Project title: Men, Depression and Social Networks in Rural Communities: Linking Epidemiologic Evidence to Effective Interventions (known as xTEND: eXtending Treatments, Education and Networks in Depression)

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Main Messages

One of the main aims of the xTEND study was to examine the association between social factors and depression and suicidal ideation in rural communities. The main messages with a focus on two important factors in mental health: suicidality and social support are summarised below.

In terms of suicidality and psychiatric disorder the xTEND study found that:

- Personal social support and links with community networks impact on the risk of suicidal ideation among rural residents.
- Changes in social factors and levels of psychological distress contribute to the fluctuation of suicidal ideation over time.
- Clinical assessment of substance use and anxiety disorders may help to better identify people at risk of suicide in rural areas.
- Among older people, those with high psychological distress and lower physical functioning have an increased risk of suicidal ideation. Poorer social support also plays a significant role in suicidal ideation in this group which has implications for programs to address suicide risk in the elderly in rural areas.

In terms of social support and mental health we found:

- Further evidence of the importance of social support on psychological symptoms, and the effect on age and locality on the links between social support and levels of distress. The links between social support and age on distress levels varied with levels of remoteness of the region in which people live. Older persons in remote regions reported lower distress levels than those in less remote regions.
- Higher levels of perceived community and personal support improve current wellbeing and protect against moderate to high psychological distress in older rural Australians.
Executive Summary

The xTEND project enabled the establishment of a unique set of mental health-related data from two large community samples across rural and urban regions of New South Wales in which to explore the role of community and interpersonal networks, adversity and depression as potential risk factors for suicide and poor physical and psychological outcomes. Given the critical need for effective and accessible interventions to address rural suicide risk and mental health needs, including depression and alcohol use problems, this program of research was designed to build upon existing data sets to quickly inform strategies to assist in addressing mental health problems among people in rural communities. It incorporated the development of a pilot intervention combining existing effective interventions for depression and risk factors for suicide, including substance use and family breakdown.

The existing data sets used by xTEND were from the Australian Rural Mental Health Study (ARMHS) incorporating regional and remote communities of NSW, and the Hunter Community Study (HCS), incorporating urban and inner regional areas from NSW. To support this work data from the 2007 National Survey of Mental and Well-being (under-representative of remote and very remote regions) were also utilised as well as environmental data from the Australian Bureau of Statistics (community remoteness, socio-economic advantage/disadvantage, drought severity, population change), NSW Adult Population Health Survey (area-level social capital and health service accessibility) and Australian Bureau of Meteorology (i.e. drought severity); geocoded to survey participants.

The project consisted of three phases. The first allowed cross sectional analyses on baseline data from ARMHS in key areas including suicidal thoughts and behaviours, unintentional injury, alcohol misuse, help-seeking and service use, and wellbeing in older residents to be undertaken. Baseline data across rural (ARMHS) and urban (HCS) communities were
combined to assess the impact of geographical differences on the demographic and social risk factors for psychological distress and the impact of chronic illnesses on quality of life.

ARMHS data was linked to the 2007 national survey to identify the differences in determinants of suicidal behaviours across urban and rural communities. The second phase allowed follow-up of both the ARMHS and HCS cohorts using common measures, allowing comparison across geographical regions to further identify risk and protective factors for mental health problems over time. The third phase allowed the pilot of two evidenced based interventions to establish their acceptability and feasibility in rural communities: (1) an online treatment for co-existing depression and alcohol misuse; and (2) a program that provides support for the partners of someone with depression.

This research has highlighted the key roles that social support and adversity play for people with mental health problems, including depression or suicidal thoughts, in rural communities. Adversity, including chronic illness or injury, impacts significantly on our mental health. A significant relationship between at-risk alcohol use and the number of recent adverse life events highlights the importance of individualised care, particularly for young males.

The study allowed the exploration of the consequences of poor mental or physical health and detected a significant link between a history of depression and unintentional injury in rural populations, highlighting the importance of attending to mental health factors in injury prevention. Heart disease and depression were also shown to have a significant adverse impact on quality of life among older community residents in urban and rural areas, emphasises the importance of addressing both physical and psychological problems in older people.

Multiple recent adverse life events including relationship strain, especially for younger men was associated with higher risk of alcohol misuse. This was higher for those who had been
living in a rural area for a shorter time. Among rural residents who sought professional help for mental health problems the overall perception of the adequacy of the service they received was low, especially among those with the highest levels of distress and greatest adversity (recent adverse life events). Promising findings suggested acceptability of internet based services for mental health problems to young men in rural areas. Nevertheless, a number of attitudinal barriers to internet treatments were identified.

