in rural than in metropolitan areas.[1] Adolescent and young adult males,[2,3] especially those in rural or remote areas, have particularly high suicide rates.[4-6] Mental health disorders have been described as the strongest risk factor for suicide across all ages[7] and in young people.[8] However, only a small body of literature has specifically focused on how mental health differs by age and sex across rural and metropolitan areas.

Judd et al[9] conducted a literature review on rural psychiatric morbidity and found few differences in the prevalence of mental health disorders among urban and rural residents.[9] The adult component of the 1997 Australian National Survey of Mental Health and Wellbeing (NSMHWB)[10] revealed a slightly increased risk of anxiety disorders in rural centres, but a lower risk of "any mental health disorder" in "other rural" compared with urban areas. However, these differences were not significant after adjusting for a wide array of sociodemographic characteristics. Judd et al[9] commented that variation in subgroups may be missed by such broad analyses and that further analysis of the NSMHWB data was needed.

Betts and Thornicroft[11] noted that mental health services are generally recognised as being less available in rural and remote areas, where access to qualified specialist staff is often very limited. For instance, there are far fewer psychiatrists (by main place of work) for rural and remote populations (3.3 and 1.8 per 100 000, respectively) than for metropolitan populations (14.2 per 100 000).[12] Service use is not independent of provision, ease, and means of access. However, there are few Australian community-based studies looking at service use and mental health that incorporate area of residence in their analyses. In the NSMHWB, residents of rural centres and "other rural" areas were found to be less likely than metropolitan residents to receive help from psychiatrists and psychologists for a mental health problem, findings which persisted after taking a wide range of characteristics into account, including the prevalence of disorders.[13] However, there was no association between participants' area of residence and whether or not they accessed help from any mental health professional or from a general practitioner for a mental health problem.[13]

Higher suicide rates in rural compared with metropolitan areas, despite similar rates of reported mental disorders, suggest that factors other than mental health (including sociodemographic and service-related factors) may also influence suicide rates. For instance, compared with other age groups, young adults, particularly young men, visit GPs infrequently for general healthcare.[14,15] Andrews et al[16] found that men without tertiary education and without family responsibilities were the group least likely to consult a professional for a mental health problem and suggested they may not recognise they have a problem. These investigators argued that mental health literacy programs should specifically target these men.[16]

The aim of our study was to determine, using existing datasets, whether age, sex and area differences in the prevalence of mental disorders and the use of professional help parallel differences in suicide rates.

METHODS

In Australia, deaths are recorded by the state registries of births, deaths and marriages. The Australian Bureau of Statistics (ABS) codes these mortality data according to ICD-10 "X" codes for suicide.[17] Suicide refers to deaths resulting from intentional self-harm (X60–X84), including poisoning; hanging/suffocation; drowning; use of a firearm, explosive material, sharp or blunt objects; motor vehicle crashes; and other or unspecified means.

In our study, we used suicide data collated by the Australian Institute of Health and Welfare over a four-year period (1997–2000). We also analysed data from the NSMHWB to examine

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regional differences in prevalence of mental health disorders and use of professional help for these disorders.

The NSMHWB was designed to establish the prevalence of common mental health disorders and the utilisation and need for mental health services. The survey was carried out by the ABS using trained interviewers. Households were randomly selected using a stratified, multistage area sample. The ABS provided appropriate weights so that an individual's chances of selection, which varied by state, territory and region, did not bias the results.[18] About 13 600 private dwellings were approached between May and August 1997. From each household, one resident aged 18 years or over was randomly selected and interviewed. The response rate was 78% ($n = 10\,641$). The survey did not include homeless people or people living in non-private dwellings such as prisons, hospitals or nursing homes. Comprehensive descriptions of the NSMHWB methods have been previously reported.[18,19]

In the NSMHWB, a modified version of the Composite International Diagnostic Interview was used to assess past-year prevalence rates for substance use, affective and anxiety disorders according to ICD-10 criteria.[20] All respondents were asked about consultations for mental health problems with a wide range of health professionals, including GPs, psychiatrists, psychologists, social workers, welfare workers, drug and alcohol counsellors, nurses, a mental health team or other health professionals.

