

# Geographical Analysis of the Risk of Homelessness

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## Executive Summary

<b>Year:</b> 2013	<b>Project Title:</b> Geographical Analysis of the Risk of Homelessness
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**KEYWORDS:** homelessness, disadvantage, determinants, geographic variation

**OBJECTIVES:**

- 1 Identify the risk factors associated with homelessness;
- 2 Identify a number of indicators that measure these risk factors;
- 3 Using these indicators, calculate a summary index of the risk of homelessness;
- 4 Use this summary index, along with the indicators, to better target policies on reducing homelessness to specific areas.

**NON-TECHNICAL SUMMARY:**

This study has examined the factors that contribute to homelessness in Australia; identified some indicators that are associated with these risk factors; and then used these indicators to identify a 'risk of homelessness' index. This index can then be used to identify areas where there is a high risk of homelessness, so that policies can be better targeted to these areas. Once an area has been identified using the index, the indicators can be used to identify what risk factors exist in that area, and this can then inform any policies as they can be more targeted to the specific risk factors.

The literature review identified a number of pathways into homelessness, including housing crisis; family breakdown; mental health; substance abuse; labour markets; social networks; structural factors; previous homelessness; and youth. A number of available indicators were then identified for a number of these pathways, and these indicators were grouped into domains.

These domains were then combined into an index, using statistical techniques, depending on how correlated the indicators were to each other.

The final indexes were then mapped, allowing users to identify areas with a high risk of homelessness. Two indexes were created, due to data limitations in a number of States. In the literature review, domestic violence came up as a significant risk factor for homelessness, so where data on domestic violence was available (NSW, ACT and Qld), a separate index was constructed incorporating domestic violence. Because these data were not available in all States, the main index uses the proportion of sole parent families as a proxy, with availability for all States and Territories.

Overall, we found that the NT and Tasmania had the highest proportion of people living in areas with the greatest risk of homelessness. There was also a greater proportion of people outside capital cities living with in areas with the highest risk of homelessness.

## 1 Background

The Rudd Government's White Paper on Homelessness identified a number of causes of homelessness, and these included disadvantage, poverty, long term unemployment, poor education, violence, mental health problems, disability and substance abuse. Particular causes discussed in detail in the report included the unavailability of stable and affordable housing, family breakdown, people leaving mental health services, child protection and correctional facilities without adequate support.

One of the aims of the White Paper was to reduce primary homelessness by 25 per cent by 2013 and to offer supported accommodation to all rough sleepers who need it by 2020. To achieve this reduction, the Government will need to target the causes of homelessness highlighted above; and target the pathways into homelessness. To do this most effectively, the location of people and families with characteristics that are associated with homelessness (as identified above) need to be identified, so that the Government can effectively target programs to reduce the number of homeless.

This project identifies areas where there is a high proportion of people in the highest risk of homelessness, using the literature on pathways into homelessness. Indicators of risk of homelessness in an area are then aggregated to provide an index of risk of homelessness in an area. So the project aims to provide indicators for an area to identify what type of risk is associated with the area; and an index to provide an assessment of the total risk.

It should be noted that this index and the indicators are not designed to identify needs or policy responses. The index is designed as a "litmus test" to quickly identify areas where there is a high proportion of people experiencing factors that indicate a high risk of homelessness; and the indicators are designed to be used to drill down further to investigate why this risk occurred in this area. The design of a policy response to this risk factor needs to involve extensive qualitative research, policy implementation, and review.

These indicators and indexes are mapped using online maps to provide policy makers and researchers access to the indicators and the index in a user friendly format.

In conducting a geographical analysis of the risk of homelessness in Australia, this report presents the following:

- A literature review on risk factors associated with homelessness;
- Quantifies these risk factors where possible at a small area level and presents this data with online interactive maps; and
- Develops an index that enables the relative risk of homelessness at the small area level to be assessed.

We acknowledge the contributions to this research made by the ACT, NSW and QLD police departments, without whom the second index including indicators on domestic violence, could not have been created.

We would also like to thank Dr Guy Johnson, Dr Chris Chamberlain and Associate Professor David Mackenzie for their invaluable input on this project.

## 2 Purpose

The overall aim of this project is to provide policy makers and researchers with information on which areas in Australia have the highest proportion of people experiencing factors associated with a high risk of homelessness. While a person in the area may move if they do become homeless, preventative programs are best targeted to areas which have a high number of people experiencing factors associated with a high risk of homelessness but who have not yet become homeless.

The research questions that this project will answer are:

- Which areas should the Government focus on to reduce homelessness the most, given the pathways into homelessness and risk factors identified?
- What issues in each area contribute to the greatest risk of homelessness, and how can these issues be proxied using available data?

The method used was to assess the risk of homelessness based on performance against certain indicators. These indicators were chosen based on an extensive literature review into risk factors that could bring about homelessness.

## 3 Objectives

One of the objectives of the Housing Assistance and Homelessness Prevention Program is:

" To prevent homelessness and reduce its impact, particularly on families and young people, through funding to support innovative prevention and early intervention initiatives." (FaHCSIA, 2009, p. 2).

The findings presented in this report contribute to this objective by identifying at a small area level where there is a greater risk of homelessness occurring. The spatial unit with which this research has been conducted is Statistical Local Areas (SLAs). There are over 1,400 SLAs as described in more detail in Section 4. This enables small areas with a high proportion of people at greater risk of experiencing homelessness to be identified. These geographic indicators are then supplemented with the construction of a Risk of Homelessness Index (RHI).

## 4 Methods

This Section discusses the methods that were used to assess the risk of homelessness across Australia. A review of the literature was first performed and this was then used to inform the search for suitable data related to the risk of becoming homeless. A key limiting factor in data availability was that prospective data had to be available at the SLA level. In some instances, spatial microsimulation was used to develop simulated small area estimates based on larger scale aggregates, which were then benchmarked to SLA level benchmarks. The spatial microsimulation method is described in Section 4.3.2. These indicators were then used to develop a Risk of Homelessness Index (RHI). Furthermore, because data on family violence could be obtained for two states and one territory (NSW, Queensland and the ACT), an enhanced version of the RHI was also developed for these jurisdictions. The two indexes and the variables used in their respective construction are also presented in a set of interactive online maps (available [on the NATSEM website](#)).

### 4.1 Literature Review

Recent Government policy on homelessness has concentrated on those who are potentially at risk of homelessness. The policy response has focussed on getting people into housing and building cheaper housing that will be more accessible to lower income families. However, the spatial aspect of homelessness has not been considered. Evidence in Australia shows that disadvantage is clustered (eg see Vu et al, 2008), which means that those at risk of homelessness may also live in the same areas. If this is true, then directing support services to these people will be much more effective if it is known where people who are at a high risk of homelessness live.

In looking at a definition of homelessness, Chamberlain and Mackenzie (2008) defined the threshold for homelessness using a description of a minimum living standard as follows:

“The minimum community standard is a small rental flat with a bedroom, living room, kitchen, bathroom and an element of security of tenure - because that is

the minimum that most people achieve in the private rental market”.  
(Chamberlain and Mackenzie, 2008, p. 3)

While the minimum living standard definition is a useful way to conceptualise homelessness, it can be problematic as it is subjective – what is meant by small? Does the bedroom need to be separate or are bedsitters appropriate? Can the bathroom be a shared bathroom (otherwise most University residences would be considered below standard)? Recently the ABS has been doing work on homelessness and has defined homelessness as:

“When a person does not have suitable accommodation alternatives they are considered homeless if their current living arrangement:

- is in a dwelling that is inadequate; or
- has no tenure, or if their initial tenure is short and not extendable; or
- does not allow them to have control of, and access to space for social relations.” (ABS, 2012b)

As is evident from both these definitions, homelessness is no longer just associated with not having a roof over one’s head, but also encompasses quality of housing, stability of tenure and access to space.

Within this report, we analyse and identify various indicators that either predict or are associated with homelessness. This section derives its matter extensively from existing research on the issue of homelessness.

The importance of a stable living environment cannot be overstated as it creates a base from which all other activities can take place. Burke describes it as a foundation that acts as an “anchor” for one’s life, identity and sense of community (Burke, 2003). Furthermore, the experience of homelessness can have serious detrimental effects on a person’s health and wellbeing, in addition to adversely affecting other aspects of their life. Homelessness also serves to alienate and further marginalise individuals and is one of the key indicators of social exclusion (Hayes et al, 2008).

While theoretical frameworks on what causes homelessness help us understand the circumstances in which homelessness often occurs, caution must be adopted in classifying all homeless people using any given framework. This is because they are an extremely diverse group of people and their individual circumstances are determined by a variety of outcomes that do not necessarily stem from their actions but can instead be a product of the structural factors that already exist in society.

With this caution in mind, following on from the definition by Chamberlain and Mackenzie (2008), three categories of homelessness have been identified in the literature:

- 1) Primary homelessness,
- 2) Secondary homelessness
- 3) Tertiary homelessness

Primary homelessness refers to living without conventional accommodation and includes those sleeping rough, in tents or in makeshift temporary shelters. Secondary homelessness refers to those who move frequently from one form of accommodation to another. It includes those staying in social housing and those living temporarily with other households, for a period of 12 weeks or less. Tertiary homelessness refers to those who live in boarding houses on a medium to long-term basis for a period of 13 weeks or more. This gradient of homelessness captures the notion previously referred to that homelessness is not just about occupying the accommodation, but is also concerned with the stability of tenure and quality of the accommodation.

Research shows that individuals do not necessarily fit into specific types of homelessness based on demographic profiles and circumstances. Rather, it is more common for the homeless to move between the different categories at different stages throughout their lives (Chamberlain and Mackenzie, 2006)

This report uses these definitions and categories of homelessness to identify indicators to show areas where there are a high proportion of people at risk of homelessness. The demographic characteristics of homeless people are then considered in terms of their age, family type etc. This profile is important because it provides background information to better understand the characteristics of the homeless population and those at risk of homelessness.

#### **4.1.1 Assessing the 'risk' of homelessness**

This project uses indicators based on a literature review to identify areas where there is a high proportion of people with characteristics that suggest they have a high risk of experiencing homelessness. The area-based indicators are then combined to develop a summary index that will allow easy identification of high risk areas. It is these high risk areas that can then be targeted for interventions aimed at targeting the pathways into homelessness.

The advantage of this index and indicator approach is that the index can be used to identify an area to target in terms of Government policy; and then the indicators can be used to identify what type of policy would be most effective in reducing homelessness.

We should stress that this is an area based analysis, and is based on risk factors associated with homelessness and pathways into homelessness. Area based analysis uses averages so does not reflect on all the individuals in the area (who may not be part of the high risk groups). An area showing up as having a high risk of homelessness does not mean everyone in the area has a high risk of homelessness. It means that within the area, there are a high proportion of people experiencing a high risk of homelessness on a number of indicators.

Another aspect to be wary of is, in the social exclusion literature, there has been a reluctance amongst the research community, particularly voiced by Wyn and White (1998), to label certain groups of people as being "at risk" of exclusion. They believe that this could overemphasise the role played by individual factors as opposed to societal factors in explaining disadvantage. More conventionally, they worry that overemphasis on the individual could lead to "victim-blaming" in what could be a society issue. This is similar to the risk of homelessness.

While indexes are good as summary measures to quickly identify areas of high risk, they cannot then be used to help explain why the area concerned experiences a high risk of

homelessness. The indicators used to construct the indexes give a clearer idea of the reasons, but provide no information on causality. There is limited scope to look at causality within this particular research project but it is hoped that the results provided could act as a good base for subsequent research.

#### 4.1.2 Demographics

The demographics of homeless people provides important information on some of the risk factors associated with homelessness, which can then feed into the indicators. This section considers the demographics of homeless people, identifying their age groups and family structure.

Figure 1, which comes from data derived from the Specialist Homelessness Services Collection<sup>1</sup> (SHSC), shows that most homeless people are young, with 50 per cent under the age of 24 and 85 per cent under the age of 44 (AIHW, 2012). Children aged between 0 and 9 years accounted for about 18 per cent of the homeless population, a significant increase from the 2006 estimates (which used data from the Supported Accommodation Assistance Program, see Chamberlain and Mackenzie, 2008) where the “under 12” category consisted of about 12 per cent of the homeless population.

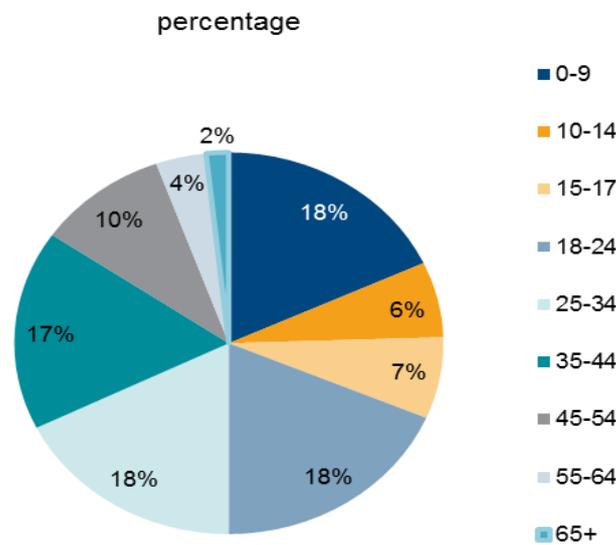
The youth cohort, defined as those between 12 and 24, accounted for about 46 per cent of the homeless population in the SAAP, but according to the estimates from the SHSC this has dropped to approximately 31 per cent. This could in part be explained by the differences in the methods used to count the homeless in the two surveys and the difference in the age groups used in each of the reports (ABS, 2011).

It should be noted that these figures only include those who seek help from services and may understate the true number of homeless as it excludes those who are turned away from services due to capacity constraints, or are not enumerated as they do not seek help.

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<sup>1</sup> The SHSC has now replaced the previous Supported Accommodation Assistance Program (SAAP) Data collection procedure. This collection is more comprehensive than the SAAP (which was in operation from 1996-2011) as it includes shelters and homes that were previously not covered under the SAAP Data Collection.

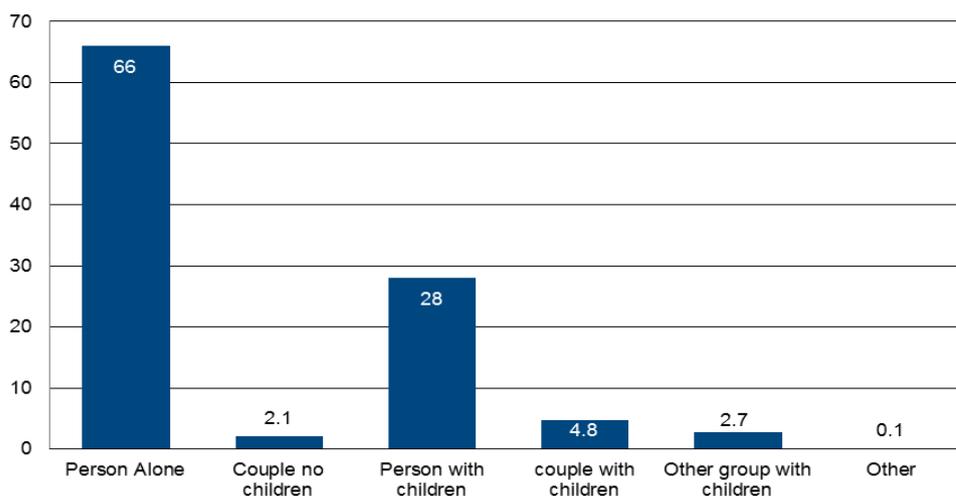
**Figure 1 Homeless clients in the SHSC by age**



Source: Australian Institute of Health and Welfare (2012)

Most people experiencing homelessness are from lone person families (Figure 2). This may be because of the existence of a single source of income. When a lone person loses their employment it is harder for them to find the funds to keep paying housing costs. Couple households are less susceptible to this because of the favourable effect of having two peoples' incomes to depend upon and the greater likelihood of at least one adult retaining employment. It has been found that for people from family households<sup>2</sup>, the experience of homelessness is of a much shorter duration and is more temporary than for other types of households (AIHW, 2012).

**Figure 2 Homeless clients by family type**



Source: Australian Institute of Health and Welfare (2012)

<sup>2</sup> Defined as those with two or more members.

Overall, in this section we have identified some of the demographic characteristics of homeless people. The data on users of homeless services shows that they are generally younger and alone. It is therefore not surprising that the youth homelessness pathway was noted (Chamberlain and Johnson, 2011). Additionally, besides accounting for a large proportion of those who are homeless, homeless youth are viewed as a significant cohort because of the need for different types of intervention strategies. These interventions have different costs and effectiveness (Chamberlain and Mackenzie, 2003).

#### 4.1.3 Pathways to homelessness

This section reviews the literature on pathways into homelessness. While the previous section has outlined demographics that characterise the homeless, this section identifies characteristics that may be associated with a greater likelihood of becoming homeless. These include structural reasons external to the individual, such as housing costs and availability in an area or labour market opportunities, and reasons associated with individual circumstances, such as poverty or mental health issues.

It should be stressed that all the pathways identified in this section are only potential pathways into homelessness and that not all people experiencing these circumstances will become homeless. However, people experiencing these circumstances will face a higher likelihood of becoming homeless.