In terms of frameworks for investigating mental health and methods of combining data sets we found that pooling data from multiple studies can be worthwhile where the effects of interest are small though important, where events are of relatively low frequency or rarely observed, and where the issues are of immediate regional or national interest – such is the case for suicidal behaviours. xTEND researchers were able to investigate the course of suicidal thoughts, to assess factors that lead to both the development and amelioration of suicidal thoughts, in order to inform early interventions for rural populations. Linking existing health-related national and urban-based cohort data sets with rural data sets can be used to better understand geographic variation in risk and protective factors for mental health, contributing to knowledge about how the determinants of mental disorders affect outcomes over time.
The Report

Context

Where we live can have a major influence on our health. Both international and Australian research indicates that in general people living in rural and remote regions have poorer health than people living in urban areas.\(^1\)\(^2\). This evidence is most marked for physical illness (e.g. incidence rates of some forms of cancer, rates of diabetes and renal disease), for accidents, and, of particular interest in this project, for suicide.

Reasons behind higher rural suicide rates are unclear. Most major mental health studies have failed to consistently show a difference in rates of mental disorders such as depression or anxiety across rural and urban areas; yet rural areas generally have higher rates of suicide.\(^3\)

Understanding the drivers of this difference prior to developing and implementing interventions is crucial. In view of the difficulties in achieving uniformly relevant and acceptable definitions of what “rural” means, it may be better to think about rural or remote regions as “proxy” terms for a range of characteristics that vary by location and that may have specific health risks attached to them.\(^4\)\(^5\). We have adopted this approach for this work.

A critical factor among these characteristics is the role of social networks. There is evidence that families, neighbourhoods and living environments can influence mental health, including levels of depression,\(^6\) but this work has chiefly been conducted in urban communities.\(^2\). The characteristics of communities and their influence on individuals may be more readily apparent in rural and remote districts by virtue of their smaller size and in some cases their remoteness. The number of families engaged in farming has been decreasing,\(^7\) suggesting a reduction in social networks in communities reliant on farming. There is also evidence that in farming communities there may be greater sensitivity to family conflict and relationship breakdown leading to depression and potentially to suicidal behaviour.\(^8\)\(^9\). These issues are
important as they provide direct opportunities to improve the mental health of the community through strategies to promote social networks and social support. The role of such social factors in rural and urban patterns of depression needs to be examined in the context of other key drivers of health in rural communities including:

- Hazards associated with specific occupations $^5,^{10}$
- Vulnerability to environmental adversity and its consequences $^{11}$
- Access to health and social services: $^1,^2,^4,^{12}$
- Physical health and risk factors $^{13,14}$
- Socio-economic factors $^{15,16}$

The xTEND study aimed to examine the association between social factors and relationship breakdown with depression and suicidal ideation in rural communities and to use these findings to inform the adaptation and piloting of existing interventions to address depression and related relationship breakdown.

**Implications**

xTEND findings have important implications for policy and practice as summarised below:

**For communities**

- Enhancing community education and familiarity with internet-delivered treatments may be effective in improving perceptions of and ultimately access to these services.
- Public health strategies, focusing on encouraging help seeking among those with higher psychological distress, lower social support, and unstable or absent employment opportunities, may present useful long-term initiatives to reduce the prevalence of suicidal ideation in the general rural community.
- Initiatives aimed at improving mental health outcomes in urban and regional areas should aim to improve supportive relationships at the personal level.
Public health strategies that promote community support for older rural Australians may protect against psychological distress.

Social support and community value have potential protective effects in reducing the impact of stressful life experiences on mental health and could have important implications for the role of community development and social interventions in mental health promotion and prevention programs.

Mental health literacy in rural and remote communities needs to be increased.

Initiatives aimed at improving mental health outcomes in urban and regional areas should aim to improve supportive relationships at the personal and community level. Initiatives in remote communities may be better targeted at improving other aspects of social wellbeing, such as community level social capital.

Public health strategies, focusing on encouraging help seeking among those with higher psychological distress, lower social support, and unstable or absent employment opportunities, may be useful as long-term initiatives to reduce the prevalence of suicidal ideation in the general rural community.

Primary care
- Targeting services to address mental health problems among clients with high needs, especially those without a partner; those with poor financial circumstances; those with co-morbid cardiovascular and affective disorders; and those who have experienced recent adverse events may help to improve mental health.
- Targeting individuals with low social support and high psychological distress may be an effective suicide prevention strategy in rural areas.
- Assessing physical and social factors, in addition to psychological factors, may enhance identification of older people at risk of suicidal ideation.
• Given the high rate of injury in rural communities, assessing prior depression as part of the management of injury may improve recovery.

