

# How does mental health status relate to accessibility and remoteness?

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**M**ental illness contributed to almost 11% of the total world disease burden in 1990, and is predicted to reach 15% by 2020.<sup>1</sup> In Australia, nearly one in five individuals suffer from a mental illness such as anxiety, depression or substance use, and almost half of these are affected long term.<sup>2,3</sup> Young adults experience the highest prevalence of mental illness, and rates steadily decline with age. Young adult male suicide rates are particularly high in rural areas.<sup>4</sup>

When comparing the health of rural and urban Australians, there is a tendency to rely on longstanding stereotypes. Rural areas may be portrayed either as idyllic settings in which to escape the many stressors associated with urban living, or as places of isolation and disadvantage where inhabitants suffer from a lack of health services and hence experience poorer health.<sup>5</sup> Rural and remote communities have been targeted as priority populations for increased mental health prevention and promotion initiatives.<sup>6</sup> However, the perception of rural mental health disadvantage is difficult to confirm or refute because of limited published data on the extent of mental illness in regional Australia.<sup>3,7-9</sup> Moreover, most research to support policy decisions is based on population estimates from large rural and urban units of geographical aggregation, a distinction that no longer adequately captures the growing diversity and complexity of rural and remote populations.<sup>10</sup>

The aim of this study was to determine if the prevalence of mental illness is associated with accessibility and remoteness in South Australia. This is important information for consumer advocacy, health policy and health service planning.

## METHODS

### Survey design and sample selection

Data were obtained from the South Australian component of the Collaborative "Health

## ABSTRACT

**Objective:** To determine whether mental illness is associated with accessibility and remoteness.

**Design:** A cross-sectional, population-based, computer-assisted telephone interview survey, stratified by Accessibility and Remoteness Index of Australia (ARIA) categories.

**Setting:** Secondary analysis of data collected from 2545 South Australian adults in October and November 2000.

**Outcome measures:** Psychological distress and depression as determined by the Kessler 10 Psychological Distress Scale, the SF-12 measure of health status, and self-reported mental illness diagnosed by a doctor in the previous 12 months.

**Results:** Overall, mental illness prevalence estimates were similar using the three measures of psychological distress (10.5%), clinical depression (12.9%) and self-reported mental health problem (12.7%). For each measure, there was no statistically significant variation in prevalence across ARIA categories, except for a lower than expected prevalence of depression (7.7%) in the "accessible" category. There was no trend suggesting higher levels of mental illness among residents of rural and remote regions.

**Conclusions:** The prevalence rates of psychological distress, depression and self-reported mental illness are high. However, we found no evidence that the prevalence of these conditions varies substantially across ARIA categories in South Australia. This finding may challenge existing stereotypes about higher levels of mental illness outside metropolitan Australia.

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and Wellbeing" Computer Assisted Telephone (CATI) survey conducted in Western Australia, the Northern Territory and South Australia during October and November 2000 by the Population Research and Outcome Studies Unit, Department of Human Services, South Australia.<sup>11</sup> CATI is a telephone monitoring system that is an efficient method for monitoring self-reported aspects of population health, particularly in rural areas.<sup>12</sup>

All households in South Australia with a telephone number listed in the latest version of the electronic white pages were eligible for inclusion. Separate random samples were drawn for each of the geographic regions (metropolitan, rural and remote), and oversampling was undertaken in the

non-metropolitan areas. The aims, methods and initial findings of the survey have been reported elsewhere.<sup>11</sup>

### Sociodemographic data

Respondents were asked their marital status, country of birth, and educational attainment; what type of work they had done for most of their life; their work status; and their annual combined household income.

### Geographical dispersion of mental illness

Comparisons of the prevalence of mental illness were made using the Accessibility and Remoteness Index of Australia (ARIA).<sup>13</sup> ARIA is a geographical index that defines remoteness as accessibility to goods, services and opportunities for social interaction across Australia, based on road distance from populated towns. For each populated location, distances are converted to a continuous measure, ranging from 0 for high accessibility to 12 for extreme remoteness. ARIA measures are then grouped into five categories ("highly accessible", "accessible", "moderately accessible", "remote", "very

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remote”) using “natural breaks” in the 0 to 12 continuous variables. To allow adequate confidence for population estimates, the remote and very remote categories were combined in this study.