In describing transitions to homelessness, Chamberlain and Johnson (2011) identified five main pathways into adult homelessness and we draw on some of these in this paper.

##### (a) Housing crisis

The housing crisis pathway as identified by Chamberlain and Johnson (2011) refers to a financial crisis that often results in a loss of housing. The first signs of risk occur when the person accumulates debt beyond their ability to pay or loses their employment. Chamberlain and Johnson (2011) show that while every effort is subsequently made to avoid becoming homeless, in particular because of the associated stigma, people in this situation are eventually evicted and in what is described as a “sharp break” are then forced into homelessness. This may then be followed by what is called a transition to chronicity, as the person resigns himself or herself to the situation and adapts to homelessness as a way of life (Chamberlain and Johnson, 2011).

Their research also indicated that the housing crisis pathway led to shorter durations of homelessness compared to the other identified pathways, largely because those who were experiencing a housing crisis did not associate themselves or attempt to make friends with other homeless people as they felt like they themselves were different to the “alcoholics” and the “druggies” (Chamberlain and Johnson, 2011 p. 9). In other words, those on this pathway were fiercely resistant to adapting and becoming accustomed to their surroundings. This is a positive thing as studies have shown that social adaptation is rife in the homelessness subculture, including exposure to drugs. Once this happens, homelessness is harder to get out of (Johnson and Chamberlain, 2008). The demography of this pathway is comprised largely of single persons (AIHW, 2012).

While most people coming into homelessness in this way hope that it is a temporary state of affairs, the evidence shows that it is more difficult than expected to break the cycle of homelessness. Accumulation of debt and a lack of appropriate references usually means that they are unable to rent a new property (Liddiard and Thoresen, 2011). This implies a level of entrenchment of homeless experienced through this causative path.

While housing stress is a sign of housing crisis, those living in severely overcrowded dwellings are also covered under the ABS definition of homelessness as they do not have control of, or access to space for, social relations (ABS, 2012b). Under the ABS definition, those in other overcrowded dwellings are considered to be in marginal housing, and therefore at risk of homelessness (ABS, 2012b). This definition fits in with this project on the risk of homelessness.

#### (b) Family breakdown

Family breakdown was cited as one of the main reasons for homelessness (Chamberlain and Mackenzie, 2006). This includes cases of domestic violence that compel the victimised party to move out of the family home and young persons' experiences of homelessness because of poor domestic situations. Moreover, two of the key pathways identified in this piece of literature - the youth to homelessness pathway and the family breakdown pathway - account for 46 per cent of the surveyed homeless population in one study (Chamberlain and Johnson, 2011).

Flatau et al (2006) elaborate on this further explaining that when interpreting the data on family violence cases involving women, it must be recognised that there are women who continue living in potentially harmful situations of family violence. They argue that the definition of homelessness should be altered to include these groups as they are at risk of becoming homeless.

In this section, we will concentrate largely on the experience of women facing domestic violence who as a consequence are either forced to move into emergency accommodation (including living with family and friends or into state supported housing) or remain in the situation. The latter group is considered significant but there is a lack of data regarding this due largely to how we assess these "situations in a measurement context" (ABS, 2012a)

Murray (2008) has argued that more recently the definition of domestic violence has been broadened to include other forms of violence including threats and intimidation, in addition to emotional and financial abuse. Domestic violence can manifest itself in many ways, which further complicates the issue of how it should be identified. Moreover, these newly recognised forms of domestic violence are less talked about and harder to measure. This is something that has been highlighted in McDonald (2005) where the concern is that the other forms of abuse are often not reported. While it has been found that women initiate domestic violence almost as much as men (Straus 1993 as cited in Tomison, 2000), the repercussions for women are generally worse as incidents of domestic violence initiated by men are six times more likely to cause serious injury.

In the context of domestic violence, victims may also be reluctant to approach friends and neighbours about issues that they were having with their partners for fear of judgement (Murray, 2008). This was a sentiment that echoed in other pathways such as the youth

homelessness pathway, the drug use pathway and mental illness. It appears that the way society views these issues has an understated impact on the way and the timeliness with which the victims of these issues reach out for help.

#### (c) Mental health

There has been much debate about the links between mental health and homelessness. While the data shows that there is a significant prevalence of mental health issues among the homeless (Johnson and Chamberlain, 2011), it is often not clear whether these issues brought on the experience of homelessness or whether they were caused by the experience of homelessness.

Different studies that delve into mental health and its relationship with homelessness have found contradictory results producing a mixed picture. While some adopt a rather broad definition of mental health (eg see Hemerman et al, 1989), others are more selective (eg see ABS, 2007). As noted in Johnson and Chamberlain (2011), a large part of the debate about the direction of causality between mental illness and homelessness stems from differences in the way individual surveys define mental illness and who could be at risk of homelessness.

Johnson and Chamberlain (2011) have found in their research that 31 per cent of their sample of homeless people had a mental health condition at the time of being surveyed; 15 per cent recorded having mental health issues before becoming homeless; and 16 per cent said that their mental health issues came about after their experience of homelessness. Among those surveyed, it was estimated that 40 per cent were under 25 years of age.

Additionally it was shown that those who were suffering from short term and medium term homelessness were less likely to be experiencing mental illness both before and after homelessness than their long term homeless counterparts (Johnson and Chamberlain, 2011).

#### (d) Substance abuse

There is a strong link between substance abuse and homelessness (Johnson and Chamberlain, 2008), although questions have been raised about the direction of causality. It is estimated that about 17 per cent of homeless people were identified as being on the substance abuse pathway and about 82 per cent who had a substance abuse problem were homeless for 12 months or more.

The experience of those described in the literature shows that drug abuse is associated with homelessness. For younger cohorts, it can in some circumstances be experienced as a rite of initiation. For others, it is a way through which they come to terms with their situation and facilitates the cultural adaptation process (Johnson and Chamberlain, 2011).

It has been found that those on a pathway to homelessness as a result of substance abuse typically place maintenance of their habit over other more functional aspects of their life. The move into homelessness is associated with three descending stages. The first of these is loss of employment which is then followed by changing social networks which then ultimately leads to homelessness. This has been described as sliding into homelessness by Johnson and Chamberlain (2011). The experience of these types of substance abusers suggests that they

lose touch with the world as their dependence on their habit intensifies and shelter no longer takes on importance.

In a survey of drug and substance abuse amongst the homeless in Sydney (Teesson et al, 2000), it was identified that this population was six times more likely to have a drug abuse disorder<sup>3</sup> and 33 times more likely to have an opiate abuse disorder than the Australian general population<sup>4</sup>. They also found that substance abuse was noticeably more common in Australian cases than elsewhere in the world. Furthermore, when comparing international studies, "Homeless in Sydney are 3.4 times more likely to have a drug-use disorder than homeless people in comparable studies in both Munich and Los Angeles." (Teesson et al 2003, p 469). It is suggested that this could be an Australia specific issue with drugs

Due to the high cost of illicit drugs and the tendency for drug abusers to prioritise "scoring" over basic necessities like housing (primarily due to the addictive nature of these drugs), this group become more vulnerable to becoming homeless. Once their own funds are exhausted, they may then turn to family and friends for help, but in the experience of those interviewed, this strained these relationships. Once these became tense, this can lead to a breakdown in healthy relationships which are then replaced by new social networks, often with fellow users. These issues are further exacerbated by, in some cases, increasing psychological distress.

In Johnson and Chamberlain (2011), it was found that about 43 per cent of the sample had substance abuse issues and two thirds of the sample developed substance abuse issues after becoming homeless. This research also emphasised the relevance of the in-and-out nature of homelessness, implying that it is rarely the case that a clean break from homelessness can be made. Instead, it is more common that a person will experience several bouts of homelessness as this group of people are more susceptible to relapse.

#### (e) Labour market exclusion

Unemployment is a major reason why individuals and groups become homeless. This is because the absence of a fixed income inevitably leads to financial stress and an inability to maintain stable housing. Quiggin (1998) argued that homelessness is closely related to employment, however Quiggin did emphasise that identifying causality was difficult. For instance, a homeless person is unable to fully engage in the job search. He further states that the qualities required to sustain oneself whilst living on the streets are markedly different from those that are required to hold down a job, and that once these are acquired it is very difficult to re-assimilate into mainstream society

Another thesis put forward in his argument is that the fault essentially lies with the structure of labour markets. There are serious penalties to being unemployed (loss of income and bridging social networks) and he argues that this provides an important deterrent to finding employment again.

<sup>3</sup> Defined as being dependent (more than five times over the last twelve months) on any of the following groups of drugs: cannabis; stimulants; sedatives; or opiates.

<sup>4</sup> According to the study, opiates include heroin, opium, codeine, doloxene, methadone, morphine and pethidine.

The welfare to work legislation has also been criticised for failing to acknowledge the complexity of participants' experiences of homelessness (Campton and Pickles, 2008, p. 31). Part of the argument linking unemployment to homelessness is that a job is linked to not only income, but other non-pecuniary benefits like independence, access to social networks and feelings of self-worth. Loss of a job does not just mean a loss of income – it is much deeper than this, and losing some of these non-pecuniary benefits of work may be what is pushing people into homelessness as they lose social connections and self-worth.

(f) Social networks

We can explain social networks in two ways. One is through understanding social networks as a way through which experience of social exclusion further entrenches homelessness; and the other refers to the support that those at risk of homelessness can seek from their family and friends which may mitigate the risk of homelessness. We discuss both of these below.

Social networks are extremely important to the homeless. It is the way through which they gain acceptance and meet their basic needs. However, it is a double-edged sword. Grigsby et al (1990) believe that the formation of social capital further entrenches the experience of homelessness and makes it even more difficult to extract oneself from the cycle.

The development of negative social networks, especially amongst younger cohorts, are also inextricably linked to experiences of substance use. Interviews with younger persons who became homeless reveal that drug use was something of an initiation rite into the social network, often referred to as a homeless subculture. Furthermore, it appears that once inculcated into a social network, social norms become subjective, and not as relevant as they are in wider society.

Snow and Anderson (1993) found that the homeless subculture provided a stable, supportive and non-stigmatising reference group for homeless people. This is particularly the case for young people, as long-term familial relationships and friendships are replaced by the links formed in the homeless subculture.

In their research, Johnson and Chamberlain (2008) found increasing evidence of homeless people engaging in substance abuse in order to adapt to their social situations. In what is described as social or cultural adaptation, the homeless with the help of their social network, become accustomed and resigned to their situation. Substance or drug usage usually serves to aid this process.

This is not an experience reflected by the entire sample of homeless people used by Chamberlain and Mackenzie (2011). It appears that a substantial number of those who became homeless saw their situation as temporary and struggled to rise above their predicament. Nevertheless, it appears that those who form close social networks within the homeless subculture then find it harder to extricate themselves from their situation and are generally homeless for a longer period of time.

The lack of an appropriate support network, such as friends and families who live nearby and can offer assistance when needed, puts an already vulnerable individual at even greater risk of losing shelter. This is found to be quite relevant, especially in cases of domestic violence where the victims isolate themselves from friends or family due to feelings of shame and regret and

the families act in the same way, as they are made uncomfortable by interactions with the partner (Murray, 2008).

(g) Structural factors

Thus far, we have focussed largely on the individual factors responsible for bringing about homelessness. However, structural factors also have a part to play. These structural factors are not related to the individual, but are a function of the systems in which the individual operates. This includes the state of the housing market, housing stress and the less-than-adequate capacity of social housing.

Research conducted by Quigley and Raphael (2001) delves into the economics of homelessness. They argue that, amongst the lower rungs of the housing market, there is a point at which the cost of housing far exceeds the perceived quality and at this point the person becomes indifferent between living in dilapidated derelict housing and sleeping rough. They argue that homelessness arises from changes in the housing market and in the income distribution of people at the lower end of the housing market. They suggest that tighter housing markets generally attract higher levels of homelessness and that most of the variation in homelessness can be explained by structural factors rather than individual or personal factors.

Research conducted by the Australian Institute of Social Research also emphasises the importance of structural factors (Australian Institute of Social Research, 2004). They argue that labour market conditions, mortgage stress and interest rates and home loans, have a significant part to play in the rate of homelessness

(h) Past experience of homelessness

Those who have experienced homelessness in the past are more likely to relapse into this state in the future (Chamberlain and Johnson, 2011). This has been found to hold true especially in the case of those that have previously experienced medium to long term homelessness. Compounding this with mental health issues further entrenches the experience of homelessness (Johnson et al, 2011) as it is harder for these groups to permanently remove themselves from being at risk of homelessness as they are more likely to have limited social networks, income and inadequate family support. All these are also reasons which would have contributed to their homelessness in the first place leading to a vicious cycle.

(i) Homeless youth

Issues of youth homelessness encompass more than just those running away from destructive domestic situations. One argument could be that young people who leave the family home can be “running away from” and “running to” with the former groups, feeling the need to escape family violence or other issues, and the other group emphasising a destination, perhaps independence. This highlights the existence of a diverse group of people within the homeless cohort, and also brings to light different ways of conceptualising why young people leave home. Whilst it appears that in most instances, they move away to escape, there are a few that leave home to assert their independence, and to pursue objectives that they were unable to when living under the shelter of the family home.

For younger people, where homelessness can be temporary, it is preferable that this is abated through early intervention initiatives rather than prevention strategies, which are generally more expensive and harder to track than early intervention strategies. For example, it is relatively easy to quantify the costs and benefits that are associated with the Reconnect program. However the prevention strategies stress the importance of structural changes and these are harder to monitor and relatively more expensive (Chamberlain and Mackenzie, 2003).

Much of the research into youth homelessness has also identified this group as being far from homogenous with respect to their housing patterns (Cobb-Clark, 2008). They are usually suffering from a myriad of problems to the extent that the defining characteristic of this group is the lack of corroborating circumstances surrounding why they become homeless.

While we already know that the structure of the housing market is an important determinant of housing stress and shortages, this issue is even more pertinent for young people (defined by the ABS as those aged between 12 and 24). Furthermore, there is a concern that youth are locked out of social housing, which due to scarcity, is usually prioritised on need with families placed ahead of single people (Liddiard and Thoresen, 2011).

The youth age group are further vulnerable to the effects of the housing market as they typically have relatively low incomes while also facing a highly competitive rental market that is subject to a large number of stringent tests before approval for rental properties is obtained (Quiggin, 1998).

Whilst there are some who fault the nature of the real estate system (renting referrals, the need for a positive renting history and a highly competitive market), others argue that there are a range of other issues that together are responsible for homeless youth (Wyn and White, 1998). For example, another less talked about reason for the persistence of disadvantage that is identified in the literature on social exclusion appears to be the tendency of government departments to require a permanent address, particularly with regard to welfare payments (Wyn and White, 1998). Furthermore, the frequent change in address that young people often experience by virtue of their circumstances, is made worse by the loss in social connection that they subsequently experience.

A further pathway through which some youth could enter homelessness is when they leave state sponsored care. Also called care-leavers, this group is particularly vulnerable as they usually don't have access to the sort of information required to act independently nor access to an established social support network to ease the transition to independence. While service providers have identified that this group in particular is in need of additional assistance, a structured plan post-care was found to be provided in only 26 per cent of cases (Liddiard and Thoresen, 2011).

#### (j) Persistence of homelessness

The experience of homelessness, as has been discussed, is not uniform across different people. It has been noted in the literature that those who are substance abusers tend to be in the homelessness population for much longer than those that arrive at this situation through other pathways. Contributing factors to this include the stigma of drug abuse. Because some of them

have been using drugs for an extended period of time, they dissociate themselves from mainstream society as they do not fit in and prefer not to engage (Johnson and Chamberlain, 2011). Another factor which was found to influence the duration of homelessness was the homelessness subculture which is commonly found in boarding houses and other types of emergency accommodation and is seen as a way of coping with the experience. These two factors are also cited as being responsible for those on the youth pathway experiencing extended bouts of homelessness (Flatau et al, 2006).

While a lot of the impetus for bringing about change in a homeless person's life comes from the person themselves, creating structures to support and help those experiencing homelessness make a safe and comfortable transition to a normal life are nevertheless important as a social policy objective (Liddiard and Thoresen, 2011).

## **4.2 Ideal domains and indicators to identify high risk areas**

Given this literature review, we have derived a table of individual indicators that could be associated with homelessness and indicators of future potential homelessness. These indicators are under a number of domains reflecting the different pathways into homelessness identified above. As mentioned elsewhere in this literature review, these are not the only pathways into homelessness, and by identifying a given set of indicators we recognise that this may not capture the full range of causal factors pertinent to the issue of homelessness. However, we do believe that identifying areas where there are a high proportion of people experiencing these indicators, and targeting homelessness prevention services to these areas, the value of these services will be maximised. The list of indicators is shown in Table 1. As a minimum, this represents an initial exploration into quantifying the many qualitative insights outlined above.

The list of indicators in Table 1 was limited by the availability of data. We think that many of the chosen indicators shown in Table 1 will act as proxies for other pathways into homelessness. In this respect, we are attempting to capture a wide range of dynamics from a necessarily constrained set of proxy indicators and summarise the issue of homelessness within a concise quantitative metric.