• Alcohol consumption in rural residents with multiple recent adverse life events, and people who have spent less time residing in rural areas should be assessed for misuse.

• Internet services for mental health problems are likely to be feasible and acceptable in younger age groups, particularly males, and those with current mental health problems.

Policy
• Need to increase mental health literacy in rural and remote communities

• Classifications of remoteness that are sensitive to both the social and service determinants of health may better inform investigations into the impact of context on quality of life.

Approach
This study followed adults from two existing studies, living in the community within a geographical area that encompasses urban, rural and remote regions, who have been characterised by a broad range of physical and mental health measures at baseline. The first of these studies, the Australian Rural Mental Health Study (ARMHS), is a longitudinal investigation of individual, family and community factors associated with the mental health of residents in rural communities across New South Wales (NSW). A community sample of randomly selected households was recruited, using the Australian Electoral Roll across regions of NSW, with oversampling of remote regions. A total of 2,639 people from 70 Local Government Areas of rural and remote NSW, participated at baseline between 2007 and 2008 (see Figure 1). Of these, 650 resided in the Hunter New England region. Participants were extensively characterised at baseline with various mental health and social health measures and some physical health measures. A detailed description of the methods is provided elsewhere 17.
The second study was the Hunter Community Study (HCS), which aimed to investigate the health of individuals aged between 55 and 85 years and to develop an information resource for researchers to answer a number of public health, genetic, medical, health services, social, economic and environmental questions related to ageing and chronic disease in the Hunter Region. The HCS recruited 3,207 people in urban Newcastle between 2004 and 2007 and these participants have been extensively characterised at baseline with various physical, mental and social health measures, including clinical assessments and biological samples. A detailed description of the methods is provided elsewhere. 

![Figure 1](image-url)

**Figure 1 Remoteness categories (colouring) by New South Wales (NSW) area health service regions (black outline).** Uncoloured area within NSW is the Australian Capital Territory. Shaded areas represent local government areas sampled by the ARMHS study. NSW has a total area of approximately 809,000 km².
The xTEND project consisted of three phases: (1) analysis of existing data sets from both ATMHS and HCS; (2) follow-up of ARMHS and HCS participants using common measures; and (3) implementation of evidenced-based mental health interventions for selected rural participants.

**Phase 1 - Analysis of existing data sets**

Analyses of existing data sets from ARMHS and HCS were undertaken in samples of similar age, comprising regional and remote areas (ARMHS – baseline & 12 month follow-up) and urban and inner regional areas (HCS). Data from communities across rural and remote NSW (ARMHS) were also compared to national data from the 2007 Australian National Survey of Mental Health and Well-Being, which under-sampled from rural and remote regions. To inform these analyses two reviews (published) were undertaken on 1) using cohort studies to investigate rural mental health and 19; 2) identifying gaps in existing literature on urban and rural influences on suicidality 20. Statistical methods undertaken are detailed the seven data based publications arising from this phase 21-27.

**Phase 2 - Follow-up of participants from two studies using common measures**

The common follow-up of ARMHS and HCS participants was undertaken from November 2010 to February 2012. This phase examined the course and outcome of psychological symptoms and mental disorders, disability associated with mental health and the role of family and interpersonal factors on mental health outcomes among a rural and urban sample. Common measures included current psychological symptoms, quality of life, physical health and alcohol use; past medical and psychiatric history, family history of mental illness; personal predisposition factors such as life events, social support, personality factors; family and household characteristics; community level factors such as social connectedness, community participation and perception of community along with community level adversity
(such as drought and environmental factors); and measures of health service use, including perceived barriers to use.

As part of the common follow-up, individuals were selected to participate in comprehensive structured telephone interviews to assess psychiatric disorders based on levels of psychological distress. The measures used in this interview are comparable with the instrument used in the 2007 Australian National Survey of Mental Health and Well-Being and the ARMHS study at baseline, providing the opportunity to complement the national findings with a large group from rural and remote regions. Statistical methods used for the analyses are detailed in the five manuscripts resulting from this phase.

Phase 3 – Implementation of evidenced-based mental health interventions for selected rural participants

The third phase of xTEND develops a novel intervention for depression and co-existing alcohol use problems. Participants from ARMHS who reported current depressive symptoms, hazardous alcohol consumption and who have access to the internet at home, were offered access to the online treatment program known as SHADE (Self-Help for Alcohol/other drug use and Depression). Participants eligible for SHADE were also offered information about the support program for family members or spouses, known as Partners in Depression, which they could give to their partner or support person. Further detail about SHADE and Partners in Depression are summarised in Appendix 1.

