This is the authors' final peer-reviewed (post print) version of the item published as:


Available from Deakin Research Online:

http://hdl.handle.net/10536/DRO/DU:30077045

Reproduced with the kind permission of the copyright owner

Copyright: 2015, Australian Health Promotion Association
Environmental barriers and enablers to physical activity participation among rural adults: a qualitative study

<table>
<thead>
<tr>
<th>Journal:</th>
<th>Health Promotion Journal of Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manuscript ID:</td>
<td>Draft</td>
</tr>
<tr>
<td>Manuscript Type:</td>
<td>Article</td>
</tr>
<tr>
<td>Keywords:</td>
<td>health behaviours, healthy environments, qualitative methods, rural and regional health</td>
</tr>
</tbody>
</table>
Abstract

Issue addressed: Social-ecological models of health behaviour acknowledge environmental influences, but research examining how the environment shapes physical activity in rural settings is limited. This study aimed to generate evidence to assist health professionals, planners, urban designers, and community workers in rural areas to create environments that support physical activity.

Methods: Forty-nine adults from three regions of rural Tasmania, Australia, participated in semi-structured interviews that explored features of the environment that supported or hindered physical activity. Interviews were digitally recorded, transcribed verbatim, and analysed thematically.

Results: Four key themes emerged. The ‘functionality’ theme included connectivity with other destinations, distance, safety, continuity, supporting infrastructure, and surfacing. While there was limited ‘diversity’ of structured activities and recreational facilities, the importance of easy and convenient access to a natural environment that accommodated physical activity was highlighted. The ‘spaces and places for all’ theme highlighted the importance of share-use areas, particularly those that were family- and dog-friendly. Despite desires for more physical activity opportunities, many participants had ‘realistic expectations’ of what was feasible in rural settings.

Conclusions: Functionality, diversity, spaces and places for all, and realistic expectations were identified as considerations important for physical activity among rural adults. Further research using quantitative approaches in larger samples is needed to confirm these findings.
So What? Urban-centric views of environmental influences on physical activity are unlikely to be entirely appropriate for rural areas. Recommendations are provided for creating new or modifying existing infrastructure to support active living in rural settings.
Introduction

Physical inactivity, which has been defined as physical activity that is insufficient to result in positive health-related effects, is causally related to a number of non-communicable chronic diseases (1). Physical inactivity significantly increases the risk of cardiovascular diseases, type 2 diabetes, colon and breast cancer, overweight and obesity, stroke, hypertension, osteoporosis and depression (2, 3). Consequently, physical inactivity is a major contributor to worldwide mortality (4) and results in a financial burden to Australians of $1.5 billion/year in direct health care costs (3).

While physical activity has the benefit of improving health and quality of life, less than 50% of adults in Australia and many other developed nations are active at recommended levels (5, 6). The proportion of adults not meeting physical activity guidelines is even higher among those living in rural areas (7-13). In order to develop appropriate public health strategies to increase physical activity, it is crucial to understand the factors that influence this behaviour. Social-ecological models highlight the roles of individual, social and environmental factors that may influence behaviour (14, 15). A lack of studies examining multiple levels of influence (16), as well as a dearth of studies focusing on specific population groups such as those living in rural areas (16), means that our understanding of the role of the built and natural environment in facilitating or preventing physical activity participation among rural populations is limited. The purpose of this study was to explore the environmental factors that may act as barriers or facilitators to physical activity participation among adults in rural settings.
Methods

This was a qualitative study conducted in 2011 to identify features of the rural environment that impact on rural adults’ physical activity participation. Ethics approval was granted by the Human Research Ethics Committee (Tasmania) Network, and the study followed the ‘Consolidated criteria for reporting qualitative research (COREQ)’ guidelines (17).

Elsewhere, we have reported findings from this study that explored the salience of urban physical activity environment constructs to rural adults (minor revisions under review with PLOS One; resubmitted 22nd December 2014; manuscript available upon request).