The Rural, Remote and Metropolitan Area (RRMA) index was included in both the NSMHWB and the ABS mortality data. It is a seven-category classification system based on statistical local areas (Box 1).[21] First, statistical local areas in capital cities and statistical subdivisions containing an urban centre of 100 000 or more people are identified.[22] Then, other statistical local areas are designated an RRMA category based on population numbers and an index of remoteness. The index of remoteness includes a factor relating to the distance from an urban centre (ie, a centre of > 10 000 people) and a population density factor.

The NSMHWB data available to us had been collapsed into three area divisions: metropolitan (RRMA categories 1 and 2), rural centre (RRMA categories 3 and 4) and other rural/remote area (RRMA categories 5, 6 and 7).[19] The suicide data (classified according to the RRMA designation of the usual residence of the deceased) were grouped according to the three NSMHWB area divisions to enable comparison across datasets.

Age-specific suicide rates per 100 000 population were calculated using the ABS estimate of the population age groups living in the different RRMA divisions between 1997 and 2000.

All analysis of the NSMHWB data was conducted using STATA software[23] and applying the weights provided by the ABS. The differences between metropolitan areas and each of the other RRMA divisions were evaluated using z-scores, calculated according to the formula $z = D_{xy} / \sqrt{(S_x^2 + S_y^2)}$, where D_{xy} represents the difference between rates for two RRMA divisions x and y (assumed independent), and S_x^2 and S_y^2 are the variances of the suicide rate among people in RRMA divisions x and y, respectively. A z-score greater than 1.96 or less than −1.96 indicates a significant difference ($P < 0.05$).

1 Rural, Remote and Metropolitan Area (RRMA) index[1]

Category number	RRMA index categories
1	Capital cities
2	Other metropolitan centres (urban centre population> 100 000)
3	Large rural centres (urban centre population 25 000–99 999)
4	Small rural centres (urban centre population 10 000–24 999)
5	Other rural areas (urban centre population < 10 000)
6	Remote centres (urban centre population > 5000)
7	Other remote areas (urban centre population < 5000)

2 Suicide rates (95% CI) per 100 000 population, by sex, age and RRMA division*

Age (years)	Metropolitan area†	Rural centre‡	z§	Other rural/ remote area¶	z§
Men					
20–29	31.8 (30.1–33.4)	**40.4 (35.5–45.4)**	**3.2**	**51.7 (46.1–57.3)**	**7.2**
30–44	30.4 (29.0–31.7)	**38.0 (34.2–41.8)**	**3.7**	**34.9 (31.4–38.3)**	**2.6**
45–59	20.5 (19.3–21.8)	**29.5 (24.8–32.1)**	**4.0**	**28.3 (25.0–31.6)**	**4.7**
⩾ 60	22.1 (20.6–23.5)	24.0 (20.5–27.4)	1.0	**27.7 (24.231.1)**	**3.1**
Overall	20.2 (19.6–20.7)	**24.0 (22.625.4)**	**4.9**	**25.7 (24.426.9)**	**7.9**
Women					
20–29	7.2 (6.4–8.0)	8.0 (5.8–10.2)	0.7	7.2 (5.2–9.2)	–0.0
30–44	7.9 (7.2–8.6)	**10.2 (8.212.2)**	**2.1**	7.7 (6.2–9.2)	–0.3
45–59	6.8 (6.1–7.5)	5.5 (3.9–7.1)	–1.4	6.4 (4.9–7.9)	–0.4
⩾ 60	6.1 (5.4–6.8)	4.8 (3.4–6.2)	–1.5	4.9 (3.5–6.3)	–1.5
Overall	5.6 (5.3–5.9)	5.7 (5.0–6.4)	0.4	5.1 (4.5–5.7)	–1.4

RRMA index = Rural, Remote and Metropolitan Area index.[21]
* **Bold** figures indicate proportions significantly different from those in metropolitan areas ($P < 0.05$).
† Metropolitan area = RRMA categories 1 and 2. ‡ Rural centre = RRMA categories 3 and 4.
¶ Other rural/remote area = RRMA categories 5, 6 and 7.
§ z-score of the difference between RRMA groups and metropolitan areas.

RESULTS

Suicide

Across almost all age groups, suicide rates for men were higher in rural centres and other rural/remote areas than metropolitan areas ($z > 1.96$), but men aged 20–29 years in non-metropolitan areas had particularly high suicide rates. For women, only those in the 30–44-years age group in rural areas had higher suicide rates than metropolitan women of the same age (Box 2).