This component is ongoing. Qualitative data analysis will be undertaken using qualitative description methodology as information on people’s general concerns, thoughts and feelings about SHADE will be very useful in terms of determining the feasibility and acceptability of SHADE to rural participants. A description of the referral patterns to Partners in Depression
will be provided and will help to determine if including this information alongside offering a treatment program is feasible and acceptable to people with depression in rural areas.

To inform this phase three analyses using data collected as part of xTEND were undertaken assessing the feasibility of internet treatments programs for mental health problems, the need for and use of services for mental health problems, and the barriers to service use. The methods used for these analyses are detailed in the publications arising from this phase \(^{35-37}\).

**Results**

The baseline sample of ARMHS comprised 2,639 participants with a mean age of 55.1 years, of whom 59% were female. The baseline sample from the HCS comprised 3,253 participants with a mean age of 66.3 years, of whom 53% were female. When the ARMHS and HCS baseline data sets were combined (\(n = 5,892\)) 51% resided in a metropolitan region, 20% in inner regional, 16% in outer regional, 8.8% in remote and 3.6% in very remote regions; using the Australian Standard Geographical Classification \(^{38}\) – see Figure 2. At common follow-up there were 2,252 HCS participants and 1,261 ARMHS participants.

The xTEND program of research examined a number of dimensions of health outcomes and mental health among people in rural communities including suicidal thoughts and behaviours, non-intentional injury, alcohol use and general wellbeing. We also examined the patterns of health service use for mental health problems within the rural sample from ARMHS. Social support has been examined as a factor influencing these problems. Using the combined rural and urban samples from ARMHS and HCS we examined the influence of social support on quality of life and mental health outcomes in people with chronic physical illness. Two manuscripts have been prepared on the challenges of undertaking longitudinal research and research by combining data sets.
The main findings from this work are summarised under the following headings for each phase of this work:

1. Frameworks for investigating mental health and methods of combing datasets
2. Suicidality and psychiatric disorder
3. Social support as a mediating factor in determining mental health outcomes

**Phase 1 - Analysis of existing data sets**

**1.1 Frameworks for investigating mental health and methods of combining data sets**

**1.1.1 Using cohort studies to investigate rural and remote mental health**

A set of current large-scale Australian population mental health research studies with a focus on climate/environmental adversity, social factors and mental health highlight the value of
linking existing related national and urban-based data sets to improve understanding of key themes in rural health, including the translation of population level research to improved health resources in non-metropolitan areas. Using the Household, Income and Labour Dynamics in Australia study; Australian Rural Mental Health Study; Hunter Community Study; and Extending Treatments, Education and Networks in Depression study key themes in rural and regional areas can be used to better understand geographic variation in risk and protective factors for mental health and have the potential to move understanding beyond simple prevalence to building knowledge about how the determinants of mental disorders affect outcomes over time.

1.1.2 Urban-rural influences on suicidality: Gaps in the existing literature and recommendations for future research

A comprehensive review of existing literature on suicidality found several areas in which suicide research may be improved. Existing research largely focuses on urban populations, resulting in the development of suicide prevention strategies that may be less appropriate and applicable to rural areas. Studies also tend to look at risk factors for suicide attempts or completed suicides; however, suicidal thoughts are an important risk factor for suicide, and increasing research in this area may allow early interventions to be developed. Much suicide research is based on one time point, looking at the characteristics of people who attempt suicide at the time of their attempt. Increasing longitudinal studies will allow researchers to look at the factors that lead to thoughts of suicide developing, and ways to help these thoughts decrease. By using these strategies in future research the capacity to develop early interventions targeted towards rural populations will be greatly enhanced.

1.2 Suicidality and psychiatric disorder

1.2.1 The predictive value of social support in suicidal ideation

Although mental illness is one of the strongest predictors for suicide, the rates of common mental illnesses do not differ across urban and rural locations, suggesting that the high rural suicide cannot be explained by mental illness alone. One possible area of difference between urban and rural areas is the nature of social networks and the availability of sources of social support. This study used data from ARMHS (n = 1,356) to explore the role of social factors in thoughts of suicide among rural residents by using baseline data to predict thoughts of suicide at 12-month follow-up. Thirty-six (3.9%) participants indicated thoughts of suicide at 12-month follow-up. These participants had higher levels of psychological distress and lower levels of available social support at baseline than participants with no thoughts of suicide. They were also more likely to have experienced thoughts of suicide in the past. These findings suggest that social factors, as well as psychological factors, contribute to thoughts of suicide among rural residents. Targeting individuals with low social support and high psychological distress may be an effective suicide prevention strategy in rural areas.

