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Youth Social Exclusion in Australian Communities: A New Index

NATSEM Working Paper 14/25

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June 2014

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Contents

About NATSEM ii

Author note iv

Acknowledgement iv

General caveat iv

Abstract v

1 Introduction 6

1.1 Defining youth 8

2 Methodological approach 10

2.1 Domains approach 10

2.2 Principal components analysis 10

2.3 Data source 11

2.4 Geographic unit 11

3 Domains, indicators and summary statistics 13

3.1 Socio-economic background 15

3.2 Youth participation 16

3.3 Education 17

3.4 Caring responsibilities 17

3.5 Access to health services 18

3.6 Housing 19

3.7 Summary statistics 19

4 Statistical analysis and results 21

4.1 Estimating domain indexes 21

4.2 Estimating the composite YSE index 24

4.3 Results 25

4.4 Characteristics of areas with greatest and least risk of youth social exclusion 28

5 Conclusion and Discussion 30

5.1 Discussion and future directions 30

6 References 32

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ACKNOWLEDGEMENT

This study was funded by a Discovery Grant from the Australian Research Council (DP1094318). Chief and Partner Investigators on the grant include Professor Anne Daly, Professor Laurie Brown, Rebecca Cassells, Professor Asher Ben-Arieh, Professor Michael Noble and Leanne Johnson.

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The microdata do not contain any information that enables identification of the individuals or families to which they refer.

The citation for this paper is: Abello A, Cassells R, Daly A, D'Souza G and Miranti R (2014). 'Youth Social Exclusion in Australian Communities: A New Index, NATSEM Working Paper 2014/25, NATSEM: Canberra

ABSTRACT

Social exclusion and inclusion has been given a great deal of attention in Australia and throughout the world. This broader concept of disadvantage has replaced much of the social discourse around poverty and inequality, with the realisation from researchers, practitioners and policy makers that disadvantage is often a multi-dimensional occurrence, spanning many dimensions of an individual's life. Despite the attention social exclusion has been given, particular population groups are often overlooked – particularly young people. A growing interest in the power of geographic data and the prevalence of social exclusion, has lead the authors to develop the first nation-wide geographically disaggregated index of youth social exclusion for Australia. A number of domains and indicators deemed important to youth wellbeing were identified and constructed to develop a comprehensive index of youth social exclusion for young people aged 15-19 years. Using specialised data from the 2011 Census, supplemented with national school assessment data, we use a domains approach to construct an index that is representative of youth at risk of social exclusion, using a combination of principal components and equal weighting techniques. Particular attention is paid to 'youth' as an important stage of life in its own right and the implications of the delayed transition into adulthood that is now seen in many developed nations. Many more young people now remain as dependent children well into their twenties. A final index of youth social exclusion across Australian communities is presented and discussed.

Keywords: social exclusion; youth social exclusion; youth unemployment, spatial indexes, Australian communities

1 INTRODUCTION

Social exclusion and inclusion has been given a great deal of attention in Australia of late. This latest social phenomenon has replaced much of the discourse around poverty and inequality, with the realisation from researchers, practitioners and policy makers, that disadvantage is often a multi-dimensional occurrence, spanning many dimensions of an individual's life. It is widely understood that deprivation encompasses more than just a lack of financial resources but is extended to include other forms of disadvantage, such as lack of access to services and poor health outcomes.

While measurement of health and development have gradually broadened out to encompass wider measures of well-being (see, for example, AIHW 2012a), so has the measurement of disadvantage broadened from a narrow focus on income poverty to wider measures of both material deprivation and other types of advantage and disadvantage, including health and development factors (see, for example, UNICEF 2013). Multi-dimensional approaches to well-being which have emerged from a disadvantage perspective are based in a range of conceptual frameworks, but in Australia the notion of social exclusion/inclusion has been a particularly strong influence in the development of this broader perspective, in relation to both child and adult poverty (see, for example, Daly's 2006 review of the literature related to child social exclusion). Historically, poverty has been approached from a limited focus on household economic resources, which, in much contemporary discussion has broadened out to include impacts on variables such as health and education. A wider multidimensional, view taken by many recent studies highlights 'exclusion' from social participation and opportunities and basic rights such as physical safety or quality housing. Headey et al. (2005), although not discussing these issues directly in regard to children, argues strongly for the validity of this approach, both academically and in terms of policy intervention.

In Europe, the prominence of the term 'social exclusion' reflects wide acceptance of this broader view of the components of poverty. The establishment of the British Social Exclusion Unit (SEU) by the Blair government in 1997 is a demonstration of the extent of this acceptance. The importance of social exclusion as a concept was consolidated by the Lisbon and Nice summits in 2000 and 2001, which required every European Union country to place social inclusion issues at the top of their social policy agenda and publish a report on these issues biennially. In Australia, social exclusion/inclusion was placed at the forefront of government policy when the Labor government came to power in 2007, with both Federal and state governments establishing Social Inclusion Units and much Australian policy aiming for a 'socially inclusive society'.

Definitions of social exclusion abound, but a frequently used definition is one developed by the UK SEU, which defines social exclusion as a 'short-hand term for what can happen when people or areas suffer from a combination of linked problems such as unemployment, poor skills, low incomes, poor housing, high crime environment, bad

health and family breakdown' (British Government Social Exclusion Unit 1997, in Adelman and Middleton 2003, p. 4). In the case of children and young people, not all of these factors will apply. However, research can be framed to measure factors which may lead to exclusion in the present (eg low parental income or children's poor health) or the future (for example through poor educational experiences or narrow life opportunities)(ibid, p.4).

To be socially excluded will often mean different things to different individuals and groups. For Australian youth, to be socially excluded is likely to weigh more heavily on peer interaction and accessibility and those factors which may inhibit participation, such as poor physical and mental health, geographic isolation, youth unemployment, school retention, teen pregnancies, and drug and alcohol use (see Eckersley 2011; Billet 2012 and Edwards 2010). Social exclusion is a phenomenon that involves being disadvantaged in several areas of one's life. These areas can be grouped into domains, with individual indicators underlying each domain.

Previous Australia wide indices of child social exclusion factored in five key domains that impact upon child outcomes (Abello et al. 2012 and Daly et al. 2008). These included socio-economic characteristics; education; connectedness; housing and health services. A recent review of the literature focused on similar broad areas that affect youth outcomes (see D'Souza and Cassells 2013); however, differences in indicators underlying each domain were uncovered, as this unique age group contends with a life stage that will inevitably transition them into adulthood. The youth life stage is one of discovery, independence, experimentation and often risk taking behaviour. This means that while the relevance of each domain remains, new domains are likely to emerge and indicators will differ. For example, while 'health' remains an important broad area that will impact upon individuals lives; the prevalence of poor mental health as an underlying indicator will become more important than rates of immunisation as individuals transition from childhood to youth.

The youth labour market has recently gained attention in policy discourse, with youth unemployment rates internationally reaching above 50 per cent in Greece, and averaging above 20 per cent throughout the European Union (OECD 2013). While Australia appeared to have escaped these types of impacts from the Global Financial Crisis, youth unemployment levels have remained high since 2008 at or above 17 per cent nationally. While still some way off the one in four unemployment levels that Australian youth experienced in the early 1990s, the lack of progress for this group raises concerns of entrenched poor labour market outcomes and loss of national productivity, as well as increased reliance on government assistance. The resultant pressure on government resources is evident, with New Start Allowance recipients increasing by 20 per cent from 586 745 to 704 005 between July 2012 and July 2013. The number of long-term job seekers has also increased considerably recently (by 26.4 per cent) from 186 422 to 235 643 across the same period.