Variation in mental health disorders across RRMA divisions

Findings from the analysis of the 1997 NSMHWB data are shown in Boxes 3–6.

Compared with men in metropolitan areas and rural centres, a smaller proportion of men in other rural/remote areas reported substance-use disorders or "any mental health disorder". Apart from this, there were no significant differences in mental health disorders across RRMA divisions for either men or women (Box 3).

While small cell sizes prevented an examination of specific disorders by age, sex and RRMA division, it was possible to make comparisons based on the broader category of people with "any mental health disorder". In rural areas, women aged 30–44 reported higher rates of "any mental health disorder" than their metropolitan counterparts, but otherwise there were no significant differences in the prevalence of mental health disorders between metropolitan areas, rural centres and other rural/remote areas within age groups (Box 4).

3 Proportion of the population (weighted estimates and 95% CIs) with various types of mental health disorder, by sex and RRMA division*

	Metropolitan area† (3151 men, 3986 women)	Rural centre‡ (677 men, 885 women)	z§	Other rural/remote area (877 men, 1065 women)	z§
Affective disorders					
Men	5.4% (4.5%–6.2%)	6.9% (4.9%–9.0%)	1.4	4.1% (2.7%–5.5%)	–1.5
Women	9.3% (8.4%–10.3%)	9.7% (7.7%–11.8%)	0.3	8.4% (6.7%–10.1%)	–0.9
Anxiety disorders					
Men	7.2% (6.2%–8.1%)	8.3% (6.0%–10.6%)	0.9	5.4% (3.8%–7.1%)	–1.7
Women	11.8% (10.7%–12.9%)	14.2% (11.8%–16.7%)	1.8	11.0% (8.9%–13.0%)	–0.7
Substance use disorders					
Men	11.5% (10.2%–12.8%)	11.1% (8.5%–13.6%)	–0.3	**8.6% (6.5%–10.7%)**	**–2.3**
Women	4.4% (3.8%–5.1%)	4.6% (3.2%–6.1%)	0.2	4.1% (2.7%–5.4%)	–0.5
Any mental health disorder					
Men	18.4% (16.8%–19.9%)	18.9% (15.6%–22.1%)	0.3	**15.2% (12.5%–17.8%)**	**–2.1**
Women	19.4% (18.0%–20.7%)	21.2% (18.3%–24.1%)	1.1	16.8% (14.4%–19.2%)	–1.8

RRMA index = Rural, Remote and Metropolitan Area index.[21]
* **Bold** figures indicate proportions significantly different from those in metropolitan areas ($P < 0.05$).
† Metropolitan area = RRMA categories 1 and 2. ‡ Rural centre = RRMA categories 3 and 4.
¶ Other rural/remote area = RRMA categories 5, 6 and 7.
§ *z*-score of the difference between RRMA groups and metropolitan areas.

4 Proportion of the population (weighted estimates and 95% CIs) with any mental health disorder in the previous year, by sex, age and RRMA division*

Age (years)	Metropolitan area† (3151 men, 3986 women)	Rural centre‡ (677 men, 885 women)	z§	Other rural/remote area (877 men, 1065 women)	z§
Men					
18–29	25.6% (21.9%–29.4%)	23.5% (15.0%–32.0%)	–0.5	18.8% (11.1%–26.5%)	–1.6
30–44	21.0% (14.3%–27.7%)	22.4% (9.0%–35.9%)	0.2	22.1% (12.1%–32.2%)	0.2
45–59	14.8% (11.9%–17.7%)	16.8% (11.0%–22.5%)	0.6	13.0% (8.2%–17.7%)	–0.6
⩾ 60	7.9% (5.6%–10.1%)	11.3% (5.5%–17.2%)	1.1	5.2% (2.1%–8.4%)	–1.3
Women					
18–29	25.5% (22.3%–28.7%)	25.9% (19.2%–32.7%)	0.1	23.1% (15.8%–30.4%)	–0.6
30–44	21.1% (18.7%–23.4%)	**27.1% (21.6%32.6%)**	**2.0**	20.3% (15.9%–24.7%)	–0.3
45–59	19.3% (16.3%–22.2%)	20.1% (14.2%–26.0%)	0.3	17.8% (13.2%–22.5%)	–0.5
⩾ 60	9.6% (7.5%–11.8%)	10.0% (5.7%–14.4%)	0.2	6.7% (3.4%–9.9%)	–1.5

RRMA index = Rural, Remote and Metropolitan Area index.[21]
* **Bold** figures indicate proportions significantly different from those in metropolitan areas ($P < 0.05$).
† Metropolitan area = RRMA categories 1 and 2. ‡ Rural centre = RRMA categories 3 and 4.
¶ Other rural/remote area = RRMA categories 5, 6 and 7.
§ *z*-score of the difference between RRMA groups and metropolitan areas.