1.2.2 Contributors to suicidality in rural communities

Rural populations experience a higher suicide rate than urban areas despite similar rates of depression suggesting it is important to find additional factors that contribute to suicide in rural regions. This study looks at the role of depression and the role of a range of other psychiatric diagnoses, in suicidal thoughts and suicide attempts, in rural communities using telephone interview data from ARMHS (n = 618). Twenty-eight percent of the ARMHS sample met criteria for depression during their lifetime, while 25% had experienced serious suicidal thoughts in their lifetime and 6.6% had made a suicide attempt in their lifetime. Forty percent of people with a history of suicidal thoughts, and 34% of people with a previous suicide attempt, did not have a history of depression (See Figure 3). After taking the effects of depression into account, people with suicidal thoughts were more likely to be younger, unmarried, and have a history of an anxiety disorder or post-traumatic stress disorder. People
who had made a suicide attempt were also more likely to be younger and unmarried, as well as more likely to be unemployed, and have a history of anxiety disorder or drug use disorder. Overall, this study found that measuring substance use and anxiety disorders may help to better identify people at risk of suicide in rural areas.

![Diagram showing the relationship between depressive disorder, suicidal ideation, and suicide attempt.]

**Figure 3: Relationship between (A) depressive disorder, (B) suicidal ideation and (C) suicide attempt**

### 1.3 Social support as a mediating factor in determining mental health outcomes

#### 1.3.1 Social support, age and distress across urban-regional and remote Australia

Variation of determinants of mental health with remoteness has rarely been directly examined. This paper examined whether the association of psychosocial factors with psychological distress outcomes varied with increasing remoteness. Participants were persons aged 55 and over (mean age = 69 years; 46% male) from across rural and urban NSW (ARMHS & HCS; n = 4219). Not being in a married or defacto relationship, lower education and decreased social support were significantly associated with psychological distress. There was a significant interaction of age and remoteness, indicating that as remoteness increases,
older persons are less likely to be highly distressed, as well as a significant interaction of social support and remoteness, indicating that as remoteness decreases, persons with low levels of social support are more likely to be highly distressed (see Figure 4). Therefore, remoteness may moderate the influence of social support and age on psychological distress.

![Figure 4: The effect of age on the prediction of distress outcomes by remoteness category](image)

1.3.2 Well-being of older residents in rural communities

Although Australian national data indicate an age-dependent decline in the prevalence of mental disorders, physical ill health is clearly associated with mental disorder in the elderly. Plus there are conflicting findings regarding rural–urban differences in the prevalence of mental disorder. We investigated the determinants of well-being in a sample of ARMHS participants (n = 2,624) with particular focus on the role of social factors. Wellbeing was generally higher among those aged 65 years or older (n = 722, 28%), compared with younger groups, with the notable exception of perceived physical health. Among those aged 65 years or older, poorer well-being was independently associated with older age, one or more chronic
diseases, and a history of depression, stress or anxiety. Having increased community and social support significantly increased well-being in the older participants. In summary, despite increased rates of chronic illness and poorer physical health, older rural Australians reported better well-being than younger groups, possibly reflecting a survivor effect or perhaps a generational effect, in terms of greater resilience or stoicism in the older generation. Higher levels of perceived community and personal support improve current wellbeing and were protective for moderate to high psychological distress within this age group.

1.4 Consequences

1.4.1 Unintentional injury, psychological distress and depressive symptoms in rural communities

Of 2,639 participants who completed the injury component of ARMHS, 364 (13.8%) reported injury requiring treatment from a doctor or a hospitalization in the previous 12 months. Of these, 147 (40.4%) reported being injured in a domestic or public setting and 207 (56.9%) in a high-risk setting. The most common types and mechanisms of injury were sprains and strains, and falls, trips and slips, respectively. Pre-injury depression was independently associated with unintentional injury in a domestic or public setting. Being injured in this setting was associated with double the odds of experiencing current depressive symptoms. The likelihood of a high-risk setting injury was significantly associated with male gender. High-risk setting injury was associated with current psychological distress and higher levels of alcohol usage. This study indicates the important role of prior depression in management of injury, given the high rate of injury in rural communities.

1.4.2 Alcohol use and mental health in rural communities

Excessive alcohol use is a significant problem in rural and remote Australia. This paper aims to investigate individual-level and district-level (socio-economic disadvantage, rates of
population change, environmental adversity, and remoteness from services/population centres) predictors of alcohol use in a sample of rural adults (n = 981). Gender, age, marital status, and personality made the largest contribution to at-risk alcohol use. Five or more adverse life events in the past 12 months were also independently associated with at-risk alcohol use. When these individual-level factors were controlled for, at-risk alcohol use was associated with having spent less time living in a rural district. Higher alcohol consumption per month was associated with less socioeconomic disadvantage. District-level factors were not significantly associated with lifetime consequences of alcohol use. Individual attention should focus on rural residents with multiple recent adverse life events, and people who have spent less time residing in a rural area.

