

PERCEIVED RISKS TO HOUSING UNAFFORDABILITY IN RESOURCE-LED REGIONAL COMMUNITIES: LESSONS FOR AUSTRALIAN REGIONAL CITIES

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ABSTRACT: Periodic housing unaffordability in Australian resource-led regional cities has been continuing over the last two decades, creating pressures on the economic and social life of individuals to communities. This paper examines the perceived household risks to housing unaffordability in resource-led regional communities through a case study of Rockhampton and Gladstone cities in Queensland, Australia. Two hundred households were surveyed from these two cities and a probability based consensus and agreement method was then used to analyse the risks that the community perceived to exist due to housing unaffordability. The study found that economic and social risks and stresses such as extra pressures on household budgets, long commuting time, and difficulty with children's schooling, moving away from friends and relatives and poor health were the most common perceived risks in these two communities. The result of chi-square tests confirmed that perceived risks of housing unaffordability vary over different socio-demographic backgrounds and also that the level of risks vary over types of perceived risks. Although this study is partially skewed towards female and senior participants, these findings provide lessons for similar Australian resource-led regional cities. Policy makers can use the results to address the risks associated with housing unaffordability in these cities.

Key words: Housing stress, economic and social stress, regional cities

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1. INTRODUCTION

Usually housing affordability refers to the relationship between household income and household expenditure on housing costs (Yates *et al.*, 2007; Australian Government, 1991), but in reality the choice of affordable housing is a response to a complex set of economic and social drivers (Burke *et al.*, 2007). Housing affordability in Australian resource-led regional cities is a major issue as it influences people's wellbeing and also impacts on liveability of the regional cities (Akbar *et al.*, 2009; Mckenzie *et al.*, 2009). Declining housing affordability can lead to social exclusion, increased community stress and travel fatigue (Yates *et al.*, 2007).

Housing affordability is not only the individuals' capacity to afford a liveable dwelling, it is also a collective matter for communities where the people can afford to rent or buy a home of their choice. Therefore, an understanding of the impact of housing unaffordability on people's wellbeing requires better conceptualisation of the need for and appropriate ways to address housing affordability issues (Gurran *et al.*, 2007). Basic need theory (Getz and Page, 2016), housing need contextual theory (Suhaida *et al.*, 2011), social housing theory (Milligan *et al.*, 2009; Stone *et al.*, 2011) and dwelling location theory (Guan, 2012) have highlighted the multiple dimensions of housing affordability and their follow-on implications (i.e., impacts of unaffordability) on people's wellbeing. However, an analytical platform capturing people's perceptions towards the impact of housing unaffordability on their wellbeing is yet to be developed. This study fills this gap at the methodological level with empirical evidence of housing unaffordability and its multi-dimensional impacts on resource-led regional cities.

This introduction forms Section One of this paper followed by a literature review, in Section Two, on the dimensions and impact of housing affordability. Section Three describes the research methods used for identifying and examining risks associated with housing affordability. This is followed in Section Four with a description of the study area. Section Five presents the findings and analysis of the study followed by conclusions in Section Six.

2. DIMENSIONS AND IMPACTS OF HOUSING AFFORDABILITY

Housing affordability can be described from four dimensions: economic, social, psychological (i.e., mental) and physical (i.e., environmental) (Kearns *et al.*, 2000; Evans *et al.*, 2003; Gabriel *et al.*, 2005; Berry, 2006; Yates *et al.*, 2007; Mallett *et al.*, 2011). Interactions among these dimensions are very complex. These factors have both positive and negative impacts on the individual and households (Kearns *et al.*, 2000). For illustration, housing affordability has positive impacts on increased employment, productivity, education, community wellbeing, social cohesion and improved health. Conversely housing unaffordability has negative impacts of financial hardship, more travel time to work, additional travel costs, labour market instability, increasing inequity, reducing social cohesions, increasing homelessness, lack of safety, emotional and physical stress (Hopton and Hunt, 1996; Evans *et al.* 2000; Cairney and Boyle, 2004; Taylor *et al.*, 2007; Wright and Kloos, 2007).

The location of housing has significant economic implications for both the employability and functional efficiency of regional labour markets (Berry, 2006; Akbar *et al.*, 2009). The concentration of lower cost rental households in remote or flood prone parts of towns can also lead to spatial isolation (Burke *et al.*, 2007). Living in a low cost house but in a spatially segregated area can increase the severity of housing stress, as the households need to pay additional transport costs for journeys to work and access to basic human services. Similarly, the longer distance of lower income housing to jobs may reduce the ability to secure employment (Gurran *et al.*, 2007). Housing affordability affects both physical and mental health through dwelling quality, location and distance (Somerville *et al.*, 2000; Cairney and Boyle, 2004; Schanzer *et al.*, 2007; Wells and Harris, 2007; Foster *et al.*, 2011; Mallett *et al.*, 2011; Rebecca *et al.*, 2011).