Participants

The Australian Standard Geographical Classification (ASGC) Remoteness Structure which classifies geographical areas based on characteristics of remoteness (18), was used to classify all postcodes in the state of Tasmania, Australia. Three rural areas (two ASGC-defined as Outer Regional, one as Remote) were purposefully selected to represent diversity in area types (e.g., a coastal area with significant vegetable production; the central highlands and lakes district plateau with mixed agriculture and tourism; and a forest/waterway area with forestry and fruit growing-based area) and location (north, central and south). Characteristics of these areas are summarised in Table 1.

Purposive sampling was used to recruit 34 women and 15 men (18-55 years) from these areas for semi-structured interviews. Study resourcing resulted in unequal numbers of women and men (more funding was available for interviews with women). The recruitment strategies employed included local newspaper advertisements, local radio, posters in key community locations (libraries, community houses, neighbourhood centres) and through key community leaders.
contacts. Participants referring other eligible members of their community introduced an element of snowball sampling.

**Measures**

Prior to the semi-structured interviews participants completed a questionnaire to provide a demographic profile that included date of birth, language spoken at home, country of birth, highest qualification (and partner’s if applicable), employment status (and partner’s if applicable), marital status, number of children, access to a motor vehicle, injury/illness/disability that limits activity, height and weight. From the reported height and weight measures, body mass index (BMI $\text{kg/m}^2$) was calculated and weight status classified using standard definitions of overweight (BMI $25-<30\text{kg/m}^2$) and obesity (BMI $\geq 30\text{kg/m}^2$).

The majority of interviews (n=45) were conducted by one female interviewer with qualifications in social work, women’s studies and environmental health. A further four interviews were conducted by the first author (VC; female), a postdoctoral research fellow with qualifications in health promotion and epidemiology. Both interviewers followed the same semi-structured interview schedule which explored physical activity and features of the rural physical environment. Specifically participants were asked open-ended questions about physical activity (the intensity, duration and frequency of physical activity in the past two weeks at work, to get from place to place, around the house/yard, and during leisure/discretionary/spare time) which was deliberately defined broadly as ‘any activity that lasts for at least 10 minutes and causes your body to work harder than normal – so your heart rate might go up, you might breathe a little heavier like huffing and puffing, and you might “warm up” a bit’; definitions of ‘neighbourhood’ and ‘community’; ease or difficulty of being active in the local area; relevance and understanding of urban physical activity
environment constructs (functional characteristics, road and personal safety, destinations, aesthetics, availability and accessibility); whether these constructs impacted on their physical activity; environmental factors or features that would help the participant be more active if they wanted to be; and any other aspects of their environment that may impact on physical activity.

Interviews were conducted face to face in community houses (n=13), community health services (n=5), community centres (n=6), local council offices (n=4), a participant’s home (n=1), participants’ workplaces (n=3), the first author’s university (n=7) or via telephone (n=11). Interviews, which ranged in duration from 27 to 62 minutes, were digitally recorded and transcribed verbatim. Following the interviews the participants were provided the opportunity to review their transcript, but none took this opportunity.

Data analysis

Interviews were digitally recorded, transcribed verbatim and imported into NVivo software (QSR NVivo 8®), which was used to support data coding and organisation of emergent themes. Data were analysed thematically by one analyst (KS), with constant and frequent discussion and refinement of themes with a second author (VC); a third independent person also contributed to the further refinement of themes. Coding and continuous cross comparison was used to identify recurrent patterns of relevance and to establish significant themes.

Results

Participants were aged 26 to 59 years (mean 43 years for women and 48 years for men). Most were born in Australia (85 and 93% of women and men, respectively), were married/living as
married (88 and 80% of women and men, respectively), and around half had a university degree (53% of women and men). Most men were in full-time employment (93%), while women were predominantly in either full-time (35%) or part-time (35%) employment. Of the 61% that had children in the household, ages ranged from 0.6 to 26 years. All participants had access to a motor vehicle, two participants had an injury, illness or disability that prevented physical activity, and 67% of men and 33% of women had a body mass index over 25kg/m² (classified as overweight/obese). No other relevant issues were raised by participants, and none took the opportunity to examine their transcript.