**Table 1 Indicators to be used in the Risk of Homelessness Index (RHI)**

Age	Indicator	Calculation	Description
0 - 17	% Not attending school <sup>1</sup>		
	- Numerator	STUP=1 & LFSP=6 & AgeP=0-17	Not attending school Not in labour force Age 0 – 17
	- Denominator	AgeP=0-17	Age 0 – 17
18 - 24	% Not attending school and not in labour force <sup>1</sup>		
	- Numerator	STUP=1 & LFSP=6 & AgeP=18-24	Not attending school Not in labour force Age 18 – 24
	- Denominator	AgeP=18-24	Age 18 – 24
25 - 54	% Lower than Year 12 education <sup>1</sup>		
	- Numerator	HSCP <> 1 & AgeP=25-54	No Year 12 or equivalent Age 25 – 54
	- Denominator	AgeP=25-54	Age 25 – 54
55+	% In public housing <sup>1</sup>		
	- Numerator	TENLLD=4	Rented: S/T Housing
	- Denominator	Total dwellings	Total dwellings
	% In extreme rental stress <sup>1</sup>		
	- Numerator	Number of renters spending > 60% of income on rent Age 55 years and over	
	- Denominator	Total number of renters aged 55 years and over	
All ages	Unemployment rate <sup>1</sup>		
	- Numerator	Number unemployed	
	- Denominator	Total labour force	
	% Income less than half median income <sup>2</sup>		
	- Numerator	Number with equivalised income less than half median	
	- Denominator	Total number of people with income	
	% Unable to raise \$2,000 <sup>2</sup>		
	- Numerator	Number of people in area who cannot raise \$2,000	
	- Denominator	Total number of people in area	
	% In receipt of welfare payments <sup>2</sup>		
- Numerator	Number of people in the area receiving welfare payments		
- Denominator	Total number of people in area		
% Family violence cases in the area <sup>3</sup>			
- Numerator	Number of incidents of family violence in a given area		
- Denominator	Total number of households in area		
Families	% Lone parents <sup>1</sup>		
	- Numerator	FMCF=3	One parent families
	- Denominator	All families	Total number of families
	% Overcrowding <sup>1</sup>		
- Numerator	People aged 15 – 24 in overcrowded dwellings using the CNOS definition		
- Denominator	Number of people aged 15 - 24		

- 
- <sup>1</sup> 2011 Census of Population and Housing (ABS, 2012b)  
<sup>2</sup> Spatial microsimulation using the Survey of Income and Housing and Household Expenditure Survey  
<sup>3</sup> NSW, Queensland and ACT Police

#### 4.2.1 Domains-based approach

We have adopted a two-stage approach to developing the Risk of Homelessness Index (RHI). The individual indicators are first grouped into domains that reflect some of the key dimensions associated with homelessness. The domains are then combined into a composite index. The two-stage approach allows the separate measurement of different aspects of the risk of homelessness, enabling users to focus on aspects of particular relevance to their area of interest, while also generating a single final quantitative measure of the risk of homelessness.

Our choice of domains was informed by our literature review, research on the policy relevance of variables and on the availability of such data at the local-area level. We have included the following four domains:

- Participation and education;
- Financial need;
- Housing; and
- Other factors.

At this stage, there are some aspects or indicators associated with high risk of homelessness that have not been included due to data limitations including indicators on mental health, substance abuse and negative social networks.

### 4.3 Data and measurement

Following discussions with advisors and various stakeholders, a recommendation was made to partition the index into four age groups, 0-17, 18-24, 25-54 and 55+. This is because as the literature review has shown, the pathways into homelessness are different for each age group, hence the indicators will have differential weights for each of these age groups.

Many of the indicators in this report are based on data from the 2011 Census of Population and Housing, as the Census is the best source of Australian data for personal, family and household characteristics at a small area level. For all the indicators, any Not Stated responses were removed from both the numerator and denominator of the indicator.

Where Census data was not available, or was not available at the required level of detail, we instead made use of synthetic data generated through spatial microsimulation. Spatial microsimulation essentially combines two or more sets of data, one which is geographically rich but may be lacking certain household and individual data detail (eg a census) and a survey which includes more detailed components about household and individual characteristics but only represents a sample from the full population (see Tanton and Edwards, 2013). This is a method which has become increasingly relevant for economists and public policy makers who previously faced a trade-off between a broad range of topics but low geographic detail in a

survey and a narrow range of topics but high geographic detail in a Census. Spatial microsimulation is described further in Section 4.3.2.

Once data for each of the domains and proxy indicators have been assembled, we then employ a statistical technique called principal components analysis to combine the various indicators into a composite index. A key feature of this analysis as discussed in Abello et al (2012) is that the component indicators need to be correlated with each other in order for the analysis to be suitable. If this is not the case, an alternative technique such as equal weighting could be used.

#### 4.3.1 Spatial unit

The Statistical Local Area (SLA) was adopted as the geographical unit of analysis for this project. SLAs cover the whole of Australia as opposed to Local Government Areas (LGA) that do not include areas with no local government. There are also more than twice as many SLAs than LGAs meaning that the spatial unit is smaller and potentially more homogenous with respect to characteristics that place people at risk of homelessness than is likely to be the case at the more geographically aggregated LGA level.

The SLA from the Australian Standard Geographical Classification (ASGC) was used rather than the more recent SA2 geography from the Australian Statistical Geography Standard (ASGS) as most of the administrative data used was not available for the new geography.

To improve the reliability of our estimates, we removed any SLAs that had low cell counts or had a very high non-response rate in the Census. Low cell counts mean that even a very small change in the data can produce a large percentage change in the indicator of interest. To account for this issue, we excluded SLAs with fewer than 30 persons in the different age groups of interest (7-17 years, 18-24 years, and 25-54 years), although a lower cut-off of 20 persons for the 18-24 age group was used given the prime policy interest directed towards this group of people.

The presence of high non-response for a particular variable means that there is not a reliable estimate of the value for that variable in that SLA. SLAs with an 80 per cent or higher non-response rate for any variable were excluded from our analysis. For each variable, persons (or households) with a 'not stated' response were excluded from the analysis. When results are presented on each indicator or characteristic associated with the risk of homelessness, these estimates therefore only relate to persons or households that provided valid or stated responses on those characteristics.

There were a total of 75 SLAs excluded due to low population size and another two excluded due to a high non-response rate. This leaves a total of 1,323 SLAs for further analysis.

All indicators were calculated as proportions based on the segment of the population with valid values after excluding those with 'not stated' responses. For example, the variable 'proportion of children aged 7-17 years not attending school' was calculated as follows: the number of children in that age group not attending school was divided by the total number of children in that age group less the number of 'not stated' responses. This was then repeated for each SLA.

The limitations inherent in the data on which the RHI is based should be kept in mind when interpreting the results. The individual characteristics that have been combined in the index do not by themselves measure homelessness, but rather serve as proxy variables that have some measure of association with factors that are considered to cause or lead to homelessness. Throughout this report we refer to the index as a measure of the *risk* of homelessness. It should be emphasised that the RHI is an area-based measure that may be used to summarise the general risk of homelessness faced by the population living in each SLA. However, even in areas with a particularly high risk of homelessness, there may be persons living there from families who do not face those high risks (and vice versa). Known in the literature and spatial analysis as the ecological fallacy, this means that a characteristic attributed to an area cannot necessarily be attributed to any given individual within that area. The nature of the ecological fallacy was first identified by Robinson (1950).

#### 4.3.2 Spatial microsimulation to generate synthetic data

For this project, some of the data were not available directly from the Census, so spatial microsimulation was used to derive these indicators. Looking at Table 1, these indicators were % Income less than half median income, % Unable to raise \$2,000 and % In receipt of welfare payments.

The spatial microsimulation technique re-weights the survey data based on population characteristics taken from the Census which covers the entire population in small areas. It essentially reweights a national level sample survey to small area census population characteristics.

In Australia, spatial microsimulation modelling has been successfully applied to a number of indicators, including small area poverty estimates (Miranti et al, 2011) and housing stress (Rahman et al, 2010). This provides confidence in the possibility of estimating indicators of the risk of homelessness at the small area level that are based on income and rent/mortgage payments, such as:

- The percentage of households with income less than 25 per cent of the median income and paying more than 60 per cent of their income on housing cost.
- The percentage of poor people: these are people in households with less than half the median income.
- The percentage of households unable to raise \$5,000 in a week for an urgent expense.
- The percentage of households whose main source of income is government welfare payments.

Spatial microsimulation analysis is considered robust (see Tanton et al, 2011; and Tanton and Edwards, 2013 for a description of the validation processes used) and has particular advantages over other approaches for small area estimation, including the ability to further disaggregate data using different cross-tabulations, which has been used for this analysis.

Similar to the Census data, where we excluded areas with too few people or low response rates, there are some areas where an estimate cannot be produced by SpatialMSM, since the estimation process does not achieve an acceptable level of error for the estimate. In SpatialMSM, 'error' is measured by the total absolute error (TAE) from all the benchmarks. The

TAE has been used in spatial microsimulation models as a criterion for reweighting accuracy (Anderson, 2007; Williamson et al, 1998) and has been assessed and supported by the results of other studies (Smith et al, 2009; Voas and Williamson, 2000). Further discussion on the application of TAE in SPATIAL MSM can be found in Tanton and Edwards (2013).

The 2009-10 Survey of Income and Housing and Household Expenditure Survey (HES) were used for the SpatialMSM model. The HES is a subsample of the households surveyed by the Survey of Income and Housing (SIH). The HES collected information on the expenditure, income, net worth and other characteristics of households resident in private dwellings throughout Australia.

The 2011 ABS Census of Population and Housing data (ABS 2012b) was used for benchmarks, or constraints, to which the HES and SIH data was reweighted using the method described above and in Tanton et al (2011) and Tanton and Edwards (2013)

### 4.3.3 Variables used for reweighting from SIH, HES and the Census

One important aspect of spatial microsimulation is choosing the variables that will be benchmarked. This is an important decision, and the choice of benchmarks determines which output indicators can be reliably estimated (see Tanton et al, 2011). The benchmarks from the Census data and the variables in the survey that are being benchmarked need to be defined in exactly the same way and have the same classifications. This section shows how the variables used for the benchmarking were defined.

#### (a) Demographic variables

1. Age: Individuals in each data set were assigned to one of the following age groups: 0-14, 15-24, 25-64 and 65 and above.
2. Sex/gender: Male or Female.
3. Family structure: Individuals within each database were classified according to their relationship in the family such as :
  - Member of a couple only (married or de facto)
  - Member of a couple with children (married or de facto)
  - Single person household
  - Member of a single parent household
  - Adult offspring living with parents
  - Member of a group household
4. Households by number of adult residents were classified into one of the following categories:
  - One person
  - Two persons
  - Three persons
  - Four persons
  - Five persons

- Six persons
- Seven persons
- Eight or more persons

(b) Economic variables

1. Employment: Employment status of each individual in each dataset were classified as:
  - Employed
  - Unemployed
  - Not in the labour force
  - Not applicable
2. Household income: The weekly household income classes were:
  - below \$300
  - \$300-\$799
  - \$800-\$1499
  - \$1500-\$3999
  - \$4000 and over
3. Dwelling Structure : Each household dwelling structure was classified into one of the following categories:
  - Other dwellings (caravan, cabin, tent, houseboat)
  - Flat, unit or apartment
  - Semi-detached, row, terrace or townhouse
  - Separate house
4. Housing tenure : Tenure of each household was classified as:
  - Owned outright
  - Owned with a mortgage
  - Rented: Real estate agent
  - Rented: State or territory housing authority
  - Rented: Person not in same household
  - Other tenure type
5. Rent Payment: For those households renting their weekly rent payment classes were:
  - 0-149
  - 150-299
  - 300-449
  - 450 and over
  - Not applicable
6. Mortgage Payment: For those households who owned their own dwelling with a mortgage their monthly mortgage payment classes were:
  - below \$999
  - \$1000-\$1999

- \$2000-\$2999
- \$2000-\$2999
- Not applicable

(c) Social variables

1. Education: For individuals aged 15 years and above their non-school qualifications were classified as:
  - Postgraduate, Graduate Diploma and Graduate Certificate Level
  - Bachelor Degree Level
  - Advanced Diploma and Diploma Level
  - Certificate Level
  - Not applicable
  
2. Occupation: For individuals aged 15 years and above their occupation levels were classified as one of the following:
  - Managers
  - Professionals
  - Technicians and Trades Workers
  - Community and Personal Service Workers
  - Clerical and Administrative Workers
  - Sales Workers
  - Machinery Operators and Drivers
  - Labourers
  - Inadequately described
  - Not applicable

Most benchmark tables are multi-dimensional, as they are cross-tabulations of the variables to be benchmarked. This provides greater accuracy for the model. Table 2 shows the list of benchmark tables used for the spatial microsimulation model used in this work, along with the level (Household or Person). The SpatialMSM model allows benchmarks at different levels, and uses integrated weighting to derive these weights (see Tanton et al, 2011 for a technical description of the reweighting method).

**Table 2 Benchmark tables used for SpatialMSM/13**

Number	Benchmark Table	Level
1	All household types	Household
2	Age by sex by labour force status	Person
3	Persons by non-school qualifications	Person
4	Occupational status	Person
5	Housing Tenure by weekly household income	Household
6	Monthly household mortgage by weekly household income	Household
7	Dwelling structure by household family composition	Household
8	Number of adults usually resident in household	Household
9	Weekly household rent by weekly household income	Household

#### 4.3.4 Domain groups and indicators

Now that the indicators have been identified (Table 1) and calculated either from the Census, Spatial Microsimulation or another source, this section allocates the various indicators to specific domains associated with the risk of homelessness.

##### (a) Participation and education domain

The first domain is composed of three indicators — not studying (7-17 years), not learning or earning (18-24 years) and did not complete Year 12 (25-54 years).

*Not studying:* This variable measures the proportion of children between the ages of 7 to 17 years in each SLA that are not attending school. This group excluded children younger than 7 years so as to ensure that only children of school age are counted.

*Not learning or earning:* This variable measures the proportion of youth between the ages of 18 to 24 years that are not studying and not in the labour force.

*Did not complete Year 12:* This variable measures the proportion of persons between the ages of 25-54 who do not have a Year 12 or equivalent educational qualification.

All three indicators are calculated as proportions. Values can range from 0 to 1 and the higher the proportion the greater the risk of homelessness.

Note that each of the indicators applies to different age groups (7 – 17, 18 – 24 and 25 – 54). This is because participation in education is measured differently as people progress through the education system – for very young people and early youth (aged 7 – 17), it is that they are attending school; for those ages 17 - 25 it is that they are not in tertiary education and not in work; and for those older than 25 it is their highest level of schooling.

## (b) Financial need domain

The second domain includes three indicators — in receipt of welfare payment, in financial stress and in poverty.

All of these indicators were obtained through spatial microsimulation techniques as described above. Financial stress has been defined as those households earning less than half of the median income. Percentage in receipt of welfare payments identifies those whose main source of income is from government pensions.

*In poverty:* This variable measures the proportion of people whose equivalised household income falls below the half-median equivalised household income (see Harding et al, 2000 and Saunders and Bradbury, 2006). Another alternative considered was extreme poverty, which could have been calculated as income below quarter median equivalised household income, which could be more associated with homelessness, but we found that extreme poverty gave too few observations with many SLAs having zero values.

## (c) Housing domain

The third domain is composed of two indicators on housing stress and overcrowding.

*High housing rental cost and in bottom 20 per cent of income distribution:* This variable represents an extreme measure of housing stress. It is calculated based on the proportion of persons aged 55 and over in households spending 60 per cent or more of gross household income on rent, and are in the bottom quintile of equivalised income (60/20 rather than the usual 30/40 rule). We only considered those in rental housing as those with mortgages would have some equity in the house if forced to sell, so are at less risk of homelessness. The 30/40 rule is the most commonly used measure of housing stress and has also been found to be the most suitable measure for examining regional variations in housing stress (Yates and Gabriel, 2006; Nepal et al, 2010). This modified indicator represents a more extreme version of the 30/40 rule.

*Overcrowding:* This variable measures the proportion of households that do not have a sufficient number of bedrooms for the people living in the house. This was calculated by using the Canadian National Occupancy Standard (CNOS). The CNOS compares the number of bedrooms required in the house, based on people in the house by age, sex and relationship in the household, with the actual number of bedrooms in the dwelling. The standard specifies that:

- there should be no more than two persons per bedroom;
- children less than 5 years of age of different sexes may reasonably share a bedroom;
- children 5 years of age or older of opposite sex should have separate bedrooms;
- children less than 18 years of age and of the same sex may reasonably share a bedroom; and
- single household members 18 years or over should have a separate bedroom, as should parents or couples. (ABS, 2012d)

Households living in dwellings where this standard cannot be met are considered to be overcrowded.

Most overcrowding is experienced by young people aged 15 – 24. Data from the Australian Institute of Health and Welfare show that 10 per cent of 15 – 19 year olds and 8 per cent of 20 – 24 year olds live in overcrowded dwellings. This falls to 5 per cent of 25 – 44 year olds; and only 3 per cent of 45 – 64 year olds (AIHW, 2011). We have therefore only included in the index those people aged 15 – 24 in overcrowded dwellings. The data that we used is on overcrowding (as opposed to *severe* overcrowding who are considered homeless). Young people in overcrowded dwellings are considered to be in marginal housing and may be at risk of homelessness.