Australian resource-led regional towns have been facing problems of housing affordability over long periods because of commodity boom and bust cycles (Rolfe *et al.*, 2012; Akbar *et al.*, 2013; DSDIP, 2013a). These same cycles make it difficult to encourage new housing developments because of concerns about market downturns. This study explores the perceived risks (i.e. 'implications') of housing unaffordability in the resource and regional towns in Queensland.

3. METHODOLOGY

A case study approach has been undertaken, employing two methods: quantitative analysis of structured questions in household interviews and qualitative analysis of the open-ended questions in the same interviews. This is followed by a review of the housing affordability situation in the cities of Rockhampton and Gladstone. These cities have been selected as the focus of this case study because they are long-term regional cities with a relatively stable workforce. The two cities have many mining servicing and mining raw product processing industries, and most of the workers in these industries are also living in the cities on a permanent or long-term basis. In addition, the cities also support other stable workforce from the agriculture and public services sectors. Thus, the two cities exemplify mining servicing cities in Australian resource rich regions.

The study conducted a household housing affordability survey in Rockhampton and Gladstone in March-April 2015. The sample size for this study was 200 households (i.e. 100 from each of the cities). A computer-assisted telephone interview (CATI) process was used to interview all respondents over a maximum of 15 minutes. Prior to this, a pilot survey was conducted in the beginning of March 2015, in order to select the appropriate questions and test suitability of the survey method and instruments. Households were selected randomly and respondents under the age of 18 or those not in a position to respond to the survey's intent were excluded. Participation was on the basis that respondents were able to respond adequately and voluntarily to the survey questionnaire.

Data analysis was performed by categorising and tabulating evidence to understand the perceived risks of housing affordability in these two cities. A range of techniques were used: descriptive analysis, consensus and agreement analysis for quantitative data analysis and thematic issue analysis for the qualitative data. Under descriptive analysis, the study used a cross-tabulation to analyse the socio-demographic characteristic associated with housing affordability as currently perceived. A Likert scale (an ordinal scale, for example – 1. 'not at all relevant', 2. 'somewhat relevant', 3. 'moderately /relevant', 4. 'very relevant', and 5. 'extremely relevant') was used to capture households' opinions about the risks associated with housing unaffordability in these cities. Consensus and agreement measures were used to examine the relevance of risks associated with housing unaffordability.

Consensus is a measure of the general agreement among the members of a certain group or community i.e., to approximate the average dispersions

among the responses (Tastle and Weirman, 2006). It is a function of shared group feelings towards an issue such as risks associated with housing unaffordability. Tastle and Wierman (2007) estimated the consensus score with the following equation (equation 1).

$$\text{Cns}(x) = 1 + \sum_{i=1}^n p_i \log_2 \left(1 - \frac{|x_i - \mu_x|}{d_x} \right) \quad (1)$$

Here, Cns (X) means consensus of group x, p is the probability associated with the distribution under consideration, i is an index, f_i is frequency and n is the number of categories.

$$\begin{aligned} \mu_x &= \frac{1}{n} \sum_{i=1}^n x_i \\ d_x &= x_{\max} - x_{\min} = 4 \\ p_i &= \frac{f_i}{n} \end{aligned}$$

In addition, an agreement measure, defined as a harmony of opinion or action to a defined level (or target) such as the highest level of relevance (here '5') or lowest level of relevance (here, '1') was used (Tastle and Weirman, 2008) (equation 2). A 'harmony of opinion' does not imply that all respondents convey the identical view.

$$\text{Agr}(x, \tau) = 1 + \sum_{i=1}^n p_i \log_2 \left(1 - \frac{|x_i - \tau|}{2d_x} \right) \quad (2)$$

Here, Agr (x, τ) means agreement of group x with a certain target (defined below), p is the probability associated with the distribution under consideration, i is an index, f_i is frequency and n is the number of categories.

$$\begin{aligned} \tau &= \text{target}(1,2,3,4 \text{ or } 5, \text{ here } \tau = 5), \\ d_x &= x_{\max} - x_{\min} = 4 \\ p_i &= \frac{f_i}{n} \\ 0 &\leq \text{Agr}(x, \tau) \leq 1 \end{aligned}$$

The consensus measure ranges from 0 to 1 or a score of 0 per cent to 100 per cent, with 0 per cent indicating no consensus or targeted agreement with the relevance of the risks of housing unaffordability and 100 per cent indicating complete consensus and targeted agreement, respectively.

