

The Accessibility/Remoteness Index of Australia (ARIA) and Lifeline Australia's calls

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ABSTRACT

Nationally there are more than 50 member centres and sub-centres of Lifeline Australia's telephone counselling and referral service, providing an equitable, free, anonymous, and highly accessible primary health resource. The accessibility of this service may mean that it has a particularly important role to play in contributing to the health and well-being of rural and remote Australians. The trained volunteer counsellors of the service receive more than 400 000 calls annually. Information on many of these calls is recorded by telephone counsellors in Lifeline's Client Service Management Information System (CSMIS).

The purpose of this study was to establish if a relationship between the Accessibility/Remoteness Index of Australia (ARIA) and calls to Lifeline Australia could be found. Population standardised areal call rates to Lifeline Ballarat were compiled using Telstra exchange service area to test the hypothesis that a positive relationship between the call rates to the service and the ARIA would be found. 90 128 CSMIS cases from 2003 were examined to explore if any linear relationship between caller characteristics and a centre's ARIA score were apparent. A number of significant associations with the ARIA scores and CSMIS call variables were observed. However, the hypothesis that a positive relationship between call rates to the service and the ARIA would be found was not supported. An important implication of this exploratory study is that Lifeline's telephone counselling and referral service may need to be promoted more widely to rural clients and health care providers.

INTRODUCTION

Rural Australia is characterised by distance, sparse infrastructure and population, and a lack of health services.¹ Even if services are readily available to rural clients, they may be reluctant to seek assistance such as face-to-face counselling from services located within their community.² Telephone counselling means people can gain access to a counselling service and referrals to other providers whilst they maintain their anonymity and dignity. For housebound callers, people in rural communities, and isolated individuals a telephone counselling service can be thought of as an important component of the mental health service.³ For these and other reasons telephone counselling services have become an "integral part of community health care and welfare resources throughout the developed world".⁴

Research has revealed geographical variations in health services access, help seeking behaviours, health risk factors, and health status across Australia,⁵ and other countries.^{6,7,8} There are clearly recognised differentials in health care access and availability between metropolitan and rural populations. Compared to metropolitan areas the health services access for people living in regional Australia are influenced by the lower number of general practitioners,⁹ lower rates of bulk billing,¹⁰ and lower levels of access to specialists and major hospitals as a consequence of longer travel distances.¹¹

Help-seeking behaviour in non-metropolitan areas may also be different. Non-metropolitan and metropolitan individuals with equally severe disorders can perceive a similar need for services, yet rural residents may need to reach a higher need-for-care threshold before seeking care.¹² A traditional stereotype of rural masculinity is associated with stoicism and a stigma attached to seeking help with problems.¹ Stigmatisation and confidentiality issues may be responsible for reluctance to accept assistance from formal services in rural areas.¹³ Health risk factors have been reported to be higher in rural and remote Australia. For example, rates of asthma and diabetes have been reported to be greater in rural Australia.¹¹ Residents in rural and remote areas were more likely to be regular smokers (26%), compared to people from metropolitan areas (21%).¹⁴ Compared with their metropolitan counterparts, rural/remote areas males and females aged 20–29 were twice as likely to consume alcohol in hazardous or harmful quantities.⁵ Health status between metropolitan and non-metropolitan areas also shows inequalities. However, it must be noted that Indigenous people make up a greater proportion of the population in rural and remote compared to metropolitan Australia. Indigenous populations have been identified as having relatively poorer health status on a number of indicators compared to the general population, which may confound metropolitan and regional health comparisons.⁵ Metropolitan areas of Australia have the highest life expectancy, while those in rural areas follow. Remote areas report the lowest life expectancy.⁵ There has been a trend for higher rates of suicide amongst males in rural and remote areas when compared to metropolitan areas.¹⁵ Significant increases in suicide rates have been reported from populations of less than 4000.¹⁶

Telephone counselling services have been identified as having a role in the community mental health network. Telephone counselling has also been suggested to have a role in tertiary prevention, by supporting callers with chronic disorders and disabilities.³ It seems well established that crisis telephone counselling can help to avert some personal tragedies such as suicide.² Bobevski and Holgate⁴ have suggested that telephone counselling services have become an important part of community health care and welfare resources in the developed world. It has been shown that a call to such services can reduce caller stress levels. It has been found that more than half of the callers to a telephone counselling service found a single call to meet their needs.³² Whatever the crisis, big or small, the volunteers of the centres may be the only contact the person seeking assistance will have available and it may well be their only contact with the health services.³² Telephone counselling services would therefore seem to have the ability to contribute to the health and well-being of the populations they service.