#### (d) Other factors domain

The Other Factors domain included domestic violence for three States, so at this point the index was split into two – an index which included sole parent families as a proxy for domestic violence which was available for all States; and an index that excluded sole parent families but included the domestic violence data and was available only for the three States that domestic violence data was available for. The other indicator in this domain was public housing.

*Sole parents:* This variable measures the proportion of families headed by sole parents. The proportion of sole parents indicator has been included in the RHI that does not contain domestic violence as a rough proxy, with other variables, of families experiencing financial stress. These other variables include receipt of welfare payments and low income households. It should be noted that the proportion of sole parents is not being used solely as a proxy for domestic violence, but combined with other variables in the index, sole parents with financial stress will act as a broad proxy for a higher risk of domestic violence. This is supported by recent research from the Bureau of Crime Statistics and Research, which identified a significantly higher risk of actual or threatened violence against women for women who were sole parents, had experienced financial stress, or had experienced personal stressors like divorce or separation in the last 12 months (Weatherburn, 2011). The research showed that sole parents, taking other factors into account, were between 1.92 and 2.76 times more likely to experience actual or threatened domestic violence; and that those in financial stress were between 2 and 3.8 times more likely.

*Public Housing:* This variable measures the proportion of households residing in public housing, to total households. It has been included in the catchall 'Other factors' domain rather than with the housing domain. While those residing in public housing can be seen as being in housing disadvantage, they are relatively better off than those in extreme housing stress due to the lower rent in public housing. This indicator provides a proxy for precarious housing in the SLA.

*Domestic Violence:* The index with domestic violence uses domestic violence data from two states and one territory – NSW, ACT and Queensland. NSW and ACT data were available at the postal code level which was then aggregated to the SLA level using established concordance tables. Unfortunately these data were not available from other jurisdictions across Australia. However, the SLAs included in this second index cover nearly half of the Australian population.

The variable for domestic violence in our index measures the incidence of domestic violence in a given area as a proportion of the total households in that area. Incidents were defined as criminal activity that occurred at one place at one time and which is of interest to the police i.e. that the incident was either reported to or detected by the police. Domestic violence was broadly categorised as including violence between other family members in addition to spousal/partner violence. For these reasons, it was of particular interest in developing the alternative RHI as the youth homelessness pathway to homelessness includes a significant domestic violence component.

It should be noted that the variable is domestic violence reported to police. While this is the best variable we can get as there are no national surveys on domestic violence with information for small areas, it does have limitations. In particular, cases of domestic violence are very rarely reported to police. In 2005, the ABS conducted a survey on personal safety, and found that only 36 per cent of female victims of physical assault and 19 per cent of female victims of sexual assault reported the incident to police (ABS, 2006). We would also expect there to be spatial differences in this reporting rate, which we cannot identify from the personal safety survey.

#### **4.3.5 Final indicators**

The summary statistics on the final set of indicators are shown in Table 3. Nearly all indicators are calculated as proportions and values can range from 0 to 1. The only exception to this is the indicator on domestic violence which is a ratio that can exceed 1. Given the way in which the indicators have been measured, it is clear that the higher the value for each indicator, the greater the risk of homelessness.

**Table 3** Summary statistics on risk of homelessness variables

Domain	Variables	Unit	Mean (%)	Stand dev
Education/ participation	Not earning or learning	% of youth aged 18-24 years	7.7	8.5
	Not attending school	% of children aged 7-17 years	1.4	1.4
	No Year 12 qualification	% of persons aged 25-54 years	37.0	16.1
Financial need	In receipt of welfare payment	% of persons	27.3	9.5
	Financial stress (cannot raise \$2K)	% of households	14.0	5.3
	In poverty	% of persons	5.3	4.5
Housing	Housing stress (60/20)	% of persons	5.3	3.1
	Overcrowding	% of youth aged 15-24 years	7.6	7.1
Other factors	Lone parent	% of families	15.9	5.6
	Public housing	% of households	3.9	10.1
	Ratio on domestic violence	Total number of incidents reported, divided by total number of households	8.8	21.4

#### 4.4 Statistical analysis

This section describes the methodology to calculate the domain scores and composite index. The final indices measure the aggregate risk of homelessness for all age groups in a small area. We did not generate separate age group specific RHI's as there is only one indicator specific to each age group.

In order to create an index or summary measure of the risk of homelessness, it is necessary to combine the individual indicators together. There are numerous ways of creating indexes, with some common methodologies being the use of principal components analysis (PCA); the practice of equal weighting; and the use of theoretical or empirical information to decide on how to weight input variables.

PCA is a statistical technique which takes a set of highly-correlated variables and combines them to form a set of new variables, or components (Dunteman 1989). Generally, the first component captures the largest part of the variation in the original set of variables and becomes the index. Principal components analysis is most suitable when the variables used are highly correlated with each other. When variables are less highly correlated, researchers must decide to either equally weight indicators or to develop an alternative rationale for assigning weights to variables. Illustrations of both these methods are available in the literature. Hagerty and Land (2007) provide examples of equal and unequal weighting, where the unequal weights are based on survey data regarding the importance of specific domains, while Noble *et al* (2004) discuss theoretically-based weights. The use of principal components (or a similar statistical technique) to combine highly correlated variables into a single domain, and handling variables that are less correlated differently, follows the general approach taken by Noble *et al.* (2004) and Bradshaw *et al.* (2009).

The method provides a final index which then needs to be interpreted in light of the variables that load strongly on the index. In this case, there is a literature review which provides a theoretical basis to the selection of the indicators. This means the index reflects the theoretical basis used to choose the indicators, and it can be labelled according to this theoretical construct – so a Child Social Exclusion index, for example (McNamara et al, 2009) or a Social Exclusion index (see Scuttella et al, 2009). The index created for this report uses a homelessness construct, and all indicators reflect a risk of homelessness, so we have called it the Risk of Homelessness index.

We explored the use of domains, and a combination of PCA and equal weighting to create the Risk of Homelessness Index (RHI). The development of local area level indices on disadvantage (as well as well-being) using a domains-based approach has been employed by various researchers including Noble et al. (2004) and Bradshaw et al. (2009). The use of domains allows the separate measurement of different dimensions of disadvantage (or well-being).

The first step taken was to examine the correlations between the variables we had chosen for inclusion in the index, to examine the extent to which variables within domains are correlated. These results are shown in Table 4. As expected, moderate to high correlations were noted among variables within each domain.

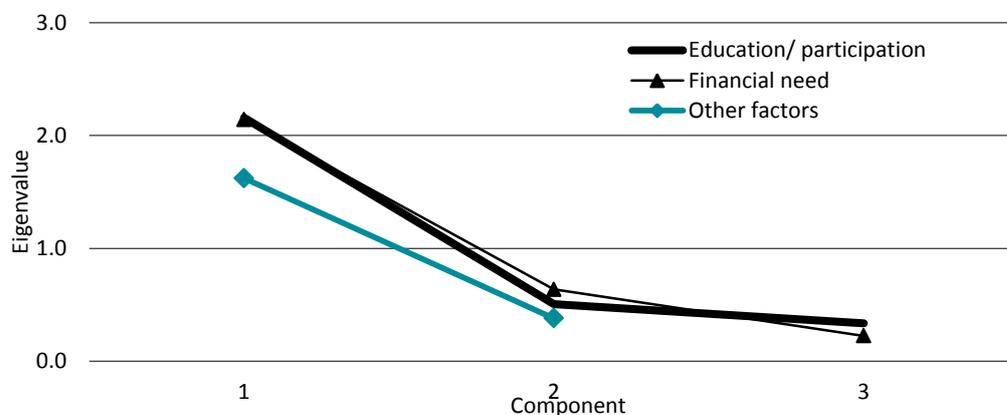
Given the reasonably strong correlations between the variables within the Education/participation, Financial Need and Other Factors domains, we used PCA to summarize the chosen variables within these domains into a single score for each domain. Given the negative and low correlation between the two housing variables (high renting cost and overcrowding), we did not use PCA, but simply took the arithmetic mean of these variables to constitute the domain score for Housing.

Based on the standard practice in the construction of indexes (see for example ABS 2004, ABS 2008; Salmond and Crampton 2002), the first component produced by the PCA procedure was used as the domain index. We did consider whether any of the additional components might make a viable index in themselves (capturing additional dimensions of meaning within each of the domains). This assessment is made by examining the eigenvalues produced by the PCA procedure. When we examined the eigenvalues (see scree plot in Figure 3), the second component across all domains had a low value (less than 1.0) of between 0.38 to 0.64, and the third component, from 0.22 to 0.34. The clearer the ‘flattening out’ of the slope of the scree plot after the first eigenvalue, the clearer the decision to reject other components. As can be seen in Figure 3, this classic pattern is most evident for the Education/participation domain, but is nevertheless present for all three domains constructed using PCA.

**Table 4 Correlations among variables to measure the risk of homelessness**

	Pearson correlation coefficients, n = 1,323									
	Prob >  r  under H <sub>0</sub> : Rho = 0									
	Education/participation			In financial need			Housing		Other factors	
	Not earning or learning 18-24 yo	Not studying 7-17 yo	No Year12 qualificatn 25-54 yo	Welfare payment	Financial stress	In poverty	Housing stress (60/20)	Over- crowding	Lone parent	Public housing
Not earning or learning 18-24 yo	<b>1.00</b>	0.63	0.61	0.48	0.73	0.34	0.11	0.73	0.57	0.55
Not studying 7-17 yo	0.63	<b>1.00</b>	0.49	0.27	0.57	0.09	ns	0.59	0.50	0.52
No Year12 25-54 yo	0.61	0.49	<b>1.00</b>	0.66	0.60	0.55	0.44	0.27	0.29	0.19
Welfare payment	0.48	0.27	0.66	<b>1.00</b>	0.69	0.64	0.51	0.23	0.41	0.14
Financial stress	0.73	0.57	0.60	0.69	<b>1.00</b>	0.37	0.18	0.61	0.71	0.53
In poverty	0.34	0.09	0.55	0.64	0.37	<b>1.00</b>	0.76	ns	-0.02	ns
Housing stress (60/20)	0.11	-0.01	0.44	0.51	0.18	0.76	<b>1.00</b>	-0.16	-0.10	-0.22
Overcrowding	0.73	0.59	0.27	0.23	0.61	0.03	-0.16	<b>1.00</b>	0.63	0.69
Lone parent	0.57	0.50	0.29	0.41	0.71	-0.02	-0.10	0.63	<b>1.00</b>	0.62
Public housing	0.55	0.52	0.19	0.14	0.53	-0.08	-0.22	0.69	0.62	<b>1.00</b>

Figure 3 Scree plot on Index of Risk of Homelessness domains



Loadings (or the amount of correlation between the original set of variables and the domain score created from the first principal component for each domain) for each of the variables and the proportion of variance explained by the model are shown in Table 5, and demonstrate high correlations between the original variables and the domain indexes. The table shows that for the Other Factors domain, 81.0 per cent of the variation in the original set of variables is explained by the index while for the other domains, the proportions are moderately high at 71.9 and 71.3 per cent, respectively, for the Education/Participation and Financial Need domains. (These figures were calculated by dividing the eigenvalue by the number of variables used in the principal components analysis and multiplying by 100.) The weights were estimated by dividing the loading for each variable by the square root of the eigenvalue. One thing noticeable from Table 5 is the near equality of the loadings on the risk of homelessness index within each domain. This suggests that the rankings of the SLAs by an equally weighted index would be quite similar to those of the PCA weighted index.

**Table 5** Loadings on each domain of the Risk of Homelessness Index

Variable	Domain		
	Education/ participation	Financial need	Other factors
Not earning or learning	0.60		
Not attending school	0.57		
No Year 12 qualification	0.56		
Welfare payment		0.64	
Financial stress		0.55	
In poverty		0.54	
Lone parent			0.71
Public housing			0.71
Per cent of variance explained	71.95	71.34	81.03

**Note:** Loading is the correlation between the first component and the variable.

#### 4.4.1 Estimating the composite Risk of Homelessness Index

As the five domain indexes had different units of measurement, they were transformed into comparable figures using an exponential transformation, following the formula described in Noble et al. (2004) and Bradshaw et al. (2009).<sup>5</sup>

We then took the arithmetic mean of the domain indexes to form the composite RHI. Finally, in order to produce results that would be easily interpretable, as well as to address the issue of unequal population numbers in small areas, we used the final index scores to calculate population weighted quintiles on the risk of homelessness. The results are presented using these quintiles, with the lowest quintile representing the highest risk of homelessness, and higher quintiles representing lower risk. Our bottom homelessness quintile thus represents the *20 per cent of the population* (rather than 20 per cent of small areas) facing the highest risk of being homeless.

Because those areas where there is a high proportion of people experiencing a high risk of homelessness could be at the extremes of the distribution, we have also broken up the areas in the bottom quintile into another 4 groups, representing those areas in the bottom 5%, 5% – 10%, 10% – 15%, 15% – 20% and higher than 20% (so those in the top 4 quintiles).

Table 6 presents the correlations among the domain indexes and the RHI. For this table, we have used the Spearman rank correlation coefficient as all the indexes created are ranks. The largest correlations were between the financial need and Education/Participation domains ( $r = 0.73$ ) and financial need and housing stress ( $r = 0.63$ ). The degree of correlation between the remaining domains was significant except for overcrowding and housing stress. The correlation between housing stress and other domains was also low (0.09). As expected given the overall index is made from the domain indexes, correlations between the domain index scores and the composite RHI index were reasonable, ranging from  $r = 0.55$  to  $r = 0.87$ .

<sup>5</sup> The transformation used is as follows. For any small area, denote its rank on the index, scaled to the range [0,1], by  $R$  (with  $R = 1/N$  for the least deprived, and  $R = N/N$ , ie,  $R = 1$ , for the most deprived, where  $N$  = the total number of small areas). The transformed index,  $X$  say, is  $X = -23 * \log \{1 - R * [1 - \exp(-100/23)]\}$  where  $\log$  denotes natural logarithm and  $\exp$  the exponential or antilog transformation.

**Table 6 Correlation of domains and Indexes on Risk of Homelessness**

	Education/ participation	Financial need	Other factors	Housing stress	Over- crowding	RHI
Education/ participation	<b>1.00</b>	0.73	0.30	0.44	0.26	0.78
In financial need	0.73	<b>1.00</b>	0.38	0.63	0.33	0.87
Other factors	0.30	0.38	<b>1.00</b>	-0.09	0.51	0.55
Housing stress	0.44	0.63	-0.09	<b>1.00</b>	ns*	0.55
Overcrowding	0.26	0.33	0.51	ns*	<b>1.00</b>	0.61
RHI	0.78	0.87	0.56	0.55	0.61	<b>1.00</b>

\* ns – not statistically significant at  $\alpha = .05$ .

\*\* The correlation coefficients were calculated on the final values of each domain score after the exponential transformation.

#### 4.5 Online maps

A series of interactive online maps were developed to visually represent the homelessness risk indicators and both of the Indexes for the Risk of Homelessness. These can be viewed at <http://web.natsem.canberra.edu.au/maps/RHI/atlas.html> for the map without domestic violence and [http://web.natsem.canberra.edu.au/maps/RHI\\_DV/atlas.html](http://web.natsem.canberra.edu.au/maps/RHI_DV/atlas.html) for the map with domestic violence. Some documentation for these maps is given in Attachment 1.

The Online Maps are created to interactively present the distribution of homelessness indexes and indicators for small areas. These maps were created using Instant Atlas 6.5 and can be viewed in a web browser (eg Firefox or Internet Explorer).