In addition, this study used the Chi-square (χ^2) test of independence, also known as Pearson Chi-square test, to determine if there is any relationship between two categorical variables. The formula for calculating chi-square (χ^2) is:

$$\chi^2 = \sum [(o-e)^2/e] \quad (3)$$

which means it is the sum of the squared difference between observed (o) and the expected (e) data, divided by the expected data in two categorical variables. Here five original perceived agreement levels (from 'not at all relevant through to extremely relevant') were converted into two levels (i.e., not-relevant and relevant). This helped preparing in 2X2 tables and also allowed the respondent's agreement towards the perceived risks to be compared across different socio-demographic categories. The study tested the following hypothesis to understand the relationship between socio-demographic variables and perceived risk of housing unaffordability.

Null hypothesis, H_0 : There is no relationship between socio-demographic variables and the perceived risks of housing unaffordability (i.e., independent of each other).

Alternative hypothesis, H_a : There is a relationship between socio-demographic variables and the perceived risks of housing unaffordability (i.e., not independent of each other).

Here we used SPSS software to estimate the significance of the Pearson's Chi-square values, which estimates these values using the asymptotic method by default.

The Chi-square test provides p values and if the calculated p value is less than 0.05, then the null hypothesis is rejected with 95 per cent level of significance, and vice versa. However, a Chi-square test does not depict how close the relationship is (i.e., effect size), however, effect sizes are important in understanding whether the differences are meaningful (Murphy and Myers, 1998). Effect size, generally noted as phi (Φ), can be measured as an amount of impact an independent variable has on a

dependent variable (Murphy and Myors, 1998). Effect sizes are generally reported as small, medium, or large. Here, *phi* (Φ) is defined by:

$$\Phi = \sqrt{\frac{\chi^2}{n}} \quad (4)$$

where n = the number of observations (Murphy and Myors, 1998). This study used the effect size to show how socio-demographic variables are associated with the perceived risk of housing unaffordability.

The survey also contained an open-ended question which asked respondents to indicate whether they have recently experienced any housing related stress or risk. This question generated a large amount of data which was analysed using a qualitative data analysis technique – thematic content analysis. The results of this analysis are presented in terms of key risks associated with housing unaffordability identified by the survey respondents. This qualitative content analysis complements the quantitative analysis.

4. CASE STUDY CITIES: ROCKHAMPTON AND GLADSTONE

Gladstone and Rockhampton cities in central Queensland were historically resource and service providing cities. Gladstone is a port city and also an industrial city for resource processing and Rockhampton is now largely a regional city providing services both to the mining and agricultural communities (Figure 1).

Housing stress takes many forms, from extreme housing stress to modest need for a dwelling, including homelessness, overcrowding, unaffordability or cost-related pressures, stresses associated with poor quality dwellings, stresses arising from a lack of services, or isolation and security of dwellings, stresses arising from poor security of tenure and stresses arising from the appropriateness of a dwelling to the households' needs (DHPW, 2016; Rolfe *et al.*, 2012). The homelessness rate in Rockhampton and Gladstone was 94 and 103 per 10 000 of the population (Chamberlain and Mackenzie, 2009), which is higher than the rate (45.8) for Queensland as a whole; the rate for Australia as a whole is 48.9 per 10 000 of the population (ABS, 2012). In Queensland, 19 831 people were experiencing homelessness, using rough sleeping (8%), supported accommodation for homelessness (19%), boarding houses (19%),

overcrowded dwelling (39%), staying with other households (17%) and other temporary accommodation (1%) (AIHW, 2013).