### Survey instruments and outcome measures

The Kessler 10 (K10) is a short self-administered scale that detects psychological distress, and has been found to be useful in large epidemiological population health surveys in Australia.<sup>14,15</sup> The K10 consists of 10 questions that ask participants how often during the previous four weeks they experienced symptoms of psychological distress (tired out for no good reason; nervous; so nervous that nothing could calm you down; hopeless; restless or fidgety; so restless you could not sit still; depressed; everything was an effort; so sad that nothing could cheer you up; worthless). Responses are recorded on a five-category scale, and scores range from 10 (indicating no distress) to 50 (indicating severe distress), and were partitioned into four levels: low (10–15), moderate (16–21), high (22–29) and very high (30–50).<sup>16</sup> Prevalence estimates were based on high and very high scores.

The SF-12 health status measure is a subset of the SF-36 that has previously been validated in Australian populations.<sup>17</sup> Each question contributes to a score derived from one of eight dimensions of health and well-being and is aggregated into two measures: the Mental Component Summary (MCS) and the Physical Component Summary (PCS).<sup>18</sup> Scores range from 0 to 100, and a higher score indicates better mental or physical health or wellbeing. An MCS score of 42 or less detects depression, and a PCS score of 50 or less determines a physical condition. Analyses using the PCS were beyond the scope of this article.

Data for the third outcome measure were derived from the question “In the last 12 months, have you been told by a doctor that you have anxiety, depression, a stress-related problem and any other mental health problem, or receiving treatment for this?”.

### Statistical analysis

We conducted a secondary analysis of the data generated by this survey, using SPSS for the analysis.<sup>19</sup> Data were weighted by region (metropolitan, rural, remote), age, sex and probability of selection in the household using the 1999 census total resident estimated population figures obtained from the Australian Bureau of Statistics. The weights

reflect unequal sample inclusion probabilities and compensate for differential non-response. Direct age–sex standardisation was applied to mental health prevalence estimates. Overall estimates and 95% confidence intervals were based on state weights, and regional weights were applied to ARIA geographical strata. Our study had 92% power, at the 5% level, to detect a 50% difference in prevalence between remote/very remote areas and elsewhere.

Overall significance was examined using  $\chi^2$  tests. Adjusted standardised residuals were obtained using the method of Haberman,<sup>20</sup> and were used to test deviations from expected values separately in each cell. Bonferroni corrections were applied for multiple testing.<sup>21</sup> These tests were calculated using macros to avoid the inaccuracies associated with using non-integer weights in SPSS.

### RESULTS

Of the 3989 eligible respondents, 2545 participated in the survey (response rate, 64%). The proportion of Aboriginal people included was one per cent. Residents from the highly accessible areas tended to be more highly educated and engaged in higher-status occupations and were more likely to be never married, born outside Australia, and employed (Box 1).

#### Prevalence of mental illness

Overall (across South Australia), the prevalence of mental illness as measured by the three different instruments was similar (Box 2). The most frequently occurring self-reported mental illnesses were depression and stress-related problems (5.8% each), followed by anxiety (5.1%).

Mental illness prevalence estimates for the three different measures were similar across ARIA categories (Box 2). There was no trend towards higher prevalence of mental illness for the three measures across ARIA categories.

### DISCUSSION

We found similar, and high, prevalence rates of psychological distress, depression and self-reported mental illness in South Australia using the K10, SF-12 and self-reporting. When the prevalence rates were examined by degree of accessibility and remoteness, there was little evidence for differences across ARIA regions and no evidence of poorer mental health in more remote areas. Our findings challenge some

of the existing stereotypes that mental illness may be higher in rural Australia.