Telephone counselling services such as Lifeline would seem to represent a health service with few barriers to their access, which may make them vital to rural and isolated people. Nationally there are more than 50 member centres and sub-centres of Lifeline Australia's telephone counselling and referral service, providing a free, 24 hour, anonymous, confidential, and accessible primary health care resource to all Australians. A significant advantage to the use of a telephone service is that a person can decide to seek assistance and receive it whenever and wherever the need arises with complete anonymity.¹⁷ Geographic distance and isolation is no obstacle to people benefiting from being linked to telephone support at all times.¹⁸

The accessible nature of the Lifeline telephone counselling service suggests it may have a particularly important role to play in contributing to the health and well-being of rural and remote Australians. In support of this claim Men's Line Australia²⁴ report almost 60% of its calls for counselling are from men living in rural Australia, yet only around one third of Australia's population live outside major metropolitan areas. It was thought that as rural Australians have generally poorer access to health care, less opportunity for social interaction, and, in many cases, a relatively greater risk of health problems than populations in metropolitan areas, they would also use the Lifeline service with greater frequency than those in less remote and more accessible areas of Australia. Therefore, it was hypothesised that a positive relationship between call rates to the service and the Accessibility/Remoteness Index

of Australia (ARIA) would be found. The ARIA offers an unambiguous geographical approach to defining remoteness. The ARIA system employs a 0–12 continuous variable to classify a populated centre's accessibility to the nearest major service centres. A score of zero indicates low remoteness and high accessibility, while a score of 12 indicates greater remoteness.²⁵

Lifeline's telephone counselling and referral service grew from humble beginnings in Sydney Australia, to now be a leading national and international organisation in its field.^{19,20} The service recently introduced a computer based Client Services Management and Information System (CSMIS).²¹ This system stores a wide range of call information on the enormous number of calls that reach Lifeline counsellors each year. Lifeline Australia²² reports answering 450 289 calls nationally during the 2002–2003 financial year. Call variables from the CSMIS system were used in the following study to explore the research question of do caller characteristics show an association with rurality as measured by the ARIA.²³ Lifeline Ballarat's Telstra exchange service areas (ESA) data was used in the following study to examine the hypothesis of a positive relationship between call rates and ARIA.

METHOD

Materials

The ARIA system was utilised by this study to classify the remoteness of Lifeline call centre locations and small-areas in a rural region. The ARIA system provides a model for measuring incremental health disadvantage with rurality and remoteness as possible determinants.²⁵ ARIA calculates remoteness as accessibility to 201 service centres and provides values for 11 340 locations throughout Australia. The ARIA values have been grouped into five categories using 'natural breaks' in a 0–12 continuous variable.²⁶ An ARIA score of zero indicates high accessibility to services and low rurality, while a score of 12 indicates low accessibility and a high level of rurality. The ARIA scores and categories are thought to not only indicate a degree of rurality, but also the opportunity for social interaction that may be available there.²³

Procedure

Successful calls from Lifeline Ballarat's primary call catchment for January (682), February (744), March (656), and April (657) 2004, were assigned to the Telstra ESAs ($N = 106$) from where they originated. This Lifeline Ballarat Telstra data was used as it was the only Telstra data available to the researchers. The Telstra data allowed accurate call locations to be identified at the ESA level and allowed population standardised call rates to be compiled. This could not be achieved by using CSMIS data. Lifeline Ballarat's primary call catchment area covers much of the Department of Human Services Grampians Region. The Grampians Region covers an area of 47 980 square kilometres and has a population of approximately 208 226.²⁷ Population standardised call rates were calculated for each ESA using the Telstra data and Australian Bureau of Statistics CDATEA 2001.³³ ESAs were assigned an ARIA score based on the average score of the populated centres that fell within them. The 106 ESA areas had an ARIA score range of 2.7, for the ESA containing the rural city of Ballarat, to 4.88 for the ESA containing Telopea Downs.

Data from 51 Lifeline Australia call centres and sub-centres were obtained for the period 01-04-2003 to 29-06-2003. The data set consisted of some 90 128 individual CSMIS cases. Each centre's raw variable counts were transformed to proportional rates. This was done for all CSMIS variable groupings, except for total calls. This was done to control for the range of total calls recorded by various centres for the period examined. For example, there were 1566 calls from female to the Adelaide centre, but only 40 calls from females to the Burnie centre. Therefore, by

standardising the CSMIS variable grouping counts as proportions of all calls for the variable the volume of calls between centres could be controlled for. The centre's call totals for the period ranged from 2 cases for Sutherland (New South Wales) to 7140 cases for Brisbane (Queensland). An ARIA population centre score was assigned to each of the 51 Lifeline centres, and was based on the centre's physical location. It was recognised that calls to a centre may have come from locations with different ARIA ratings from then centre. However, the location of callers to a centre was not reliably available from the CSMIS data set. This issue is addressed further in the discussion. The ARIA Lifeline centre scores estimates ranged from zero to 3.7 for the centre located at Mackay in Queensland.