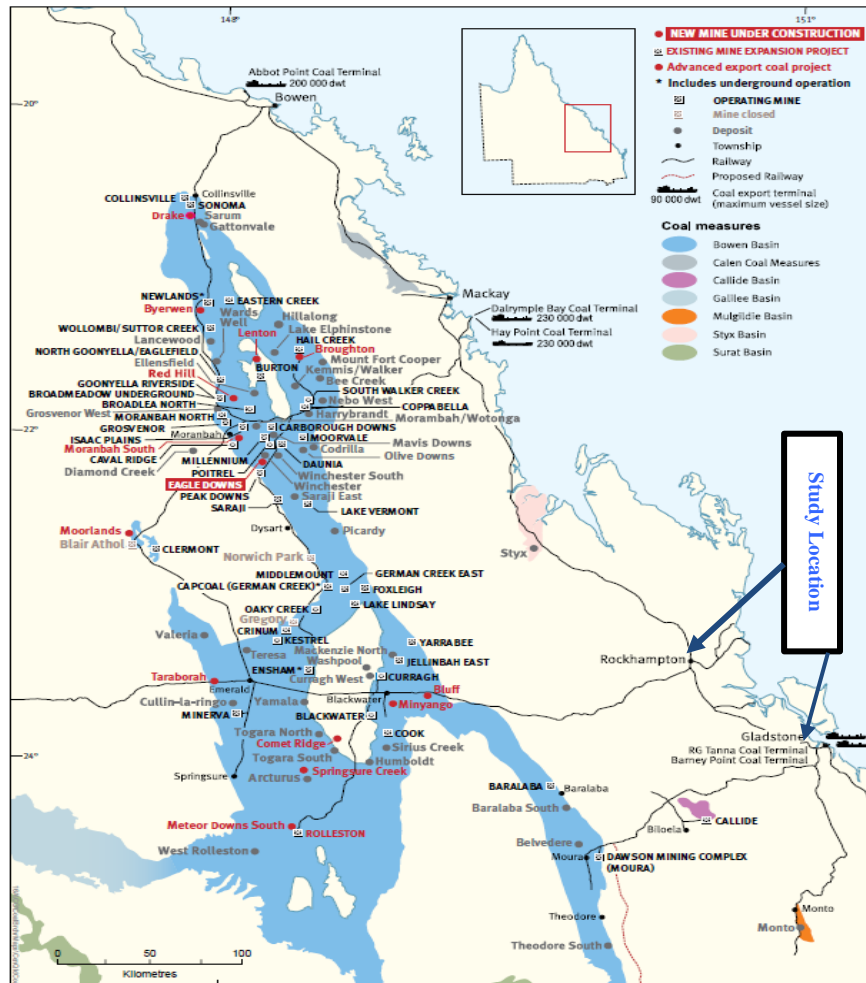


Figure 1. Study Location (Gladstone and Rockhampton cities) in Central Queensland. Source: DNRM 2016, pp.4.

Social and community rental housing has been delivered to eligible tenants through forms of subsidy from government programs—in the Gladstone and Rockhampton Regional Council areas, these include: the

Public Rental Housing Program, the Aboriginal and Torres Strait Islander Rental Housing Program, the Crisis Accommodation Program (CAP), Long Term Community Housing (LTCH), the Same House but Different Landlord Program (SHDL), the Community Managed Housing Studio Units Program (CMSU), the Community Rent Scheme (CRS) and the Employment Related Accommodation Program (ERAP) (DHPW, 2016; Anglicare, 2016; QCOSS, 2011).

The majority of public rental dwellings are owned and managed directly by the Department of Housing and Public Works (DHPW, 2016). Others are owned by the Department but managed by community housing providers and support services (Anglicare 2016; DHPW, 2016). Some community organisations such as Anglicare manage dwellings that are head-leased from the private market, and offered at discounted rents to eligible tenants. Social rental housing programs have also been supplemented by assistance programs funded by the Liquefied Natural Gas project proponents in Gladstone (but not in Rockhampton), and by new rental dwellings constructed under the Australian Government's National Rental Affordability Scheme (NRAS).

In addition to some long-standing programs (as mentioned above) for social and community rental housing, Gladstone residents have access to initiatives taken in the recent housing crisis in 2009-12 because of huge development pressures from the liquefied natural gas (LNG) sector. Gladstone Regional Council (GRC) provided rent assistance with funding provided by the LNG companies (GRC, 2012). In 2012, State Government in partnership with Rockhampton Regional Council (RRC) facilitated mixed land development at Gracemere (an outer suburb of RRC) and Parkhurst to open up some affordable housing plots (DSDIP, 2013b). Pressure from the resource sector has been reducing since 2015 and the rental payment rate has been softened (Anglicare, 2016); however, lower income groups, people with disability, single parents, senior citizens, women and children facing family violence and redundant workers in Rockhampton and Gladstone have been living in a situation of housing unaffordability and stress. Survey findings presented in the next section will provide detailed scenarios of the housing affordability situation and the risks that the residents perceived due to housing unaffordability in these two cities.

5. CASE STUDY FINDINGS AND ANALYSIS

This section describes the case study findings which include Rockhampton and Gladstone residents' socio-demographic characteristics, their perceptions about the current housing affordability and the risks associated with housing unaffordability.

Socio-Demographic Characteristics

Rockhampton and Gladstone are the first and the third largest cities in Central Queensland with a resident population of 110 582 and 60 317 respectively (ABS, 2012). Socio-demographic characteristics of the survey participants are presented below as well as compared with the 2011 census data.