1.4.3 Quality of life impact of cardiovascular and affective conditions among older community residents

Demographic, health, and rural contextual factors and their association with quality of life impairment were investigated in older persons from ARMHS and HCS. The influence of comorbidity and remoteness on quality of life when living with cardiovascular and affective (depression/anxiety) conditions were explored. The results indicated that physical impairment was consistently associated with older age, male gender, lower education, being unmarried, retirement, stroke, heart attack/angina, depression/anxiety, diabetes, hypertension, current obesity and low social support. Psychological impairment was consistently associated with lower age, being unmarried, stroke, heart attack/angina, depression/anxiety and low social support. Remoteness tended to be associated with lower psychological impairment, however, the impacts of cardiovascular and affective conditions were not influenced by remoteness. Social capital increased and health service accessibility decreased with increasing remoteness, though no differences between outer-regional and remote/very remote areas were observed. Trends suggested that social capital was associated with lower psychological
impairment and that the influence of cardiovascular conditions and social capital on psychological impairment was greater for persons with a history of affective conditions. The use of classifications of remoteness that are sensitive to social and service determinants of health may better inform future investigations into quality of life.

**Phase 2 - Follow-up of participants from two studies using common measures**

**2.1 Frameworks for investigating mental health and Methods of Combining Data Sets**

**2.1.1 Integrating and extending cohort studies**

Epidemiologic studies often struggle to adequately represent populations and outcomes of interest. Differences in methodology, analysis and research questions often mean that reviews of the existing literature have significant limitations. The current paper details our experiences in combining data across two existing cohort studies to address questions about the influence of social factors on health outcomes across urban to remote areas of Australia. The rationale, challenges encountered, and solutions devised by the project are described. Opportunities in combining individual participant data for assessing common assumptions in research synthesis, such as measurement invariance are highlighted. Pooling individual participant data can be worthwhile, particularly where adequate representation is beyond the scope of existing research, where the effects of interest are small though important, where events are of relatively low frequency or rarely observed, and where the issues are of immediate regional or national interest.

**2.1.2 Validity of the Assessment of Quality of Life - 6D scale**

The Assessment of Quality of Life - 6D scale (AQoL-6D) is a self-report instrument designed to provide a sensitive multidimensional evaluation of health related quality of life. We assessed the validity of the AQoL-6D in a combined longitudinal population sample drawn from across urban, regional and remote areas of Australia (ARMHS & HCS). The AQoL-6D was found to be a useful tool for assessing quality of life impairment in epidemiological...
cohort studies, both cross-sectionally and over time. It displayed appropriate levels of construct, concurrent and convergent validity. Conceptualisation of higher-order factors as representing the physical and psychological aspects of quality of life impairment may increase the sensitivity and appeal of the AQoL-6D, particularly for studies examining predictors of and changes in social and psychological outcomes.

2.2 Suicidality and Psychiatric Disorder

2.2.1 Predictors of suicidal ideation in a rural community sample over time

This study explored the long-term patterns and predictors of change in suicidal ideation within rural areas using ARMHS data (n = 2,135 participants who completed at least one phase of ARMHS). Overall, 8.1% of the sample reported suicidal ideation during at least one phase of the study, 76% of whom reported suicidal ideation intermittently rather than persistently across study phases. Across the three time points (baseline, 12 month and 3 years), suicidal ideation was significantly associated with higher psychological distress, higher neuroticism, and lower availability of support, with a non-significant association with unemployment, even after controlling for the effects of perceived financial hardship. Future suicidal ideation was significantly predicted by psychological distress and neuroticism. Fluctuations in suicidal ideation are common, and may be associated with changes in psychological and social wellbeing. Public health strategies, focusing on encouraging help-seeking among those with higher psychological distress, lower social support, and unstable or absent employment opportunities, may be a useful long-term initiative to reduce the prevalence of suicidal ideation in the general rural community.

2.2.2 Predictors of suicidal ideation in older people

Suicide among older adults is a major public health issue worldwide. Few studies have explored the specific interactions between psychological, physical and social contributors to
suicidal thoughts in older adults. In this study, psychological distress was the strongest predictor of suicidal ideation, with 62% of people with suicidal ideation identified in this initial decision tree split. For those with high psychological distress, lower physical functioning significantly increased the likelihood of suicidal ideation, with high distress and low functioning being associated with ideation in 41% of cases. A substantial sub-group reported suicidal ideation in the absence of psychological distress; dissatisfaction with social support was the most important predictor of suicidal ideation among this group. Assessing physical and social factors, in addition to psychological factors, may enhance identification of older people at risk of suicidal ideation.