Statistical analysis

The Ballarat Lifeline centre's Telstra ESA data was used to examine the hypothesis of a positive relationship between the call rates to the service and ARIA. The population standardised successful call total for each ESA were correlated with the ESA average ARIA scores using Spearman's rho correlation coefficient. Spearman's rho was used as ARIA scores were not normally distributed. The CSMIS centre call total was correlated with its ARIA score using Spearman's rho correlation. The CSMIS centre call total was used as an additional test of the hypothesis.

The standardised CSMIS call variable groupings such as the proportion of male, female, and unknown gender callers for each centre were correlated with the centre's ARIA score using Spearman's rho correlation coefficients. This was done to identify if there was any statistical relationship between the centre's ARIA score and the proportion of calls within each CSMIS call variable grouping. Inturn, this would identify possible systematic linear variation between the CSMIS call variable grouping proportions and the centre's ARIA score. It was thought that this analysis could provide some indication of possible remoteness/accessibility related differences in service use and some insight into the research question posed by this study. The results of this CSMIS call variable analysis are reported in the results section in Table 1.

RESULTS

The ARIA score for the 106 exchange service areas in the study area were correlated with their respective call rates to determine if any linear relationship was apparent. Spearman's correlation coefficient for the ESA call rates and the ARIA ESA scores were statistically significant ($\rho = -.389, n = 106, p < .001$) (two tailed). The relationship between the CSMIS centre call totals and the centre ARIA scores were also negatively associated in a statistically significant way ($\rho = -.644, n = 51, p < .001$) (two tailed).

To explore any linear relationship between the Lifeline centre's ARIA score and CSMIS variables, bivariate Spearman's correlation coefficients were obtained. These correlations are presented in Table 1.

Table 1 Spearman's rho correlation coefficients for ARIA call centre scores and CSMIS variables

Variable	Correlation	Significance
Gender (N=51)		
Female	0.239	0.091
Male	0.567	0.567
Gender unknown	-0.272	0.054
Marital status (N=50)		
Married and partnered	0.328	0.020*
Not known	-0.302	0.033*
Single/no relationship	0.144	0.317
Caller focus (N=50)		
Self focus	0.315	0.026*
Self focus total	0.324	0.022*
Age (years) (N=50)		
0-14	0.021	0.887
15-19	-0.240	0.098
20-24	-0.289	0.042*
25-34	0.088	0.537
35-44	0.109	0.453
45-54	0.275	0.051
55-64	0.313	0.027*
65-74	0.103	0.369
75-84	-0.276	0.052
85+	0.123	0.394
Unknown	-0.357	0.011*
Presenting issue (N=51)		
Community crisis	-0.158	0.273
Non-counselling	0.019	0.894
Adjustment and loss	0.316	0.024*
Family challenges	0.052	0.715
Behavioural problems	0.303	0.031*
Health and disability	-0.208	0.144
Abuse and violence	0.176	0.217
Practical help	0.149	0.295
Life's direction	0.056	0.697
Self and society	0.048	0.740
Miscellaneous (N=51)		
Mental health	-0.065	0.650
Suicidal thoughts	-0.051	0.911
Hang up	-0.187	0.189
Regular caller	0.117	0.220

Note: All significance values reported are two-tailed

*significant at <0.05

DISCUSSION

The hypothesis that a positive relationship between the call rates to the service and the ARIA was not supported by the results. Indeed, the opposite was the case and ESA call rates and CSMIS centre call totals were found to be negatively associated with the ARIA in a statistically significant manner. A number of statistically significant correlations were found between the ARIA Lifeline centre scores and CSMIS variables.

There was a significant negative relationship between the Lifeline centre's CSMIS call total and its ARIA score. However, it was not known if centres with lower ARIA scores, suggesting greater accessibility and less remoteness, had more capacity to answer calls, or serviced an area with a greater numbers of potential callers, which may have accounted for the significant negative relationship found. For example, a sub-centre may only operate over limited hours and would have been more likely to be located in a regional area. Further, a metropolitan centre with an ARIA score of zero may have serviced clients from locations with greater ARIA scores. For these reasons the ESA study was undertaken to test the hypothesis that a positive relationship would be found between the call rates to the service and the ARIA. The ESA call rate analysis examined population standardised call totals from small-areas to a single centre. Therefore, the statistically significant negative correlation shown between the ARIA and the call rate indicator was a less ambiguous result than for the combined centres, but still supported the result of a statistically significant negative relationship between the ARIA and the CSMIS centre call totals.