Age, Gender and Parental Status of the Survey Participants

The study included more female than male respondents (Table 1) compared to the gender proportions in the region (i.e., about 51% male and 49% female in 2011 census) (ABS, 2012). Respondents were categorised into six different age groups of which respondents in the 55-64 group were higher (29.5%) compared to other groups; however, this is the fourth highest age group in Gladstone and Rockhampton regions respectively in the 2011 census statistics (ABS 2012). The second highest group of survey participants were respondents above 65 years (28.5%), (Table 2), which is similar to the 2011 census statistics for Rockhampton but it is the fifth highest age group in Gladstone (ABS, 2012). Most of the respondents (more than 88%) had children (Table 3) and 2011 census statistics showed about a similar family pattern i.e., most parents (76%) had children in Rockhampton and Gladstone regions (ABS, 2012).

Table 1. Gender of the Respondents.

Gender	Rockhampton (%)	Gladstone (%)	Overall (%)
Male	34	44	39
Female	66	56	61
Total =	100 (n=100)	100 (n=100)	100 (n=200)

Source: Housing Affordability Survey, 2015.

Table 2. Age Group of the Respondents.

Age group	Rockhampton (%)	Gladstone (%)	Overall (%)
18-24 years old	2	2	2
25-34 years old	5	10	7.5
35-44 years old	14	16	15
45-54 year old	16	19	17.5
55-64 years old	30	29	29.5
65 years and above	33	24	28.5
Total =	100 (n=100)	100 (n=100)	100 (n=200)

Source: Housing Affordability Survey, 2015.

Table 3. Number of Children at Home.

Number of children	Rockhampton (%)	Gladstone (%)	Overall (%)
No child	14	10	12
One child	4	16	10
Two children	32	36	34
Three Children	24	20	22
Four children	14	10	12
More than four children	12	8	10
Total =	100 (n=100)	100 (n=100)	100 (n=200)

Source: Housing Affordability Survey, 2015.

Education, Occupation and Income

The majority of respondents (41%) held a secondary education as the highest level of education, followed by TAFE/vocational education (23.5%), tertiary education (24.5%) and primary education (11%) (Table 4). As all participants were 18 years old and above, these educational groups cannot be easily matched with the 2011 census statistics.

Table 4. Highest Level of Respondent Education.

Level of education	Rockhampton (%)	Gladstone (%)	Overall (%)
Primary Education	15	7	11.0
Secondary Education	43	39	41.0
Certificate Level	12	17	14.5
Advanced Diploma And Diploma Level	10	8	9.0
Bachelor Degree Level	14	20	17.0
Graduate Diploma And Graduate Certificate Level	3	2	2.5
Postgraduate Degree Level	3	7	5.0
Total =	100 (n=100)	100 (n=100)	100 (n=200)

Source: Housing Affordability Survey, 2015.

About one-third of respondents were retired while about 56 per cent of the respondents worked full time or part-time, and rest of the respondents are either full time home makers or students or looking for job (Table 5). In the 2011 census, on an average 60 per cent of the total labour force either had full or part-time jobs in Rockhampton and Gladstone regions (ABS 2012), which is very similar to that of the survey proportions.

Table 5. Respondents' Employment Status.

Occupation type	Rockhampton (%)	Gladstone (%)	Overall (%)
Working Full time	23	37	30.0
Working Part time	16	13	14.5
Retired	36	29	32.5
Home Maker	8	8	8.0
Student	2	1	1.5
Looking For work	2	9	5.5
Other	13	3	8.0
Total =	100 (n=100)	100 (n=100)	100 (n=200)

Source: Housing Affordability Survey, 2015.

When the residents were asked about their household income, about one quarter (24.5%) of the families had a weekly income of less than \$475. ABS (2013) defined this income group as low income families and the survey proportion is very similar (i.e., 20.0% in Gladstone and 24.3% in Rockhampton) to the 2011 census statistics (included in this income group are nil or negative income, partial income and all income not stated groups) (ABS, 2012). Housing affordability is a serious issue within this income group in Gladstone and Rockhampton (Rolfe *et al.*, 2012). On the other hand, a large proportion (20%) of the respondents, in particular, 29 per cent in Gladstone were in the high income bracket (Table 6), which is above the national average.

Table 6. Weekly Household Income of the Respondents.

Income group	Rockhampton (%)	Gladstone (%)	Overall (%)
Less than \$475	26	23	24.5
Between \$476 and \$800	33	16	24.5
\$800 to \$1000	18	18	18.0
\$1000 to \$1200	8	7	7.5
\$1200 to \$1400	4	7	5.5
\$1400+	11	29	20.0
Total =	100 (n=100)	100 (n=100)	100 (n=200)

Source: Housing Affordability Survey, 2015.