Using a domains approach, this paper focuses on geographic differences of youth experiencing or at risk of social exclusion throughout Australian areas. It contributes to the growing evidence that examines differences in disadvantage at a small area level and plays

an important role in developing knowledge about small area indicators of youth well-being, a focus of growing interest in the field of child indicators research. While a number of recent studies examine geographic disparities in advantage and disadvantage for children (see Abello et al. 2012; Barnes et al. 2009; Bradshaw et al. 2009; Daly et al. 2008 and McNamara et al. 2009 and 2010), no study to date focuses on the substantial differences that exist for youth — an important life transition stage that will potentially see previous parental and state investment in childhood realised.

The index developed here provides important additional information about regional variations in youth social exclusion. It also has strong potential for informing policy and program development related to youth, providing information that could improve the targeting of education and training and job support expenditures.

1.1 DEFINING YOUTH

It is particularly difficult and challenging to define a term as broad and one with as many connotations as "youth". Although, often thought of as a period of transition to adulthood, Coles (1995) argues that it is a state in life characterised by the absence of responsibilities associated with adulthood but where members of this cohort are not necessarily adorned with the same privileges and welfare programmes available to those in the "childhood" group. He argues that a defining feature is the lack of dependence on parents or guardians and the tendency for the majority of this group to be engaged in either full time education or work.

In bringing out the difference between the responsibilities and privileges given to children and adults, Coles (1995) distinguishes the two and explains that youth are characterised as having membership of neither cohort. Whilst being expected to be independent and make their own decisions, it is understood and in some cases expected that they will receive some kind of support in making these autonomous decisions. He explains the transitions in terms of the completion of three pathways; the school-to-work transition from full time education to full time employment, the domestic transition from family of origin to family of destination and the housing transition from living with parents to living away from them (Coles 1995).

Arnett (2001) points to the discrepancies across disciplines when defining the experiences which mark the transition into adulthood. He posits that whilst the anthropologists see the transition into adulthood in terms of marriage, other social disciplines have different conceptions of this transition. Sociologists also emphasise the importance of marriage in this transition alongside pathways that coincide with those described by Coles (1995). However among the psychology profession, the emphasis is on the qualities of one's character and how that changes as the transition occurs; to one that focuses on accepting responsibility, making independent decisions and more importantly - being financially independent.

Youth is often a period of one's life that is characterised by much uncertainty. Arnett's analysis (2001) brings to mind that this wasn't always the case. The present generations especially those living in industrialised countries (and arguably future generations as well) have ambiguous futures; ones that haven't been defined and decided by their parents. Whilst their parents may have had their futures decided for them by virtue of their parents' occupations, this isn't the same for this highly heterogeneous group of people. Technological advancement and indeed education has markedly changed the prospects for youth, such that they can now avail of far more opportunities than were ever offered to their parents. Using the term "Emerging adulthood" to describe this phenomenon, Arnett (2001) goes onto explain that it is a period of neither adulthood nor adolescence.

Mortimer (2012) which investigated transitions to adulthood using a longitudinal sample of youth in Minnesota from their teen years, till they reached their 30's, found that in most cases the key to a successful transition to adulthood is obtaining stable employment as a job acts as an anchor from which all other personal obligations can be fulfilled.

Taking into account these arguments and the general practice of statistical authorities in both Australia and other developed nations, youth is often defined as those within the age of 15 through to 24 years. This age often represents many of the defining transitions that symbolise the period of childhood to adulthood, albeit somewhat delayed. The majority of young Australians stay in full-time education until the age of 17 and many go on to further education, delaying entry to the full-time work force, and marriage and children until their late twenties. Whilst initially the aspiration was to analyse the 15-24 year age group that typically represents 'youth', it became quickly apparent that the diverse living arrangements of the 20-24 year age group would become problematic for our research.

The majority of 15-19 year olds reside within the parental home and are still largely classified as dependents. However, this group are at a stage in life where individual education and labour force participation become increasingly important. This information, together with parental characteristics such as parental income are used to determine the relative level of social exclusion this group may be experiencing. The 20-24 year age group, however, have diverse and complex living arrangements, making it difficult to determine their true socio-economic status and level of social exclusion. Many still live at home, some have partnered, some have children, and others live in group households. Those that have left the family home are often still reliant upon their parents for financial support and living standards for this group are often temporary, serving as a stepping stone to better economic and social outcomes. Therefore the household characteristics of many of these young people may not necessarily reflect their standard of living. In order to overcome this issue, and noting the limitations, we have defined youth as those aged 15-19 years.

2 METHODOLOGICAL APPROACH

2.1 DOMAINS APPROACH

Following methodology used to construct the Australian child social exclusion index (Abello et al. 2012) and informed by previous literature in this area (see for example Barnes et al. 2009; Bradshaw et.al 2009 and Land and Crowell 2010), a domains approach is adopted in order to be able to better identify and combine different aspects of youth disadvantage. This methodology involves a two-stage index construction approach. The first stage involves grouping individual indicators using principal components analysis into overarching domains that reflect key dimensions of youth social exclusion. The second stage combines the domains equally into a composite index of YSE for small geographic areas throughout Australia.

The development of local area level indices of 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 has the advantage of allowing the separate measurement of different dimensions of disadvantage (or well-being).

The choice of domains and indicators was informed by a review of previous literature that uncovered factors that were either likely to be an indicator of or to lead to undesirable outcomes for Australian youth (D'Souza et al. 2013). Indicators were also selected based upon their policy relevance and the availability of such data at a geographically disaggregated level across Australia.

At this stage some important aspects of potential disadvantage common to the youth population have not been included in the index or have been incorporated using proxy indicators due to data limitations. These include crime statistics such as juvenile assaults and incarceration; health factors such as mental health, youth suicide and sexually transmitted disease and homelessness, which tends to affect youth more than any other age group (ABS 2012b; ABS 2012c). Despite the absence of these individual indicators, it is likely that some of these aspects are captured through indicators that have been included.For example, young people not attending school or in the labour force and local unemployment rates serve as proxies for the prevalence of homelessness in the creation of a Risk of Homelessness Index (D'Souza et al. 2013).

2.2 PRINCIPAL COMPONENTS ANALYSIS

Principal components analysis (PCA) is a statistical technique that takes a set of highly-correlated indicators and combines them to form a set of new indicators, or components (Dunteman 1989). Generally, the first component captures the largest part of the variation in the original set of indicators, and becomes the index. Principal components analysis is most suitable when indicators are highly correlated. When indicators are less highly

correlated, principal components analysis is not the best solution and alternative methodologies need to be applied to combine the indicators such as equally weighting index indicators, or developing a rationale for assigning weights to indicators. Examples of both these methods are available in the literature (see Hagerty and Land (2007) for an example of equal weighting and Noble et al. (2004) for an example of theoretically-based weights).

2.3 DATA SOURCE

The development of an Australia wide index of youth social exclusion for small geographic areas is a particular challenge as data sources for indicators which have a consistent definition across all Australian areas (including geographic unit) are typically confined to Census or administrative data. Where available, supplementary data from either administrative sources or survey data can be used to enhance, validate or compare the index for specific areas.

For our purposes, the recent release of 2011 Census data provided a great opportunity to utilise the most current information about Australian youth. As with all Census data, the advantage with such data is the detailed information available at a spatially disaggregated level. However, disadvantages with this data source include the limited number of indicators and individual variable richness (for example income is available but only in categories). Special tables were requested from the Australian Bureau of Statistics in order to overcome some of these limitations.

Other data sources used for the index include the National Assessment Program Literacy and Numeracy (NAPLAN) literacy and numeracy scores. More information about these data is provided below.

2.4 GEOGRAPHIC UNIT

A number of factors were considered when selecting the most appropriate geographic unit for the index. These include representativeness of a relatively homogenous population, ability to identify regional inequality, utility in that the index relates to real political or economic boundaries that can result in targeted resources and programs; and alignment with other data sources and their associated geographic units.

The 2011 Census has been accompanied by a restructuring of the Australian geographies used by the Australian Bureau of Statistics (ABS). The Australian Statistical Geography Standard (ASGS) has now replaced the Australian Standard Geographic Classification (ASGC); with the Statistical Local Area (SLA) unit remaining as a consistent interim geography to allow comparison between the 2006 and 2011 Censuses, however this spatial unit will not be available in future Censuses.