Professional help for mental health problems

The proportion of the population who had received professional help for any mental health disorder during the previous year is shown in Box 5. Small cell sizes meant that all rural centres and other rural/remote area categories (ie, RRMA categories 3–7) needed to be combined into one group ("non-metropolitan") for purposes of analysis. A smaller proportion of non-metropolitan than metropolitan young adults (both men and women) had received professional help for a mental health problem.

The proportion of those who met the ICD 10 criteria for any mental health disorder who had received professional help for a mental health disorder during the previous year is shown in Box 6. In non-metropolitan areas, a smaller proportion of young men with any mental health disorder accessed professional help than in metropolitan areas. There was no difference between young women from metropolitan and non-metropolitan areas when only those with a mental health disorder were included in the analysis. Subsequent analyses also indicated that, in non-metropolitan areas, a smaller proportion of young men with any mental health disorder accessed professional help than young women (z, 2.3).

DISCUSSION

Our study confirmed that young men in non-metropolitan areas have higher suicide rates than their metropolitan counterparts. However, while mental health disorders are a leading risk factor for suicide, we did not find that young men in non-metropolitan areas reported higher levels of mental health disorders.

For women, both mental health disorders and suicide rates in the 30–44-years age group were slightly higher in large rural areas compared with metropolitan areas. However, these findings were of borderline statistical significance, and further confirma-

5 Proportion of the population (weighted estimates and 95% CIs) who had received professional help for any mental health disorder during the previous year, by sex, age and RRMA group*

Age (years)	Metropolitan area† (3151 men; 3986 women)	Non-metropolitan area‡ (1554 men; 1950 women)	z§
Men			
18–29	8.1% (5.9%–10.4%)	**3.8% (1.0%–6.5%)**	**–2.4**
30–44	10.9% (8.9%–12.9%)	8.0% (5.7%–10.3%)	–1.9
45–59	8.8% (6.6%–10.9%)	9.9% (6.7%–13.1%)	0.6
⩾ 60	4.5% (2.8%–6.3%)	3.8% (1.7%–5.9%)	–0.5
Overall	8.5% (7.5%–9.6%)	**6.7% (5.4%8.0%)**	**2.1**
Women			
18–29	15.8% (13.2%–18.4%)	**9.5% (6.3%12.7%)**	**3.0**
30–44	16.1% (14.0%–18.2%)	18.1% (15.0%–21.3%)	1.1
45–59	15.6% (13.0%–18.3%)	14.3% (11.0%–17.6%)	–0.6
⩾ 60	7.6% (5.6%–9.7%)	5.2% (3.1%–7.4%)	–1.6
Overall	14.1% (12.9%–15.3%)	12.4% (10.8%–13.9%)	–1.8

RRMA index = Rural, Remote and Metropolitan Area index.[21]
* **Bold** figures indicate proportions significantly different from those in metropolitan areas ($P < 0.05$).
† Metropolitan area = RRMA categories 1 and 2.
‡ Non-metropolitan area = RRMA categories 3, 4, 5, 6 and 7.
§ z-score of the difference between RRMA groups and metropolitan areas.

tion is needed before conclusions can be drawn. Overall, for women, there were few differences in rates of suicide and mental health disorders across RRMA divisions.

Our results show that only a small proportion (11%) of 18–29-year-old men with mental health disorders in non-metropolitan areas had accessed professional help. Young men (the group with the highest suicide rates) had less contact with health professionals for a mental health problem than both metropolitan young men and non-metropolitan young women with any mental health disorder.