Living in the Cities

When the residents were asked about how long they had lived in their cities, about 13 per cent of them had lived for five years or less but the majority (51.1%) had lived for 20 or more years (Table 7). Thus, respondents' needs and perceptions about their housing affordability may vary over time, which has not been captured in this study. The majority (79%) of respondents were living in a self- or partner-owned property while 21 per cent were renting or sub-leasing their dwellings (Table 8). In the 2011 census, the majority of the residents (about 68%) also had similar types of home ownership in the Rockhampton and Gladstone regions (ABS, 2012).

Table 7. Length of Stay

Age group	Rockhampton (%)	Gladstone (%)	Overall (%)
Up to 5 years	11	15	13.0
5 to 10 years	14	10	12.0
10 to 15 years	13	14	13.5
15 to 20 years	11	11	11.0
20 to 25 years	6	6	6.6
More than 25 years	45	44	44.5
Total =	100 (n=100)	100 (n=100)	100 (n=200)

Source: Housing Affordability Survey, 2015

Table 8. Resident Tenancy Arrangement.

Tenancy type	Rockhampton (%)	Gladstone (%)	Overall (%)
Own a house	78	76	77.0
Own an apartment/ duplex/ townhouse	1	3	2.0
Renting a house	14	11	12.5
Own an apartment/ duplex/ townhouse/ mobile home	4	5	4.5
Living rent free in a home owned by a friend or relative	2	3	2.5
Sub-Leasing space from a friend or relative	1	1	1.0
Total =	100 (n=100)	100 (n=100)	100 (n=200)

Source: Housing Affordability Survey, 2015.

The survey respondents may be overrepresented by senior citizens and women in the region, which is one of the limitations of this study; however, other socio-demographics such as family type, employment status, household income and tenancy types have broad correspondence between the survey participants and the overall residents' status enumerated in the 2011 census.

Housing Affordability

When residents were asked about the perceived affordability of their monthly mortgage or rent, most (50.5%) indicated a desire to pay less than

\$750 per month (i.e. less than \$188 per week) (Table 9), which is just below the one-third weekly family income of the people belonging to the low income group (i.e., the families had a weekly income of less than \$475). However, low income respondents are 24.5 per cent of the total respondents (Table 6) compared to the 50.5 per cent of the total respondents that would like to pay mortgage or rent less than \$188 per week. Therefore not only the low income families but also the respondents from other income groups would like to pay mortgage less than \$188 per week, perhaps because of other pressures on household expenditure. Comparing this to their level of affordability (Table 10), 33.5 per cent of respondents could afford their rent or mortgage completely whilst others either could not afford completely or did not answer this question. Thus, responses to both questions (Tables 9 and 10) confirmed that low income people could not afford current monthly rental or mortgage payments.

The study also cross-examined levels of affordability (Table 10) with perceived mortgage or rental payment (Table 9) in Table 11. Here, 52.4 per cent respondents were able to afford their rent or mortgage payment completely, slightly higher than previous figures given (Table 11). Only those who provided a complete response to this question (Table 10) were recorded. Again a large group of respondents (47.6%) did not find themselves in an affordable situation when buying or renting a dwelling unit (Table 11). Therefore, housing affordability is a key issue in this region.

Table 9. Perceived Affordability of Monthly Mortgage or Rental Payment by the Respondents.

Payment group	Rockhampton (%)	Gladstone (%)	Overall (%)
Under \$650	41	39	40.0
\$650 to \$750	10	11	10.5
\$750 to \$850	13	8	10.5
\$850 to \$950	7	10	8.5
\$950 or More	21	27	24.5
Dont know/Not sure	8	5	6.5
Total =	100 (n=100)	100 (n=100)	100 (n=200)

Source: Housing Affordability Survey, 2015.

Table 10. Affordability of the Current Mortgage or Rental Payment by the Respondents.

Level of affordability	Rockhampton (%)	Gladstone (%)	Overall (%)
Not affordable at all	1	3	2.0
Slightly affordable	6	2	4.0
Moderately affordable	10	13	11.5
Mostly affordable	10	15	12.5
Completely affordable	33	34	33.5
Not applicable	40	33	36.5
Total =	100 (n=100)	100 (n=100)	100 (n=200)

Source: Housing Affordability Survey, 2015.

Table 11. Affordability vs Perceived Mortgage or Rental Payment by the Respondents.