Statistical Area Level 2 is the closest geographic unit to the previous SLA unit, with its primary aim to 'represent a community that interacts together socially and economically' (ABS 2011b p.21). The delineation of this spatial unit was based upon a set of criteria related to population, functionality, projected growth and alignment with gazetted suburbs and localities. As such, this geographic unit was chosen as the base unit for the index. There are 2,196 SA2 spatial units, which typically have a population range of 3,000 to 25,000 persons and an average population of 10,000 persons.

It should be noted that, even in relatively small spatial units, pockets of disadvantage will not always be detected by the type of geographically based research used in this analysis, particularly if such disadvantage occurs within particular population groups. Kennedy and Firman (2004), for example, note the challenges of accurately estimating the extent of disadvantage for Indigenous populations using general population area-based measures of socio-economic status.

NAPLAN data on school performance includes information on the postcode and locality/suburb of the school. A concordance to SA2s was derived for the NAPLAN data. NAPLAN data on school performance was summarised for each SA2, SA3 and at the national level, weighted by the number of students taking each test. In most cases the NAPLAN data at the SA2 level was utilised. However NAPLAN results based on small sample sizes were not used. In such cases NAPLAN results at the SA3 level were used instead.

Geographic unit for data on GPs and dentists Data on the number of GPs and dentists was generated using the ABS TableBuilder database 2011 Census - Counting Employed Persons, Place of Work at the 4-digit occupation level. Data was generated at the SA2 and SA3 level. In most cases the GP/dentist data at the SA2 level was utilised. However in the case of capital cities, data at the SA3 level were used instead as services in capital cities often have a wider radius of access than the immediate locality.

Excluded Areas

After preparing the individual indicators, the final step before creating the index was to remove any SA2s that had low cell counts or had high non-response rates. To deal with the issue of low cell counts, we excluded from the analysis SA2s with fewer than 30 youth aged 15-19. This cut-off was based on the total number of youth in the SA2, not the number of youth at risk of a particular aspect of social exclusion. Also excluded were SA2s with an 80 per cent or higher non-response rate for any variable included in the social exclusion index.

In total, 137 small areas were excluded due to low population counts or high non-responses, detailed as follows: 124 SA2s were excluded due to low population, 25 due to high non-response and 21 migratory/off-shore, other territories or those with no usual address. This left a total of 2,077 SA2s for use in the index creation. In the case of the YSE index based on SA2s, many of the small areas that were excluded from our analysis

consisted of airports, parks, lakes, or industrial/commercial areas with low resident population.

Remoteness

The concept of remoteness is an important dimension of policy development in Australia. The provision of many government services are influenced by the typically long distances that people are required to travel outside the major metropolitan areas. Here, we have selected a standard measure of remoteness to examine internal migration trends by.

The degrees of remoteness range from 'Major Cities' (highly accessible), 'Inner Regional Australia', 'Outer Regional Australia', 'Remote Australia' to 'Very Remote', and have been determined using the Accessibility/Remoteness Index of Australia (ARIA) (further information about ARIA is available from http://www.adelaide.edu.au/apmrc/research/projects/category/about_aria.html)

3 DOMAINS, INDICATORS AND SUMMARY STATISTICS

The domains and underlying indicators selected to measure youth social exclusion are described below and listed in Table 1. Most indicators are calculated as proportions and values can range from 0 to 1. Each proportion is constructed as follows: the numerator is the number of youth in the SA2 having the described exclusion characteristic, and the denominator is the total number of youth in the SA2 with valid data for that variable, excluding those in the not stated or not applicable categories. The 'not stated' category was identified separately for each variable. Where any family member had a 'not stated' response, the youth in that family were excluded from the sample for that variable alone. Response rates differed between questions and small areas but for Australia as a whole, less than 1 per cent of youth were excluded because of a 'not stated' classification in the non-income indicators. A description of these indicators is provided below.

Table 1 Domains and indicators included in the YSE index

Domain	Measure included in the YSE index	
Socio-economic background	Sole parent family and in bottom income quintile	Proportion of youth aged 15-19 in single parent families and in the bottom income quintile
	Bottom income quintile	Proportion of youth aged 15-19 in households in the bottom quintile of equivalent gross household income, among all Australian households
	No parent in paid work	Proportion of youth aged 15-19 in families where no parent is working
Youth participation	Not learning or earning	Proportion of youth aged 15-19 who are not attending school and not in the labour force
	No internet at home	Proportion of youth aged 15-19 living in dwellings with no internet connection
	No motor vehicle	Proportion of youth aged 15-19 living in households with no motor vehicle
	Unemployment rate	Proportion of unemployed youth aged 15-19, divided by youth aged 15-19 in the labour force
Education	No family member completed Year 12	Proportion of youth aged 15-19 with no one in the family having completed Year 12
	Youth not studying	Proportion of youth aged 15-19 that are not attending school
	NAPLAN reading score *	A statistical proportion based on the Year 9 NAPLAN average reading score, divided by the national average
	NAPLAN numeracy score*	A statistical proportion based on the Year 9 NAPLAN average numeracy score, divided by the national average
Caring responsibilities	Disability in the family	Proportion of youth aged 15-19 living in households where someone needs assistance with core activities
	Teenage pregnancies	Proportion of females aged 15-19 with at least one child ever born
Health service access	Ratio of GPs*	A statistical proportion based on the number of General Practitioners (GPs), divided by the total population (000s)
	Ratio of dentists*	A statistical proportion based on the number of dentists, divided by the total population (000s)
Housing	High rent and low income (30/40 rule)	Proportion of youth aged 15-19 living in households where rent constitutes 30% or more of household income, and in the bottom 40% of equivalent gross household income among all Australian households
	Overcrowding	Proportion of youth aged 15-19 living in dwellings that are overcrowded (require at least one additional bedroom)

* Note: The NAPLAN scores and GP/dentist population ratios were converted to proportions using *proc rank* in SAS, to be on the same metric as all other indicators i.e. the higher the value, the more disadvantaged.
Source: Australian Census of Population and Housing 2011, ACARA 2011

3.1 SOCIO-ECONOMIC BACKGROUND

Socio-economic conditions can influence a number of aspects of people's lives and typically denote the economic resources accessible to an individual or family. These resources will impact upon a number of factors, including the ability to fully participate in society, health outcomes and future opportunities available to individuals – for example in the case of youth, whether they can afford to go on to higher education with support from their parents.

The socio-economic background domain comprises three indicators — youth living in sole parent families in the bottom income quintile, youth living in households in the bottom income quintile and youth living in jobless families.

Information about individual and household income from Census data is restricted to categorical data, which limits accuracy, along with under and mis-reporting. While under and mis-reporting are unable to be dealt with in this instance, we requested ABS specialised tables of gross equivalised household income for youth, which are modified using OECD equivalence scales, using information from the ABS Survey of Income and Housing to gain income values. Income quintiles were then calculated from these equivalised gross family incomes. The indicator is calculated based on the proportion of youth in each SA2 whose household income falls into the lowest 20 per cent of all Australian household incomes.

Growing up in a jobless household is a well-established measure of child and youth wellbeing, both in regard to economic security during childhood and in relation to future educational and employment opportunities (OECD 2005 p.38). The many benefits of children and youth growing up in households where the parents are participating in paid work include the increased achievable standard of living, reducing the likelihood of these children living in poverty, as well as the contribution of a role model in encouraging aspirations of workforce participation for children (see, for example, Cassells et al. 2011; Headey and Wooden 2006; Gregory 1999 and Leigh 2007). Wilson (1987) notes that areas with a high proportion of jobless households will have a profound effect on child and youth outcomes, as they become isolated from role models and resources in terms of job networks. Youth living in jobless families is captured by the proportion of youth in each SA2 living in households where no parent is in paid work. Youth living away from home were unable to be included when calculating this indicator. As well as the close association between

The third indicator selected for the socio-economic domain is youth living in single parent families that are also within the bottom equivalised income quintile. This indicator deviates somewhat from previous indictors operationalised in the child social exclusion index, where living in a single parent family in itself was viewed as a risk factor. Further consideration and testing of this indicator, has led to a qualifying income component, recognising that many single parents sit in the middle of the income distribution. We considered that being a single parent and in the bottom of the income distribution signified

a greater likelihood of persistent disadvantage, intergenerational traps and income inequality. Income inequality has been shown to have strong links with many negative social outcomes including social and political unrest, crime, reduced social cohesion and unequal education and health outcomes (Pickett 2009).