Our study has many of the shortcomings evident when attempting to investigate aspects of rural health. Although the higher proportion of Indigenous people in rural and remote areas may be an important factor affecting suicide rates, it was not possible to identify Indigenous status in the data we used. The NSMHWB data file did not specify Indigenous status, and suicide rates among Indigenous people were not available for all Australian states. The NSMHWB data reported here did not include adolescents (aged < 18 years), so our analysis cannot explore this population. While this study discusses trends and suggests possibilities, it cannot directly evaluate cause and effect, because the data were cross-sectional. Furthermore, the RRMA classification does not allow for diversity within statistical local areas and combines the concepts of distance and population density.[22] We acknowledge and emphasise that there is considerable variability within and across regions of Australia. It is also important to note that the NSMHWB data reflect self-reported symptoms/disorders and that young men, particularly those in non-metropolitan areas, may have been less likely to report, recognise or be concerned about symptoms than their metropolitan counterparts.

The small number of participants surveyed in non-metropolitan areas has several implications. First, rural and remote RRMA categories needed to be collapsed when reporting service-use patterns from the NSMHWB dataset, so we were unable to compare rural and remote areas. Second, a range of subgroups, specific services, patterns of use and characteristics could not be examined. Third, four years of suicide data (1997–2000) from the ABS needed to be combined to enable a breakdown by age and sex, whereas the NSMHWB was conducted over a single year (1997). Finally, the small sample sizes in rural and remote areas may have meant that some significant differences between groups were not found (eg, in the proportion of mental health disorders among young men in rural and remote areas compared with metropolitan areas).

We were unable to investigate the reasons why professional help is or is not used. Tudiver and Talbot[24] argued that men do not seek general healthcare for a range of reasons, including a tendency to use indirect sources of help; the perception that seeking help will show their vulnerability; fear and denial; difficulty relinquishing control; and systematic barriers. Another study indicated that knowledge about depression and its treatments was greater among women and younger people.[25] Mental health literacy may be a particular problem for young men in rural areas, who may be less likely to recognise or report symptoms of distress or know what can be done to help.

Some researchers have argued that a high proportion of suicides among patients with psychiatric disorders may be preventable through appropriate service-system responses.[26,27] While improving suicide prevention strategies for people already in contact with professional help is vitally important, mental health policy and services also need to better incorporate people who currently have little contact with the healthcare system.

6 Proportion (weighted estimates and 95% CIs) of those meeting the ICD-10 criteria for any mental health disorder who received professional help during the previous year, by sex, age and RRMA group*

Age (years)	Metropolitan area† (602 men; 823 women)	Non-metropolitan area‡ (264 men; 386 women)	z§
Men			
18–29	25.2% (18.1%–32.3%)	**11.4% (1.1%–21.7%)**	**–2.2**
30–44	34.0% (27.3%–40.7%)	27.3% (19.1%–35.6%)	–1.2
45–59	35.8% (25.9%–45.8%)	41.3% (27.9%–54.7%)	0.6
⩾ 60	26.9% (14.1%–39.7%)	24.4% (8.4%–40.4%)	–0.2
Overall	30.6% (26.4%–34.7%)	26.2% (20.5%–31.9%)	–1.2
Women			
18–29	37.3% (30.6%–44.0%)	27.9% (17.8%–38.0%)	–1.5
30–44	49.7% (43.5%–55.9%)	50.1% (41.7%–58.5%)	0.1
45–59	53.5% (45.1%–61.9%)	53.7% (43.1%–64.3%)	0.0
⩾ 60	39.5% (27.8%–51.2%)	41.0% (24.2%–57.8%)	0.1
Overall	45.4% (41.6%–49.3%)	44.3% (38.9%–49.7%)	–0.3

RRMA index = Rural, Remote and Metropolitan Area index.[21]
* **Bold** figures indicate proportions significantly different from those in metropolitan areas ($P < 0.05$).
† Metropolitan area = RRMA categories 1 and 2.
‡ Non-metropolitan area = RRMA categories 3, 4, 5, 6 and 7.
§ z-score of the difference between RRMA groups and metropolitan areas.

Overall, a wide range of factors, including those relating to being male, together with a fundamental lack of services, may help to explain why young men, particularly those in rural areas, do not access professional help.

Given that mental health problems are a major risk factor for suicide, a better understanding of the reasons behind young rural men's use and non-use of services is of considerable importance. Increasing service use by and for these men, even to a small degree, might reduce their suicide rates.

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COMPETING INTERESTS

None identified.

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