Level of affordability	Under \$650	\$650 to \$750	\$750 to \$850	\$850 to \$950	\$950 or More	Total
Not affordable at all	1.6%	0.8%	0.0%	0.0%	0.8%	3.2%
Slightly affordable	3.2%	0.8%	0.8%	0.0%	1.6%	6.3%
Moderately affordable	6.3%	1.6%	4.0%	2.4%	4.0%	18.3%
Mostly affordable	7.1%	3.2%	0.8%	2.4%	6.3%	19.8%
Completely affordable	19.0%	6.3%	6.3%	4.8%	15.9%	52.4%
Total =	37.3%	12.7%	11.9%	9.5%	28.6%	100.0%
n =	47	16	15	12	36	126

Source: Housing Affordability Survey, 2015.

Perceived Household risks to Housing Unaffordability

The study found economic and social risks and stresses such as extra pressures on household budgets, reduction in disposable income, difficulty with children’s schooling, strain in family relations and poor health condition are more relevant risks compared to the risks such as requirements to move to distant places and inaccessibility to transport (Table 12). Gladstone respondents identify more highly with risks of commuting and travel than respondents from Rockhampton (Table 12).

Table 12. Perceived Household Risks to Housing Unaffordability – Consensus and Agreement Score.

Types of risks	Rockhampton		Gladstone		Average	
	Consensus	Agreement	Consensus	Agreement	Consensus	Agreement
Households move to remoter/distance locations to find cheaper housing.	42.4	65.5	52.7	69.6	47.5	67.6
Increase in length of commuting (such travel to work/school/shop)	50.1	71.3	58.7	76.7	54.1	74.0
Extra pressures on household budgets (such as spending more on fuel or transport)	62.4	77.9	58.8	70.9	60.0	74.3
Increases in homelessness and overcrowding.	55.6	64.6	64.3	70.5	59.6	67.6
<i>High mobility rate resulting in inability to integrate into community</i>	65.4	55.9	59.7	64.2	61.1	60.1
Effect on children's schooling	59.4	75.5	67.3	75.8	63.3	75.7
Reductions in disposable income (i.e., income after taxes)	68.2	75.3	60.9	71.5	64.0	73.4
Strain family relations	65.3	87.1	61.2	81.1	62.6	84.1
Affect health outcomes	69.7	82.8	64.7	82.7	67.2	82.7
Loss of home for those with high levels of debt	49.9	58.3	50.3	66.3	49.1	62.3
Average =	58.9	71.4	59.9	72.9	58.9	72.2

Note: Shaded numeric score refers to higher level of consensus or agreement than that of average level.

These findings (Table 12) are also supported by the qualitative responses that we found in this study (Box 1 and Table 13), where the majority (between 69.2% and 80%) of respondents identified the economic and social risks that they might experience because of an unaffordable housing

situation. However some of the respondents mentioned (Box 1) that they are currently having some psychological or mental health problems as they are away from their children and friends because they could not afford their housing needs in the same location.

Box 1: Respondent's narratives to the perceived household risks to housing unaffordability

Economic stress – “The effect of the community costs makes the prices rise. The industry in the area has put the cost of living in the area through the roof. So that for anyone who is on a basic wage it's making it unaffordable to live here. I have been lucky that I own my own house, but the cost of living in Gladstone is ridiculous.”

Economic stress – “Our house was way overpriced when we bought it, because of a boom that happened here. We had been kicked out of our rental place because the owner wanted to charge more rent without telling us. So we were forced to buy a home at the peak time. And now it's a loss of like \$100,000.”

Economic stress – “My wife passed away and that cut the payroll down and I sold my house to my daughter and now I bought a caravan which I take out on deployment.”

Social and psychological stress – “My world collapsed three years ago. I moved to this neighbourhood and my friends are no longer with me. I find myself here as a very lonely and unhappy person. I am doing my best to do voluntary work. I want to go to the Geological group to make new friends. I believe a lot of this is family stuff but I don't know if it is what I want or not.”

Social and psychological stress – “I've been divorced and I've been left with three big boys that I've got to feed and I've still got to pay maintenance and it's all about trying to keep the household together, there's a lot of things and I'm worried about job security, so there are a lot of factors about trying to keep affordability in line.”

Geographic and Social – “I live in Gladstone and it's a very hard place to live for a family. My partner has to work thirteen days in a row and ten hours a day, which means I then get one grumpy partner. There is nothing for the school kids to do in this town. I don't let my kids out because we have a high rate of violence, teen drinking, drugs and fighting.”

Table 13. Thematic Content Analysis: Risks Faced by the Residents.