3.2 YOUTH PARTICIPATION

The importance of age-appropriate participation is well recognised. For youth, this important transition stage into adulthood, typically means engagement in education and the workforce or a combination of both. While the youth labour market has undergone considerable change over the years and more emphasis is placed on further education and training, there still exists over 760,000 15-19 year olds that are participating in the paid labour force (ABS 2014).

This domain includes a combination of direct participation variables – that is 'youth earning or learning' and variables that suggest barriers to participation or lack of connectedness to the community - no internet access at home, no motor vehicle and the youth unemployment rate. Youth not earning or learning is characterised by the proportion of youth that are not studying (full or part-time) and not in the labour force, and captures the lack of engagement in either work or study.

Access to a computer and the internet are increasingly essential as tools to participate fully in education, access social networks and information. While there is vigorous debate about the possible negative influences of the internet on child and youth wellbeing, its subjective importance in the lives of young people, and the extent to which exclusion from this resource due to financial constraints may be widening divisions between more and less affluent children and families, make digital access an issue of concern. Not having access to the internet can restrict educational, social and economic participation and also serves as a proxy for service access and relative wealth.

Youth living in households with no motor vehicle is a proxy for wealth, however also implies a potential barrier to participation (socially and/or economically), with many young people living in areas where public transport availability is limited.

The youth unemployment rate is the fourth indicator operationalised in the participation domain. While higher rates of youth unemployment compared with the total population are not uncommon, national and state averages can often mask large geographic variations. In 2011, youth unemployment levels across Australian SA2s range from zero to more than 80 per cent, with the majority of areas recording levels of between 15 and 30 per cent.

3.3 EDUCATION

The importance of education in equipping young people with the skills they need to succeed in life, enhance participation and a nations productivity has been well documented (see for example. Both participation and achievement in education can bring about a variety of gains to individuals, communities and a nation. Participation in education more often than not increases social and human capital, preparing individuals with the necessary skills needed to enter the workforce and add productivity to a nation (Becker 1993 and Mincer 1974).

Our education domain includes a combination of participation and achievement in education, combining four indicators — no family member completing Year 12, non-attendance at school, Year 9 NAPLAN reading score, and Year 9 NAPLAN numeracy score.

Having a family member that has completed Year 12, can be an indicator of the likelihood of educational success, with those with parents having completed high school also more likely to go on and complete their secondary education or indeed higher. Cassells et al. (2011) found that 66 per cent of individuals whose father had completed a University degree also went on to complete a university degree, and more than 50 per cent of those whose father had achieved higher secondary school levels gained a university level qualification.

Recently the Australian government took steps to raise the minimum school leaving age to 17 years, with the expectation that most young people will obtain a Year 12 or equivalent qualification. Access to government payments have also become much more difficult for early school leavers who are not engaging in approved activities. Consequently, those 15-19 year olds that are not attending school are at of greater risk of being left behind if they do not go on to finish high school.

Educational achievement has also been included within this domain, through literacy and numeracy scores sourced from NAPLAN. NAPLAN was introduced nationally in 2008 and seeks to test the sorts of skills that are essential for every child to progress through school and life (ACARA 2008). The consistent testing allows comparison of student's progress to the national average. We have selected those students in Year 9 that completed the NAPLAN in 2011 to assess academic progress.

3.4 CARING RESPONSIBILITIES

Caring responsibilities can impact upon the ability to participate adequately in society, restricting individuals in their ability to earn, learn and socialise. Having caring responsibilities at a young age in particular can harm human capital gains and socially isolate people. This domain includes two indicators — disability in the family and teenage pregnancies.

The role of teenage pregnancy in the persistence of social exclusion amongst young women is of particular importance. Research shows that teenagers who encounter parenthood often experience multiple forms of exclusion. For example, teenage mothers are more likely to have lower educational outcomes, become single mothers, suffer from various types of income deprivation and be dependent on welfare payments. Teenage pregnancies measures the proportion of females aged between 15 to19 years that have at least one child ever born.

Caring for a family member that has a long-term disability can place added burdens on individuals, especially if inadequately supported. For youth, this can have far reaching impacts, adversely affecting their own health and wellbeing, social capital and education. Currently more than 300,000 Australian's aged under 24 years care[1] for someone on a regular basis, and more than 20,000 are the primary carer (ABS 2012a). Even if young people are not caring for someone on a regular basis, living in a household where at least one member has a long-term disability can add pressure to the family's resources. The Census now has information about the extent to which Australians have a long-term disability, as such we have included the proportion of youth growing up in households where at least one member has a disability.

3.5 ACCESS TO HEALTH SERVICES

While direct health measures were not able to be included in our index, proxies for access to health services within an area were developed in order to measure the extent of service provision available to young people. The rate of doctors and dentists per 1,000 people was used to represent potential access. Note that while the rates indicate the number of doctors/dentists relative to total population within each SA2, these do not provide any other information on accessibility (such as the availability of bulk-billing, or specialised youth services) or the time and distance involved in seeing a doctor or dentist in less densely populated rural and remote areas. For capital cities, we calculated the ratio of GPs or dentists at a higher level of aggregation — at the SA3 rather than the SA2 level. This was done after taking into account the noticeable specialisation in health expertise in capital cities, with some areas having a large number of health specialists that serve adjacent and outlying areas.

[1] A carer is a person of any age who provides any informal assistance, in terms of help or supervision, to persons with disability or long-term health conditions or persons who are elderly (i.e. aged 65 years and over).

3.6 HOUSING

The importance of secure, adequate and affordable housing has been well documented over time, with children and youth growing up in disadvantaged housing circumstances likely to impact upon current and future wellbeing (see McNamara et al. 2010 for a full discussion). Young people in particular are more likely to be susceptible to poor housing outcomes including homelessness and living in overcrowded circumstances (AIHW 2012a and ABS 2012b). Indigenous people in particular are much more likely to be living in overcrowded circumstances than other Australians, and overcrowding has been identified by Indigenous women as problematic, in particular in relation to the exacerbation of family violence (Cooper and Morris 2005). Overcrowding measures the proportion of youth living in households that do not have a sufficient number of bedrooms and are defined to be overcrowded, based on the house Canadian National Occupancy Standard (CNOS).

While no Australian studies specifically focus on the impact of housing stress on youth, a number of studies note the effects on families and communities of the increasing proportion of family income being spent on housing costs, particularly housing costs that do not necessarily provide long-term stability such as renting. Several recent Australian studies highlight that housing stress is a significant issue affecting large numbers of low-income Australians (see for example Cassells et al. 2014; Phillips 2011 and Yates and Gabriel 2006). Here we have included youth living in households that are experiencing housing stress, as defined by paying more than 30 per cent of their gross income in housing, being in the bottom two income quintiles and renting. We only considered those in rental housing as home owners paying off their mortgage (even if experiencing housing stress) are deemed much better off than those just renting. The 30/40 rule is the most commonly used measure of housing stress (Gabriel et al. 2005 and Yates and Gabriel, 2006) and has also been found to be the most suitable measure for examining regional variations in housing stress (Nepal et al. 2010).