2.3 Social support as a mediating factor in determining mental health outcomes

2.3.1 Social networks and mental health in rural areas

Rural populations face particular environmental and socio-economic stressors which are thought to shape the nature of their material and social resources yet little is known regarding the association of social capital and health in these environments. A causal role of social capital on health outcomes has frequently been posited but rarely assessed. Results from our cross-lagged analysis indicate that area-level trust was associated with mental health when assessing individual demographic, personal and social characteristics and area socio-economic characteristics over three time-points. Causal models provide no evidence for a direct influence of individual social capital on mental health over time. However the influence of social support and social capital on other potential determinants of mental health may represent an indirect path through which social factors influence mental health outcomes. The effect of gender on causal models is discussed along with interpretation of findings in light of the differing structures of social networks in rural as compared with urban environments. These findings have implications for research and interventions for environments with disperse and socio-economically disadvantaged populations.
3.1 Consequences - help seeking and service use after mental health problems

3.1.1 Help seeking and health service use for mental health problems in rural and remote communities

The patterns of health service use by rural and remote residents are poorly understood and under-represented in national surveys. This study examines professional and non-professional service use for mental health problems in rural and remote communities in Australia, using baseline ARMHS data (n = 2150). The overall rate of professional contacts for mental health problems during the previous 12 months (17%) in this rural population exceeded the national rate (12%). Rates for psychologists and psychiatrists were similar but rates for GPs were higher (12% vs. 8.1%). Non-professional contact rates were 12%. Higher levels of help seeking were associated with the absence of a partner, poorer finances, severity of mental health problems, and higher levels of adversity. Remoteness was associated with lower utilization of non-professional support. A provisional service need index was devised, demonstrating that those with greater needs were more likely to access specialist services, even in remote regions, although a substantial proportion (47%) of those with the highest service need sought no professional help. Perception of service adequacy was low, especially among those with the highest levels of distress and greatest adversity.

3.1.2 Feasibility of internet-delivered mental health treatments for rural populations

While internet-delivered mental health treatments may offer an accessible and cost-effective answer to barriers to mental health care, there has been little evaluation of the feasibility of this approach among rural communities. Using data from 1,246 ARMHS participants (mean age 59 years, 61% female, 22% from remote areas), 75% had internet access and 20% would consider using internet-based interventions, with 18% meeting both of these feasibility criteria. Feasibility for internet-delivered mental health treatment was associated with
younger age, male gender, being a carer and having a 12 month mental health problem. Participants who had used internet-delivered services in the past were significantly more likely to consider these treatments as acceptable. Despite the aims of internet-delivered interventions to increase access to mental health care, significant impediments to implementation exist in rural regions. Resistance to internet treatments appears to be largely attitudinal, suggesting that enhancing community education and familiarity with such programs may be effective in improving perceptions and ultimately access.

3.1.3 Facilitators and barriers to treatment-seeking for people with mental health problems in rural areas

Rural and remote Australians face a range of barriers to mental health care limiting the extent to which currently available services may provide assistance. While internet-delivered treatments for mental health problems may theoretically overcome the treatment-related issues faced by rural residents experiencing mental illness, the specific relationship between internet interventions and rural treatment barriers is yet to be explored. Half of the 365 ARMHS participants reporting a mental health problem in the past 12 months had not sought help for their mental health problem, while 12% were unsatisfied with the help they had received. Attitudinal barriers were most common, reported by 91%, and were higher among remote/very remote residents. Structural barriers were significantly associated with lower financial status, lack of internet access, residing in an outer regional area, recent suicidal ideation, and not seeking help, while time-commitment barriers were most common among participants in a caring role, those in outer regional areas, and those who had not sought help for their mental health problem. Barriers to mental health care are a significant impediment to receiving adequate treatment for mental health problems in rural areas. Despite suggestions that internet-delivered treatments may improve accessibility, our findings indicate that these treatments may be subject to the same barriers as traditional mental health services.
### 3.2 Rural SHADE and Partners in Depression Intervention

An initial pilot of the SHADE (Self-Help for Alcohol/other drug use and Depression) and Partners in Depression interventions were trialled in the ARMHS sample from October 2012 until March 2013. Of the 40 participants who met criteria for the intervention, nine consented to have their contact details passed from ARMHS to SHADE project staff and six consented to participate in SHADE and completed baseline assessments. Three people withdrew following the baseline assessment and three people commenced the program modules. Two people completed the treatment modules and the follow-up assessment. Due to the lower than expected recruitment rate we have extended this pilot to ARMHS participants as part of the 5 year follow-up currently underway (March-September 2013). The evaluation of the intervention component has a qualitative focus and despite the small number of participants this data will help us to refine implementation of these programs for use in other settings.