Functionality of walking and cycling networks

A central theme to emerge was the notion of functionality, where participants described features of walking and cycling networks that positively influenced their physical activity. Irrespective of participant region or sex, this was described by the majority (n=47: 94%) as an important aspect of the usability of these networks. Key aspects were connectivity with other destinations, flat terrain, distance, and safety. For example:

‘It’s a great ride. And you can pop your thermos in your bike basket and some morning tea and ride out there, again sit by beach, tie your bike up and sit by beach. And then ride back… it’s brilliant.’ [Female, 50 years, North]

‘…we’ve got a Platypus Walk and there’s good footpaths. Ah, there’s a BBQ area in there and it’s used fairly heavily…there’s actually a good walking track…halfway through [Town] and at [Town]. And it’s done on crown land around [Town] …It’s only a kilometre but people use it. And it’s nice.’ [Male, 59 years, South]
Interruptions to the continuity, lack of pathways and/or other infrastructure, and surfacing were considered barriers to physical activity by a number of participants (n= 26; 52%) for a range of reasons:

‘...they are a little bit scary because of like rivers or bridges going over the geographical features, the bridge themselves actually narrow the roads, so you are then forced back into the traffic...cycling to [Town] a couple of weeks ago... I got to the bridge ... then all of a sudden there is basically no bit on the side of the road. You’re on the road. And I nearly got cleaned up by a bus going across the bridge.’

[Male, 50 years, North]

‘It is about crossing roads...there is one place where you cross at the roundabout, there’s not even any footpaths there. There’s cars coming in all different directions and somehow you’ve got to get across. And it’s interesting because the footpath just stops right bang where the roundabout is, where most of the traffic is.’ [Male, 56 years, Central]

Also mentioned by some rural residents, particularly females (n=18 of 21 comments), was street lighting, or a lack of, which was considered a modifiable aspect of the environment that might help support more regular activity (e.g. ‘Street lighting is an issue. Just about every street that I’ve walked down in the evening, the lighting is almost always on the other side of the street to the footpath.’ [Female, 41 years, North]).

Diversity of opportunities to be active

The second theme to emerge was the diversity (or lack of) of opportunities to be active.

While for many rural residents the variety of opportunities was limited, one positive aspect a
number of participants (n= 30; 60%) mentioned was the diversity of physical activity options available in natural settings. Having access to the natural environment was deemed positively, and was thought to encourage physical activity participation. For example:

‘Just across the river from us there’s the big [Name] Mountain Range. There’s walking tracks all through there. There’s also mountain bike tracks. People can go on tracks to find fishing spots, lots of horse riding.’ [Male 56 years North]

‘… and where I live in [Town] is only 250 metres from the river. So I kayak, so I can just drag it down there and hop on, and off I go, and go and explore…on a weekend I’ll either go kayaking, or more cycling, walking … And the beach, you can walk a couple of kilometres on a stretch of beach here.’ (Female, 51 years, North).

While most participants were able to list at least one place to be active in their region, the lack of variety available in these rural areas was an important barrier to physical activity. A number of suggestions were made for structured or organised activities that would help facilitate participation.

‘…if there was a walking group of like-minded souls perhaps that I thought I could engage with that was at an appropriate time of the day or something, maybe yeah.’ [Female, 51 years, Central]

‘… Zumba’s really popular these days, if someone did a class every Wednesday night at [Town] at the hall then I would go. But we don’t have that at all. And I think a lot of other people would too.’ [Female, 43 years, Central]
‘But I think you know if they had badminton or if they had Tai Chi or if they had aerobics or something and it was... I think that would really make it easier for me to access and more likely to... So in an ideal world if you have a good sized hall or something and somebody that’s taken the initiative or funded to provide you know a couple of different whatever...I think that would have the dual effect of increasing physical activity but also connections amongst people.’ [Female, 35 years, North]

Some participants (n=16; 13 female) from each region indicated that a greater diversity of sporting or recreational infrastructure would assist them to be more active.