3.7 SUMMARY STATISTICS

The summary statistics on the final set of indicators are shown in Table 2. There is substantial variation in the mean values of the indicators, with 14 per cent of youth living in households where no family member had completed Year 12, compared with only 6 per cent living in households where there was no motor vehicle or 8 per cent on low income with high rental costs. Around 13 per cent of Australian youth in 2011 were living in a household where no parent was in paid work, and about 4 per cent were living in single parent families that were in the bottom quintile. The average ratio of GPs and dentists to population was 1.9 per 1000 persons for GPs and 0.5 for dentists. Nearly 5 per cent out youth were neither working nor studying, and a much higher proportion — 1 in 5 youth were not engaged in full time or part time study.

It is important to note that these indicators are combined together to form a composite measure of youth social exclusion risk, and do not all and of themselves indicate high risk. While some indicators (for example, parental joblessness and high renting cost) are indicators of disadvantage in themselves, others (such as no motor vehicle) are designed to form part of the overall index, rather than standing alone as markers of disadvantage.

Table 2 Summary statistics, YSE indicators, 2011

Domain	Variable	Unit	Mean	Std. dev.
Socio-economic background	Sole parent family and bottom income quintile	% youth aged 15-19	0.044	0.62
	Bottom income quintile	% youth aged 15-19	0.099	1.56
	No parent in paid work	% youth aged 15-19	0.133	2.16
Youth participation	Youth not learning or earning	% youth aged 15-19	0.047	0.96
	No internet at home	% youth aged 15-19	0.070	1.87
	No motor vehicle	% youth aged 15-19	0.056	2.01
	Youth unemployment rate	% youth aged 15-19	0.167	1.47
Education	No family member completed Year 12	% youth aged 15-19	0.140	2.17
	Youth not studying	% youth aged 15-19	0.219	2.61
	NAPLAN Year 9 reading score index	Ratio to national average	0.991	1.22
	NAPLAN Year 9 numeracy score index	Ratio to national average	0.991	1.43
Caring responsibilities	Family member needs assistance with core activity	% youth aged 15-19	0.086	1.00
	Teenage births	% females aged 15-19	0.021	0.67
Health service access	GPs per 1000 persons	Ratio to total population	1.899	62.1
	Dentists per 1000 persons	Ratio to total population	0.490	13.5
Housing	High rent and low income (30/40)	% youth aged 15-19	0.078	1.55
	Overcrowding	% youth aged 15-19	0.119	2.34

Source: ABS Australian Census of Population and Housing 2011, ACARA 2011

At this point, nearly all the indicators are expressed in the form of proportions, with larger values indicating higher risk of social exclusion. The GP and dentist ratios and the NAPLAN index scores are expressed in the form of ratios, with lower values indicating higher risk of social exclusion. These ratios were subsequently transformed to proportions using proc rank in SAS, to be on the same metric and to be consistent with all other indicators, such that the higher the value, the higher the risk of social exclusion.

4 STATISTICAL ANALYSIS AND RESULTS

4.1 ESTIMATING DOMAIN INDEXES

In order to create an index or summary measure of social exclusion risk, it is necessary to combine the individual indicators together. As discussed earlier, 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 indicators.

For five of our six domains, we used PCA to combine the contributing indicators into a domain score, taking the first component to represent the domain index. Our first step was to examine the correlations between the indicators we had chosen for inclusion in the index, to examine the extent to which indicators within domains were correlated. These results are shown in Table 3. Moderate to high correlations were noted among indicators in each domain with the exception of the housing domain. In the socio-economic domain, moderate correlation was observed between sole parent family and bottom income quintile at 0.65, and sole parent family and no parent in paid work at 0.64). In the education domain, the highest correlation was observed between no family member having completed Year 12 and youth not studying at 0.68. In the participation domain, there was high correlation at 0.86 between not earning or learning and no internet at home. Further, some indicators across domains are also highly correlated. In particular, we note high correlations between teenage pregnancies (in the caring domain) to not earning or learning and no internet at home in the education domain; as well as overcrowding (in the housing domain) to not earning or learning and no internet at home in the education domain.

Given the reasonably strong correlations between the indicators within our socio-economic, education, participation, caring responsibilities and health service access domains, we used PCA to summarise the chosen indicators within these domains into a single score. As there were low correlations between the two housing indicators (high renting cost and overcrowding), we did not use PCA, but simply took the arithmetic mean of these indicators to constitute the domain score for Housing.

Table 3 Correlation matrix on YSE indicators, by domain

	Socio-economic background			Education			Participation				Caring responsibilities		Health service access		Housing	
	Sole parent family, bottom income quintile	Bottom income quintile	No parent in paid work	No family member completed Year 12	Youth not studying	NAPLAN Year 9 numeracy score index *	Not learning or earning	No inter-net at home	No motor vehicle	Youth unemp-loyment rate (15-19)	Need for core assistance	Teen pregnan-cies	GPs per 1000 persons *	Dentists per 1000 persons *	High rent and low income (30/40)	Over-crowding
Sole parent family and in bottom income quintile	1	0.65	0.64	0.46	0.16	0.16	0.29	0.30	0.30	0.36	0.41	0.29	NS	NS	0.45	0.33
Bottom income quintile	0.65	1	0.60	0.32	NS	NS	0.23	0.30	0.60	0.41	0.19	0.22	-0.16	-0.07	0.73	0.39
No parent in paid work	0.64	0.60	1	0.64	0.41	0.32	0.69	0.66	0.64	0.66	0.67	0.60	NS	0.11	0.44	0.76
No family member completed Year 12	0.46	0.32	0.64	1	0.68	0.54	0.67	0.74	0.37	0.24	0.57	0.65	0.26	0.47	NS	0.47
Youth not studying	0.16	0.06	0.41	0.68	1	0.56	0.67	0.69	0.34	0.09	0.33	0.67	0.25	0.39	NS	0.39
NAPLAN Year 9 numeracy score index *	0.16	NS	0.32	0.54	0.56	1	0.38	0.40	0.09	0.09	0.40	0.38	0.28	0.40	NS	0.23
Youth not learning or earning	0.29	0.23	0.69	0.67	0.67	0.38	1	0.86	0.66	0.46	0.47	0.79	0.07	0.24	0.06	0.76
No internet at home	0.30	0.30	0.66	0.74	0.69	0.40	0.86	1	0.70	0.34	0.42	0.78	0.11	0.29	NS	0.74
No motor vehicle	0.30	0.60	0.64	0.37	0.34	0.09	0.66	0.70	1	0.51	0.21	0.54	-0.16	-0.07	0.44	0.78
Youth unemployment rate (15-19 yos)	0.36	0.41	0.66	0.24	0.09	0.09	0.46	0.34	0.51	1	0.42	0.36	-0.12	-0.09	0.43	0.58
Need for core assistance	0.41	0.19	0.67	0.57	0.33	0.40	0.47	0.42	0.21	0.42	1	0.42	0.17	0.27	0.10	0.45
Teen pregnancies	0.29	0.22	0.60	0.65	0.67	0.38	0.79	0.78	0.54	0.36	0.42	1	0.09	0.23	0.08	0.61
No. of GPs per 1000 persons *	NS	-0.16	NS	0.26	0.25	0.28	0.07	0.11	-0.16	-0.12	0.17	0.09	1	0.62	-0.29	NS
No. of dentists per 1000 persons *	NS	-0.07	0.11	0.47	0.39	0.40	0.24	0.29	-0.07	-0.09	0.27	0.23	0.62	1	-0.29	0.07
High rent and low income (30/40)	0.45	0.73	0.44	0.06	NS	NS	0.06	NS	0.44	0.43	0.10	0.08	-0.29	-0.29	1	0.24
Overcrowding	0.33	0.39	0.76	0.47	0.39	0.23	0.76	0.74	0.78	0.58	0.45	0.61	NS	0.07	0.24	1

Notes:

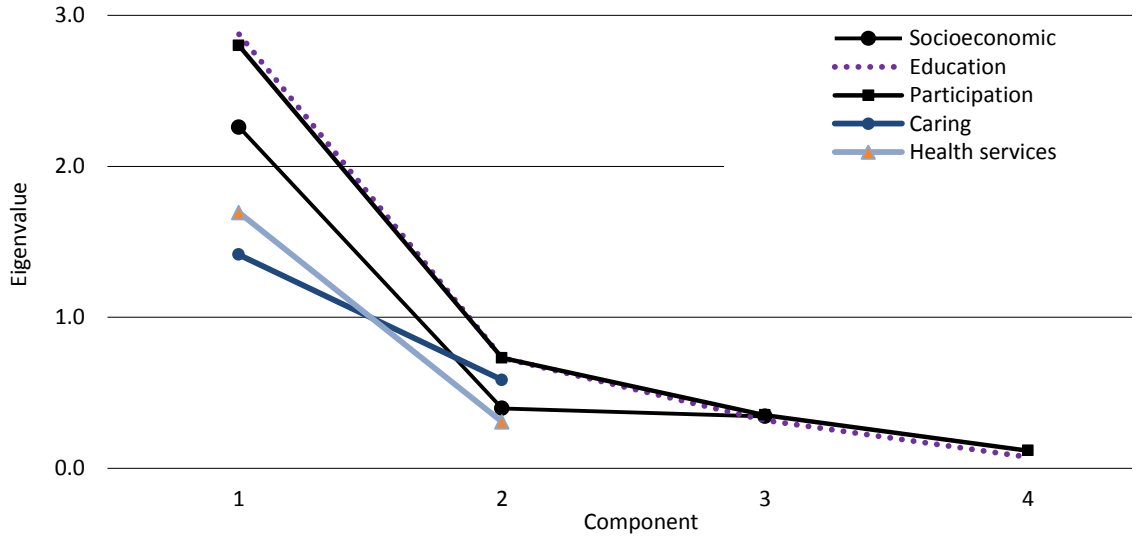
* Expressed in terms of proportions so that the variable aligns with other variable constructs, that is, the higher the value, the more disadvantaged the small area.

NS – Not statistically significant at p = .05.

Source: NATSEM calculations based on ABS and ACARA data.

Based on standard practice in the construction of indexes (see for example ABS 2004; ABS 2008 and Salmond and Crampton 2002), the first component produced by the PCA procedure was used as the domain index. Additional principal components were assessed by examining eigenvalues, with these components potentially viable as indexes, capturing additional dimensions of meaning within each of the domains. Examining the eigenvalues (see scree plot in Figure 1), the second component across all domains had a low value (less than 1.0) of between 0.31 to 0.73, and the third component, from 0.32 to 0.35. 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 1, this classic pattern is most evident for the education and participation domains, but is nevertheless present for all five domains.

Fig 1 Scree plot of YSE Index domains



Loadings (or the amount of correlation between the original set of indicators and the domain score created from the first principal component for each domain) for each of the indicators and the proportion of variance explained by the model are shown in Table 4, and demonstrate high correlations between the original indicators and the domain indexes. For the health service access domain, 84.7 per cent of the variation in the original indicators is explained by the index while for the other domains, the proportion is moderately high, with all above 70 per cent.

Table 4 Loadings on YSE index domains

Variable	YSE index domains				
	Socio-economic background	Education	Youth participation	Caring responsibilities	Health service access
Sole parent family in bottom income quintile	0.59				
Bottom income quintile	0.57				
No parent in paid work	0.57				
No family member completed Year 12		0.47			
Youth not studying		0.48			
NAPLAN Year 9 reading score index		0.52			
NAPLAN Year 9 numeracy score index		0.53			
Youth not learning or earning			0.54		
No internet at home			0.54		
No motor vehicle			0.52		
Youth unemployment rate			0.39		
Need for core assistance				0.71	
Teen pregnancies				0.71	
No. of GPs per 1000 persons					0.71
No. of dentists per 1000 persons					0.71
Per cent of variance explained	75.3	71.9	70.0	70.8	84.7

Note: These figures were calculated by dividing the eigenvalue by the number of indicators used in the principal components analysis and multiplying by 100. The weights are estimated from these results by dividing the loading for each variable by the square root of the eigenvalue. Loading is the correlation between the first component and the variable.

4.2 ESTIMATING THE COMPOSITE YSE INDEX

As the six domain scores had different units of measurement, these were transformed into comparable figures using an exponential transformation, following the formula described in Noble et al. (2004) and Bradshaw et al. (2009)[2].

We then took the arithmetic mean of the six domain scores to form the composite YSE index. 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

[2] 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.

scores to calculate population weighted quintiles of youth social exclusion risk. The results are presented using these quintiles, with the lowest quintile representing the highest risk of social exclusion, and higher quintiles representing lower risk of social exclusion. Our bottom social exclusion quintile thus represents the 20 per cent of youth (rather than 20 per cent of small areas) facing the highest risk of being socially excluded.

Table 5 presents the correlations among the domain indexes and the composite YSE index. The largest correlations were between the socioeconomic and participation domains (r =0.85) and housing and participation (r=0.83). The degree of correlation between the remaining domains was moderate to high with the exception of health service access, which showed very low correlation with all domains.

Table 5 Correlation among domain scores and YSE index

	Socio-economic background	Educa-tion	Partici-pation	Caring respon-sibilities	Health service access	Housing	YSE index
Socio-economic background	1.00	0.38	0.85	0.59	NS	0.75	0.81
Education		1.00	0.59	0.64	0.34	0.34	0.76
Participation			1.00	0.74	NS	0.83	0.92
Caring responsibilities				1.00	0.20	0.52	0.84
Health service access					1.00	-0.15	0.31
Housing						1.00	0.75
YSE index							1.00

Note: NS – Not statistically significant at p = .05.

4.3 RESULTS

In 2011 an estimated 435 Australian areas had very high levels of youth at risk of social exclusion, falling into the bottom quintile of the Youth Exclusion Index (the darkest blue on the map). This equated to -20 per cent Australians aged 15-19 years old. The spatial distribution of youth social exclusion among Australia's regions is illustrated in Figure 2. The stippled areas on the map indicate SA2s that were not included in the analysis due to low youth populations and/or high non-response. While areas with high levels of youth at risk of social exclusion tend to be concentrated in the remote and inner regional areas of Australia, it is not limited to these areas. Examining the spatial patterns of the youth social exclusion index in the capital cities of each state and territory as per the insets shown in Figure 2, there are clear clusters of areas with high levels of risk.