**Conclusion**

Social support and adversity play key roles for people with mental health problems, including depression or suicidal thoughts, in rural communities. Adversity, including chronic illness or injury, impacts significantly on our mental health. The relationship between at-risk alcohol use and the number of recent adverse life events highlights the importance of individualised care, particularly for young males.

Regardless of where you live, low social support was associated with psychological distress. However, as remoteness increases older people are less likely to be highly distressed, and as such people in more remote areas may be more resilient to the effects of low social support. Both physical and psychological impairment are associated with low social support. Having a chronic illness such as heart disease and having depression impact significantly on the physical and psychological aspects of quality of life. For older persons in rural areas, higher
levels of perceived community and personal support improve wellbeing and are protective for moderate to high psychological distress. This provides important evidence for the potential health benefits of strategies to increase the social involvement of older people in rural areas.

In terms of preventing suicide, in addition to looking for depression, measuring substance use (alcohol) and anxiety disorders may help health professionals to better identify people at risk of suicide in rural areas. Targeting individuals with low social support and high psychological distress may also be effective in suicide prevention in rural areas. For older people, assessing physical and social factors, in addition to psychological factors, may enhance identification of those at risk of suicidal ideation.

This research has improved our understanding of service use for mental health problems. People in rural communities are more likely to see their general practitioner for mental health problems than people in cities and those with greater needs were more likely to access specialist services, even in remote regions. However, a large number of people identified as having a high need for services sought no professional help. Geographic and financial barriers to service use were identified and perception of service adequacy was low, especially among those with the highest levels of distress and greatest adversity. While online treatments may be part of the solution for these problems our research suggest that there is resistance to internet treatments in rural areas that is largely attitudinal, suggesting that such programs need to be promoted more effectively to improve access.

**Additional Resources**

Organisations that contributed to this overall program of work are acknowledged with thanks:

1. Hunter Medical Research Institute (HMRI), Newcastle;
2. Xstrata Coal;
3. NSW Centre for Rural and Remote Mental Health, Orange;
Further Research

A unique large population data set has been established as part of xTEND that provides opportunities for further detailed investigation of a range of social determinants of mental health across rural and urban areas. Cross-sectional and longitudinal data analyses of the HCS and ARMHS participant postal survey data and telephone interview data, from baseline and common follow-up, as part of xTEND, will continue.

References

2. Canadian Institute for Health Information. How healthy are rural Canadians: an assessment of their health status and health determinants. 2006.


Appendix 1 – Intervention Descriptions

SHADE
Led by xTEND Investigators Dr Frances Kay-Lambkin and Professor Amanda Baker, SHADE addresses the complexities of treatment for co-existing depression and alcohol use, and the important issue of accessibility of evidence-based treatment across urban and rural NSW. SHADE is an innovative computer-delivered treatment program combining strategies to address both depression and alcohol-related problems producing significant decreases in the rates of hazardous use of alcohol, depression scores, and cognitive vulnerability to depression. SHADE has demonstrated significant improvements in social functioning and hopelessness indicating potential to reduce suicidality. Findings from SHADE suggest that participants with severe, current depressive and alcohol use problems will report benefits from a computer-based integrated psychological treatment that are similar in magnitude to those reported by participants in an equivalent clinician-delivered treatment. Computer-based therapy means easier access to evidence-based treatment which could result in more people seeking treatment for their condition, or receiving treatment in an earlier phase of their disorder. Translation of the computer-delivered SHADE treatment onto a web-based platform was undertaken as part of xTEND, with substantial investment to date from the University of Newcastle (infrastructure funding) and the National Drug and Alcohol Research Centre (NDARC, funded by NHMRC). It is hoped that this will increase the accessibility of this evidence-based treatment program and facilitate ongoing research.

Partners in Depression
The Partners in Depression program led by xTEND investigators Mr Trevor Hazell and Dr Frances Kay-Lambkin, was designed, developed and evaluated by the Hunter Institute of Mental Health with co-funding from beyondblue in response to the identification of a gap in resources for carers, family and friends of people affected by depression. Partners in Depression is a six-session group-based information and support program pilot tested in the Hunter Region of NSW throughout 2007-2008 where improved levels of depression, anxiety and stress over the course of the program were demonstrated. Participants importantly also reported significantly improved relationships following completion of the Program. A national dissemination of the program has now been undertaken.
Appendix 2 - Acknowledgements

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