‘If we had a tennis court we might be able to hire that...’ [Female, 46 years, South]

‘If there was a netball court down the road ... then I would probably play netball one night a week and if there was a tennis club or just people doing social tennis on a Monday night I would block that out in my diary ....’ [Female, 42 years, Central]

**Places and spaces for all**

Many participants highlighted the importance of shared-used areas, indicating that their environment was accessible for both families (n= 23; 46%) and dog owners (n= 18; 36%), which encouraged physical activity.

‘...[Name] Park which is great for families and things. So families get down there, have BBQs, play sport, and run. Ah, there are a number of different ovals down there. And there’s that water track that goes beside the river.’ [Male, 56 years, Central]
‘...I think if that policy wasn’t in place and they said no, there is no dog walking on beaches, I think you would certainly cut back a lot of the people that do access a lot of the walking facilities because it’s a dog friendly town. Or designated areas that are for dogs.’ [Male, 52 years, North]

A small number of participants also raised equity concerns related to accessibility of opportunities to be active for people who are mobility-impaired, or people with young children.

‘Some of our older style footpaths are a bit sudden, they don’t have that sort of easability [sic] to get anything wheeled on or off. You know, scooters, wheelchairs or whatever... [Male, 47 years, North]

‘...one thing that I hadn’t really thought about until I had a diabetic on one of the walking groups, and he actually had to stop because, a lot of it was on gravel roads, and it hurt his feet too much. And his, he didn’t have good feet anyway because of his diabetes, and he just found it too hard.’ [Female, 50 years, Central]

**Realistic expectations**

The notion of realistic expectations – the acceptance of environmental limitations to maintaining a physically active lifestyle as part of rural life – emerged as a common theme. Despite the environmental barriers to physical activity identified, many participants accepted this as part of their choice to dwell in a rural area, and felt that these problems were
outweighed by the benefits of a rural lifestyle. For instance, many participants indicated road safety as a concern, but accepted this as part of their choice to live in a rural setting.

'Ve choose to live in spread out area. So I guess the bottom line is to get the quality of life that we want, we’ve got to give up certain things.' [Male, 59 years, South]

'...like the roads that are a bit narrow and the bridge that sort of really hasn’t got a walkway. But then again it’s only our family and one other bloke that lives on this side of the river. So they’re not going to spend $40,000 of walkway for us.' [Male, 35 years, Central]

'Sometimes we are a little bit limited to some of our services perhaps…my father I suppose drummed into me a bit that … “you can’t have a view without some wind”. And the same is, you know it’s lovely to have our quieter lifestyle, but you can’t have that whilst being surrounded by services and activities. So there’s that trade off.’

[Male, 47 years, North]

Rather than accepting a lack of infrastructure as a barrier to physical activity, some participants had adopted pragmatic solutions to overcome these limitations. For example:

'You can’t really walk or cycle on the, well beginners, you wouldn’t get on that [Name] Highway with the log trucks and everything. That’s one limiting factor for that. There’d be no way you could fit a cycleway on it anyway, on that road. So that’s why, as I said if I was going to go for a ride, I’d throw the bike in the ute and go down to [Town] or somewhere a bit flatter’ [Male, 53 years, Central]
‘Well obviously because [Town] hasn’t got the infrastructure we’re never going to get footpaths, so it’s not something that you would get up and just go for a walk... I would get in the car and you’d have the bike in the car, or you’d have your running... and you’d drive somewhere, and then you’d go for a run.’ [Female, 52 years, South]
Discussion

This study aimed to explore the environmental factors that act as barriers or facilitators to physical activity participation among rural adults. Four key themes – functionality, diversity, spaces and places for all, and realistic expectations – emerged from the data that provide insights into environmental factors that could be targeted for promotion or modification to support rural adults to engage in more physical activity. While some of these themes are similar to those observed in the urban literature, some appear uniquely rural.