It is notable and encouraging that we obtained similar overall prevalence estimates using the three different outcome measures. The three instruments measure similar, but not identical, health states. This was the first South Australian survey to include the K10, which prevents direct comparisons with previous state data. However, the prevalence rate for psychological distress reported here is similar to rates reported in other state and national surveys.<sup>14,15,22</sup>

The prevalence rate for depression was similar to that obtained in an earlier South Australian population survey (11.8%), as were estimates of self-reported mental illness (11.9%).<sup>8</sup> Rates of self-reported mental illness were lower in our sample than for Australia as a whole (17.7%); however, direct comparisons are not possible, as different survey tools were used and substance-use disorders are included in the national estimates.<sup>14</sup> Similar methodological inconsistencies limit direct comparisons between our findings and those of international studies.<sup>23,24</sup>

Several limitations should be considered when interpreting our results. Residents who did not have a telephone connected, people in hospitals, nursing homes and other major institutions, and homeless people were not included in our sampling frame. Although individuals from some of these groups may have poorer mental health, it seems unlikely that exclusion would have varied across ARIA categories. Given the low representation of Aboriginal people in this survey, it is unlikely that Aboriginality had a strong influence on our results. The response rate of 64% is within the accepted range for surveys of this type.

To date, the evidence to support rural mental health policy in Australia has been based on crude population estimates using large rural and urban geographical aggregates that have produced inconsistent findings. National survey data found little difference in prevalence of mental illness between rural and urban areas in Australia, and others have found that prevalence estimates were lower in rural areas compared with elsewhere.<sup>3,8</sup> In contrast, research conducted in local rural communities reveals higher rates of mental illness.<sup>7</sup> A review of international prevalence studies reveals similar inconsistencies.<sup>5</sup>

The lack of evidence for significant differences in prevalence across ARIA categories does not mean that differences do not exist. Similar non-significant findings have been

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reported from self-reported health service utilisation research using the ARIA index, despite the fact that certain groups experience higher mortality and morbidity and would be expected to access services more frequently.<sup>25,26</sup>

After adjusting for age and sex, indicators of socioeconomic status were significantly higher in highly accessible areas, and yet recent research indicates that significant inequities in health outcomes exist between socio-economically advantaged and disadvantaged

groups in both rural and urban areas.<sup>27</sup> This suggests that estimates averaged across ARIA regions may obscure local environmental, behavioural and socioeconomic factors that may be important determinants of mental illness.<sup>5,6</sup> To describe the full range of factors