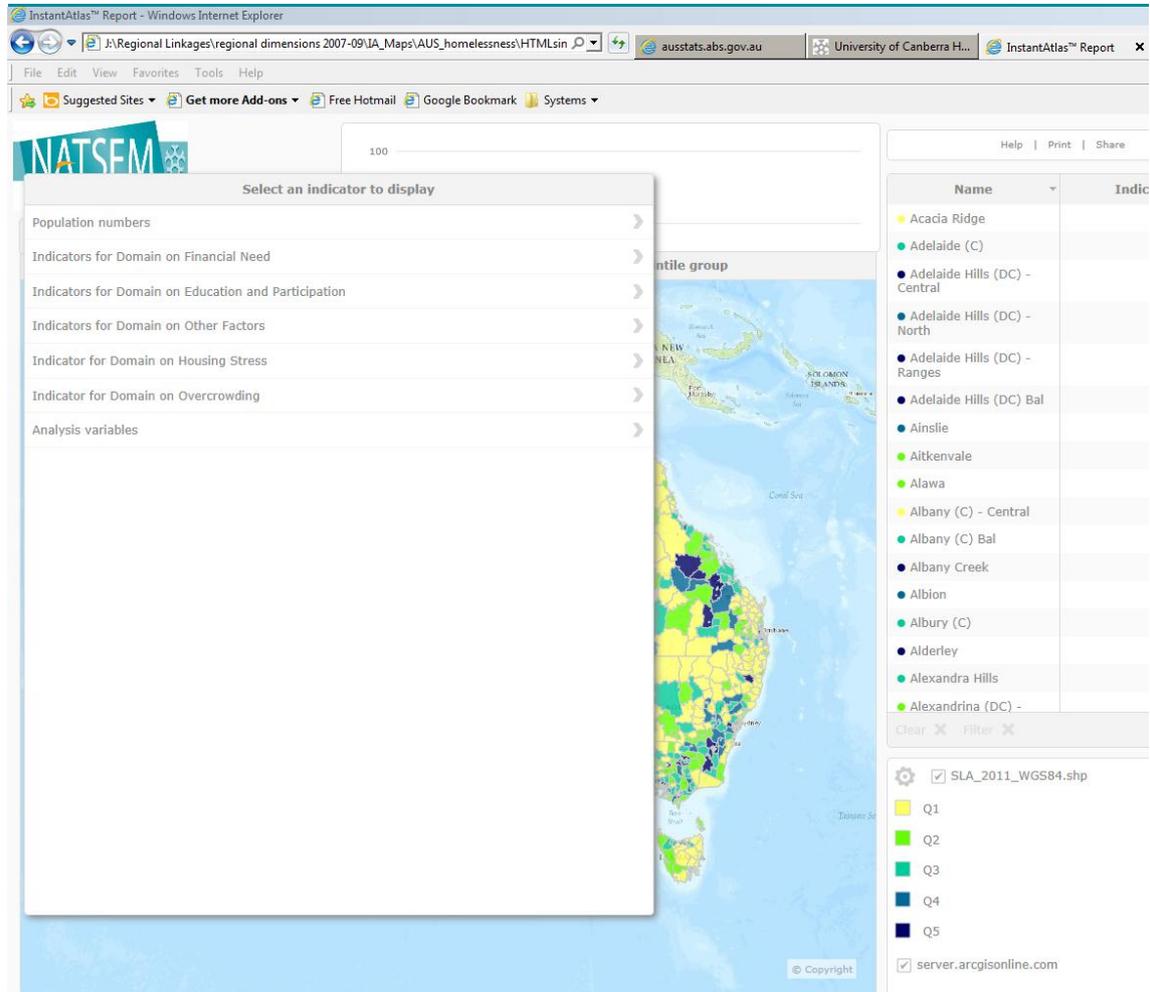
The main advantage of online maps is the ability for a user to interact with the data and to show different distributions of the data using different classification methods. At the top of the map, there is a tool to zoom in and out the map. The user can zoom the map using either the zoom tool or the scroll button on the mouse to change the map magnification, and drag the map to the location they want to view using the mouse.

The online map also allows a user to change the variables shown in the map using the Data tab in the upper left hand corner of the map. This will allow the user to see the distribution of different indexes and indicators. These indexes and indicators are categorised into 5 domains and each domain may be mapped separately. The indicators are shown in each of the domains under the Data tab – so the indicators for the financial need, education and participation, housing stress, overcrowding and other domains are shown under the Data tab. The Analysis Variables provides access to the indexes for each domain, and the overall risk of homelessness index. Within each index, there is the index score, which can be grouped in a number of ways; the population weighted quintile; and the split of the first quintile described above.

Another important option is changing the classification method. The wheel-like button above the legend on the bottom left corner of the map allows the user to change the classification (for example, to quintiles), in addition to changing the number of classes and their colour

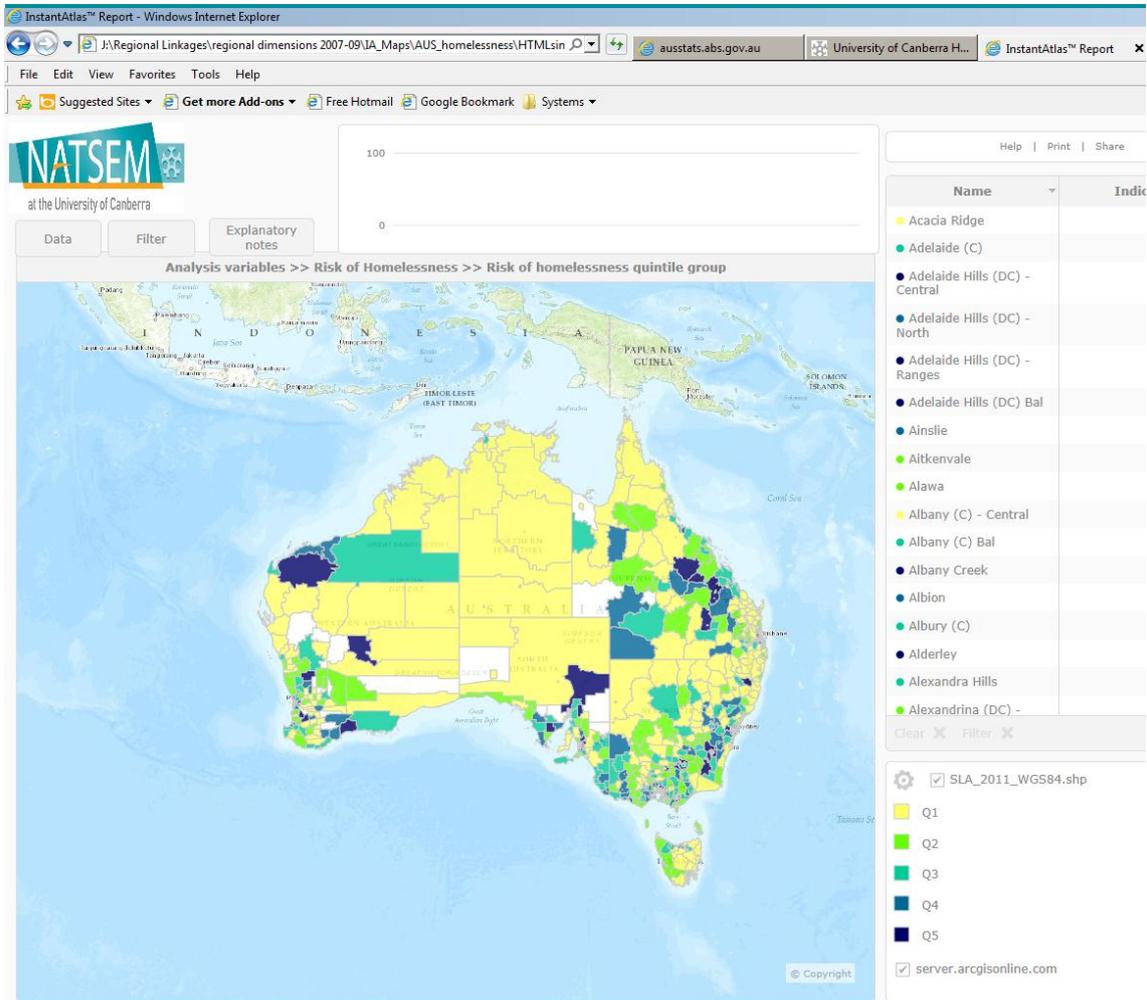
scheme. The natural break is the default for this map but other break standards such as quintiles, equal intervals and standard deviation are also available.

**Figure 4 Example of online map of the Homelessness Index**



Source: NATSEM modelling using ABS data and instant atlas maps

**Figure 5 Instant Atlas map using results from Risk of Homelessness Index 1**



Source: NATSEM modelling using ABS data and instant atlas maps

The geographies can also be changed by selecting the filter option, which brings up a list of states that can be viewed. To see the specific attributes simply click on or hover the cursor over the desired SLA.

## 5 Results

This section discusses the results attained from the Risk of Homelessness Index (RHI) including all states and the RHI including only those states for which data on domestic violence was available (RHI-DV). The performance of different states on quintiles one through to five (one being the highest risk of homelessness and five being the lowest) is discussed.

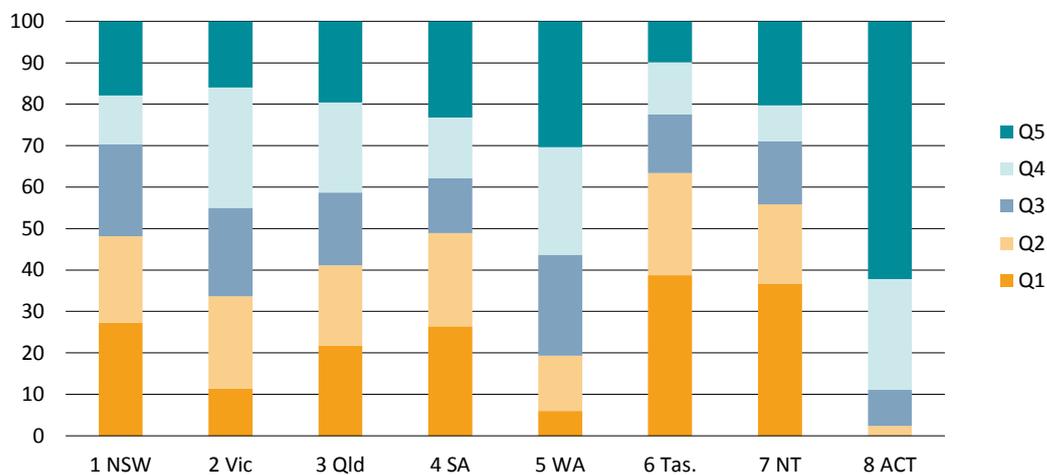
In this section we look at differences between city and balance of state, and the differences in scores between states. Finally, the effect of the incorporation of domestic violence indicators into the “Others Domain” is explored.

### 5.1 Results

#### 5.1.1 Risk of Homelessness Index (RHI)

Figure 7 shows the proportion of people in each State in each of the quintiles. So, in New South Wales, about 27 per cent of the people in New South Wales are in Quintile 1; 20 per cent are in Quintile 2; 22 per cent are in Quintile 3; about 12 per cent are in Quintile 4; and 18 per cent are in Quintile 5. As can be seen in Figure 6, Tasmania had the highest proportion of people (about 38 per cent) in areas with the highest risk of homelessness, Q1. Further inquiry into this revealed that Tasmania scored highly on the financial need domain.

Figure 6 Distribution of population by RHI quintile, by state/territory

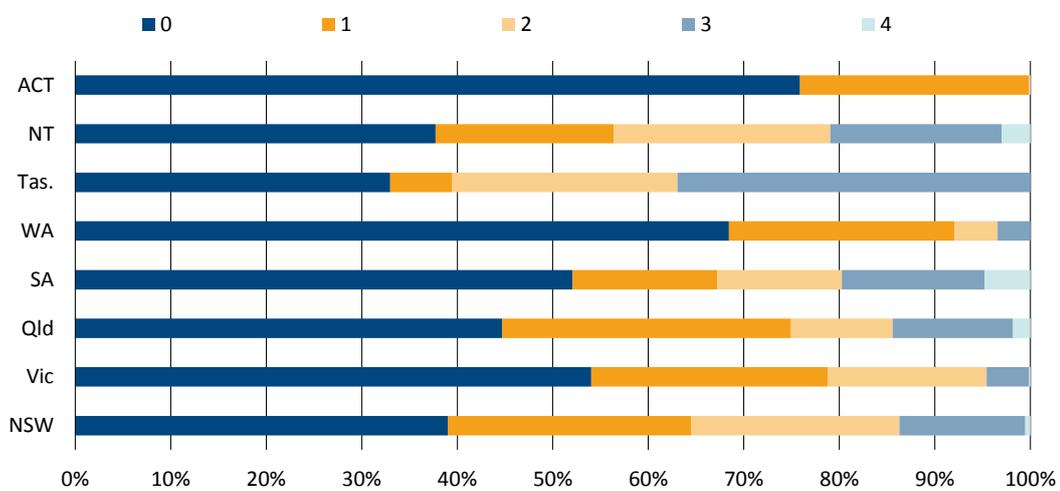


Source: NATSEM estimates.

A rather unexpected finding in Figure 6 is that the Northern Territory fares slightly better than Tasmania after combining the bottom two quintiles on risk of homelessness. As we will see in the analysis section, the ABS Estimating Homelessness report shows Tasmania as having the lowest level of homelessness and a lower than national average risk of homelessness, so the result in Figure 6 is driven by factors within Tasmania. This higher proportion of people at risk of homelessness when considering Tasmania only could be due to lower incomes in Tasmania, as it seemed to be due to the financial need domain. Despite this, compared to the national RHI, Tasmanian’s do not experience a higher risk of homelessness, as shown in Figure 16.

Figure 7 shows the intensity of risk of homelessness for the first quintile of risk of homelessness using the number of domains. The intensity of risk shows the proportion of people experiencing risk on a number of domains, so a higher intensity means more domains of risk. So Figure 7 shows that 76 per cent of people in the ACT were in areas with no domains ranked in Q1; and 24 per cent of people were in areas with one domain in Q1. The ACT, Western Australia and Victoria have the highest percentage of people in SLAs that do not have a Q1 ranking on any domain (76, 67 and 53 per cent respectively). South Australia has the highest percentage of people in SLAs that have Q1 rankings on all four domains (5 per cent).

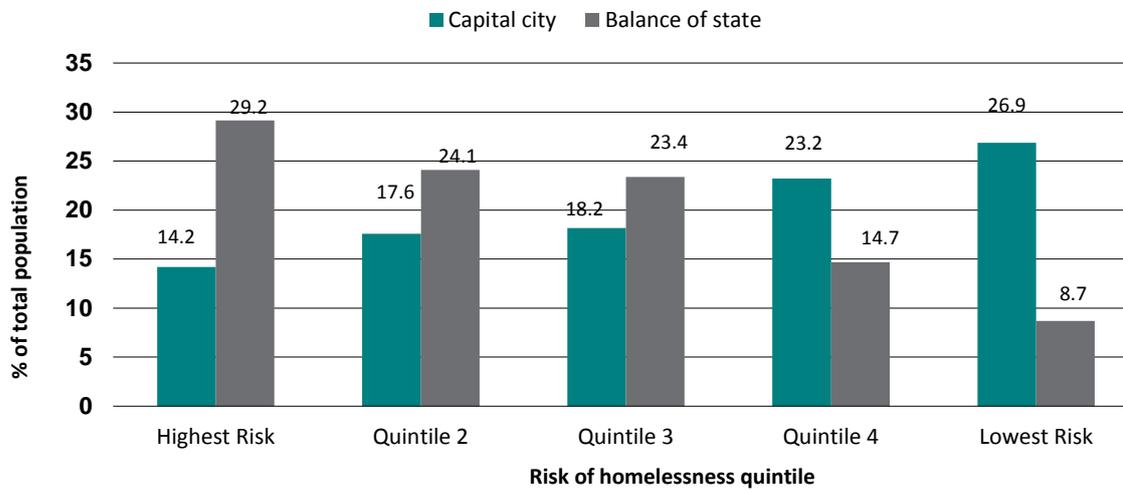
**Figure 7 Number of domains in Risk of Homelessness index**



Source: NATSEM estimates.

From the statistical analysis that was conducted on the risk of homelessness faced in capital cities and balance of state, we were able to conclude that most of the risk of homelessness occurred in areas outside the capital city. As can be seen in Figure 8, those at highest risk of homelessness were far more likely to be living in rural areas and the least risk was experienced in urban SLAs. This is consistent with where homelessness exists in Australia – most homelessness is in the balance of State areas rather than capital cities. Data from the 2011 Census reported in the ABS Estimating Homelessness report (ABS 2012b) shows that across Australia 38 per 10,000 population are homeless in capital cities; and 63 per 10,000 population are homeless in the balance of State areas. It is only Sydney, Melbourne and Tasmania where the homelessness rates per 10,000 population are higher than the Balance of State areas. This is shown in Table 7.

**Figure 8 Capital City – Balance of State distribution by Risk of Homelessness quintile**



Source: NATSEM estimates.

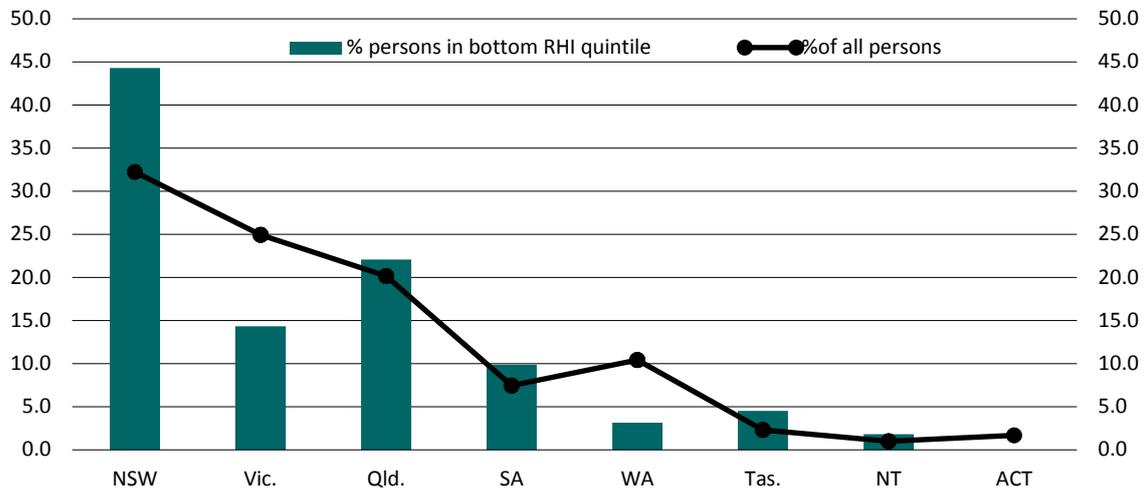
**Table 7 Homelessness per 10,000 population by Capital City/Balance of State**

	Capital City	Balance of State
NSW	46	32
Vic	46	31
Qld	35	56
SA	34	49
WA	28	94
Tas	35	30
NT	113	1,580
ACT	50	
Australia	38	63

Source: NATSEM analysis from ABS (2012b) supplementary tables – All homeless persons by Statistical Area 4 and ABS Tablebuilder for population estimates

When the index was examined by State it was found that the highest proportion of people with the highest risk of homelessness were in NSW and Queensland. This is shown in in Figure 9, which shows the proportion of people in the bottom Risk of Homelessness quintile in that State compared to the proportion of the Australian population in that State. So Figure 9 shows that 45 per cent of people in the bottom quintile of the Risk of Homelessness Index live in New South Wales; but about 32 per cent of the total population live in New South Wales. So people in the bottom quintile of the Risk of Homelessness Index are over-represented in New South Wales, South Australia and Tasmania; and under-represented in Victoria, WA and the ACT.