The theme of functionality of walk and cycleways is a similar construct to that observed in the urban literature. For example, Pikora et al (19) discussed the functional aspects of the environment as one of four key environmental determinants of walking and cycling; of the 20 functional factors outlined in their framework, six were mentioned by participants in this study: direct routes, gradients, other access points, path continuity, path maintenance and path surface. Interestingly, many of the functionality issues raised by participants in this study came from those living in the Central region. This may be due to the lack of a central ‘focal point’ in these areas – in contrast, the Northern region has a substantial coastline and the Southern region has waterfront with a large and nearby waterway, both of which provide a focus and an amenable route for cycling and walking networks. In contrast, townships in the Central region are dispersed with no obvious focal point; this may be an important consideration for the planning of walk and cycleways in rural areas.

While diversity of sporting and recreational opportunities was considered limited, the perceived ease of access to physical activity opportunities in the natural environment appears to be uniquely rural. For example, numerous participants mentioned ease of access to places for bushwalking, mountain biking and horse-riding activities, and to rivers, lakes and beaches
for aquatic activities. While some of these opportunities may be available for urban-dwellers, it appeared that the diversity and convenience of opportunities was a central enabler of physical activity for these rural adults. This finding suggests that supporting and promoting communities to utilise physical activity opportunities that exist in the natural environment may be a low-cost strategy for promoting physical activity among rural adults.

The ‘spaces and places for all’ theme highlighted the importance of consideration of the shared-usage spaces in the community, in particular, that opportunities are family-friendly and dog-friendly. The former point may reflect the limited number of physical activity opportunities in rural areas, and that places that have multiple functions and cater for multiple age groups may be of substantial appeal to families. The latter point may reflect the substantially higher dog ownership in rural areas (20), and suggests that the provision of areas that allow dog-walking may be an important factor to consider in rural settings.

Accessibility issues, as noted in one of the few existing qualitative studies of environmental influences on physical activity in rural adults (21), were also of concern to participants. These findings highlight the important role of local government policies that promote more, rather than less, access to accessible shared-use spaces for their value in physical activity promotion.

The participants in this study acknowledged many environmental barriers to physical activity and highlighted numerous improvements that could be made in their local area to promote physical activity participation. However, there was a general acknowledgement that some of these improvements were likely to be unrealistic. Participants talked about the ‘trade-off’ between the positive aspects of a rural lifestyle and the limited access to physical activity opportunities and supporting infrastructure. This point, undocumented in the urban literature,
may be a worthwhile consideration for planners when consulting with the community about physical activity needs and desires, as modifications to environments must meet the needs of multiple stakeholders with multiple interests.

While some of the seven planning considerations included the Heart Foundation’s Healthy by Design planning guidelines (22), developed for use in urban areas, were not directly supported by these findings (‘streets’, ‘public transport’, ‘fostering community spirit’), two were directly supported (‘walking and cycling routes’, ‘supportive infrastructure’, ‘open spaces’) and two had relevant constructs that may require some tailoring for rural settings (‘local destinations’, ‘open space’). For example, the ‘walking and cycling routes’ planning consideration promotes (among other things) making connections, creating stimulating and attractive routes, creating safe and functional routes, and maximising accessibility of walking and cycling routes for all. The ‘supportive infrastructure’ consideration includes promoting the provision of seating for people with restricted mobility, providing and maintaining lighting to routes and spaces used at night to increase safety, and providing facilities that encourage and support cycling and walking. Many of these issues were raised by participants in the current study, highlighting their relevance. The ‘local destinations’ planning consideration, while relevant at a broader level, focuses mostly on destinations of more salience to urban settings (e.g. food stores, newsagents, chemists, schools and cafes), which were not commonly mentioned in this study. Similarly, the concept of ‘open spaces’ was of relevance broadly (e.g. “connecting people with the natural environment”), but some specific planning considerations may require tailoring for rural communities (e.g. providing open spaces within safe and comfortable walking and cycling distance) may not be of direct relevance).
Some of the limitations of this study include the restriction to one state (Tasmania) of Australia, although three diverse regions were sampled, included one region with a similar population density to rural areas of Europe (23) and the United States of America (24); a relatively small sample (n=49) of volunteers who may not be representative of the general rural population, particularly in regards to the generally higher levels of education observed in this study (median age, proportion Australian-born, and proportion of men classified as overweight or obese was similar to the general Australian rural population); the possibility that participants who were more active had greater exposure to the environment and hence greater awareness of facilities and infrastructure; and the potential for the findings to be limited to certain contexts (e.g. Tasmania, Australia).