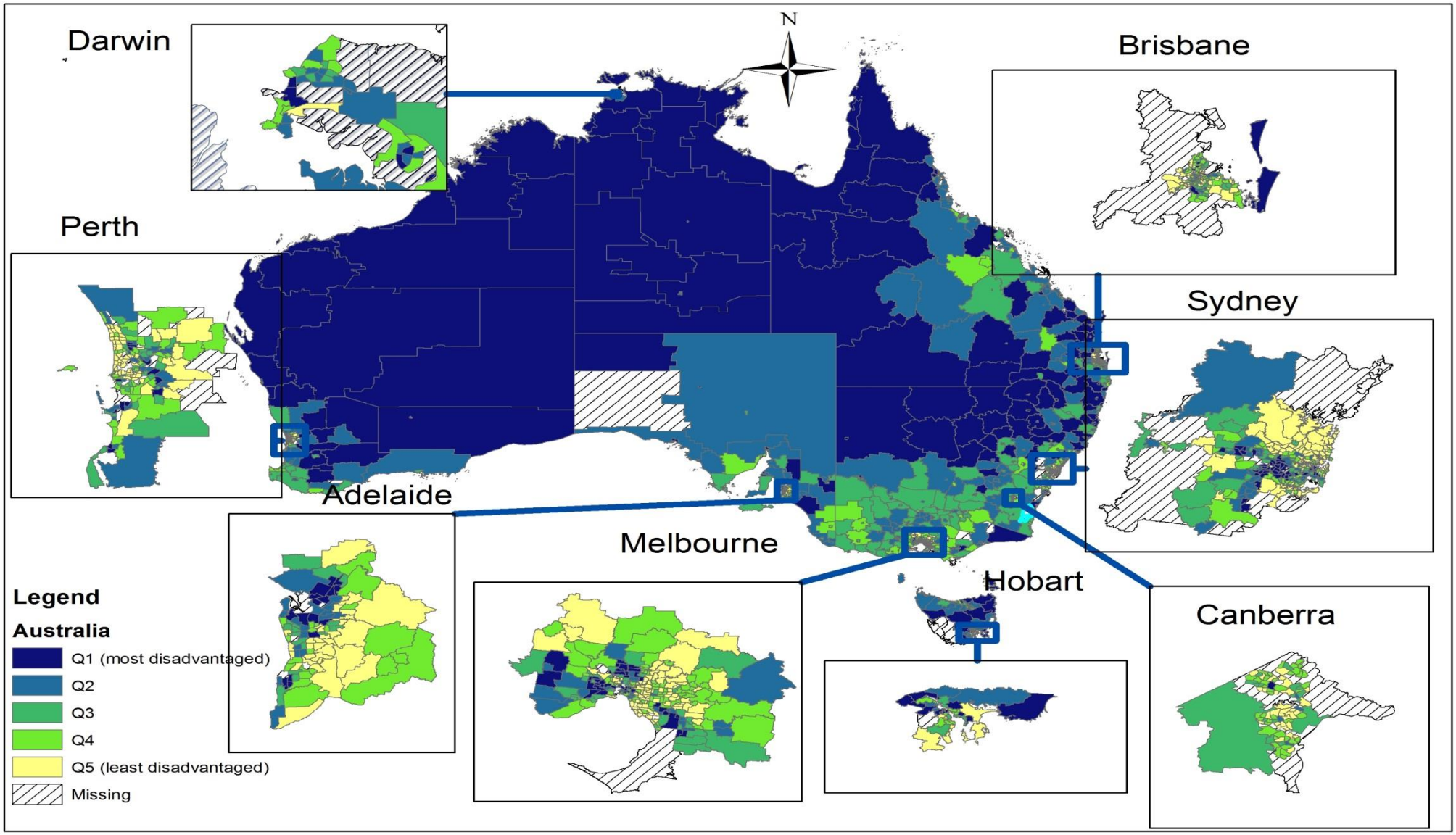
The south west fringes of Brisbane (including North Ipswich-Tivoli) show areas with high risk of youth social exclusion, with many falling into the most disadvantaged quintiles. In Sydney, a south-west cluster of high to very high areas is evident, encapsulating the areas of Parramatta-Rosehill, Bankstown and Liverpool-Warwick Farm in the bottom quintile of

the youth social exclusion. The ACT shows a more homogenous pattern when compared with other capital, with the majority of areas falling in the lowest and second lowest risk categories. However, four areas do fall within the second highest risk category – Braddon, Kingston-Barton, Richardson and Phillip.

Both north-west and north-east regions of Hobart have a number of areas within the high risk category (including –New Norfolk, Bridgewater - Gagebrook and Berriedale – Chigwell). The city of Melbourne shows four distinct clusters of SA2s with high risk of youth social exclusion, in the north-east, the south-east, the west of the inner city and further along to the west. Adelaide also has obvious clustering of areas with high youth social exclusion, to the north of the city (incorporating Elizabeth East and Parafield Gardens). For Perth, the relative advantage along the coastline and inner city is noticeable, with greater distance from these Rockingham, increasing the prevalence of areas with high risk of youth social exclusion. Darwin is characterised by a mix of levels of risk, but very few fall into low risk categories.

While a further exploration of the particular drivers of youth social exclusion in 'high disadvantage' areas is beyond the scope of this paper, such an analysis would clearly have important policy implications. The index's ability to identify areas where relatively large proportions of young people are experiencing multiple disadvantage and are most at risk of being social excluded provides key information about areas most in need of intervention, and further analysis of the role which individual indicators and domains play in an areas 'overall score would provide detail to further target the nature of intervention, required to improve outcomes for Australia's young people.

Fig 2 YSE index quintile distribution, 2011



Note: YSE index based on youth aged 15-19 years.

4.4 CHARACTERISTICS OF AREAS WITH GREATEST AND LEAST RISK OF YOUTH SOCIAL EXCLUSION

Ranking the 2,077 small areas from highest to lowest based on their score on the composite YSE index, the 50 small areas with greatest YSE risk, and 50 small areas with the lowest YSE risk are compared (Table 6).

Table 6 Characteristics of 50 small areas with greatest and least risk of youth social exclusion, compared with the national average, 2011

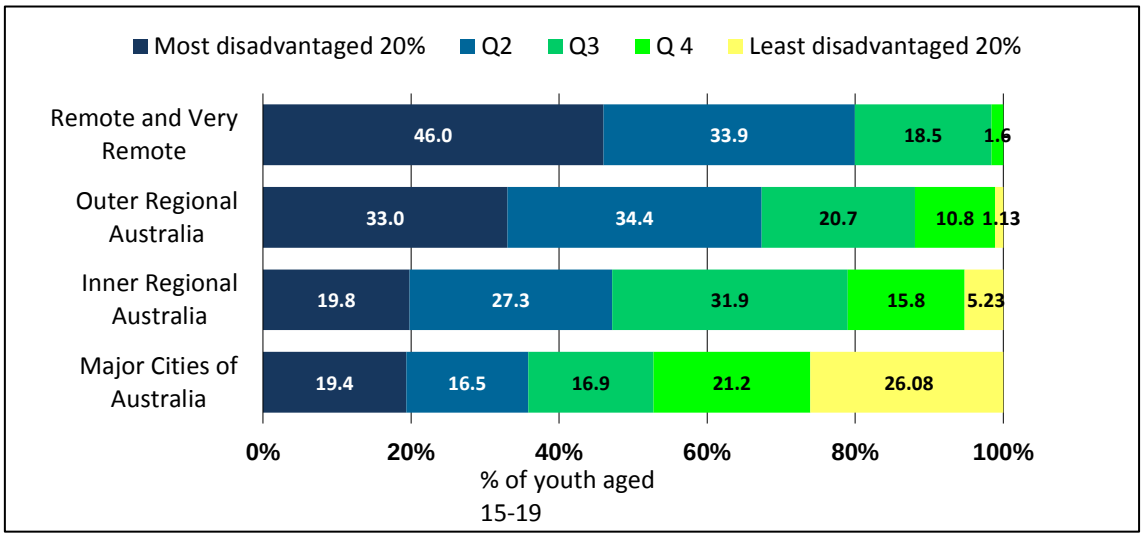
Domain/indicators	Australian average	50 small areas		Ratio to Australia	
		Greatest risk	Least risk	Greatest risk	Least risk
Socio-economic background					
Sole parent family and in bottom income quintile	0.044	0.081	0.021	1.8	0.5
Bottom income quintile	0.099	0.171	0.049	1.7	0.5
No parent in paid work	0.133	0.422	0.050	3.2	0.4
Education					
No family member completed Year 12	0.140	0.379	0.027	2.7	0.2
Youth not attending school	0.219	0.458	0.097	2.1	0.4
NAPLAN Year 9 reading score index	0.991	0.887	1.055	0.9	1.1
NAPLAN Year 9 numeracy score index	0.991	0.886	1.057	0.9	1.1
Youth participation					
Youth not learning or earning	0.047	0.228	0.016	4.9	0.3
No internet at home	0.070	0.414	0.010	5.9	0.1
No motor vehicle	0.056	0.320	0.014	5.7	0.2
Youth unemployment rate	0.167	0.322	0.126	1.9	0.8
Caring responsibilities					
Need for core assistance	0.086	0.178	0.039	2.1	0.5
Teenage births	0.021	0.128	0.002	6.1	0.1
Health service access					
No. of GPs per 1000 persons	1.899	1.812	1.968	0.9	1
No. of dentists per 1000 persons	0.490	0.129	0.678	0.3	1.4
Housing					
High rent and low income (30/40)	0.078	0.102	0.024	1.3	0.3
Overcrowding (not enough bedrooms)	0.119	0.449	0.038	3.8	0.3

As expected indicator values are substantially worse for areas with the highest risk when compared to those at least risk of youth social exclusion. These highly disadvantaged areas are characterised by low income, joblessness, low educational attainment and achievement, low rates of youth participation, very high youth unemployment, high rates of teenage pregnancy, overcrowding, disability and low access to health services. Forty one per cent of youth living in these areas do not have access to the internet, one in three do not have a motor vehicle attached to their home and one if five are not earning or learning.