Type of risks	Rockhampton	Gladstone
Economic	26.9%	32.0%
Social	42.3%	48.0%
Physical/environmental	26.9%	12.0%
Psychological	3.8%	8.0%
Total =	100.0%	100.0%

Source: Housing Affordability Survey, 2015.

Relationship between Socio-Demographic Status and the Perceived Risks

Analysing relationships between socio-demographic variables and the perceived risk of housing unaffordability is important based on the premise that the level of impacts (i.e., risk) vary over socio-demographic backgrounds (Bujang *et al.*, 2010). As mentioned earlier, Pearson Chi-Square tests have been carried out to test the relationship between six socio-demographic variables (i.e., age, gender, number of children, education, employment status and household income) of 200 respondents and their ten perceived risks of housing unaffordability. Table 14 shows the results from Pearson's Chi-Square analysis, reporting factors identified as having significant relationships and also presenting the size and magnitude of the relationship.

This study did not find any significant relationship of education and employment status with any of the ten perceived risks of housing affordability identified earlier in this paper. However, four of the socio-demographic variables (i.e., age, gender, number of children and household income) have significant relationships with six perceived risks (i.e., move to remoter/distance locations to find cheaper housing, extra pressures on household budgets such as spending more on fuel or transport, effect on children's schooling, reductions in disposable income i.e., income after taxes, affecting health outcomes and increase in length of commuting such as travel to work/school/shop) (Table 14). For illustration, there is a significant relationship between age group and the households move to a distant location; here the older age people feel more vulnerable if their family members or relatives move to a distant location. Similarly this study also found there are significant differences between low and high income groups in terms of the length of commuting. Effect size is also identified

as small to moderate, which means there are significant perceived risks of housing unaffordability in these two communities but at a moderate level.

Table 14. Pearson Chi-Square Tests Results (computed only for a 2x2 table).

Cross tabulation Variables	Value	Degrees of freedom (df)	Asymptotic Significance (2-sided)	phi (Φ) (Effect Size)	Magnitude of Effect Size
Age Vs. Households move to remoter/ distance locations to find cheaper housing	5.394	1	0.020	0.164	Small to moderate
Age Vs. Extra pressures on household budgets	8.758	1	0.003	0.209	Small to moderate
Age Vs. Effect on children’s schooling	6.828	1	0.009	0.185	Small to moderate
Age Vs. Reductions in disposable income	4.568	1	0.033	0.151	Small to moderate
Number of children Vs. Extra pressures on household budgets	4.424	1	0.035	0.149	Small to moderate
Number of children Vs. Effect on children’s schooling	4.225	1	0.040	-0.145	Small
Gender Vs. Affect health outcomes	4.540	1	0.033	0.151	Small to moderate
Income Vs. Increase in length of commuting	4.104	1	0.043	-0.143	Small

Source: the Authors.

From the above discussion it appears that the traditional financial risk of being in an unaffordable housing situation is identified in the resource-led regional cities in Queensland. This is similar to many other Australian resource regions’ risks towards housing unaffordability. However, social risks such as moving to a distant place and long commuting time, which can cause loss of social cohesion, family disintegration, and loss of social and family identities are the most important risks perceived by the survey respondents.

6. CONCLUSIONS

Housing affordability and households' perceived risks associated with housing affordability in the two case study cities of Rockhampton and Gladstone in Central Queensland region have been examined. The study found that the lower income residents could not afford their current monthly rental or mortgage payment. In addition, some middle income residents were experiencing difficulties in paying higher rent or mortgage payments. Therefore, this might reasonably establish the fact that about half of respondents in Rockhampton and Gladstone did not perceive themselves in an affordable situation when buying or renting a dwelling unit or house and, therefore, housing affordability is a key concern in this region.

Economic and social risks and stresses such as extra pressures on household budgets, reduction in disposable income, difficulty with children's schooling, strain in family relations and poor health condition are more relevant risks, compared to the risks such as the requirement to move to distant places or inaccessibility to transport. However, caution is required in using the findings from the qualitative open-ended questions as only about 40 per cent of respondents answered these questions and most were seniors identifying the financial and social problems or risks that they were currently facing.

The result of the chi-square tests show that there are relationships between respondents' socio-demographic background and the perceived risks of housing unaffordability. It also identified that the level of risks vary over various socio-demographic groups.

This study has some limitations, such as the respondent participation rate and a skew towards females and seniors. However family type, employment status, household income and tenancy types have some similarities between the survey participants and the overall residents' socio-demographic status enumerated in the 2011 census. These findings can be lessons for similar cities in the resource rich regions in Australia. Policy makers can use the results to address the risks associated with housing unaffordability.

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