### 1 Sociodemographic characteristics, by Accessibility and Remoteness Index of Australia<sup>13</sup> categories

	Highly accessible (n = 962)	Accessible (n = 574)	Moderately accessible (n = 277)	Remote/ Very remote (n = 732)	$\chi^2$ (df)	P
Age (years)						
18–34	304 (31.6%)	148 (25.8%)	87 (31.5%)	240 (33.0%)	14.525 (6)	0.024
35–54	363 (37.7%)	237 (41.2%)	94 (34.0%)	294 (40.2%)		
≥ 55	295 (30.7%)	189 (33.0%)	96 (34.5%)	198 (27.1%)		
Sex						
Male	466 (48.4%)	289 (50.4%)	140 (50.7%)	388 (53.0%)	3.512 (3)	0.319
Female	496 (51.6%)	285 (49.6%)	137 (49.3%)	344 (47.0%)		
Marital status						
Married, de facto	613 (63.7%) <sup>†</sup>	431 (75.1%)*	187 (67.3%)	521 (71.2%)	31.528 (6)	< 0.001
Separated, divorced, widowed	121 (12.6%)	67 (11.7%)	29 (10.4%)	79 (10.8%)		
Never married	228 (23.7%)*	76 (13.2%) <sup>†</sup>	62 (22.3%)	132 (18.1%)		
Country of birth						
Australia	703 (73.1%) <sup>†</sup>	498 (87.0%)*	254 (91.5%)*	654 (89.4%)*	108.535 (3)	< 0.001
Outside Australia	259 (26.9%)*	75 (13.0%) <sup>†</sup>	24 (8.5%) <sup>†</sup>	78 (10.6%) <sup>†</sup>		
Highest education attained						
Secondary education or less	615 (63.9%) <sup>†</sup>	423 (73.7%)	208 (74.9%)	518 (70.7%)	43.032 (6)	< 0.001
Trade, apprenticeship, certificate, diploma	161 (16.8%)	92 (16.0%)	39 (14.1%)	136 (18.6%)		
Degree	186 (19.3%)*	59 (10.3%)	31 (11.0%)	78 (10.6%)		
Work status						
Manager, administrator, professional, para-professional	189 (19.7%)*	87 (15.2%)	39 (14.2%)	97 (13.2%)	50.500 (12)	< 0.001
Clerk, sales or tradesperson	366 (38.0%)*	177 (30.8%)	81 (29.1%)	242 (33.0%)		
Labourer, plant or machine operator	205 (21.3%) <sup>†</sup>	168 (29.3%)	91 (32.7%)	227 (31.0%)		
Home duties, never worked	79 (8.2%)	73 (12.7%)	31 (11.1%)	84 (11.5%)		
Other	124 (12.8%)	69 (12.0%)	36 (12.8%)	82 (11.2%)		
Employment status						
Full time	384 (39.9%)	222 (38.6%)	101 (36.3%)	290 (39.6%)	29.378 (9)	< 0.001
Part time	186 (19.4%)	103 (18.0%)	51 (18.4%)	150 (20.5%)		
Unemployed	12 (1.2%) <sup>†</sup>	23 (4.1%)	5 (2.0%)	37 (5.0%)		
Home duties, retired, student	379 (39.4%)	226 (39.4%)	120 (43.3%)	255 (34.9%)		
Household income						
≤ \$20 000	225 (23.4%)	167 (29.1%)	70 (25.4%)	176 (24.0%)	22.909 (9)	0.006
\$20 001–\$80 000	477 (49.5%)	286 (49.8%)	125 (44.9%)	342 (46.8%)		
> \$80 000	120 (12.5%)	56 (9.8%)	33 (11.8%)	116 (15.9%)*		
Not stated/refused	140 (14.6%)	65 (11.4%)	49 (17.8%)	97 (13.3%)		

Bonferroni correction was applied to multiple contingency tables. The weighting of the data can result in rounding discrepancies or totals not adding.

\* Significantly higher than expected. † Significantly lower than expected.

## 2 Age-sex-standardised prevalence (95% CIs) of mental illness, by mental health outcome measure and Accessibility and Remoteness Index of Australia<sup>13</sup> category

	Overall* (n = 2545)	Highly accessible (n = 962)	Accessible (n = 574)	Moderately accessible (n = 277)	Remote/very remote (n = 732)
Kessler 10 Psychological Distress <sup>16</sup>	10.5% (9.3%–11.7%)	10.8% (8.5%–12.8%)	8.5% (6.2%–10.8%)	9.1% (5.6%–12.4%)	11.1% (8.8%–13.3%)
SF-12 Depression <sup>17</sup>	12.9% (11.6%–14.2%)	13.7% (11.5%–15.8%)	7.7% <sup>†</sup> (5.5%–9.8%)	10.8% (7.2%–14.5%)	12.3% (9.9%–14.7%)
Self-reported mental illness and receiving treatment	12.7% (11.4%–14.0%)	13.5% (11.3%–15.6%)	10.7% (8.2%–13.3%)	9.5% (5.9%–12.8%)	9.6% (7.4%–11.7%)

Bonferroni correction was applied to ARIA regions. \* Overall estimates are based on South Australian state weights, and regional weights apply to ARIA geographical strata. † Significantly lower than expected.

that affect mental illness at a local level, more sensitive measures may be needed.

There is now good evidence to suggest that Australia's non-metropolitan population has become more heterogeneous, and socio-demographic and socioeconomic patterns are increasingly mirroring those of large cities.<sup>10</sup> We need to move beyond the broad distinction between "city" and "country", and beyond the stereotype that "health status in the bush is worse than that in the city". However, our findings are no cause for satisfaction or complacency. Levels of distress and illness are high — too high — across South Australia. More resources are needed to combat this. The response will need to differ depending on the realities of the particular location, building upon an integrated statewide policy and strategy.

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## COMPETING INTERESTS

None identified

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