Areas with the greatest risk of social exclusion are also much worse than average Australia, particularly within the youth participation domain where the ratio to the national average is around 5 times or more. Teenage births were more than 6 times the national average in areas of high youth social exclusion. Youth living in overcrowded households and in households where a member was in need of core assistance was 3.8 and 2.1 times the Australian average respectively.

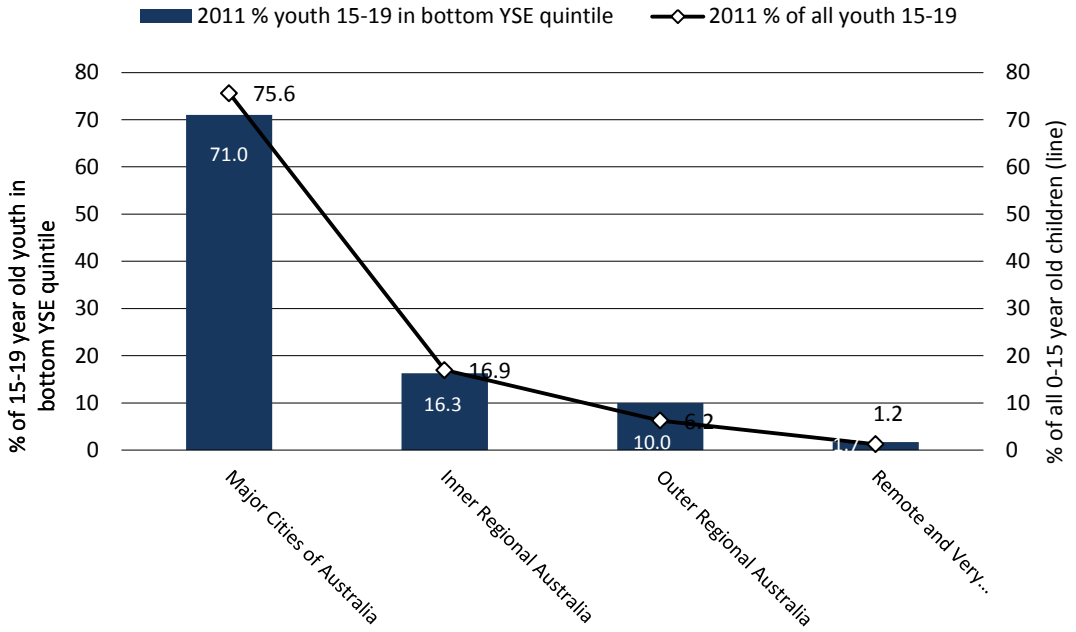
As discussed earlier, from Figure 2, we can see the high concentration of youth living in remote areas who fall into the most disadvantaged/most excluded category, although the pockets of disadvantage are also found in the capital cities. Examining these patterns further, Figure 3 shows the proportion of youth by YSE Index quintile based on the ABS remoteness structures which classify location based on distance to the nearest Urban Centre or access to various centres of public goods and services. While only 19.4 per cent of youth in major Australian cities face the greatest risk of social exclusion, the percentage of youth in remote and very remote Australia who are in the bottom YSE quintile is more than double (46 per cent). As expected there is a much higher proportion of youth aged 15-19 in the major cities who fall into the least excluded category (26.1 per cent), where only 5.2 per cent in inner regional and 1.1 per cent in outer regional Australia remain in this classification.

Fig 3 Proportion of youth by YSE index quintile, 2011 by remoteness structure



However, focussing on the bottom YSE quintile alone, youth facing the greatest risk of social exclusion are concentrated in the major cities with 71 per cent residing in major Australian cities, compared to only 1.7 per cent living in the remote and very remote areas (Figure 4). As the majority of young people reside in the major cities of Australia (75.6 per cent) and only around 1 per cent live in remote and very remote areas, this findings is not surprising. Youth aged 15-19 in the bottom YSE quintile are overrepresented in outer regional Australia and the remote and very remote areas where the distribution shows that the proportion of youth aged 15-19 in the most socially excluded category is higher than the population component.

Fig 4 Distribution of youth aged 15-19 in bottom YSE quintile, 2011



5 CONCLUSION AND DISCUSSION

5.1 DISCUSSION AND FUTURE DIRECTIONS

This paper reports the results of our first estimates of an index of risk of social exclusion for Australian youth aged 15-19 years based on data from the 2011 Census supplemented by some additional administrative data. This is a significant age group because it encompasses a period of transition in most young people's lives from living in the family home and attending school to greater independence and self-sufficiency. The indicators developed here recognise the important changes taking place at this stage of the life cycle. The results show that risk of social exclusion varies at the small area level, increasing with movement away from the major cities. Almost half the young people living in remote and very remote areas fell in the most excluded quintile of Australian youth compared to 19 per cent in the major cities. Over a quarter of youth living in major cities fell in the least disadvantaged quintile. However, given the distribution of population between urban categories and the concentration in the cities, the majority of youth in the most excluded quintile lived in the major cities.

Six domains were identified; socio-economic background, youth participation, education, caring responsibilities, access to health services and housing. The results show that the correlation between each domain and the index as a whole varies from a relatively low correlation between access to health services and the overall index of 0.31 to a correlation between outcomes in the participation domain and the index as a whole of 0.92. There was also a high correlation between outcomes in the socio-economic background domain and

participation and housing and participation. These may reflect the role of some underlying factors in creating negative outcomes and raise the possibility of inter-generational transfer of disadvantage with areas of socio-economic disadvantage and poor housing feeding into poor participation outcomes. The results show large differences between the most disadvantaged and least disadvantaged areas. The differences were particularly pronounced for four indicators; the number of teenage births in an area, the proportion of youth neither learning nor earning, access to the internet and to a motor vehicle in the household. The ratio of teenage births to the population in the small areas with the greatest risk of youth social exclusion was over six times the Australian average and the similar ratio for youth in these areas who were neither learning nor earning was five time greater than the Australian average. These two indicators are likely to be connected with young parents opting out of both study and the workforce. The concentration of young parents in particular locations highlights the opportunities to develop programs to keep them engaged in education and employment and to offer opportunities for them to return to education as their children grow up.

The combination in the most disadvantaged areas of relatively large proportions of young people without access to the internet or a motor vehicle may have a significant impact on their ability to access the job market and to be available for work. The internet is now a major source of information about work opportunities and in many casual jobs the ability to respond quickly to employment offers is important. Availability of transport is an important component of availability for work. Lack of internet and vehicle access may limit employment opportunities.

These results are a first step in analysing risk of social exclusion for Australian youth. There are some significant indicators which have not yet been included in the analysis so far such as youth suicide rates, drug and alcohol use, physical and mental health and crime rates. The Census offers limited or no information on these topics. We are exploring the possibility of including data from sources beyond the Census to cover these important aspects of the lives of young Australians. A more up-to-date measure of connectedness than home internet access which includes engagement with social media would also be desirable.

It is significant that many of the small areas that we have identified in past work as being at high risk of social exclusion for children are also the areas of high risk of social exclusion for youth. This partially reflects the use of some common indicators such as household income and the educational background of people in the household but that is not the whole explanation. There remain small areas, particularly in remote areas, where both children and youth face a substantial risk of being excluded from the opportunities offered to the wider Australian community.

6 REFERENCES

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