These results are counter to the hypothesis that a positive relationship between the call rates to the service and the ARIA would be found. A possible explanation for this finding is that rural communities have been found to have greater social cohesion²⁸ and subjective well-being.²⁹ Rural populations have been shown to be significantly less likely to say they are unhappy compared to those in metropolitan areas.¹ The Victorian population health survey used nineteen questions relating to social capital, in an attempt to measure social networks. The survey results indicated that rural areas had significantly higher network scores than metropolitan areas.³⁴ Perhaps such elements mean that those living in rural areas need the social support of a service like Lifeline less than their metropolitan counterparts, despite seeming to have more reasons to access such a service. It may be that the community cohesion and subjective well-being in regional areas buffer this population from the need to use the more formal and external support of the Lifeline service. However, Men's Line Australia²⁴ report that the majority of its calls originating from rural areas. This would indicate that there is a greater need for telephone counselling in regional Australia, particularly for men, and that its population are willing to utilise such services. Therefore, a traditional stereotype of rural stoicism and stigma attached to seeking help with problems¹ or a higher need-for-care threshold would not seem to be viable explanations for the negative relationship found between ARIA and call rates in this study. A further possible explanation for this result may be that people with mental health problems have been found to congregate in and around areas where community services are available⁶, which would be in the metropolitan and more accessible areas. Callers with mental health problems are believed to constitute a large proportion of Lifeline Australia's total calls.

The CSMIS call variables were used to examine the research question of do caller characteristics show an association with rurality, as measured by ARIA. The results suggest that remoteness/accessibility, as measured by the ARIA, was not significantly associated with the CSMIS call variables proportions. A few exceptions to this general finding included: married/partnered callers; relationship unknown; self focused calls; age 20-24; age 55-64; age unknown; adjustment/loss issues; and behaviour issues. It is possible some of these significant findings may have been confounded by a significant relationship between the total calls entered for the variable and ARIA, as was the case with the caller focus variable. This meant that the total number of caller focus entries in CSMIS was associated with centre ARIA scores. A further source of possible confounding was also identified, in the form of calls originating from a variety of locations with different ARIA scores being attributed to a Lifeline centre with a single ARIA score. For example, the centre in Perth Western Australia was assigned an ARIA score of zero. However, this centre serviced the entire state, at this time, and there was no way to isolate rural calls from metropolitan calls. These potential problems may mean any current results of the combined centre study may need to be used with caution.

The CSMIS correlation analysis was used to explore if there was any apparent statistical relationship between the ARIA and CSMIS variable proportions. An intriguing finding from this exploratory analysis, which may warrant further exploration, was that people 45–64 years of age range seem to have greater use of the service with remoteness/accessibility as indicated by the ARIA, while an opposite trend was apparent for younger callers in the 15–24 age range. Such a finding is supported by Lifeline Australia²², who report rural callers were more likely to be older. Exploration of why adjustment and loss issues and behaviour issues cases might be positively associated with the ARIA would seem a worthwhile direction for further study. The adjustment and loss category is made up of sub-issue groupings such as death, hospital, illness and disability, migration or relocation, suicide attempt, relationship breakdown, retirement, role change, separation or divorce, work changes, and miscarriage. The behaviour category is made up from sub-issues such as the caller's anger, finances, gambling, abusive behaviour, sexual compulsion, alcohol abuse, smoking, drinking, and drug use. Finding out just what contributing variables to the adjustment and loss and behaviour categories may be associated with the ARIA values would also seem a worthwhile direction for future research.

CONCLUSION

A better understanding of the origin of calls to telephone counselling and referral services such as Lifeline could provide information that will allow such services to better cater to the needs of their clients. It has been suggested that intake data from telephone counselling services may be used either in its present form or with minor modifications as the basis for useful evaluations.³⁰ For example, Rodman, Frost and Jakubowski³¹ used calls to a “nurse hot line”, in the United States, to show that call volume may prospectively identify an outbreak of disease in the community. In a similar manner Lifeline's CSMIS data would seem to have a potential to be used by social scientists in innovative ways to explore social needs and trends. An automated or more accurate system of tagging CSMIS cases with Telstra ESA details would provide more reliable information on the geographical area from where the call originated. Accurate geographic location of cases in CSMIS would increase its applications for spatial analysis. In this way the CSMIS data might more readily be used in epidemiology studies and for theory building.

Lifeline's telephone and referral service offers a highly accessible and equitable health service to rural Australians. This study presented evidence that rural and remote areas experience generally poorer health, access to health care, and greater male suicide rates. The study found a statistically significant relationship between a number of CSMIS variables and the ARIA. A significant negative relationship between the ARIA and call rates to the service was also found. Perhaps this finding suggests the service is currently not reaching its true potential in rural and remote Australia. Lifeline's telephone counselling and referral service may need to be promoted more widely to rural clients and health care providers in an effort to increase its use. It would seem that increasing the use of the service in rural and remote Australia could have a beneficial impact on health status of these populations. A key recommendation arising from this study is that telephone counselling services such as Lifeline should be promoted more widely, particularly in more remote areas.

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