**Figure 9 Distribution of persons at risk of homelessness and total population, by State/Territory**

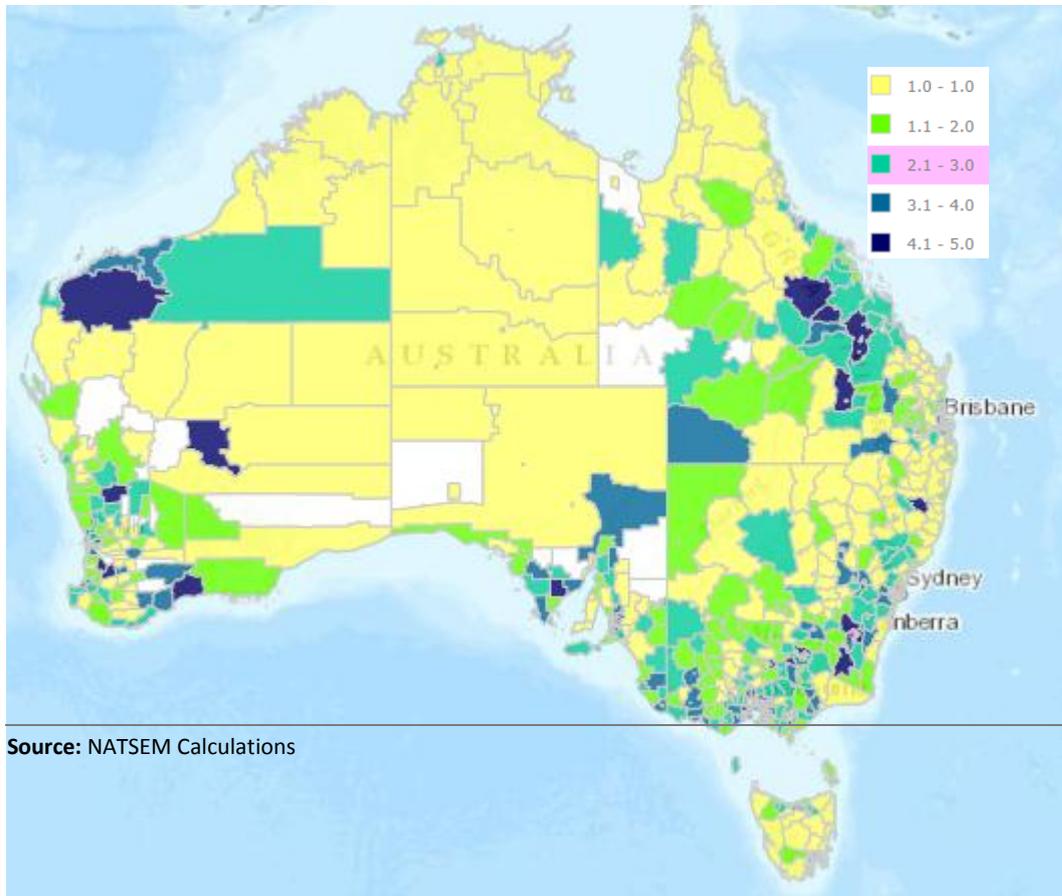


Source: NATSEM estimates.

A map of the RHI is shown in Figure 10. This map uses population weighted quintiles, so there is an equal number of people in each quintile rather than an equal number of areas. Higher numbers represent areas with a lower risk of homelessness. It can be seen that many areas in the middle of Australia have a very high risk of homelessness, and as discussed earlier, Tasmania has a high number of people living in areas with a high risk of homelessness.

Areas in rural Victoria have a much lower risk of homelessness. This is consistent with Table 7, which shows Victoria outside of Melbourne has one of the lowest homelessness rates in Australia.

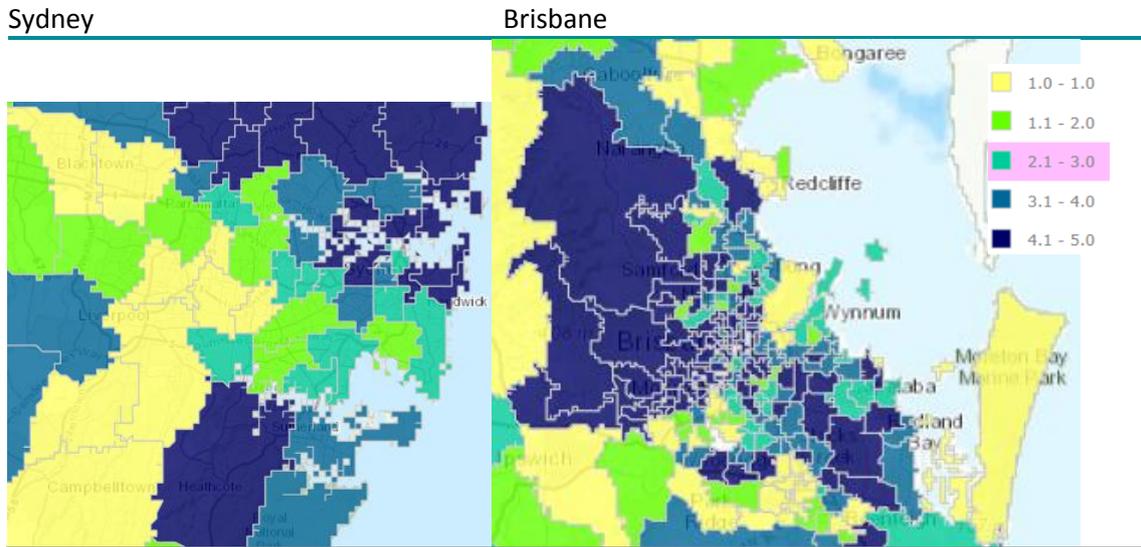
**Figure 10 Map of RHI**



Source: NATSEM Calculations

Figure 11 shows the RHI for Sydney and Brisbane. It can be seen that areas in inner Sydney have a low RHI, but areas in Western Sydney have a high RHI, possibly due to higher housing stress and a higher proportion of people in extreme poverty. In Brisbane, there are areas near central Brisbane with a high RHI; and areas on the outskirts of Brisbane to the South.

**Figure 11 RHI for Sydney and Brisbane**



a

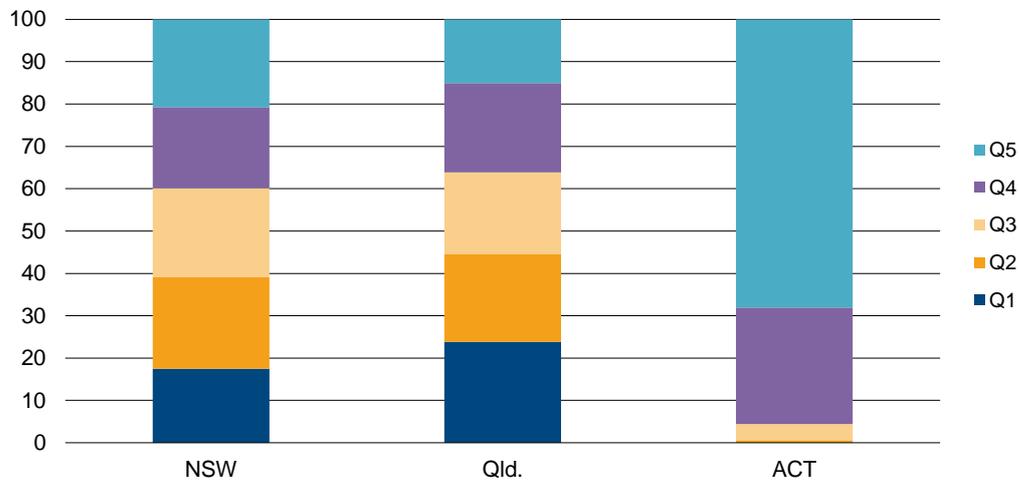
Source: NATSEM Calculations

### 5.1.2 Risk of Homelessness Index – including domestic violence (RHI-DV)

The domestic violence index includes incidents of domestic violence for States and Territories where these data were available (Queensland, NSW and ACT) and excludes the proportion of lone parents (which was being used as a proxy for domestic violence in the previous index). After making exclusions due to insufficient data, this dataset covers 760 SLAs which is about half of the SLAs analysed in the main index.

As is evident from Figure 12 below, the ACT has the lowest proportion of people in the most at risk of homelessness quintile and a little more than 70 per cent of the people in SLAs in the least at risk quintile. 18 per cent of people in NSW and 22 per cent in Queensland are in SLAs in the most at risk quintile, a slight decrease for NSW compared to the RHI, but similar for the other States and territory.

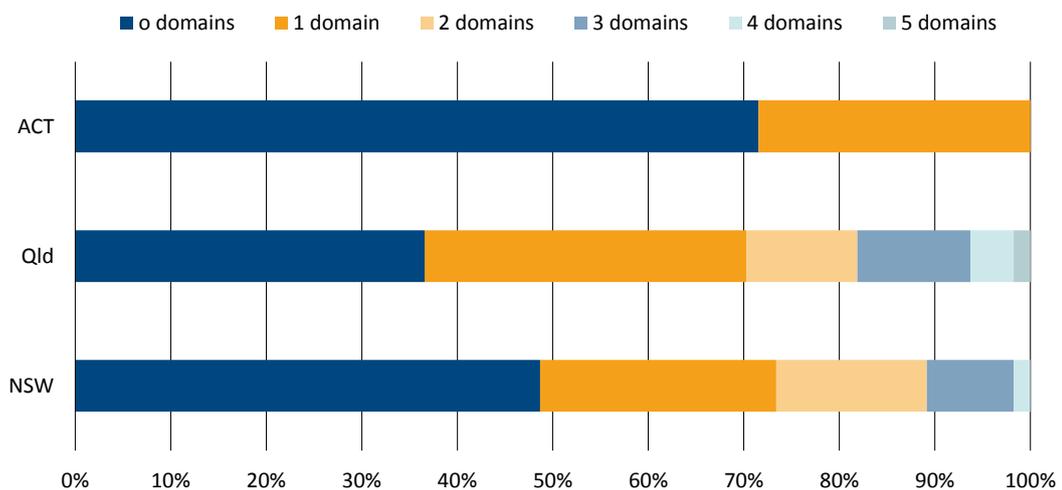
**Figure 12 Distribution of population by RHI-DV quintile, selected states/territories**



Source: NATSEM estimates.

Figure 13 shows the RHI-DV with the number of domains in which a Q1 (highest RHI-DV) ranking is obtained. It is clear that the ACT has the lowest risk of homelessness after domestic violence is taken into account with 71 per cent of people in areas where there are no domains at risk. However, when compared to the RHI results, it is also clear that incorporating domestic violence into our analysis produces an increase in the proportion of areas where there is a high risk on one domain from 24 per cent to nearly 30 per cent

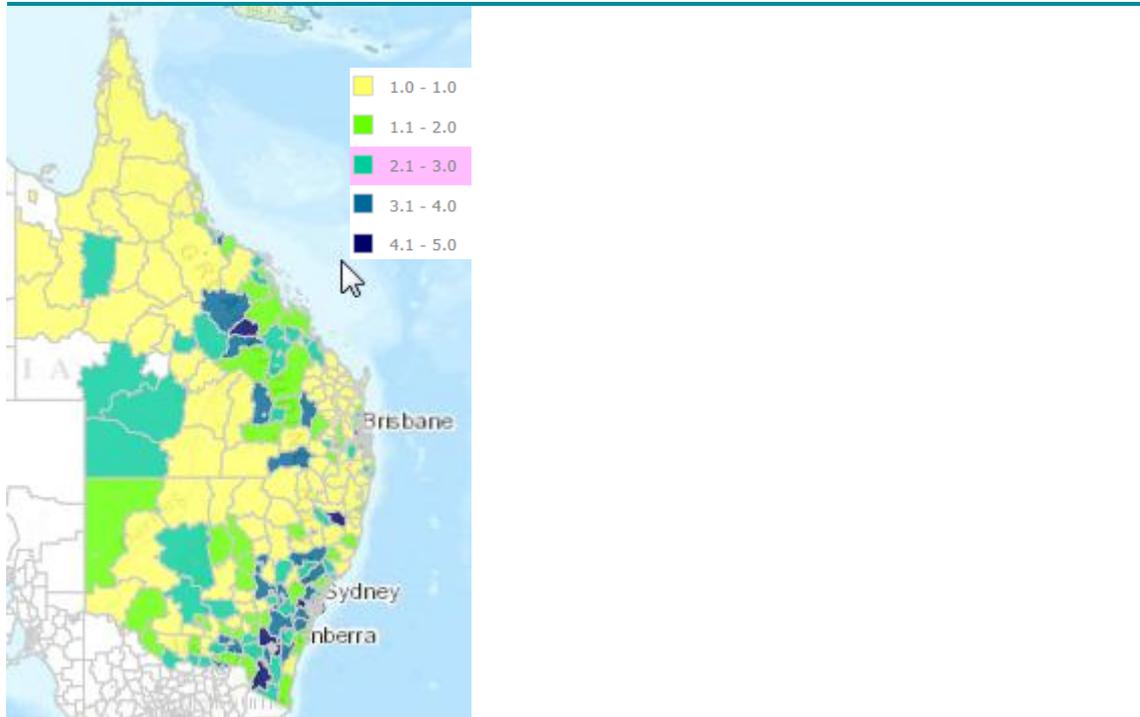
**Figure 13 RHI-DV across domains**



Source: NATSEM Modelling

The RHI-DV index is mapped in Figure 14. It can be seen that many rural and remote areas have a high RHI-DV, but regional areas near Sydney and Canberra have a lower RHI-DV.

**Figure 14 RHI-DV for Queensland, NSW and ACT**

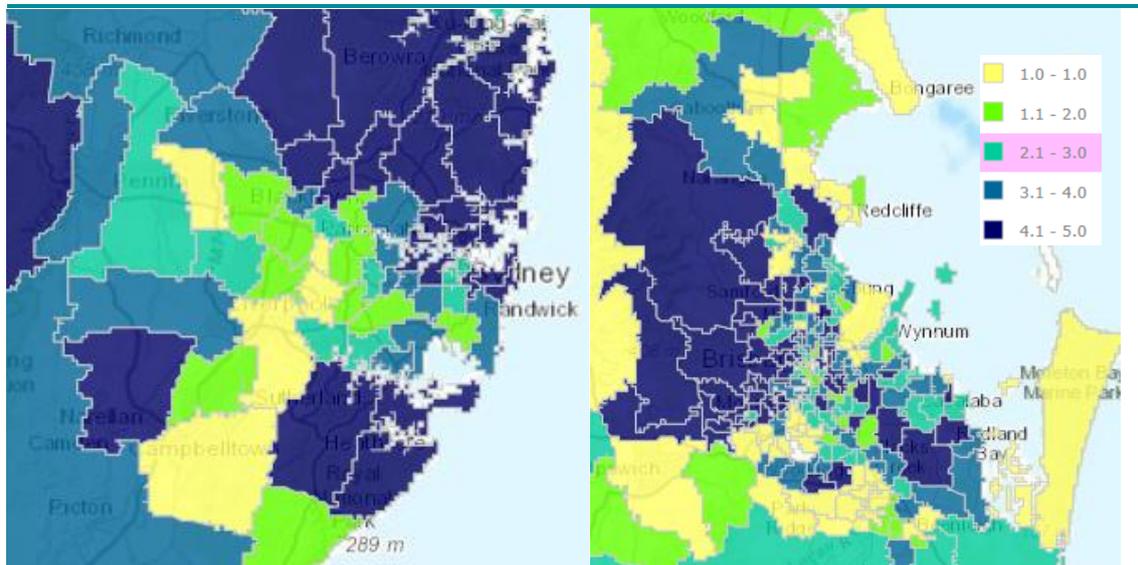


a

Source: NATSEM Calculations

The RHI-DV index for Sydney and Brisbane is shown in Figure 15. It can be seen that, similar to the RHI index, areas on the Western Suburbs of Sydney have a high RHI-DV; and some areas in inner Brisbane have a high RHI-DV. There are a few areas in Brisbane that have moved from a lower RHI to a high RHI-DV due to the incorporation of domestic violence. These areas include Chermside and Strathpine-Brendale.

**Figure 15 RHI-DV for Sydney and Brisbane**



a

Source: NATSEM Calculations

## 5.2 Validation

We validated the results in a number of ways, as there was no one ideal way to validate small area data.