Despite these limitations, this is among few qualitative studies seeking to understand environmental influences on physical activity behaviours in rural adults because much of the environment-physical activity literature to date has focused on urban samples. This work therefore provides some important insights for informing further quantitative studies in rural areas. It highlights the applicability of some constructs from urban-focused planning guidelines, but, if confirmed in larger, quantitative studies, provides additional guidance for planners, designers, developers and health promoters working to create new or modify existing infrastructure in rural areas to support active living. Box 1 highlights some possible recommendations for practice and policy from based on the first three themes, should these findings be confirmed in larger, quantitative studies of representative samples. These recommendations deliberately focus on retrofitting and modification to existing environments, rather than the creation of new developments, because residential and commercial growth is limited in rural areas.
Conclusion

While rurality itself may negatively impact on the health of rural residents, the findings from this study indicate that an urban-centric view of the environmental influences on physical activity may not be entirely appropriate in the rural setting. Although the theme of functionality in particular may be common to both rural and urban environments, this study has uncovered some uniquely rural environmental influences on physical activity that warrant consideration both in further research and in the refinement of existing or development of new planning guidelines.
References


20. Cleland V, Ball K, King AC, Crawford D. Do the individual, social and environmental correlates of physical activity differ between urban and rural women? Environment & Behavior. 2010.


### Table 1: Characteristics of the study areas

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Area 1</th>
<th>Area 2</th>
<th>Area 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>North</td>
<td>Central</td>
<td>South</td>
</tr>
<tr>
<td>Region type</td>
<td>Coastal</td>
<td>Central highlands/lakes district</td>
<td>Forest/channel</td>
</tr>
<tr>
<td>Industry</td>
<td>Vegetable production</td>
<td>Mixed agriculture and tourism</td>
<td>Forestry/Apple- and fruit-growing</td>
</tr>
<tr>
<td>Remoteness Area*</td>
<td>Outer Regional</td>
<td>Outer Regional</td>
<td>Remote</td>
</tr>
<tr>
<td>Population*</td>
<td>10,323</td>
<td>991</td>
<td>1584</td>
</tr>
<tr>
<td>Area (sq km)</td>
<td>131.8</td>
<td>336.3</td>
<td>3578.3</td>
</tr>
<tr>
<td>Population/sq km</td>
<td>78.3</td>
<td>2.9</td>
<td>0.4</td>
</tr>
<tr>
<td>IRSAD*</td>
<td>914.4</td>
<td>865.8</td>
<td>885.9</td>
</tr>
<tr>
<td>N participants (male/female)</td>
<td>25 (10/15)</td>
<td>14 (4/10)</td>
<td>11 (2/9)</td>
</tr>
</tbody>
</table>

*Based on Australian Bureau of Statistics data from the 2006 Population Census

IRSAD: Index of Relative Socioeconomic Advantage and Disadvantage (where 1000 represents the national average)
Box 1: Recommendations for policy and practice

**Theme 1: Ensure functionality of walking and cycling infrastructure to support physical activity**

- Design cycle ways and walking tracks that meet the needs of all users by ensuring they are continuous, connected, accessible and well-maintained.
- Consider retrofitting infrastructure such as cycle ways and footpaths when replacing or upgrading roadways and bridges.
- Position street lighting near footpaths and explore the use of solar power to illuminate cycle ways and walking tracks.

**Theme 2: Value and promote diversity of opportunities to be active**

- Promote activities that take advantage of the natural environmental features that exist in rural areas.
- Promote and resource structured and organised activities (such as walking groups or dance classes) through the use of existing programs and facilities.
- Explore strategies to increase and maximise usage of existing sporting and recreational facilities.

**Theme 3: Ensure places and spaces for all**

- Ensure shared-use and the promotion of family- and dog-friendly aspects when creating new or modifying existing spaces and places for active recreation.
- Ensure equitable access to cycle ways, walking tracks and footpaths for those with limited mobility.