The first form of validation was to compare the quintiles of RHI to quintiles of SEIFA, which is a general measure of disadvantage. What we are looking for is differences, to show that we don't just have a measure of disadvantage. This was similar to the validation for the 2001 SEIFA indexes (see ABS, 2004). The results from a spearman rank correlation coefficient (as both SEIFA and the RHI are ranks) of the RHI against the SEIFA shows a correlation of 0.90. In the analysis using the different SEIFA indexes (so the correlations between the Index of Advantage/Disadvantage, Disadvantage, Education and Occupation and Economic Resources), there was a correlation of 0.81 to 0.94, and the ABS considered this enough of a difference to create separate indexes. This suggests that the RHI adds additional value compared to a general index of disadvantage. This would be expected given it has a different set of indicators used to construct it.

The other validation that can be done uses the online maps. This is a continuous process of validation – as experts use the online maps, they get a feel for how reliable the indexes and indicators are, and comments from users can then be incorporated into future indexes.

## 6 Discussion

The Risk of Homelessness Index has used a literature review on the pathways into homelessness to identify areas where there is a high proportion of people who are in these high risk categories. While these areas have a high proportion of high risk people under a number of domains, this does not mean that these people will become homeless – what it means is that these areas are the most effective ones to target in terms of prevention strategies. In terms of targeting these prevention strategies, the indicators that we have used relate to different pathways into homelessness, so a housing strategy might be targeted to areas with high housing stress; and a violence prevention strategy might be targeted to areas with high levels of domestic violence.

The index shows that Tasmania had the highest risk of homelessness, and this was mainly due to the financial need domain. The lowest risk of homelessness was in WA and the ACT.

The highest risk of homelessness was in non-metropolitan areas. This is consistent with the ABS Estimating Homelessness report (ABS, 2012b), which shows that the majority of homeless people in Australia live outside capital cities (see Table 7).

Incorporating domestic violence where it was available changed the index in NSW, and meant that fewer people were in the lowest quintile. In terms of the distribution of the RHI, including domestic violence had little effect outside capital cities in New South Wales, but did have an effect on some SLAs in Queensland, including Winton, Longreach, and a number of other SLAs which went from the second quintile on the RHI to the first quintile on the RHI-DV.

One interesting analysis which can be done with the RHI is to compare it to where homelessness does exist using the ABS Estimating Homelessness report (ABS, 2012b). We know that the RHI will not line up to actual homelessness, as the aim of the Risk of Homelessness index was to identify areas where the risk of homelessness is high given a range of factors, not identify areas of high homelessness. There can also be movement of homeless people, so areas where there is a high risk of homelessness may not be the areas where homeless people are. There may also be factors that we have not been able to quantify that may be 'protective' in terms of homelessness – so for instance, social capital (family and friend ties).

We have also excluded the NT from this analysis, as the homelessness rate in the NT was 730.7 per 10,000 population, and plotting this value overshadowed all the other much smaller rates.

The comparison of the risk of homelessness and homelessness rates is shown in Figure 16, which plots the ratio between the proportion of people in the bottom quintile of the at risk of homelessness index and the national average with the ratio between the rate of homelessness from the 2011 Census from the ABS and the national average. So the estimates plotted are comparable on the graph as both are the ratio between the estimate and the national average.

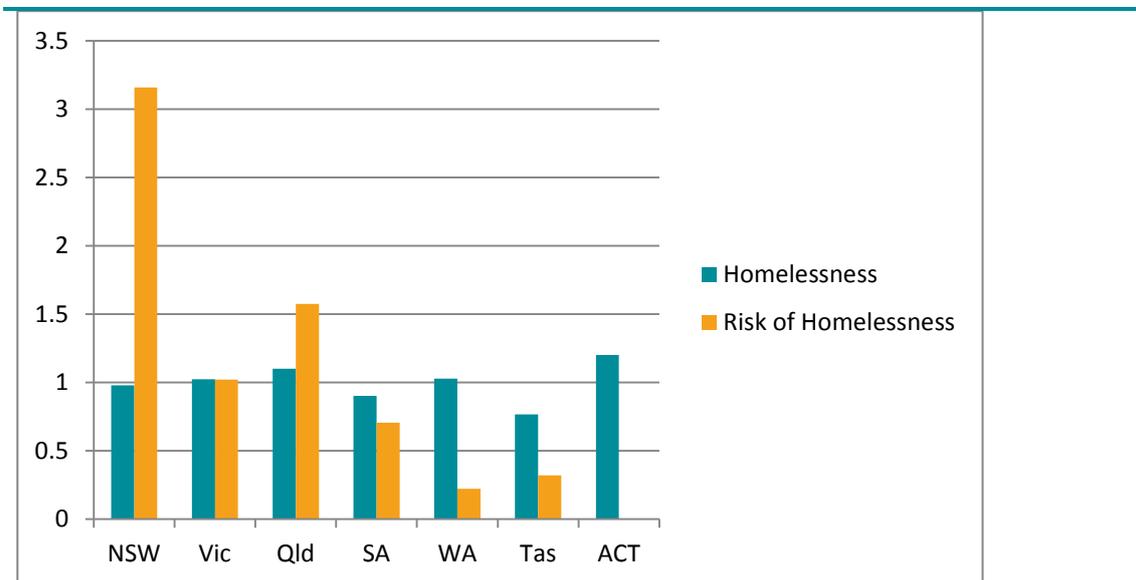
It can be seen that for many States, the risk of homelessness is not related to the actual homelessness rate. The States where they are similar are Victoria and South Australia. In particular, NSW has a much lower rate of homelessness compared to the risk of homelessness.

This may be due to homeless people moving interstate, and it may be due to the fact that not all people experiencing a risk of homelessness becoming homeless – there may be protective factors in the area they live like friends or family relationships.

One interesting result was that the ACT had the lowest risk of homelessness, but the highest homelessness rate. The ABS Estimating Homelessness report showed that the homeless in the ACT had gone from being the lowest rate in the 2001 and 2006 Census to the highest rate in the 2011 Census. The report suggested that the high homelessness rate for the ACT was due to people in supported accommodation (30.9 per 10,000 population compared to a 9.9 per 10,000 population Australian average) (ABS, 2012b). This was much higher than it was in 2001 and 2006, where in 2001 it was about the national average; and in 2006 it was slightly above the national average.

This reason for this may be that the ACT is surrounded by New South Wales regional towns. While further research would need to be done to identify where the people in the supported accommodation in the ACT have come from, it could be that the drought in New South Wales, which officially ended in 2010, was pushing people from regional towns into supported accommodation in Canberra, and that this was still continuing after the drought ended. This could explain the slight increase in the number of people in supported accommodation in 2006; and then the dramatic increase in 2011.

**Figure 16 Risk of Homelessness (ratio of % in bottom quintile to national average) and Rates of Homelessness (ratio of estimate to national average)**



**Source:** Risk of Homelessness Index; ABS 2012(b)

We also looked at this analysis using the bottom 5 per cent of the RHI, which would include more marginal people with a higher likelihood of becoming homeless. This showed that NSW was closer to the actual homelessness rate, but the other States were not. The results are not shown here, but are available from the authors.

## 7 Policy/Program Implications

The White paper on homelessness (Australian Government, 2008) identified a number of research priorities. One of these was population based research, and this research fits within this broader area of research. It identifies groups of people who may experience a greater risk of homelessness, and then identifies areas where these groups are more prevalent.

The main implications on homelessness policy and programs of the RHI and RHI-DV are that they show areas where programs can be concentrated to prevent homelessness. Prevention and early intervention was one of the guiding principles of the White Paper (Australian Government, 2008), and fewer people becoming homeless was one of the critical success measures for the Government.

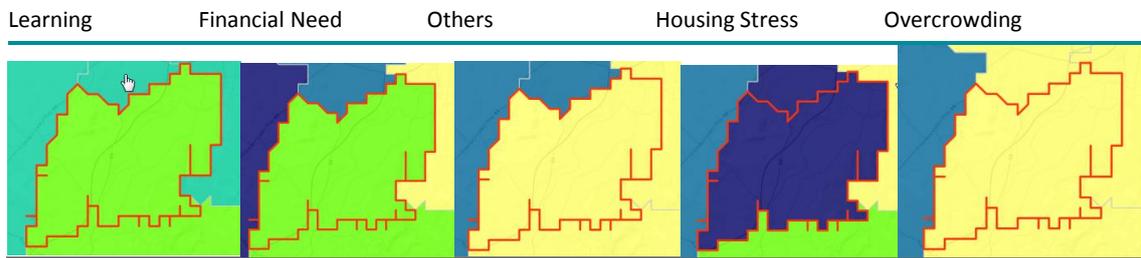
The combination of the RHI to identify high risk areas for homelessness, and then the indicators to identify why an area is high risk, allows policy makers to target particular programs to particular communities. These programs would need to have other evidence that the program will reduce the type of homelessness identified in the area using the indicators, but the RHI will allow the Government to target more effective policies to particular areas.

As an example, if the RHI shows an area has a high risk of homelessness, and the indicators show this is due to high housing stress in the area, then programs like the Household Organisation Management Expenses Advice program can be promoted in the area, whereas this program may not be as relevant to an area that has a high risk of homelessness due to overcrowding. Understanding the spatial pattern of the risk of homelessness is important in targeting programs to certain communities, rather than promoting programs that are not required in the community.

As a concrete example of this, the RHI highlighted Campbelltown as having a high RHI. We could then look at Campbelltown further, as shown in Figure 17, and see that this is mainly due to the overcrowding; and Other domains. We can drill further into the Other domain using the indicators and find that it is mainly due to the proportion of lone parents in the area.

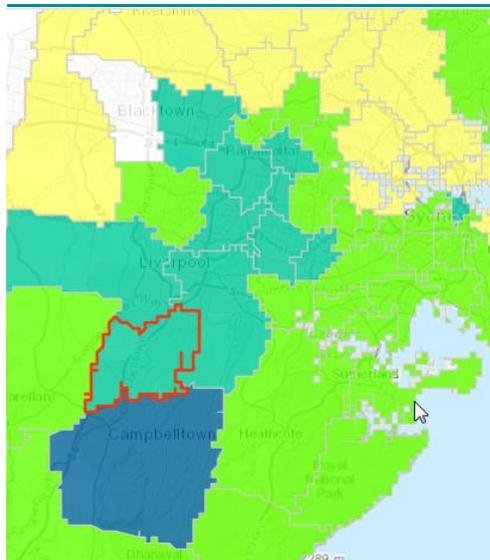
The conclusion that can be made is that policies directed to reducing housing costs in this area will have little effect. Because we also have some potential domestic violence in this area, we could also look at this further, and we do find that domestic violence is high in this area (see Figure 18). Therefore, policies and programs to target overcrowding and domestic violence would be most effective in reducing the risk of homelessness in Campbelltown.

**Figure 17 RHI domains for Campbelltown**



Source: NATSEM Calculations

**Figure 18 Rates of Domestic Violence in Campbelltown**



Source: NATSEM Calculations

## 8 Further Development

There are a number of areas that could be developed in this analysis. While we were able to get estimates of domestic violence for three States, greater coverage of domestic violence would provide a better understanding of the risk of homelessness in other States.

There are also a number of indicators which we would have liked to have added given our literature review, but which we could not collect. The main one was mental health. Small area estimates of people with mental health problems would add considerably to the RHI, and would mean that this important aspect of homelessness could be included. There may be ways to derive this using NATSEM's spatial microsimulation modelling on the HILDA dataset, but the benchmarks for mental health problems would need to be identified and collected. This is possibly work that could be conducted with one of our partners, the AIHW.

Aspects of social capital, like family connectedness, are also missing from the index due to lack of data availability. This may be the reason that there was a difference between the RHI and actual homelessness in the Discussion section.

One of the main developments would be looking further at why the ACT has a low risk of homelessness and a high homelessness rate. As explained in the Discussion, this could be due to people moving into the ACT from interstate (so the homeless in the ACT are a transient population from NSW). This could be further investigated by looking at the homeless people in the ACT from the ABS Estimating Homelessness report, and looking at where they lived 1 year ago (an indicator on the Census). This would need access to Census Unit Record Data, so would need to be done by the ABS.

## 9 Limitations

It should be noted first up that these are indexes of the risk of homelessness. They do not show where people are homeless – the ABS Estimating Homelessness (ABS, 2012b) reports do this using Census data. This project identifies a number of indicators that can identify areas where there are conditions that are associated with homelessness, based on a literature review, and then develops an index for a number of domains (Education, Financial need, Housing and Other); and then summarises these domains to an overall summary index. These indexes and indicators can then be used by policy makers and researchers to identify areas where early intervention may be useful in reducing homelessness.

The aim of this project was not designed to identify need or a service response. The indexes and indicators were designed to identify areas with people who have characteristics associated with a risk of homelessness. The domain indexes (Education, Financial Need, Housing and Other) and indicators, combined with other research linking the indicator with need, could be used to identify need, and with other research identifying links between the need and an effective service response, a service response could be identified.

## 10 Conclusion

This analysis has provided two indexes and indicators of the risk of homelessness on a number of domains, based on an extensive literature review of the pathways into homelessness. One of these indexes included domestic violence for three States only (NSW, ACT and Qld). The indexes and indicators have then been mapped using an online mapping capability, allowing the user to drill down from indexes to domains to indicators within these domains. This allows the user to identify a particular area which has a high risk, and then look at the domains, and the indicators within these domains, to identify why the area has a high risk of homelessness.

Both indexes show that most people in areas with a high risk of homelessness are in the NT and Tasmania. Rural areas have more people with a higher risk than city areas, consistent with the ABS Estimating Homelessness report showing that areas outside capital cities have higher rates of homelessness. NSW has a much higher proportion of people in high risk areas while WA and Victoria have a much lower than expected proportion of people in high risk areas.

Adding domestic violence changed some areas, but because the proportion of single parents was taken out when domestic violence was added, the effect was not great. This means that the proportion of single parents was acting as a rough proxy for domestic violence.

We then showed how these indexes and indicators could be used to inform policy by looking at the example of Campbelltown in Sydney. This had a high RHI and it was found that this was due to the Other domain, and in particular rates of domestic violence.

## References

- Abello, A., Gong, C. and Daly, A. (2012) Spatial dimensions of child social exclusion risk in Australia: widening the scope, *Child Indicators Research*, vol. 5, no. 4, pp. 685-703.
- ABS (Australian Bureau of Statistics). (2004). *Socio-Economic Indexes for Areas (SEIFA), Australia, 2001*. Technical Paper, Cat. No. 2039.0.55.001 (Canberra: ABS).
- ABS (2006) *Personal Safety Survey Australia*, Cat No. 4906.0 (Canberra: ABS)
- ABS. (2007) *National Survey of Mental Health and Wellbeing: users' guide*, Cat. No. 4327.0.
- ABS. (2008) *Socio-Economic Indexes for Areas: Information Paper*, Cat. No. 2039.0. (Canberra: ABS).
- ABS. (2011) *Methodological review of counting the homeless, 2006 - Discussion Paper*, March 2011  
[http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/C255AA8D9A430DAFCA257863000EEE6B/\\$File/2050055001\\_2011.pdf](http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/C255AA8D9A430DAFCA257863000EEE6B/$File/2050055001_2011.pdf).
- ABS. (2012a) *Information paper – a statistical definition of homelessness, 2012: domestic and family violence*, retrieved, 20<sup>th</sup> November 2012  
<http://www.abs.gov.au/AUSSTATS/abs@.nsf/Latestproducts/4922.0Main%20Features72012?opendocument&tabname=Summary&prodno=4922.0&issue=2012&num=&view=>
- ABS. (2012b) *Census of Population and Housing: Estimating the Homeless, 2011*, November 2012, Cat No. 2049.0  
[http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/EB59F237159F7102CA257AB100170B61/\\$File/20490\\_2011.pdf](http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/EB59F237159F7102CA257AB100170B61/$File/20490_2011.pdf)
- ABS (2012c) Factsheet – *Overcrowding: Census of Population and Housing: Estimating Homelessness*, Cat No. 2049.0  
<http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/2049.0Main%20Features402011?opendocument&tabname=Summary&prodno=2049.0&issue=2011&num=&view=>
- ABS (2012d), *Household Expenditure Survey and Survey of Income and Housing, User Guide, Australia 2009–10*, Cat No. 6503.0, ABS: Canberra
- Anderson, B. (2007) *Creating small area income deprivation estimates for Wales: spatial microsimulation modelling*, Chimera WP2007-11, University of Essex, Colchester.
- Australian Government. (2008) *The road home. A national approach to reducing homelessness*, Department of Families, Housing, Community Services and Indigenous Affairs, Canberra, Australia, <[www.fahcsia.gov.au](http://www.fahcsia.gov.au)>.
- Australian Institute of Health and Welfare (AIHW). (2012) *Specialist Homelessness Services Collection: first results*. Cat. no. HOU 262. Canberra: AIHW.
- Australian Institute of Health and Welfare. (2011). *Young Australians: their health and wellbeing 2011*, Cat. no. PHE 140 Canberra: AIHW.
- Australian Institute of Social Research. (2004) *Homelessness: suite of indicators*,  
[http://www.socialinclusion.sa.gov.au/files/Homelessness\\_3\\_Suite\\_of\\_indicators.pdf](http://www.socialinclusion.sa.gov.au/files/Homelessness_3_Suite_of_indicators.pdf).
- Bell, P. (2000) *GREGWT and TABLE macros—users guide*, Australian Bureau of Statistics.

- Bradshaw, J., Noble, M., Bloor, K., Huby, M., McLennan, D., Rhodes, D., Sinclair, I. and Wilkinson, K. (2009) A child well-being index at small area level in England, *Child Indicators Research*, vol. 2, no. 2, pp. 201–220.
- Burke, S. (2012) *National Quality Framework Submission: The Australian Psychological Society*, prepared for the Department of Families, Housing, Communities, Services and Indigenous Affairs retrieved from <http://www.fahcsia.gov.au/our-responsibilities/housing-support/programs-services/homelessness/a-national-quality-framework-to-support-quality-services-for-people-experiencing-homelessness/submissions-from-stage-one/national-quality-framework-submission-the-australian-psychological>.
- Campton, J. and Pickles, S. (2008) *Welfare to work, Centrelink and homelessness*, a report for St Vincent de Paul Society  
[http://www.vinnies.org.au/files/pdfs/National/SocialJustice/200805-SJ\\_Paper\\_w2w\\_v2.pdf](http://www.vinnies.org.au/files/pdfs/National/SocialJustice/200805-SJ_Paper_w2w_v2.pdf).
- Chamberlain, C. and Mackenzie, D. (2008) *Counting the homeless*, Canberra: Australian Bureau of Statistics, Cat No. 2050.0.
- Chamberlain, C. and Mackenzie, D. (2003) *The development of prevention and early intervention services for homeless youth: intervening successfully*, Working Paper No. 48, prepared for Australian Housing and Urban Research Institute.
- Chamberlain, C. and MacKenzie, D. (2006) Homeless careers: a framework for intervention, *Australian Social Work*, vol. 59, no. 2, pp. 198-212.
- Chamberlain, C. and Johnson, G. (2011) Pathways into adult homelessness, *Journal of sociology*, Nov 2011.
- Chin, S.F., Harding, A., Lloyd, R., McNamara, J., Phillips, B. and Vu, Q. N. (2005) Spatial microsimulation using synthetic small-area estimates of income, tax and social security benefits, *Australasian Journal of Regional Studies*, vol. 11, no. 3, pp. 303-336. (See also NATSEM Online Conference Paper CP 0516, which contains maps).
- COAG (Council of Australian Governments). (2009) National Affordable Housing Agreement <http://www.federalfinancialrelations.gov.au/content/npa/housing/affordable/national-agreement.pdf>.
- Cobb-Clark, D. A. (2008) Leaving home: what economics has to say about the living arrangements of young Australians, IZA Discussion Papers, No. 3309, <http://hdl.handle.net/10419/35161>.
- Dunteman, G. H., (1989) *Principal Components Analysis*. SAGE Publications: Newbury Park, California.
- FaHCSIA (Department of Families, Housing, Communities, Services and Indigenous Affairs). (2003) Working towards a national homelessness, response to consultations: Commonwealth Advisory Committee on Homelessness  
[http://www.fahcsia.gov.au/sites/default/files/documents/05\\_2012/nhs\\_040324\\_1.pdf](http://www.fahcsia.gov.au/sites/default/files/documents/05_2012/nhs_040324_1.pdf).
- FaHCSIA (Department of Families, Housing, Communities, Services and Indigenous Affairs), (2009), *Housing Assistance and Homelessness Prevention: National Homelessness Research Guidelines*, Commonwealth Government: Canberra

- Flatau, P., Martin, R., Zaretsky, K., Haigh, Y., Brady, M., Cooper, L., Edwards, D. and Goulding, D. (2006) The effectiveness and cost-effectiveness of homelessness prevention and assistance programs, Working Paper No.92, prepared for Australian Housing and Urban Research Institute.
- Gaetz, S. (2004) Safe streets for whom? Homeless youth, social exclusion and criminal victimisation, *Canadian Journal of Criminology and Criminal Justice*, No. 4 col. 46, pp. 423-455.
- Grigsby, C., Baumann, D., Gregorich, S.E. and Roberts-Grey, C. (1990) Disaffiliation to entrenchment: a model for understanding homelessness, *Journal of Social Issues*, vol. 46, pp. 141-156.
- Hagerty, M. and Land, K. (2007) Constructing summary indexes of quality of life: a model for the effect of heterogeneous importance weights, *Sociological Methods and Research*, vol. 35, no. 4, pp. 455-496.
- Harding, A., Lloyd, R., & Greenwell, H. (2000). *Financial Disadvantage in Australia 1990 to 2000: The persistence of poverty in a decade of growth*. NATSEM: Canberra.
- Harding, A., Vidyattama, Y., Tanton, R. (2011) Demographic change and the needs-based planning of government services: projecting small area populations using spatial microsimulation, *Journal of Population Research*, vol. 28, pp. 203–224.
- Hayes, A. Gray, M. and Edwards, B. (2008) Social inclusion: origins concepts and key themes, prepared by the Australian Institute of Family Studies for the Social Inclusion Unit, Department of the Prime Minister and Cabinet.
- Herman, H. McGorry, P., Bennett, P., van Reil, R. and Singh, B. (1989) Prevalence of severe mental disorders in disaffiliated and homeless people in inner Melbourne, *The American Journal of Psychiatry*, vol. 146, no. 9, pp. 1179-1184.
- Johnson, G. and Chamberlain, C. (2011) Are the homeless mentally ill?, *Australian Journal of Social Issues*, vol. 46, no. 1, pp. 29-48.
- Johnson, G. and Chamberlain, C. (2008) Homelessness and Substance abuse, which comes first, *Australian Social Work*, vol. 67, no. 4, pp. 342-356.
- Johnson, G., Gronda, H. and Coutts, S. (2008) *On the outside: pathways in and out of homelessness Melbourne, Vic: Australian Scholarly Publishing, 2008. Melbourne, Vic: Australian Scholarly Publishing, 2008.*
- Johnson, G., Parkinson, S, Tseng, Y. and Kuehnle, D. (2011) Long-term homelessness: understanding the challenge - 12 months outcomes from the Journey to Social Inclusion pilot program. Sacred Heart Mission, St Kilda.
- Liddiard, M. and Thoresen, S (2011) 'I could have used a lot more help...': The impact of Australian Housing Market Dynamics upon young care leavers and homeless youth, Curtin University Working Paper, Perth, Western Australia.
- McDonald, J. (2005) Neo-liberalism and the pathologising of public issues: The displacement of feminist service models in domestic violence support services, *Australian Social Work*, vol. 58, no. 3, pp. 275-284.

- McNamara, J., Tanton, R., Daly, A., & Harding, A. (2009). Spatial Trends in the Risk of Social Exclusion for Australian Children: Patterns from 2001 to 2006. *Child Indicators Research*, 2(2), 155–179.
- Miranti R., McNamara, J., Tanton, R. and Harding, A. (2011) Poverty at the local level: national and small area poverty estimates by family type for Australia in 2006, *Applied Spatial Analysis and Policy*, vol. 4, no. 3, pp. 145–171.
- Murray, S. (2008) Why doesn't she just leave?: Belonging, disruption and domestic violence, *Women's Studies International Forum*, no. 31, pp. 65-72.
- Nepal, B., Tanton, R., & Harding, A. (2010). Measuring Housing Stress: How Much do Definitions Matter? *Urban Policy and Research*, 28(2), 211–224.
- Noble, M., Wright, G., Dibben C., Smith, G. McLennan, D. Anttila, C. Barnes, H. Mokhtar, C., Noble, S., Avenell, D., Gardner, J., Covizzi, I. and Lloyd, M. (2004) The English Indices of Deprivation 2004, London: Office of the Deputy Prime Minister.
- Orcutt, G., Greenberger, M., Korbel, J. and Rivlin, A. (1961) Microanalysis of socioeconomic systems: A simulation study. New York: Harper & Row.
- Quiggin, J. (1998) Homelessness the human face of economic imperatives, *Parity*, vol. 11, No. 6, p 8.
- Quigley, J., M. and Raphael, S. (2001) The economics of homelessness: The evidence from North America, *European Journal of Housing Policy*, vol. 1, no. 3, pp. 323-336.
- Rahman, A., Harding, A., Tanton, R., & Liu, S. (2010). Simulating the characteristics of populations at the small area level : New validation techniques for a spatial microsimulation model in Australia. *Proceedings of the Social Statistics Section of the American Statistical Association Conference*, Vancouver, Canada (pp. 2022–2036).
- Robinson, W. S. (1950) Ecological correlations and the behavior of individuals, *American Sociological Review*, vol. 15, no. 3, pp. 351-7.
- Rosenthal, D., Mallett, S. and Myers, P. (2006) Why do homeless young people leave home?, *Australian and New Zealand Journal of Public Health*, vol. 20 No. 3, pp. 281-285.
- Salmond, C. and Crampton, P. (2002) NZDep2001 Index of Deprivation, Department of Public Health, Wellington School of Medicine and Health Sciences, Wellington.
- Saunders, P., & Bradbury, B. (2006). Monitoring Trends in Poverty and Income Distribution: Data, Methodology and Measurement. *Economic Record*, 82(258), 341–364.
- Scutella, R., Wilkins, R., & Kostenko, W. (2009). *Estimates of poverty and social exclusion in Australia: a multidimensional approach*. Melbourne Institute Working Paper 26/09. Melbourne. Retrieved from <http://www.melbourneinstitute.com/wp/wp2009n26.pdf>
- Smith, D. M., Clarke, G. P., Harland, K., (2009) Improving the synthetic data generation process in spatial microsimulation models, *Environment and Planning A*, vol. 41, pp. 1251–1268.
- Snow, D. and Anderson, L. (1993) Down on Their Luck: A Study of Homeless Street People. Berkeley, CA: University of California Press.
- Tanton, R., Vidyattama, Y., Nepal, B. and McNamara, J. (2011) Small area estimation using a reweighting algorithm, *Journal of the Royal Statistical Society Series A (Statistics in Society)*, vol. 174, pp. 931–951.

- Tanton, R., & Edwards, K. L. (2013). *Spatial Microsimulation: A Reference Guide for Users*. Springer Netherlands.
- Teesson, M., Hodder, T. and Buhrich, N. (2003) Alcohol and other drugs use disorders among homeless people in Australia, *Substance Use and Misuse*, vol. 38, nos. 3-6, pp. 463-474.
- Tomsion, A. (2000) Exploring family violence, *National Child Protection Clearinghouse Issues*, No.13.
- Voas, D. and Williamson, P. (2000) An evaluation of the combinatorial optimisation approach to the creation of synthetic microdata, *International Journal of Population Geography*, vol. 6, pp. 349–366.
- Vu, Q. N., Harding, A., Tanton, R., Nepal, B. and Vidyattama, Y. (2008) *AMP.NATSEM Income and Wealth Report 20 - Advance Australia Fair?*, AMP: Sydney.
- Weatherburn, D. (2011). *Personal stress , financial stress and violence against women*. NSW Bureau of Crime Statistics and Research Bulletin # 151, NSW BOCSR: Sydney.
- Williamson, P., Birkin, M. and Rees, P. (1998) The estimation of population microdata by using data from small area statistics and samples of anonymised records, *Environment and Planning A*, vol. 30, pp. 785–816.
- Wyn, J. and White, R. (1998) Young People, Social Problems and Australian Youth Studies, *Journal of Youth Studies*, vol. 1, no. 1, pp. 39-62.
- Vidyattama, Y., Cassells, R., Harding, A. and McNamara, J. (2011) Rich or poor in retirement? A small area analysis of Australian private superannuation savings in 2006 using spatial microsimulation, *Regional Studies*, iFirst article, pp. 1–18.
- Vidyattama, Y., Miranti R., McNamara J., Tanton, R. and Harding A. (2013) The challenges of combining two databases in small-area estimation: an example using spatial microsimulation of child poverty , *Environment and Planning A*, vol. 45, no. 2, pp. 344–361.

## Attachment 1 – Online Maps Explanatory Notes

### Acknowledgement

This data was produced under a project supported by the Australian Government through the National Homelessness Research Agenda of the Department for Families, Housing, Community Services and Indigenous Affairs.

We would like to thank the Australian Bureau of Statistics for supplying the data for this project. We acknowledge the contribution to this research made by the ACT, NSW and QLD police departments, without whom the second index including indicators on domestic violence, could not have been created.

### About the index

There are various causes of homelessness including disadvantage, poverty, long term unemployment, poor education, violence, mental health problems, disability and substance abuse, while specific causes include the unavailability of stable and affordable housing, family breakdown, and people leaving mental health services, child protection and correctional facilities without adequate support.

The Risk of Homelessness Index (RHI) is a geographic index of the risk of homelessness in Australia and combines economic and social factors specifically associated with pathways into homelessness based on available data. The index is calculated at the Statistical Local Area (SLA) level, which generally equates to Local Government Areas (LGAs).

Individual indicators on the risk of homelessness in an area are combined into domains and identify what type of risk is associated with each area. The domains are aggregated into an index to provide an assessment of the total risk. While a person in an area may move once they actually become homeless, preventative programs are best targeted at areas which have a high number of people *at risk* of homelessness but who have not yet become homeless.

Analysis variables for each domain affecting the risk of homelessness, as well as the overall index, are presented in terms of quintile groups, where quintile 1 (most disadvantaged) includes those areas that comprise of one-fifth of the total population that are most disadvantaged regardless of the magnitude of the proportions of the problems experienced. Quintile 1 is subdivided into further smaller groups representing 5 per cent of the population (see Table 1 for more detail on these classifications).

**Table 1-1 RH index classifications**

RHI classification		Definition
Quintile groups	Q1 Most disadvantaged 20%	Q1 or the lowest RHI quintile represents persons in the <i>most disadvantaged</i> group of SLAs. Quintiles are person weighted, that is, each quintile contains 20 per cent of the total population. Note that each quintile does <b>not</b> have an equal number of SLAs.
	Q2	
	Q3	
	Q4	
	Q5 Most advantaged 20%	
Quintile 1 split	Q1 1 <sup>st</sup> 25%	This variable subdivides Q1 into smaller groups. The first group represents persons in SLAs with the <i>highest risk</i> of homelessness, constituting 25 per cent of persons in Q1 or 5 per cent of total population. The last group is an aggregate of Q2 to Q5 that represents 80 per cent of total population.
	Q1 2 <sup>nd</sup> 25%	
	Q1 3 <sup>rd</sup> 25%	
	Q1 4 <sup>th</sup> 25%	
	Q2 to Q5	

Note: The index calculated depends on the variables chosen to represent the risk of homelessness at the SLA level in Australia and the methodology used to summarise these data. These are described in the report associated with this index. Any interpretation of the index should be made with full knowledge of the variables and the methodology used (see Table 2 for list of domains and variables).

The RH index was developed based on five domains that reflect key dimensions of the risk of homelessness: **Participation and education, Financial need, Housing stress, Overcrowding and Other factors**. Variables were selected for inclusion within the domains, based upon existing literature and knowledge about the importance of these indicators to the risk of homelessness (see Table 2 for variable and domain descriptions). The domain scores were then combined into a single final measure.

**Table 1-2 Summary statistics on risk of homelessness variables**

Domain	Measure included in the RHI	
Education/ participation	Not earning or learning	Proportion of youth aged 18-24 years not attending school and not in the labour force
	Not attending school	Proportion of children aged 7-17 years not attending school
	No Year 12 qualification	Proportion of persons aged 25-54 years without a Year 12 or equivalent qualification
Financial need	In receipt of welfare payment	Proportion of persons receiving welfare payments
	Financial stress (cannot raise \$2K)	Proportion of households that cannot raise \$2000 within a week
	In poverty	Proportion of persons whose equivalised household income falls below the half-median equivalised household income
Housing stress	Housing stress (60/20)	Proportion of persons aged 55 and over in extreme housing rental stress, i.e. those in households spending 60 per cent or more of gross household income on rent, and are in the bottom quintile of equivalised income (60/20 rather than the usual 30/40 rule)
Overcrowding	Overcrowding	Proportion of people aged 15 – 24 that live in households that do not have sufficient number of bedrooms for the people living in the house, calculated by applying the Canadian National Occupancy Standard
Other factors	Lone parent	No. of lone parent families divided by total number of households
	Public housing	Proportion of households residing in state or public housing
	Ratio on domestic violence	Total number of incidents of domestic violence reported, divided by total number of households

Sources: ABS 2011 Census Table Builder; ABS customised tables based on the 2011 Census; NATSEM spatial microsimulation calculations.

**Map Properties**

Title : Interactive Maps on the Risk of Homelessness Index  
 Subject : RISK OF HOMELESSNESS  
 Publisher : NATSEM  
 Software : InstantAtlas 6.3 Desktop Edition  
 Format : Double maps

Published : 2013

Creator : Yogi Vidyattama

### **Underlying map shapefiles**

Based on Shapefile sources: 1259.0.30.001 - Australian Standard Geographical Classification (ASGC) Digital Boundaries (Intercensal), Australia, 2007 Previous ISSUE released at 11:30 AM (CANBERRA TIME) 17/07/2007; with modifications using ACT Statistical Division and Brisbane Ward.

## **More information**

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